

InteliDrive DCU Industrial

Expandable engine controller

SW version 3.4.1

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1 Document information

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1.1 Clarification of notation

Note: This type of paragraph calls readers attention to a notice or related theme.

IMPORTANT: This type of paragraph highlights a procedure, adjustment etc., which can cause a damage or improper function of the equipment if not performed correctly and may not be clear at first sight.

Example: This type of paragraph contains information that is used to illustrate how a specific function works.

1.2 About this guide

InteliDrive DCU Industrial is a specialized engine controller for Industrial applications. It controls, monitors and protects the engine in single or variable speed operational modes. The controller can communicate with Engine Management System via the CAN serial line using standard J1939 or another (KWP2000) communication protocol.

InteliDrive controllers are equipped with a monochromatic graphic display with icons, symbols and bar-graphs for intuitive operation, which together with high functionality sets new standards in engine controls.

► Engine functions

- Engine sequencing and control (start/stop, warm-up and cool-down, pre-lubrication etc.)
- Engine monitoring and protections (2 or more level analog inputs protection, adjustable delays)
- Speed measurement from magnetic pick-up or from ECU
- Running hours meter, number of starts counter
- Configurable 14 Binary inputs and Outputs and 8 Analog inputs
- Setpoints are adjustable via InteliDrive panel or via PC software
- 3 level password protection
- On screen Alarm and ECU Alarm indication
- Event and time driven engine history for back tracing
- Two or more languages selectable in controller

► Communication

- RS232 / Modbus RTU
- Analog or GSM modem
- Internet

- Engines with Engine Electronic Control Unit: J1939, J1587, KWP2000
- Extension units for more I/O and Remote Display panel.

► **Physical**

- 180x120 mm front panel mounted case
- Graphic back-lit LCD display 128x64 pixel resolution with icons and bar graphs
- LED status indicators / Lamp test

1.3 Legal notice

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1.4 Document history

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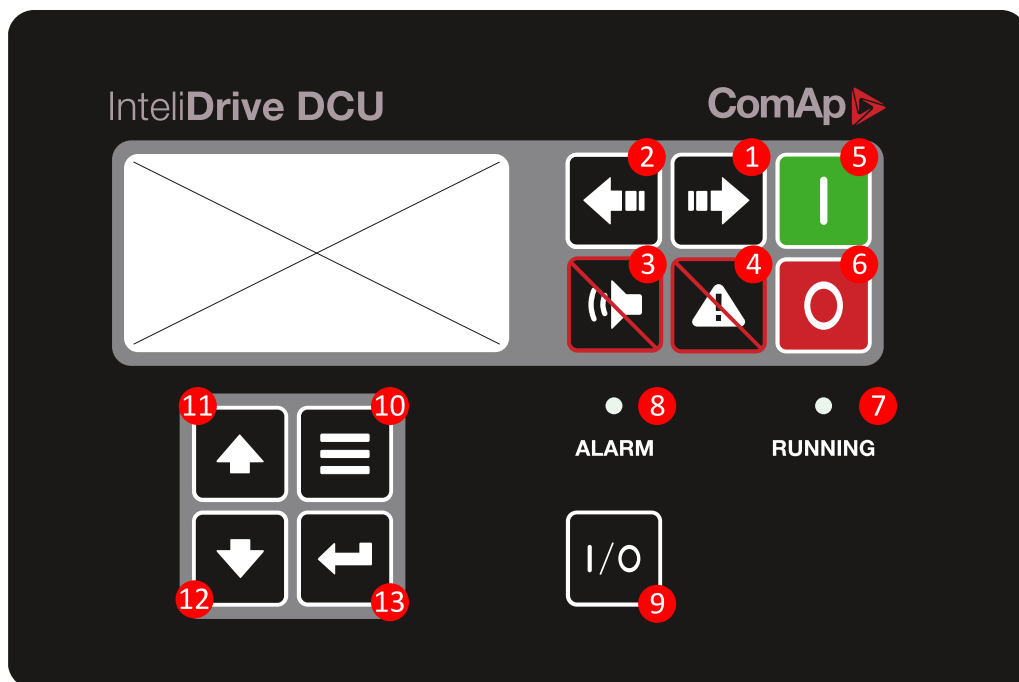
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2 System overview










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2.1 Operator Interface



1		Cycle forward through engine operation modes: OFF-RUN .
2		Cycle backward through engine operation modes: OFF-RUN .
3		Deactivates the HORN.
4		Acknowledges faults and alarms.

5		Starts the engine in OFF-RUN . mode.
6		Stops the engine in OFF-RUN . mode (hold time =1 sec).
7		GREEN = Engine running.
8		RED (blink) = Alarm list contains not confirmed alarm. RED (lit) = Alarm list contains confirmed alarm.
9		Button for Close load or Clutch Binary output control.
10		Cycles through the display screens MEASUREMENT->ADJUSTEMENT->HISTORY.
11		Select the set point, select the screen or increase set point value.
12		Select the set point, select the screen or decrease set point value.
13		Confirm set point value.

Note:

Stop button hold time is 0.5 sec. to avoid unwanted engine stop.

The 2nd (0.5 sec) push of the **Stop** button cancels the 'cooling state' of the engine and stops the engine immediately. To avoid the cancel of the 'cooling state' by the 2nd push of the **Stop** button, use LBI card of the DriveConfig tool and make the association of **Access Lock** to the **Cooling** logical binary output of the 'Source' column. It causes locking of the front panel buttons during the Cooling state.

2.1.1 Controller screens

There are three screen groups available on ID controller: Measuring – Setpoints – History.

Measuring screen will be divided to more groups – ID-DCU Industrial, BIN/BOUT, AIN.

Measuring (instruments) screens

Screen	Content
Hidden, but available by Key combination, see Functions available from ID-DCU Industrial front panel keys (page 16)	
	Info screen: Fw and App. version, s.n., .. Language list and switch.
	Language screen
	Fast edit screen
Available using ↑ or ↓ front panel keys	
	ECU diagnostics code list
	Alarm list
1 = Main screen	ID Mode, RPM1, Engine state, Oil Pressure and Coolant temperature (alternatively Aftertreatment values) Indication: LOC (Local), Alarm (in AL or ECU list), R Remote data connection active, L Access Lock
2	Analog 1 to Analog 4 , 4x single bargraph
3	Analog 5 to Analog 8 , 4x single bargraph (if they are configured)
4	Battery ID-DCU Industrial, bargraph, Engine Cylinders statistic temperatures, Engine states timer
5	ID-DCU Industrial BI 1 to 7
6	ID-DCU Industrial BI 8 to 14
7	ID-DCU Industrial BO 1 to 7
8	ID-DCU Industrial BO 8 to 14
9	Statistics: Run hours, Number of starts, Service time
10	GPS speed (value is shared from other devices)
Following screens appears depend on configuration	
Opt	Analog 1 to Analog 8, Name- value dimension, active alarm is negative (1x IS-AIN8(TC) or Inteli AIN8(TC))
Opt	IS-BIN BI indication 1 to 8
Opt	IS-BIN BI indication 9 to 16
Opt	IS-BIN BO indication 1 to 8
Opt	ECU values I.
Opt	ECU values II.

Setpoints screens correspond with Setpoint table above.

Alarm indication

Possible Alarm list and History record prefixes

Prefix	Meaning
Wm	Warning
Sd	Shutdown
Cd	Cooldown
Bw	Broken wire
Fls	Sensor fail

Three state Alarm list indication

* Wrn Water temp	Active not accepted alarm
Wrn Water temp	Active accepted alarm
* Wm Water temp	Inactive not accepted alarm
	Inactive accepted alarm

ECU Alarm list - SPN/FMI codes screen

E	n	g	O	i	I	P	r	e	s	s									W	R	N					
B	o	o	s	t	P	r	e	s	s											F	L	S				
E	n	g	O	i	I	T	e	m	p											W	R	N				
6	2	9																		F	L	S				
>	E	n	g	C	o	o	I	T	e	m	p									F	L	S				
S	P	1	1	0				O	C	7				F	M	3					E	1	0			

- SP SPN number (Suspect Parameter Number) is a particular code for each fault
- OC OC number (Occurrence Count) is ECU internal counter for each combination of SPN and FMI
- FM FMI number (Failure Mode Identifier) is a particular code for each cause of fault
- E Module index of ECU module, which transmits a fault

Info screen

Info	Comment
InteliDrive	Product type
ComAp 2019	Company name, year of release
ID	Controller type
Serial: 0200FFFF	Controller serial number
Sw ver: 3.4.1	Software version
Appl: SS	Application
Branch: DCU Industrial	Firmware branch

Statistic values

		It is calculated:
1	Run Hours	Each finished 60 minutes when engine is running.
2	NumSuccStarts	Each successful start (starter is switched off due to RPM> Starting RPM) is calculated. Each external (manual) engine start.
3	NumUnscStarts	Each finished unsuccessful cranking - MaxCrank time is over and engine is not started.
4	Service Time	It is decreased each finished 60 minutes when engine is running.
5	DayCons	Daily fuel consumption, every liter of fuel is calculated.
6	TripCons	Trip fuel consumption, every liter of fuel is calculated.
7	Memo1	Each time rising edge is detected with LBI: Memo1 Trigger
8	Memo2	Each time rising edge is detected with LBI: Memo2 Trigger
9	MomAvgFICon L	Momentary average fuel consumption per nautical mile. Calculated from fuel consumption and boat speed. Result is not rounded, e.g. 9/100 is displayed as 0,0 If FuelConsumpt is 0 then MomAvgFICon L is displayed as invalid value #####.

Note: Statistic values can be adjusted from IntelliMonitor, password 3 level protected by default.

Note: Internal display does not support Unsigned Long values so it does not display correctly values higher than 2,147,483,647. Could be roughly says that issue is connected with values having 10 digits and more. If there is higher value, it treats it as Signed long and show it as negative with "-" (minus sign). Workaround: If numbers with 10 digits has unlogically minus mark number should be recalculated.

History records

Following table does not contain Wm, Sd and FIs messages from external units.

Events specification	Protection type	Information available on binary output
Alarms		
Wm Analog input 1 to 8	WRN	YES
Sd Analog input 1 to 8	SD	YES
ID-DCU Industrial Binary input 1 to 14	Configurable	YES
ID-DCU Industrial Battery voltage <, >	WRN	YES
Wm SHBIN 1 to 6	WRN	
Sd SHBIN 1 to 6	SD	
Wm DISTBIN 1 to 32	WRN	
Sd DISTBIN 1 to 32	SD	
Wm SHAIN 1 to 4	WRN	
Sd SHAIN 1 to 4	SD	
Wm CommError(1) to (10)	WRN	

Sd CommError(1) to (10)	SD	
Wm DETCON	WRN	
Sd DETCON	SD	
Wm SCM Fail	WRN	
Sd SCM Fail	SD	
Start fail	WRN	YES
ParamFail	NONE	
Overspeed	SD	YES
Underspeed	WRN	YES
EmergencyStop	SD	
Pickup fail	WRN	
Stop fail	WRN	YES
WmServiceTime	WRN	
ChrgAlternFail	WRN	YES
Fault reset		
LOC mode ON		YES
LOC mode OFF		
Harbour mode ON		YES
Harbour mode OFF		
SecBattery		YES
ID-RPU Sd1 Broken wire	WRN	
ID-RPU Sd2 Broken wire	WRN	
ID-RPU Sd3 Broken wire	WRN	
ID-RPU Sd4 Broken wire	WRN	
ID-RPU Sd5 Broken wire	WRN	
ID-RPU Stop sol.Broken wire	WRN	
ID-RPU Fuel sol.Broken wire	WRN	
Wm RPM diff	WRN	YES

Engine events	Note
Starts	
Button start	Start from ID-DCU Industrial panel
CAN control + Button start	Start from ID-DCU Industrial
RS232 control + Button start	Start from InteliMonitor
Remote start	ID-DCU Industrial binary input
RemRepStart	ID-DCU Industrial binary input
Blackout start	ID-DCU Industrial binary input
Button start	ID-DCU Industrial panel button

Extern Start	External engine start
Stops	
Engine stop	Stop from ID-DCU Industrial panel or BI
CAN control + Engine stop	Stop from ID-DCU Industrial
RS232 control + Engine stop	Stop from IntelliMonitor
Stop button	ID-DCU Industrial panel button
Other Events	
Fault reset	ID-DCU Industrial panel button
LOC mode ON	ID-DCU Industrial panel button
LOC mode OFF	ID-DCU Industrial panel button
HRB mode ON	ID-DCU Industrial panel button
HRB mode OFF	ID-DCU Industrial panel button
RS232 control	Start, Stop, Fault reset, I/O button from IntelliMonitor or ID-DCU Industrial
RS485 control	Start, Stop, Fault reset, I/O button from IntelliMonitor or ID-DCU Industrial
Modem control	Start, Stop, Fault reset, On/Off from Modem
SMS control	Received command from GSM modem
CAN control	Received command via CAN bus e.g. from ID-DCU Industrial or IG-IB/IB-NT
ActCallCH1-OK	Successful active call on channel 1
ActCallCH2-OK	Successful active call on channel 2
ActCallCH3-OK	Successful active call on channel 3
ActCallCH1Fail	Failure of active call on channel 1
ActCallCH2Fail	Failure of active call on channel 2
ActCallCH3Fail	Failure of active call on channel 3
Extern start	Manual engine starter handling.
Engine stop	Engine changed state from
Emerg.man ON	Emergency manual mode ON
Emerg.man OFF	Emergency manual mode OFF
Clutch ON	Binary output clutch was closed
Clutch OFF	Binary output clutch was opened
Switched on	Controller was switched on
Cfg loaded	Configuration archive was changed
FwLoaded	Firmware upgrade
Time stamp	Depends on setpoint setting period
Password set	Any level from any terminal
Password changed	Any level from any terminal

Access set	Access code was set
Access changed	Access code was changed
Watchdog	Controller internal watchdog protection
Param fail	Setpoints checksum fail
RTC battery	RTC battery fail
System	Controller system related record
TimeModeChange	Winter/Summer time change
Overload	Engine overload
OthrCommEr	Intercontroller communication error
Battery Flat	Controller reset during cranking
OP RPMdep	Out of Oil pressure RPM dependent limit indication
CP RPMdep	Out of Cooling pressure RPM dependent limit indication
Close Load ON	Close Load output is closed
Close Load OFF	Close Load output is opened
SdOverride ON	Sd Override function activated
SdOverride OFF	Sd Override function deactivated

Note: Value name can't exceed 11 characters to be recorded to History file with prefix (Wm, Fls etc.). Longer names characters are canceled.

Corresponding Sd BINx, Sd BOUTx or Sd AINx is indicated in Alarm list and history record when communication with any extension units (IS-BIN, IS-AIN, IGS-PTM) is interrupted.

Example: When IS-BIN16/8 is configured for addresses: Binary inputs = BIN1, BIN2 and Binary outputs = BOUT1, then three messages Sd BIN1, Sd BIN2, Sd BOUT1 are indicated after communication is interrupted.

Note: Any "State" information can be configured to any binary output by DriveConfig software.

2.1.2 Display menu

There are 4 display menus available: MEASUREMENT, External measurement, ADJUSTMENT and HISTORY.

Each menu consists of several screens. Pressing the **Page** button repeatedly will scroll the user through the menu screens.

2.1.3 Functions available from ID-DCU Industrial front panel keys

Function	Key combination	From where
Contrast increase	Enter + ↑	Main screen
Contrast decrease	Enter + ↓	
Info screen	Enter + Page	
LOC (Local) mode ON	Enter + Mode→ (Right)	
LOC (Local) mode OFF	Enter + ←Mode (Left)	
Fast edit	Enter hold for 4 sec.	
Fault code reset	Fault reset	Alarm list
ECU fault code reset	Fault reset	ECU Alarm list
Requested speed increase	↑	Fast edit screen
Requested speed decrease	↓	
Request confirmation and exit	Enter active when Engine params: EnLocalSpeed = ENABLED	
Exit without confirmation	Page	
Exit without confirmation	Page	
Backlight increase	Enter + ↑	Info screen
Backlight decrease	Enter + ↓	
Go to Language screen	Page	
Info screen exit	Automatic after 10 sec to Main screen	
Language selection	↑ or ↓	Language screen
Language screen exit	Enter	

► The system supports following character sets:

- West European - Code page 1252 in Windows
- East European - Code page 1250 in Windows
- Russian - Code page 1251 in Windows
- Turkish - Code page 1254 in Windows
- Simplified Chinese - Code page 936 in Windows.

Note: If the configuration table has a code page that is not supported in the display processor, “Unsupported code page” message appears on the ID-DCU Industrial screen. Press **Page** to return back to Language selection.

Note: The Fast Edit function is available only in case of accessible parameter, i.e. if entered password level on ID-DCU Industrial corresponds to protected level of parameter associated to Fast Edit function.

2.1.4 How to change controller language?

Go to Info screen by pressing **Page** + **Enter**. Press **Page** to go to Language screen. Select language **↑** or **↓** a press Page to confirm selection and exit window.

2.1.5 How to change the display backlight intensity?

Press **Enter** and **↑** or **↓** at the same time to adjust the best display backlight.

Note: Only in INFO screen.

2.1.6 How to change the display contrast?

Press **Enter** and **↑** or **↓** at the same time to adjust the best display contrast.

Note: Only in MEASUREMENT menu.

2.1.7 How to check the serial number and software revision?

Hold down the **Enter** and the press **Page**. On the display you can see Controller INFO screen for 10 seconds:

Controller name	(see Basic Settings group)
Controller serial number	(8 characters number)
SW version	Standard numbering in format M.N.P.B
Application	SS/AS
Branch	DCU-Industrial

Note: Only in MEASUREMENT screen.

2.1.8 How to find active alarms?

Active alarm list and J1939 alarm list are the last two screens in the MEASUREMENT menu.

Select MEASUREMENT menu. Press **↑** and you will see the list of all active alarms with the number of alarms at the top-right corner. Inverted alarms are still active. Non-inverted alarms are not active, but not yet confirmed.

Press **Fault reset** accepts alarms of active (visible screen). Non-active alarms immediately disappear from the list.

Active alarm list appears on the screen when a new alarm comes up and Main MEASUREMENT screen is active.

Note:

Alarm list does not activate when you are reviewing the values, parameters or history.

The Fault reset button is inactive when controller screen is switched to any other than Alarm list or ECU Alarm list.

2.1.9 How to select engine mode?

Use **Mode →** or **Mode ←** to select requested engine operation mode.

Note: Switching to **OFF** mode is blocked on running engine as well as the automatic switching prior to controller programming.

2.1.10 How to view and edit setpoints?

1. Pressing the **Page** button repeatedly will scroll the user through the menu screens. Select the ADJUSTMENT screen.
2. Use **↑** or **↓** to select requested set points group.
3. Press **Enter** to confirm.
4. Use **↑** or **↓** to select requested set point.
5. Set points marked “*” are password protected.
6. Press **Enter** to edit.
7. Use **↑** or **↓** to modify the set point. When **↑** or **↓** is pressed for 2 sec, auto repeat function is activated.
8. Press **Enter** to confirm or **Page** to leave without change.
9. Press **Page** to leave selected set points group.

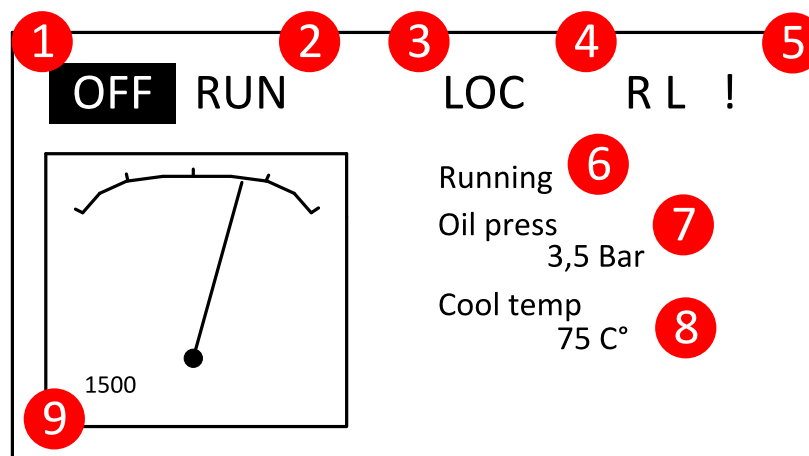
2.1.11 How to view measured data?

Pressing the **Page** button repeatedly will scroll the user through the menu screens. Select the MEASUREMENT screen. Use **↑** and **↓** to select the screen with requested data.

2.1.12 How to view the History menu?

1. Pressing the **Page** button repeatedly will scroll the user through the menu screens. Select the HISTORY screen.
2. Use **↑** or **↓** to select a requested record.
3. Use **Enter** to select requested screen (record items) within displayed records

2.1.13 Main screen indication



1	Active controller mode (inverse)
2	Available mode
3	Controller LOC (Local) mode indication

4	R = Remote connection indication (connection to IntelliMonitor is active) L = Access lock indication
5	Record in Alarm list
6	State machine indication
7	Oil Pressure (MainScrAna1) indication
8	Coolant Temperature (MainScrAna2) indication
9	RPM indication

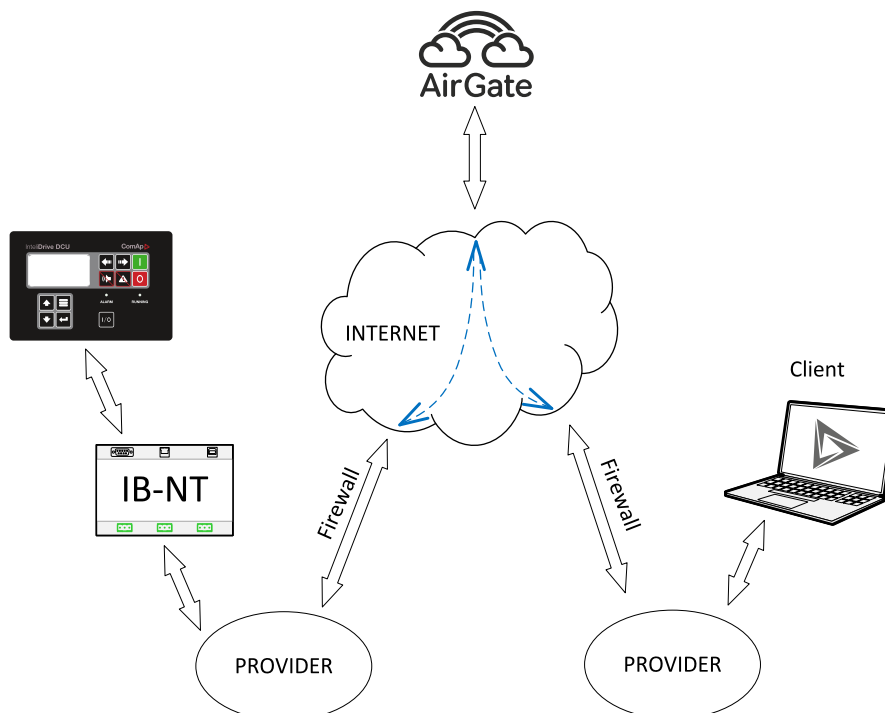
2.2 Controller configuration and monitoring

InteliDrive Install Suite is pack contains separate PC software tools related to ComAp products. The main components are: DriveConfig (DC), IntelliMonitor (IMON) and InteliDDE server.

DriveConfig and IntelliMonitor is based on Windows Vista/Win7/Win8 or higher platform.

2.2.1 AirGate connection to the PC

This connection type is used for connection to controller (s), that are connected to the Internet, however they do not have public and static IP address. The controllers connect by InteliBridge-NT module to the AirGate server and cyclically ask whether there is a connection request from a client or not. On the other side the clients (only ComAp PC applications – DriveConfig, IntelliMonitor and WebSupervisor) connect to the AirGate server instead of connecting directly to the controller. The server then creates a "tunnel" between the client and the controller.



Note: *InteliBridge-NT (IB-NT) connection into Internet network can be done via Ethernet or Cellular connection. The Ethernet connection can be realized by direct access using fixed and public IP address as well as by private network access using dynamic non-public IP address (behind Firewall, NAT, DHCP server etc. – situation illustrated in the picture above).*

Note: *AirGate ID needed as parameter for connection creation is assigned to InteliBridge-NT (IB-NT) module. Second parameter for connection to a particular controller is controller's address (there can be connected up to 8 ID-DCU Industrial controllers via CAN2 bus to one IB-NT module).*

2.2.2 Configuration steps

Following configuration steps are available in DriveConfig software:

- ▶ Configure addresses of Extension modules when more inputs and outputs are required
- ▶ Configure J1939 interface when Electronic engine is connected
- ▶ Configure Binary inputs as Protection or Function
- ▶ Configure Binary outputs
- ▶ Configure Analog inputs as Protection or Function
- ▶ Define user sensors
- ▶ Configure History record
- ▶ Configure password protection
- ▶ Configure additional PLC logic
- ▶ Modify screens for InteliVision displays
- ▶ Manage ECU Fault codes
- ▶ Add/Translate the language

Translator

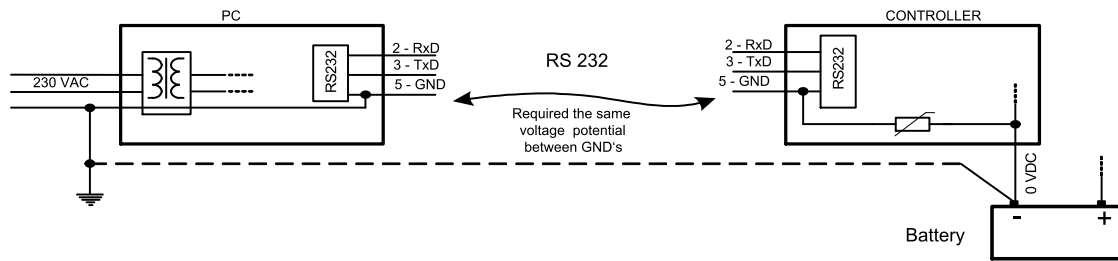
The Translator enables to translate all or some texts to up 5 languages that could be available in controller. Controller language can be changed from panel buttons. It is possible to operate different languages on each ID-DCU Industrial, Remote panel and InteliMonitor.

Note: *Check all screens if some texts are not shortened.*

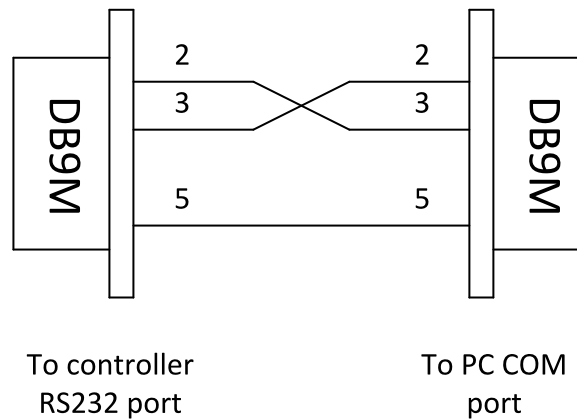
2.2.3 Direct connection to the PC

InteliDrive can be connected directly with PC via RS232 interface. Use the standard cable RS232 cable to connect PC with InteliDrive controller.

Note: *Make sure the grounding system on controller and PC – COM port (negative of the PC DC supply) are identical – before the first direct connection. There must not be any voltage between these two points otherwise the internal PTC protection activates and interrupts RS232 communication. In such case disconnect RS232 line wait a minute for PTC recovery and try again. The simple solution is to assure, that the PC supply 240/20V is ground free (GND terminal is not connected).*



SERIAL „CROSS-WIRED“ CABLE



2.2.4 DriveConfig

Standard installation pack contains following controller file types:

Firmware	Application file (archive)
ID-DCU-Industrial-3.4.1.mhx	DCU-Industrial-SS-3.4.1.aid DCU-Industrial-AS-3.4.1.aid

Delivered controller contains firmware and default configuration. Any Application file can be modified by customer using DriveConfig PC software. It is possible to download Application file from the controller, modify it and download back. There must be corresponding version of Application file with firmware in controller.

Note: Configuration aid file does not contain the History record when had been read from the IntelliDrive controller by DriveConfig.

Note: To load History file from IntelliDrive use IntelliMonitor software only.

Application file - archive

There exists one binary type of configuration file only. Config file “*.aid” contains:

- ▶ Complete I/O configuration (include extension modules if any)
- ▶ Setpoints setting
- ▶ All available languages

Configuration file can be opened (Open file or Load from ID) modified and stored to the PC (Save, Save as) or downloaded to Controller (Store to ID).

DriveConfig functions

Tool for ID-DCU Industrial controller and extension modules configuration

- ▶ Extension modules addressing
- ▶ All I/O function or protection configuration
- ▶ Setpoints adjusting
- ▶ Sensor characteristics modification
- ▶ History record modification
- ▶ Password level protection modification (password value must be changed in IntelliMonitor)
- ▶ Additional PLC logic creating
- ▶ IntelliVision displays screens modification
- ▶ ECU Fault codes management
- ▶ Controller firmware (mfx file) upgrade
- ▶ Controller application file Up/Down load
- ▶ Language translator enables (not available in version 1.0)
 - Create Dictionary between two languages (Dictionary can be used repeatedly)
 - Translate current text in Controller (in any language)
 - Add new language (up to controller memory limit)

PC to ID-DCU Industrial controller connection

- ▶ Uploading or downloading procedure only (no continuous on-line connection)
- ▶ Direct RS232 connection
- ▶ Modem and internet connection

2.2.5 Modbus protocol

- ▶ Direct connection: RS232, RS485
- ▶ Modem connection
- ▶ 9600, 19200, 38400, 57600 or 115200 bps, 8 data bits, 1 stop bit, no parity
- ▶ Transfer mode RTU
- ▶ Function 3 (Read Multiple Registers)
- ▶ Function 6 (Write Single Register)
- ▶ Function 16 (Write Multiple Registers)
- ▶ The response to an incoming message is sent with minimum 4.096 ms delay after message reception

The complete description of Modbus communication protocol can be found in Modbus Protocol Reference Guide [PI_MBUS_300.pdf](#) and Open Modbus Specification Release 1.0. Both documents are available from web site at <http://www.modbus.org/specs.php>

Communication object vs. Register

All the data intended for communication has its representation as communication objects in the controller. The communication object is represented by the n-byte array in the controller memory and identified by the unique 16-bit communication object number. The register, according to Modbus communication protocol, represents a two-byte data and in communication functions is referenced by 16-bit register address. Further in the description

of communication functions the communication object number will always be used as a register address and length of the communication object will be expressed by number of registers. Just one communication object can be read or written by one communication function.

Note: *It is possible to download the Actual IntelliDrive controller object description corresponding to actual configuration from on-line controller or from aid archive using DriveConfig software. Detail Modbus command description see in ComAp Communication guide.*

2.2.6 Password protection

Password is a four-digit number. Only setpoints associated with the entered password level can be modified.

There are three levels of password protection.

- 0 - User level allows change of non-protected setpoints only
- 1 - Operator level allows change of setpoints protected by Operator level 1.
- 2 - Master level allows change of setpoints protected by Operator 1. and Master level 2.
- 3 - Supervisor highest level allows all setpoints or configuration changes, firmware upgrade.

There can be password protected:

- ▶ Setpoints (depends on configuration)
- ▶ Statistics values (Level 3 only)
- ▶ Engine commands (depends on configuration)

Even though one level may have been set from the front panel, the affected setpoints are not accessible from IntelliMonitor (direct or Modem) until this level is set in IntelliMonitor (direct or Modem). Setpoints opened from front panel are automatically closed 15 minutes after the last key has been depressed or when wrong value of password is set.

- ▶ Any password can be changed once that level password or higher has been entered if the change is made from IntelliMonitor PC tool.
- ▶ Password level 3 must be entered at first to change any password if the change is made by controller front panel buttons.

Note:

"Engine Cmd" Password protection blocks Engine commands: Start, Fault reset, Horn reset from front panel ID-DCU Industrial, by IntelliMonitor, Modbus, ID-DCU Industrial, IntelliVision 5 CAN (Backlit), IntelliVision 8 Marine or SMS.

"Engine Cmd" Password protection does not block: activation via Binary inputs.

The following three options protect against modification of statistics values from IntelliMonitor.

There is no other access to modify statistics - i.e. can not be changed from panel.

Clear statistics is common protection for all three statistic values.

Setting of statistic is possible protect separately - from Monitor only

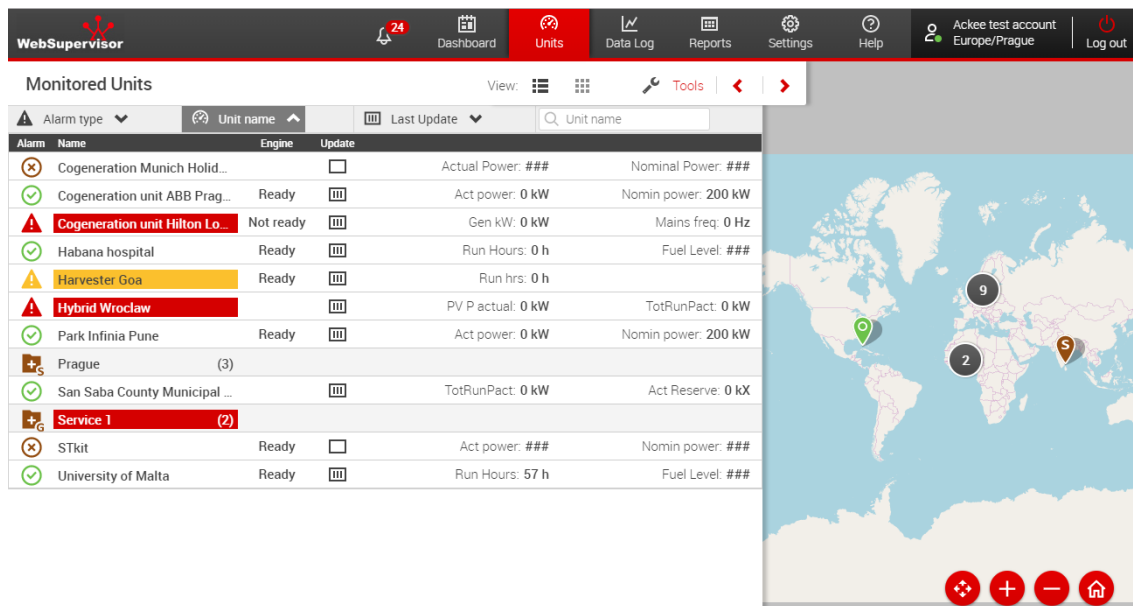
2.2.7 WebSupervisor

WebSupervisor is web based system designed for monitoring and controlling ComAp controllers via the Internet. This system offers a number of beneficial features that help optimize revenue for machinery fleets, as each piece of equipment can be individually monitored for all important operation values.

ID-DCU Industrial connection into WebSupervisor

Connection of ID-DCU Industrial controllers can be realized in two different ways:

1. Internet connection via AirGate - using InternetBridge-NT (IB-NT). No fixed and public IP address is needed.
2. Internet connection without AirGate - using InternetBridge-NT (IB-NT) or IG-IB module. The module has to have fixed and public IP address.



Note: The WebSupervisor ComAp tool is supported from ID-DCU Industrial version 3.1, specifically from ID-DCU-INDUSTRIAL-W-3.1.mhx firmware.

2.3 List of supported modules

Product	Description	Order code
Intel AIN8	8 Analog inputs (R, I, V) and 1 pulse/frequency input	I-AIN8
Intel AIN8TC	8 Thermocouple Analog inputs	I-AIN8TC
Intel IO8/8	8 Binary inputs, 8 Binary outputs and 2 Analog outputs packed in a small unit (HW switchable to IO16/0). HW switchable to IO16/0 - 16 Binary inputs	I-IO8/8
IS-BIN 16/8	16 configurable galvanically separated inputs, 8 configurable outputs	IS-BIN16/8
Intel AIO9/1	9 Analog inputs (4x DC, 4x thermocouples, 1x R)	I-AIO9/1
IS-AIN8	8 Analog inputs packed in a rugged metal unit	IS-AIN8
IS-AIN8TC	8 analog inputs for thermocouple measurement, supports J, K, L types	IS-AIN8TC
IGS-PTM	8 Binary inputs, 8 Binary outputs, 4 Analog inputs and 1 Analog output	IGS-PTM
IB-NT	Internet bridge	IB-NT
I-CB	Communication bridge	I-CB
I-AOUT8	8 Analog outputs	I-AOUT8

You can get more information on wiring of standard extension modules in the chapter **Extensional modules** (page 284).

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3 Application overview

3.1 ID-DCU Industrial 26

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3.1 ID-DCU Industrial

3.1.1 Default archives

The ID-DCU Industrial controller can be configured for auxiliary, emergency, combined (constant speed engines) or propulsion mode engines. The configuration can be changed in the DriveConfig software by selecting appropriate archive file.

Application		Archive file	Available modes	Engine start / stop
SS	Single Speed	ID-DCU Industrial-SS-3.4.1.aid	OFF - RUN	BI Blackout Start BI Remote Start BI Remote Stop BI Rem Start/Stop ID-DCU Industrial Start / Stop button
AS	All Speed	ID-DCU Industrial-AS-3.4.1.aid	OFF - RUN	BI Blackout Start BI Remote Start BI Remote Stop BI Rem Start/Stop ID-DCU Industrial Start / Stop button

3.1.2 Operational modes

3.2 LOC (Local) mode

LOC (Local) mode can be set in any mode mentioned above – **AUX, EME, HRB, PRP**. ID-DCU Industrial receives only commands entered from the ID-DCU Industrial front panel in **LOC** (Local) mode. All external interfaces – binary inputs **Remote Start, Blackout Start, RemRepStart, Remote Stop, Rem Start/Stop** and serial line commands are disabled.

LOC (Local) mode is activated and deactivated using ID-DCU Industrial front panel buttons: Enter + Mode→ to activate, Enter + ←Mode to deactivate. Active **LOC** (Local) mode is indicated in the upper right corner of the ID-DCU Industrial display.

OFF mode

All ID-DCU Industrial controller is switched off. Engine can't be started or running engine is stopped, prelubrication function is not active. Firmware and controller configuration can be changed in **OFF** mode only.

OFF mode is available in all applications – RUN mode.

3.3 RUN mode

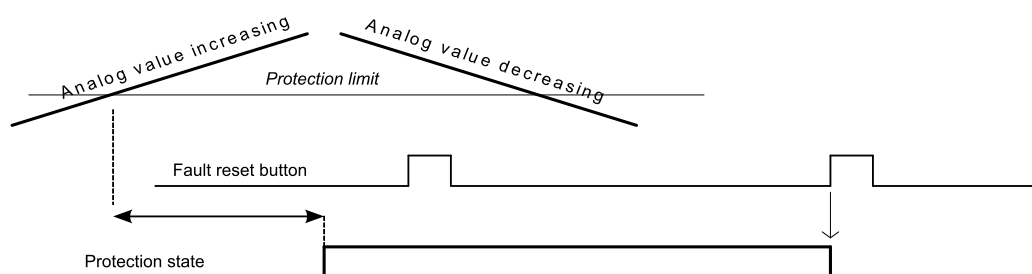
- ▶ Controller starts and stops the engine according to the binary inputs **Blackout Start** or **Remote Start, Rem Start/Stop, Remote Stop** or to the ID-DCU Industrial**Start / Stop** buttons. Binary inputs Blackout Start and Remote Start and Remote Stop are inactive in **LOC** (Local) mode.
- ▶ All engine protections and all configured shutdown protections are active. Controller continuously monitors all available engine parameters (oil pressure, water temperature, RPM, fuel level etc.). The engine will stop and activates **Common Warning** and **Common Shutdown** outputs and writes record to the history file when detects any active Shut down alarm. This condition can be signaled by Active call feature to remote operator via modem, SMS or e-mail.

Other functions

Controller (except OFF mode) accepts when engine is started outside controller (by hand) or when controller power supply is switched-on on already running engine.

3.3.1 Universal states

State is a value joined to each Analog input or value. State indicates if any protection configured on corresponding analog input is active or not. When there is any state configured as protection the corresponding Binary output appears in Analog protection list and can be used for selective external indication of the Alarm. State is resetted (output is opened) when corresponding Alarm is not active and confirmed (Fault reset was pressed).



There are seven universal (free) states available in ID-DCU Industrial-3.4.1 that are not joined to any value or input.

They can be used mostly for some values that have not state (e.g. RPM or other that are not measured on Analog input). This way can be configured protection to any ID-DCU Industrial internal value or more levels external indication.

Example of Universal state1 configuration to Engine speed (Warning for Engine speed > 1600RPM, 1s):

This configuration is available in DriveConfig – Expert mode.

DriveConfig [3.9.0.15] File: ID-DCU-Marine-PRP-3.0.0.13.aid* Name: ID Addr: 1 Firmware ver.: ID-DCU-Marine-3.0.0.13 R: 2017-10-16 Sw

File Options Tools Help

Modules | I/O | Setpoints | Command | **Protections** | History | User curves | Languages | Translator | PLC Editor | Screen Editor | LBI | LAI

+ Add - Remove

No.	Value	Protection
1.	CoolantPress	Warning
2.	CoolantPress	Shutdown
3.	Engine RPM	Warning

Property	Value
Value	Engine RPM
Protection	Warning
Active when	Under limit
Block type	All the time
State	State 1
Limit type	Const
Limit	0
Delay type	Const
Delay	0

Value	Used
Basic Settings	
Engine RPM	<input checked="" type="radio"/>
EngRPMfiltered	<input type="radio"/>
Engine Values	
Speed Request	<input type="radio"/>
T Cyl Aver	<input type="radio"/>
T Cyl Max	<input type="radio"/>
T Cyl Min	<input type="radio"/>
Oil Press	<input type="radio"/>

4 Installation and wiring

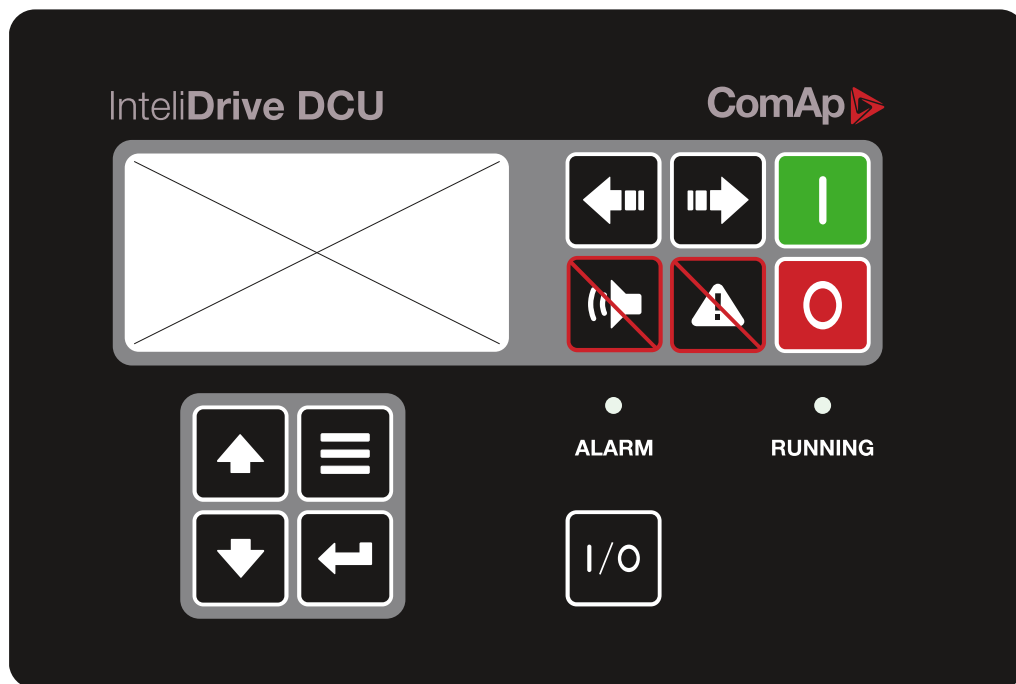
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 4.2 Recommended wiring 41
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4.1 Terminal and dimensions

4.1.1 ID-DCU Industrial

The front panel of the IntelliDrive controller is intended for installation in an overall enclosure – rubber seal for IP 65 - Technical data (page 89)

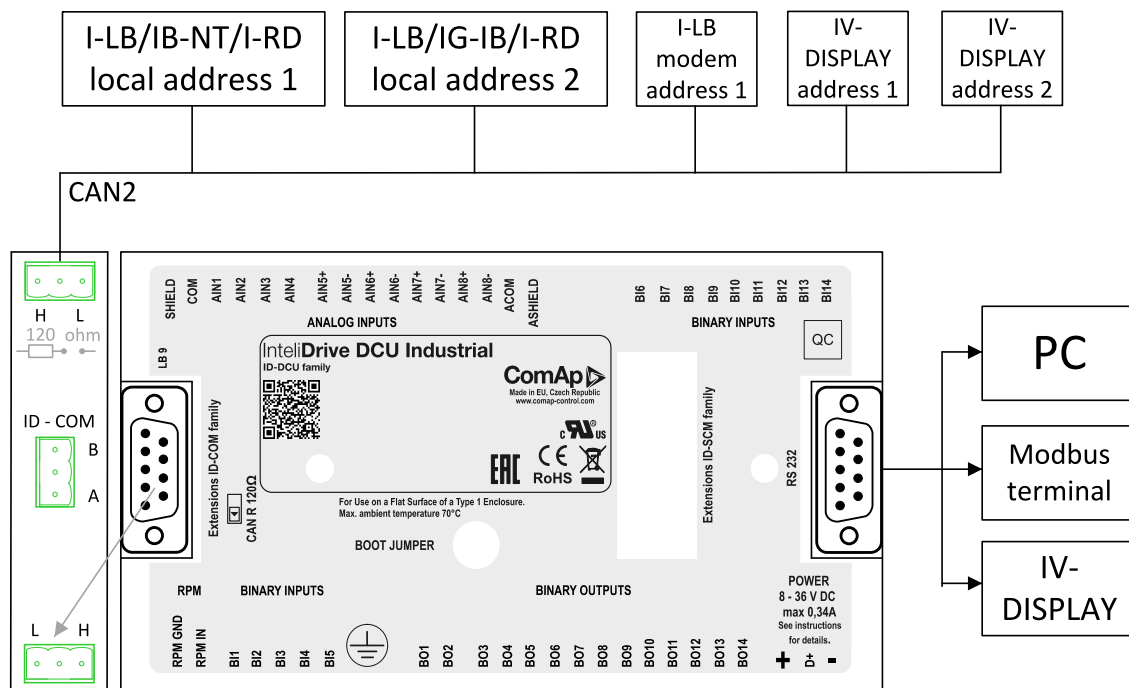


Front panel LED

Left RED	Active alarm indication	Blinks when new alarm is activated. Steady lights after "Fault reset" confirmation - when alarm is still active. Disappears after "Fault reset" confirmation.- when alarm is inactive.
Right GREEN	Engine running indication	Light when engine is running.

Note: Please check the last software version.

4.1.2 Communication lines wiring

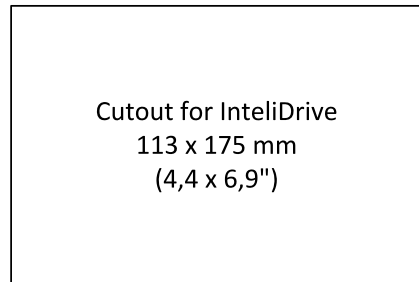
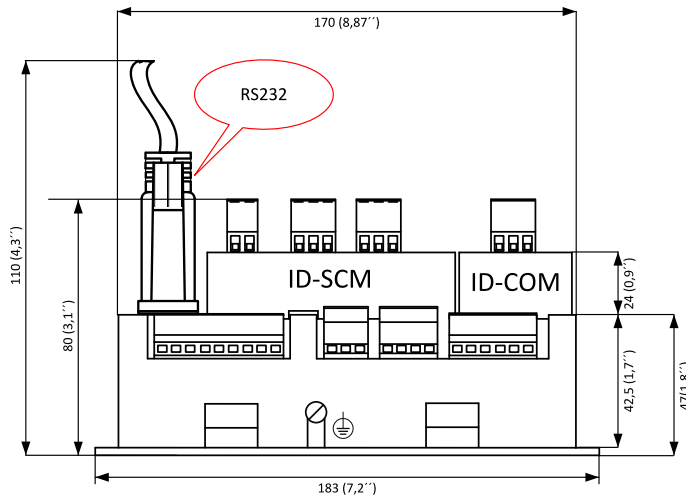
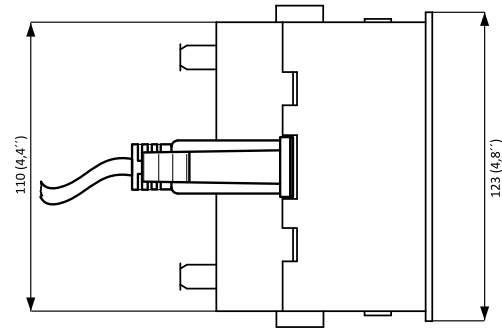
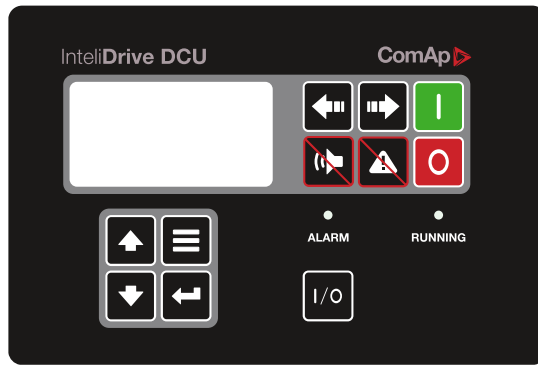


4.1.3 ECU

Electronic Control Unit is kind of extension module connected to CAN1 bus or serial line and communicating via electronic signal (J1939 or Modbus protocol). Generally can read binary and analog values from engine (inputs) and transmit binary outputs (e.g. Start, Stop commands) and analog outputs (e.g. Speed request). ECU size (count of input and output resources) are configurable and depends on controller possibilities.

4.1.4 ID-DCU Industrial dimensions

ID-COM and ID-SCM (ID-SCM1) are mounted directly to ID-DCU Industrial case.



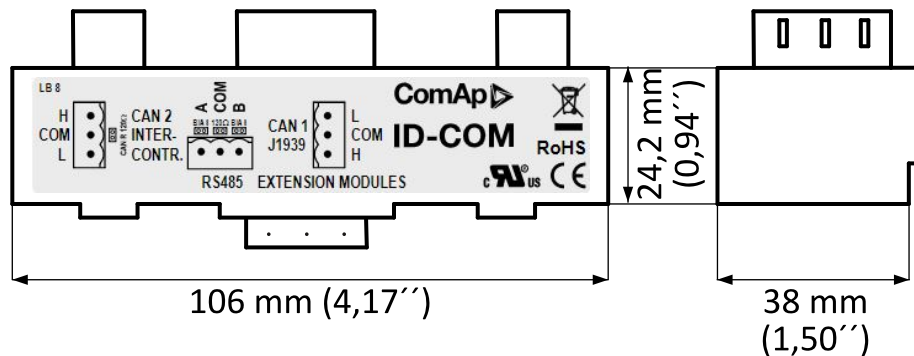
Note: ID-DCU Industrial box is fixed using four screw clips.

Note: Maximal torque to tight main screw is 0.25 Nm.

4.1.5 ID-COM terminals

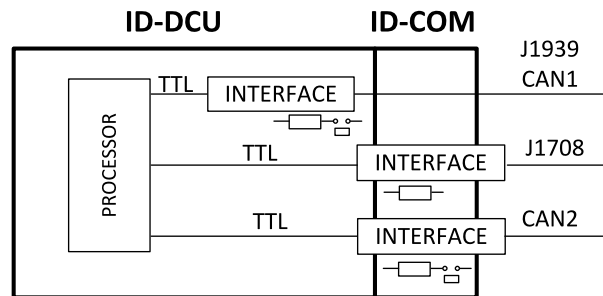
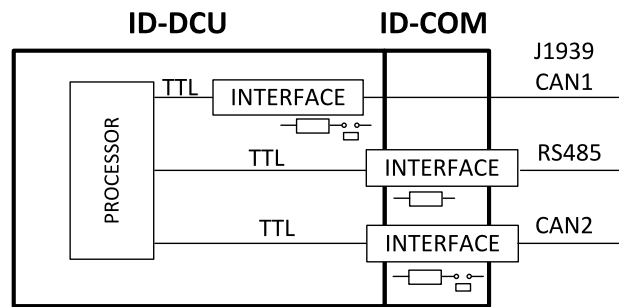
Communication interface ID-COM is mounted directly to ID-DCU Industrial box.

The new standard ID-COM will only be with the RS485 interface.



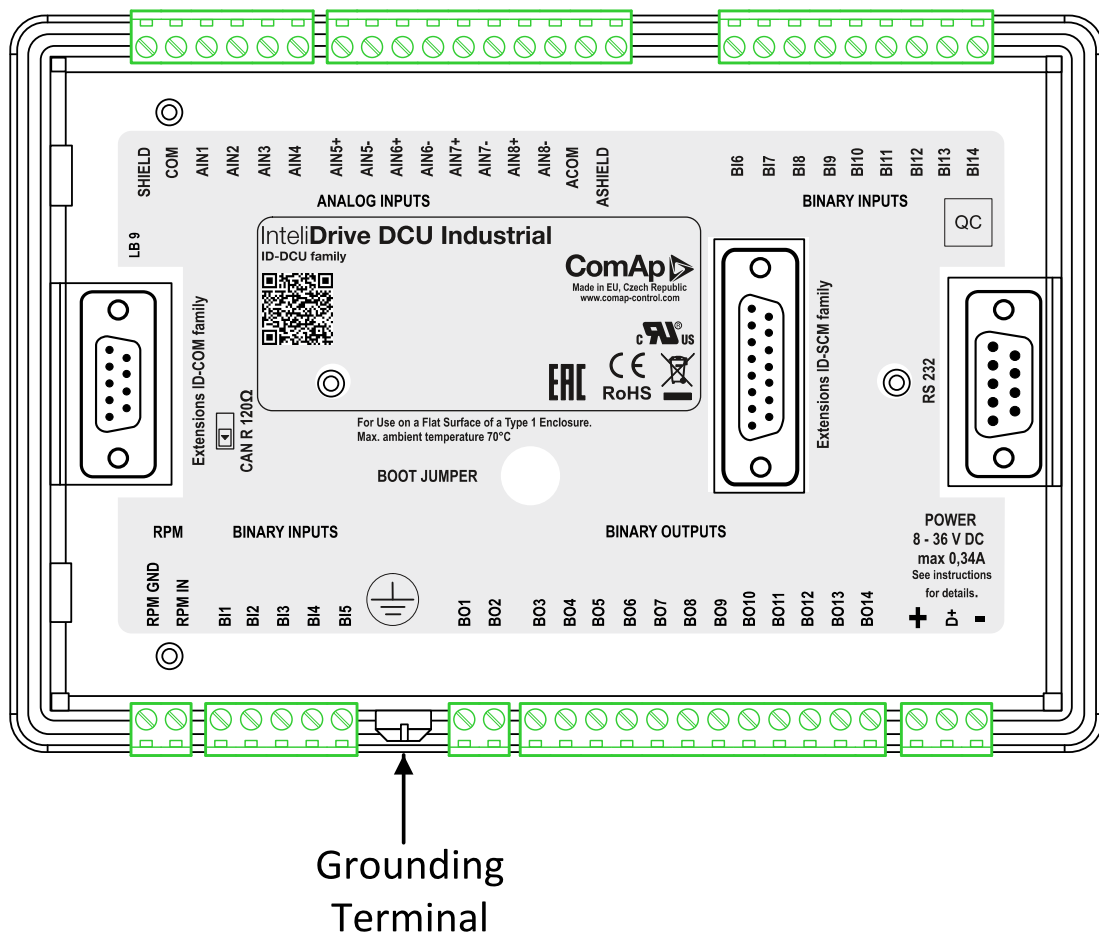
Note: Maximal torque to tight main screw is 0.25 Nm.

CAN1	Extension modules:	EMS, IS-AIN8(TC), IS-BIN16/8, IGS-PTM, IGL-RA15
CAN2	Intercontroller:	I-LB+, IG-IB, IB-NT, others ID-DCU Industrial



Note: Put jumper to connect the internal 120 Ω terminating resistor for CAN2 interface. ID-COM module is not required when inter-controller CAN2 line is not used. In this case connect Extension modules CAN1 directly to Extension modules port ID-COM on ID-DCU Industrial (9-pin connector: 5=H, 9=L).

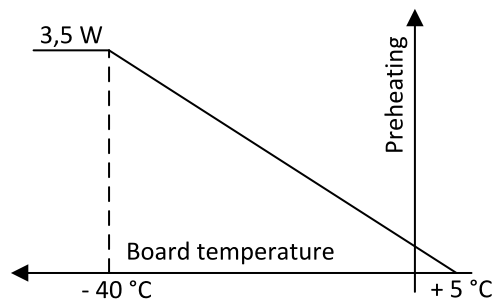
4.1.6 ID-DCU Industrial terminals



RPM	Primary RPM
BI1 to BI14	Binary inputs, active when closed to minus power supply
BO1 to BO14	Binary outputs; Low side switch; 0,5 Amps each;
D+	D plus terminal
AIN1 to AIN4	Analog inputs - group 1
AIN5+, AIN5- AIN6+, AIN6- AIN7+, AIN7- AIN8+, AIN8-	Analog inputs - group 2

4.1.7 ID-DCU xx -LT version with display preheating

LT is an option for extending of operating temperature range from -20 to -40 °C. Heating foil is not part of standard ID-DCU and ID-MCU (without -LT extension).



The only one low temperature sensitive part is the controller display.

ID-DCU -LT version contains a preheating foil on the display activated below +5°C (measured on the PCB). Heating is switched off when controller power supply is below 10VDC (together with display backlight).

4.1.8 ID-SCM Speed control module

ID-SCM module is interface module for IntelliDrive controller application. Module is mounted directly to ID-DCU Industrial controller case. Module power supply: 8 to 36VDC.

Inputs

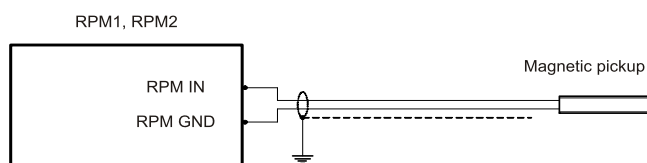
RPM1, RPM2: Two inputs for frequency (e.g. flow) measuring. Expected sensor is magnetic pickup – with maximal frequency range up to 8 kHz. The output values SCM Freq1, SCM Freq2 calculation use setpoints SCM unit: FreqRate1 and FreqRate2 - see below.

Closed jumper divides input frequency by 16 - recommended for higher frequency (>1000Hz) measuring. Jumper position does not influence output value range.

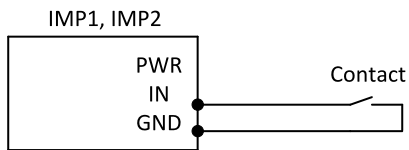
Jumper	RPM input nominal frequency range
Closed	> 1000 Hz
Closed or Opened	500 - 1000 Hz
Opened	500 Hz

IMP1, IMP2: Two impulse inputs for integral (e.g. consumption) measuring. It is expected NPN – open collector (active) impulse sensor with maximal frequency range up to 60 Hz. Minimal pulse duration is 1ms. The output values SCM Imp1, SCM Imp2 calculation use setpoints SCM unit: TransferRate1 and TransferRate2 - see below.

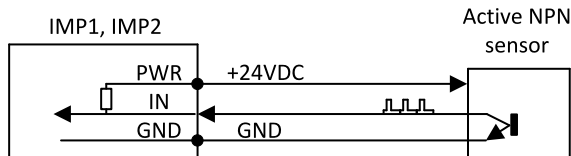
ID-SCM inputs wiring example



Magnetic pickup wiring to RPM1 and RPM2 inputs.



Contact sensor wiring to IMP1 and IMP2 inputs.



Active NPN sensor wiring to IMP1 and IMP2 inputs.

Note: Maximal torque to tight main screw is 0.25 Nm.

Outputs



4.1.9 ID-SCM1

Technical data

Power supply: internal supply from ID-DCU Industrial (8 to 36 VDC)

Operating temperature range: -40°C to +70°C

Number of analog outputs: 1, no galvanic separation

Analog output refreshment: 100 ms

Analog output options

- ▶ PWM 1600 Hz (fix), 5V level, max 10 mA
- ▶ 0 to 10VDC ± 1%, 10 kΩ output resistance

- ▶ 0 to 10VDC \pm 1%, max 5 mA (voltage output)

Configuration in DriveConfig

- ▶ Module = SCM
- ▶ I/O – Analog outputs – SCM - AOUT1 (only)
 - Source
 - Low convert limit
 - Hi convert limit

Description

- ▶ ID-SCM1 can only be configured as ID-SCM.
- ▶ ID-SCM1 has only 1 analog output unlike ID-SCM which has 3 AOUTs (plus 4 values and 4 setpoints).
- ▶ Control value **Speed Governor** is send on ID-SCM1 AOUT - equivalent output on ID-SCM is 3rd AOUT (with PWM)
 - Invalid values are shown in SCM values
 - SCM setpoints are not used (sepoints not affects the function)

Note: Maximal torque to tight main screw is 0.25 Nm.

4.1.10 IntelliVision 5 CAN, IntelliVision 5 CAN Backlit

5" color display. IntelliVision 5 CAN is offered in two hardware modifications:

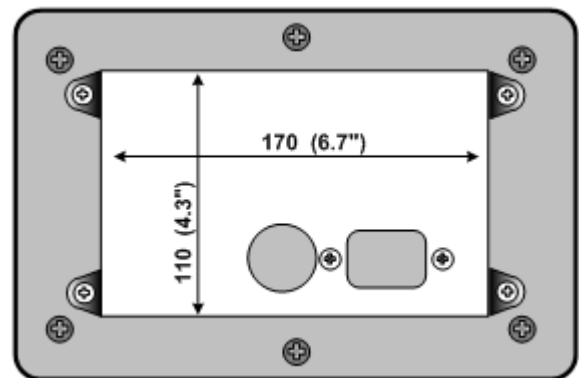
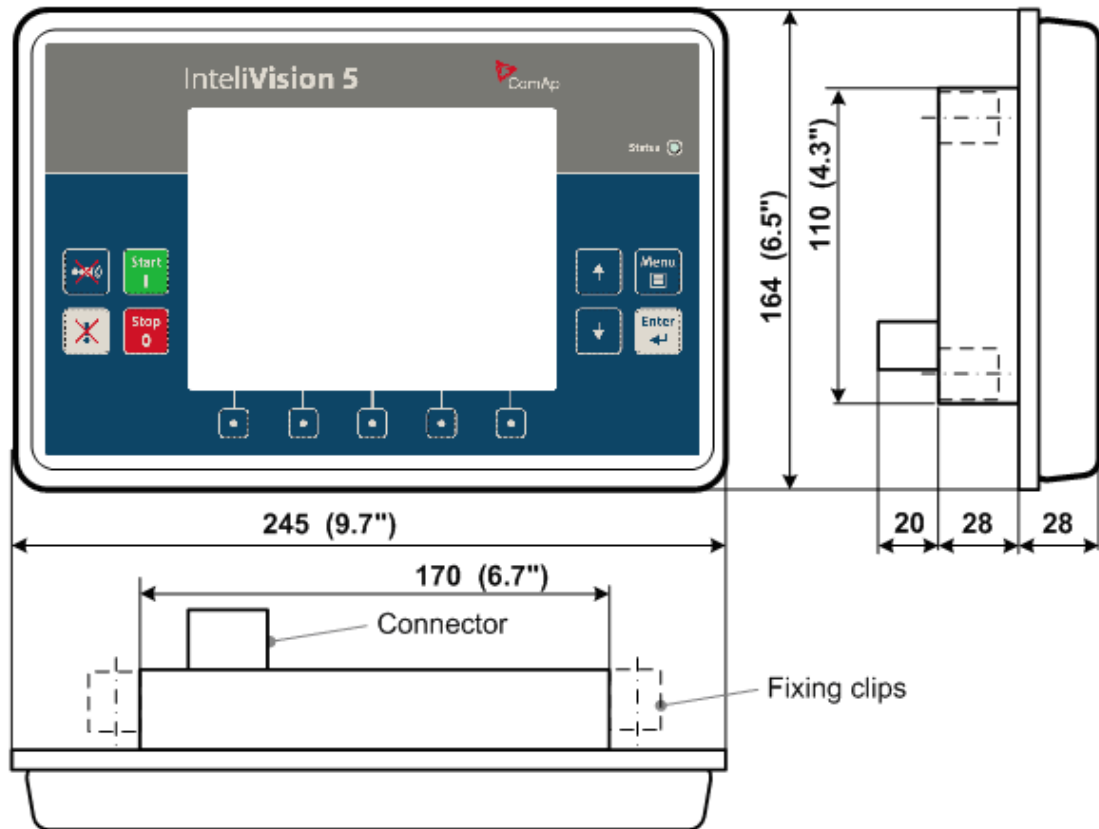
- ▶ IntelliVision 5 CAN
- ▶ IntelliVision 5 CAN Backlit

The only HW difference between two versions is presence of standard or backlight keyboard version, i.e. if there is present a feature of back-lighted buttons or not. Both versions are IP65 protected from all sides, equipped with binary output switch for HORN signaling, CAN interface is galvanically separated.

The IntelliVision 5 CAN version is intended to use with IntelliDrive controllers only (ID-DCU, ID-DCU Industrial, ID-Mobile, ID-Mobile Logger), Backlit version supports also IntelliGen-NT and IntelliSys NT controllers.

Depending on customer preferences there can be used optional accessories:

- ▶ IntelliVision 5 Harness-2
 - 2m prefabricated cable with unassigned wires at the end
- ▶ IntelliVision 5 IP 65 Connector
 - connector set containing connector body and 10 corresponding terminal female pins
- ▶ ECU Simulator
 - set containing supported USB/CAN converter and various cabling, for new firmware / font / logo download into the IntelliVision 5 CAN



IntelliVision 5 CAN connector wiring

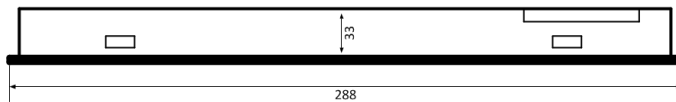
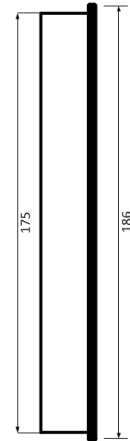
1	GND	5	UBatt
2	A/B IN	6	CAN-L
3	BO-A	7	COM
4	BO-B	8	CAN-H

1 - 5	Power supply 8 – 36VDC
6 - 8	CAN bus (with galvanic separation)
3 - 4	Binary output configured for Horn function. It is Solid State Relay with galvanic separation. Max 36VDC/0,5A (like free contact).

2 – 1 Analog/Binary Input for display and buttons backlit control. Connect resistive pot for continuous backlit change: 0Ω ~ 0%; 2400Ω ~ 100%. Or just place contact to switch between 0% and 100% intensity.

Note: It is possible to connect up to five IntelliVision 5 CAN or four IntelliVision 8 displays to common CAN2 bus. The display addresses must be different in this case.

4.1.11 IntelliVision 8, IntelliVision 8 Marine



Cutout for IV-DISPLAY
163 x 122



4.1.12 IntelliVision 12Touch and IntelliVision 12Touch OEM

IntelliVision 12Touch, industrial operator panel equipped with a 12,1" colour, multi-touch screen, is dedicated together with the main ComAp controller to visualize and control single gen-set and drive controllers in various applications.

It is designed as an intuitive, easy to use Plug and Play solution and delivers high visibility of all engine data, monitoring information and trend history in a bright, colorful and impressive industrial capacitive touch based design. The Plug and Play solution ensures the User buy the display unit and controllers, puts it together and it works for most of the applications. No additional programming skills or learning complicated tools are needed. The display unit allows the configuration of all the controller parameters. The display unit also supports the extended trending of the specified values.



Image 4.1 IntelliVision 12Touch

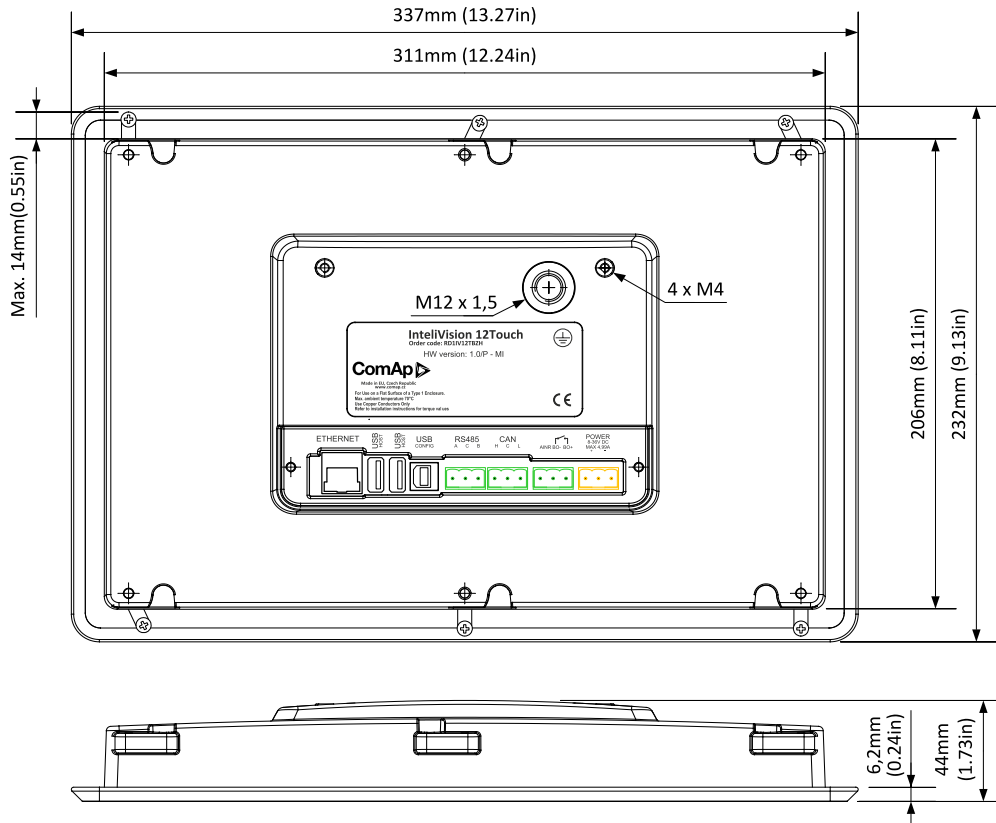


Image 4.2 IntelliVision 12Touch – dimensions

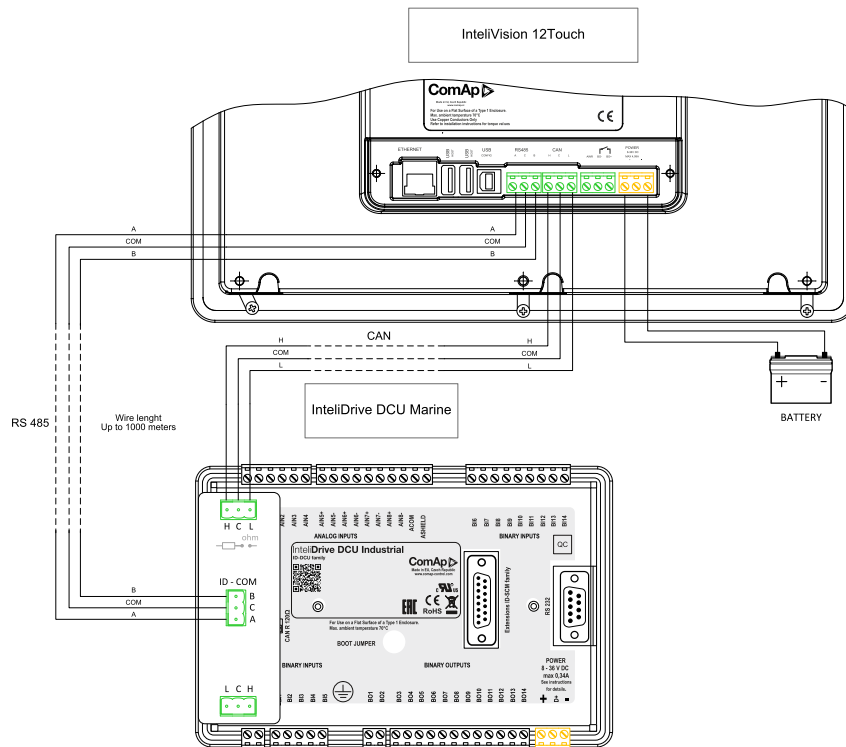


Image 4.3 Wiring example: ID-DCU Industrial to IntelliVision 12Touch

Note: For more information see [IntelliVision 12Touch OEM Global Guide](#).

4.2 Recommended wiring

4.2.1 Bus/Communication architecture

RS232

One of following possibilities is available:

- ▶ PC software interface (DriveConfig, IntelliMonitor).
- ▶ Modbus protocol option for SCADA systems.
- ▶ Analog or GSM Modem interface.
- ▶ IB-NT – internet interface.

CAN1 / J1939 / KWP2000

CAN1 is data line for controller Inputs/Outputs extension. It is possible to connect following extension modules:

- ▶ ECU (Engine Control Unit),
- ▶ IGS-PTM (8 BI, 8BO, 4AI, 1AO),
- ▶ IS-AIN8 (8AI),
- ▶ IS-AIN8TC (8AI – TC only),
- ▶ IS-BIN 16/8 (16BI, 8BO),
- ▶ Intelli IO8/8 (8 or 16 BI, 8 or 0 BO, 2AO).

Full physical CAN interface on ID-DCU Industrial is available, no ID-COM interface needed. Maximal CAN bus length is up to 200m

CAN2

Inter-controller CAN for multiple engines applications. ID-COM module is necessary. It is possible to connect

- ▶ ID-DCU Industrial controllers and/or
- ▶ IG-MU (Direct cable, analog modem or GSM modem interface) and/or
- ▶ IB-NT (Internet interface) and/or

The data rate is selectable in two levels: 250 kBd for 200 meters line and 50 kBd for 900 meters line.

Redundancy line (e.g.J1708)

There are 2 data lines in the system, one CAN SAE J1939 datalink and one SAE J1708/J1587 datalink. The J1939 datalink is used for control and monitoring data. The J1708/J1587 datalink is used for redundancy control and monitoring mainly in Volvo Penta systems.

The specific ID-COM interface is necessary to use for synchronous J1708/1587 data line.

CAN bus Connection rules

CAN bus line must be connected in series, from one unit to the next (no star, no cable stubs, no branches) both ends must be by the 120 Ω (internal or external) resistor terminated.

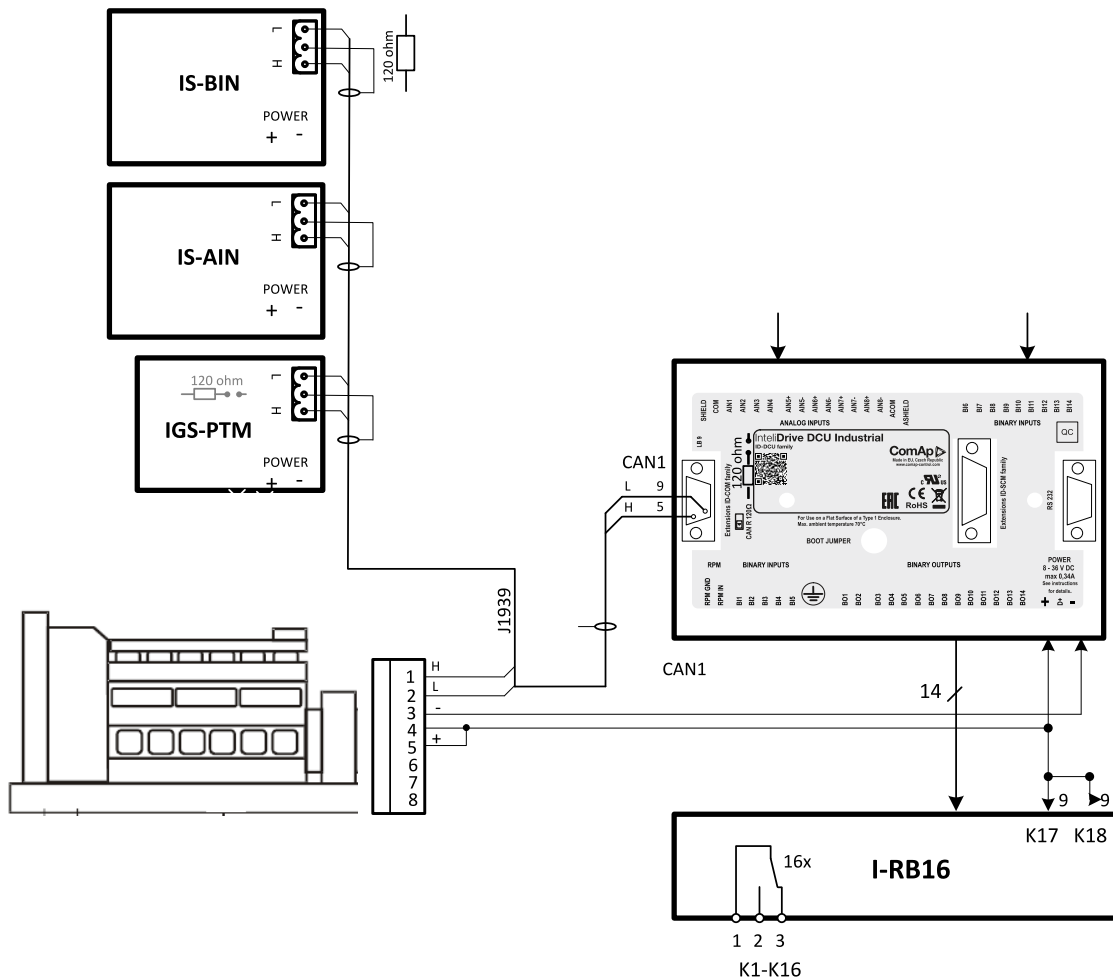
Maximal CAN2 bus length is up to 200 meters when Basic settings: CAN bus mode = 250 kBd or up to 900 meters when Basic settings: CAN bus mode = 50 kBd.

For CAN data cables details see chapter Technical data – Communication interface. CAN cable shielding connect to ID-DCU Industrial case.

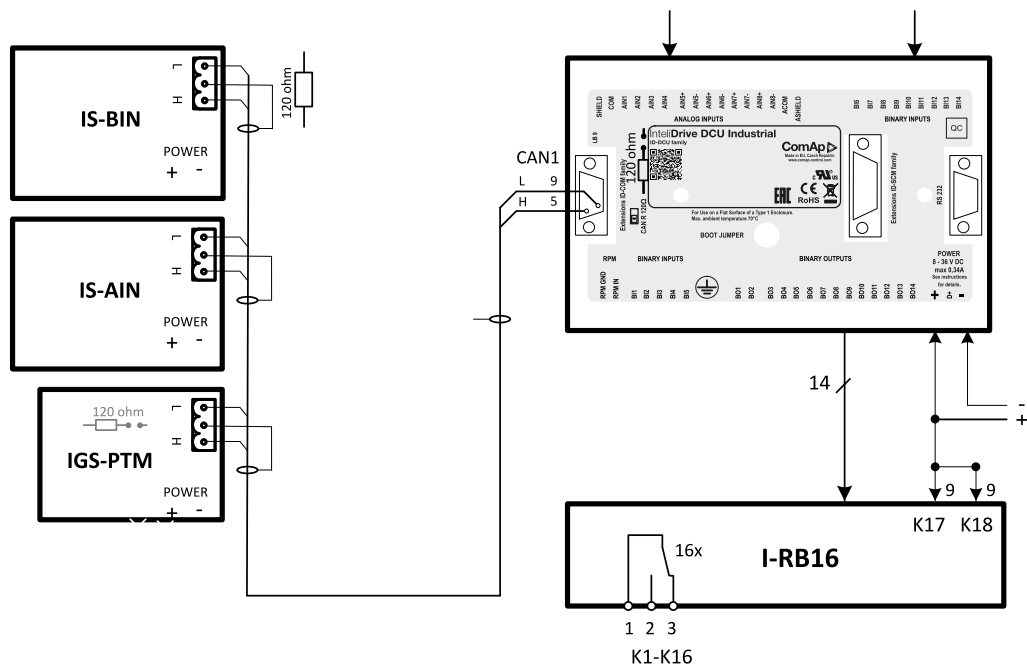
ID-DCU Industrial contains internal 120 Ω resistor over jumper setting on CAN1 bus. Use D SUB9 male connector: CAN H = 5, CAN L = 9, COMMON = 3 and 8.

IGS-PTM unit contains internal jumper-removable 120 Ω resistor. To be sure check resistor presence by ohmmeter. Unit with internal resistor should be connected to the end of CAN2 line.

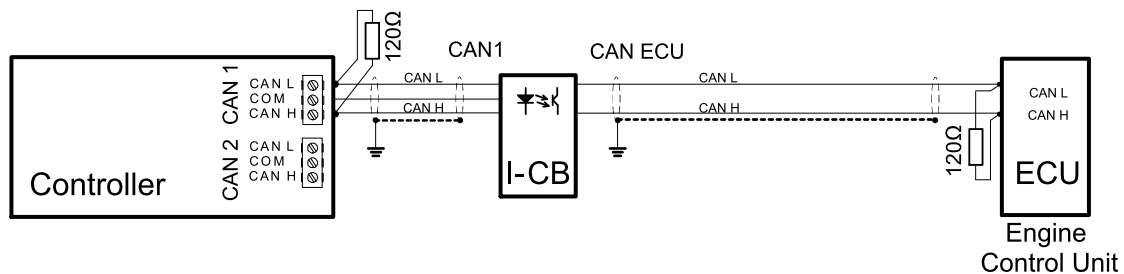
4.2.2 Electronic engine without redundancy line



4.2.3 Engine without ECU (mechanical engine)



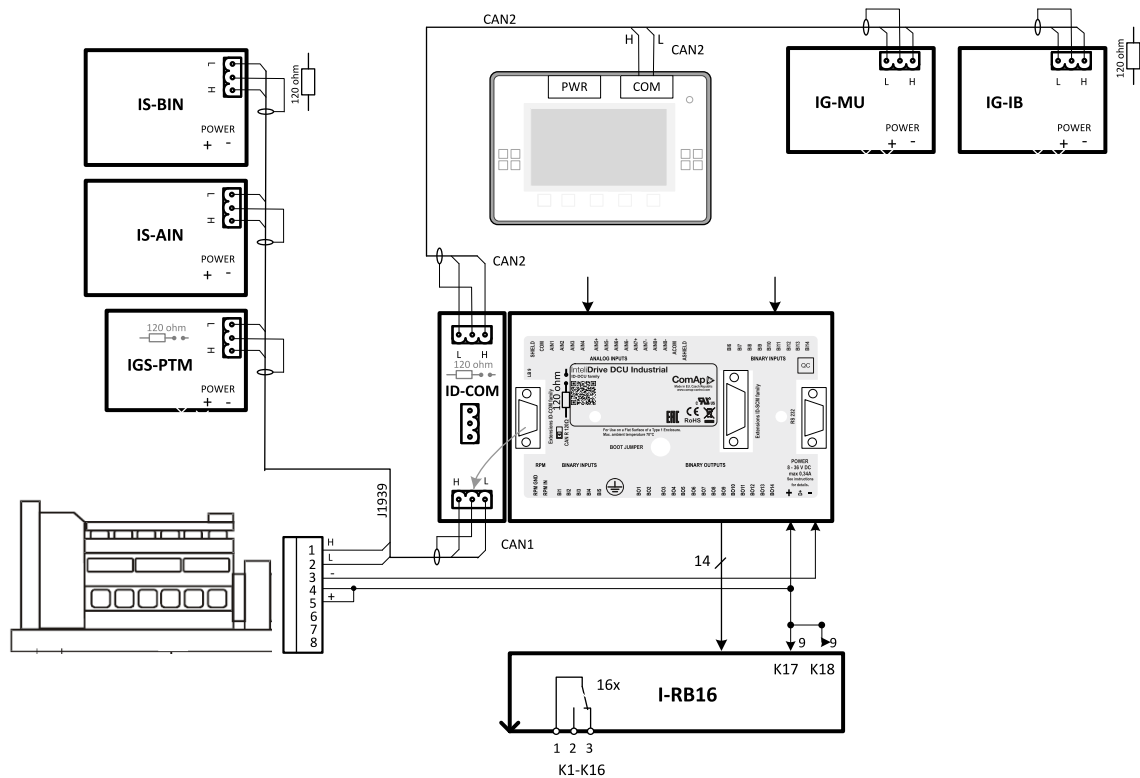
4.2.4 I-CB wiring and configuration



1. Configure I-CB using I-CBEdit software. Configured I-CB behaves like fictive IS-AIN and IS-BIN units (or better said as Generci extensions). I-CB configuration associates selected values (from ECU database) received from Engine Control Unit to selected CAN addressees (fictive IS-AIN, IS-BIN inputs and outputs).
2. Configure corresponding CONTROLLER CAN addresses in PC configuration tool.
3. Configure separate inputs and outputs in corresponding Analog, Binary inputs, outputs in PC configuration tool.

Note: In case of CAT engines, there is RS232 connection between I-CB and CCM.

4.2.5 Wiring example - Complete system without RPU



4.3 Getting started

4.3.1 How to install

Note: All components shall be used within marked electrical ratings – see chapter Technical data.

Binary output protections

Do not connect binary outputs directly to DC relays without protection diodes. Use protection diodes even if the relays are not connected directly to controller outputs. Use a fast recovery 3A / 50V diodes.

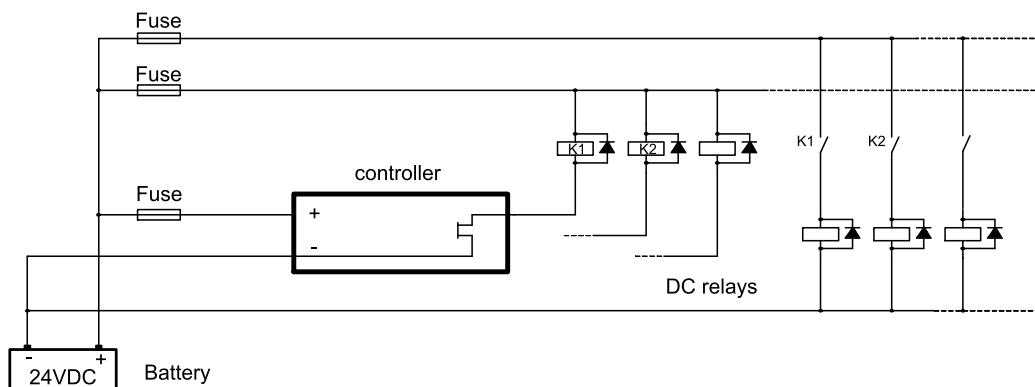


Image 4.4 Example of controller protection

Note: External fuse rated max. 2.5A shall be used to limit current from the binary outputs.

General

To ensure proper function:

- ▶ Use grounding terminals. The IntelliDrive DCU Industrial power feeding input is galvanically isolated from controller body, use the grounding terminal for proper grounding.
- ▶ Wiring for binary inputs and analog inputs must not be lead parallel with high voltage/current cables.
- ▶ Analog and binary inputs should be provided with shielded cables, especially when length >3m.

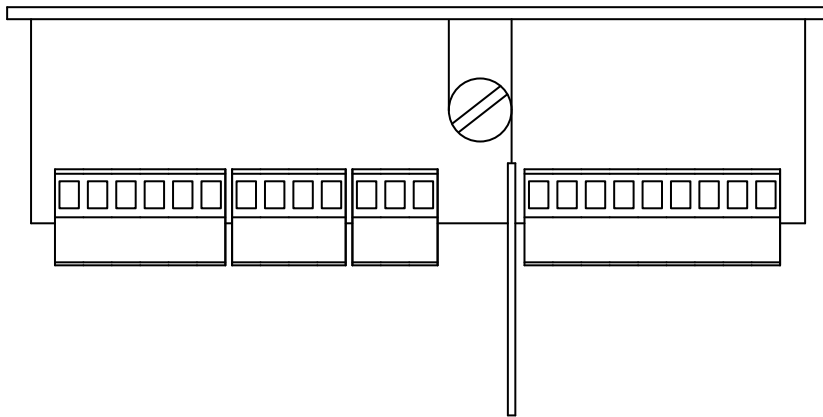
Grounding

To ensure proper function:

The shortest possible piece of wire should be used when grounding the controller.

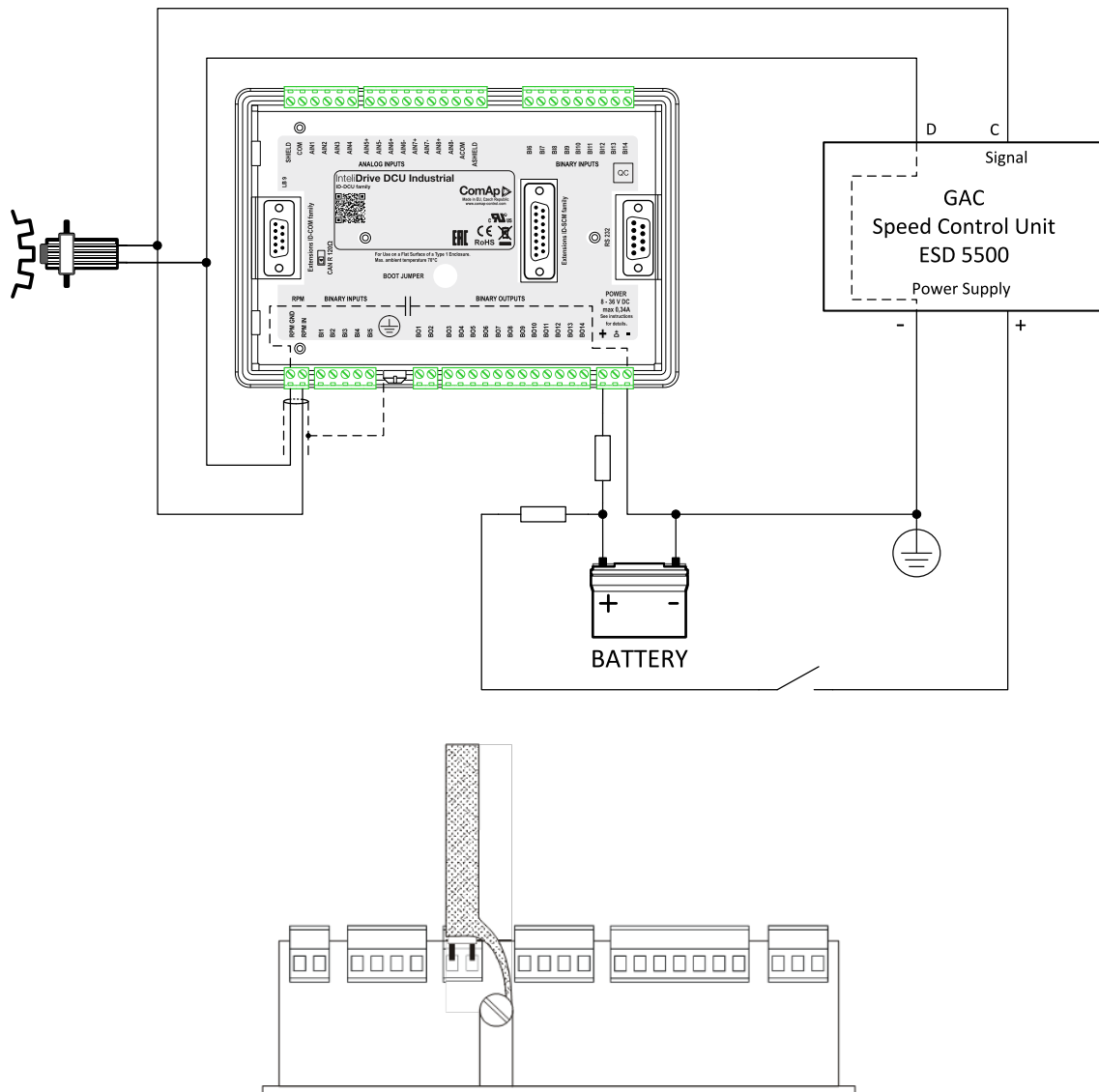
Use cable min. 2,5mm².

The “-“ terminal of the battery has to be properly grounded.



Magnetic pick-up

To ensure proper function use a shielded cable.



Be aware of interference signal from Speed governor when one speed pick-up is used.

Power supply fusing

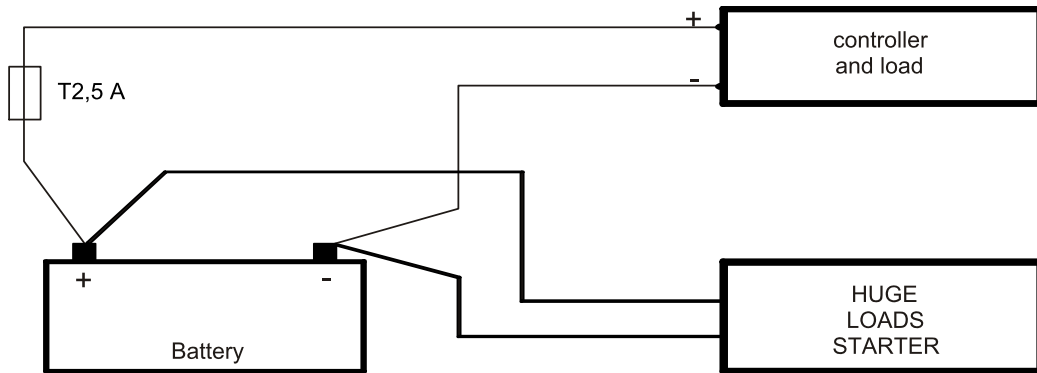
External fuse rated max. 2.5A shall be used to limit current from the power supply to the controller and modules. Controller and I/O modules should never be connected directly to the starting battery.

Fuse value and type depends on number of connected devices and wire length.

Recommended fuse (not fast) type - due to internal capacitors charging during power up.

Power supply

- ▶ Use min. power supply cable of 1.5 mm² to ensure proper function.
- ▶ Maximum continuous DC power supply voltage is 36VDC.
- ▶ Maximum allowable power supply voltage is 39VDC – see chapter Technical data.



Note:

The IntelliDrive DCU Industrial controller should be grounded properly in order to protect against atmospheric discharges!

Install separate conductors for signal and power inputs. Allow for conductor voltage drop when determining conductor size. All power supplies must have common ground.

When there is a potential risk of the controller being subjected to conditions outside its capabilities - an outside protection device should be used.

4.3.2 Analog as Binary input

To use Analog input as binary configure following characteristics:

Primary	Converted
0	0
1000	1

4.3.3 Analog as three state (tristate) binary input

Open, close and failure (broken wire, short wire) states are detected. Threshold level is 750 Ω , failure is detected when circuit resistance is $<10 \Omega$ or $> 2400 \Omega$

4.3.4 Analog Sensor availability with controller

Table of supported sensors with controller.

	IntelliDrive-AI1-4	IntelliDrive AI5-8
PT100 [°C]		Y
PT1000 [°C]	Y	Y
NI100 [°C]		Y
NI1000 [°C]	Y	Y
PT100 [°F]		Y
PT1000 [°F]	Y	Y
NI100 [°F]		Y
NI1000 [°F]	Y	Y

Thermocpl J [°C]		Y
Thermocpl K [°C]		Y
Thermocpl L [°C]		Y
Thermocpl J [°F]		Y
Thermocpl K [°F]		Y
Thermocpl L [°F]		Y
4-20 mA active	Y	Y
+20 mA active	Y	Y
0-250 Ω	Y	Y
0-2400 Ω	Y	Y
0-4 V	Y	
0-5 V		Y
+1 V		Y
0-100 mV		Y
Tristate	Y	Y

4.3.5 Analog Sensors availability with extension modules

Table of supported sensors on various modules. Do not configure sensors that are not supported on the input.

	IS-AIN8	I-AIN8	IS-AIN8TC	I-AIN8TC	I-AIO 9/1	IGS-PTM
not used analog input	Y	Y	Y	Y	Y	Y
user curves	Y	Y			Y	Y
PT100 [°C]	Y	Y				Y
PT1000 [°C]	Y	Y			Y	
NI100 [°C]	Y	Y				Y
NI1000 [°C]	Y	Y			Y	
Thermocpl J [°C]	Y		Y	Y	Y	
Thermocpl K [°C]	Y		Y	Y	Y	
Thermocpl L [°C]	Y		Y	Y	Y	
4-20 mA passive	Y	Y				Y
4-20 mA active	Y	Y				Y
0-20 mA passive	Y	Y				*
±20 mA active	Y	Y				Y*
0-250 Ω	Y	Y				Y
0-2400 Ω	Y	Y			Y	Y**
0-2.4 V	Y	Y				
±1 V	Y	Y				
0-10 V	Y	Y				
0-100 mV	Y					Y

PT100 [°F]	Y	Y				Y
PT1000 [°F]	Y	Y			Y	
NI100 [°F]	Y	Y				Y
NI1000 [°F]	Y	Y			Y	
Thermocpl J [°F]	Y		Y	Y	Y	
Thermocpl K [°F]	Y		Y	Y	Y	
Thermocpl L [°F]	Y		Y	Y	Y	
Tristate						
Thermo(nc) J [°C]	Y		Y	Y	Y	
Thermo(nc) K [°C]	Y		Y	Y	Y	
Thermo(nc) L [°C]	Y		Y	Y	Y	
Thermo(nc) J [°F]	Y		Y	Y	Y	
Thermo(nc) K [°F]	Y		Y	Y	Y	
Thermo(nc) L [°F]	Y		Y	Y	Y	
0-5 V		Y				
0-10 kΩ		Y				
±65 V					Y	
±75 mV					Y	

Note:

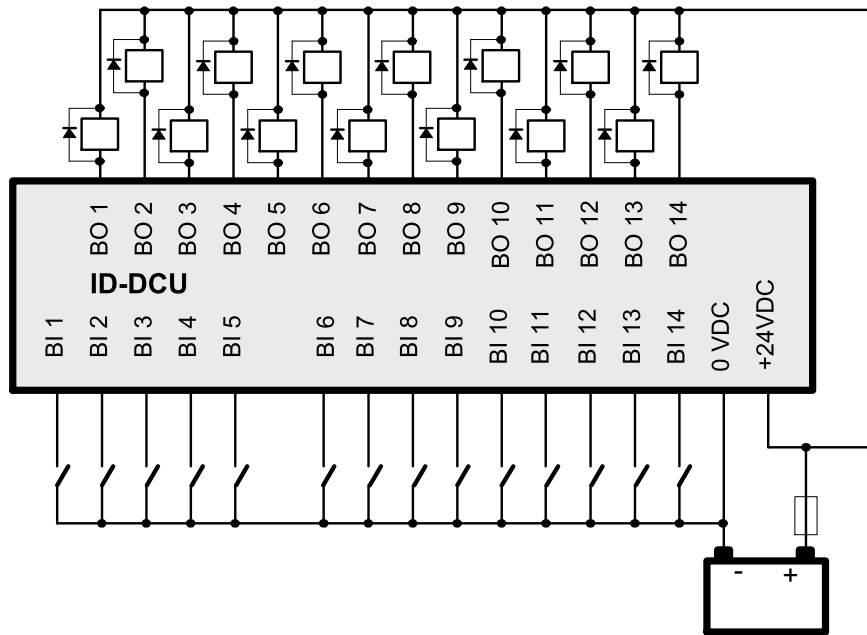
* IGS-PTM has hardware range 0-20mA but offered sensor in DriveConfig is ±20mA

** IGS-PTM has hardware range 0-250Ω only - DriveConfig offers correct sensor for I/O configuration but for User define input curve only sensor 0-2400Ω.

Note: Fahrenheit sensors are supported from IS-AIN8 of sw version 2.2 only.

4.3.6 Binary inputs/outputs on ID-DCU Industrial

Use wiring cables min. of 1.0 mm² to ensure proper function.

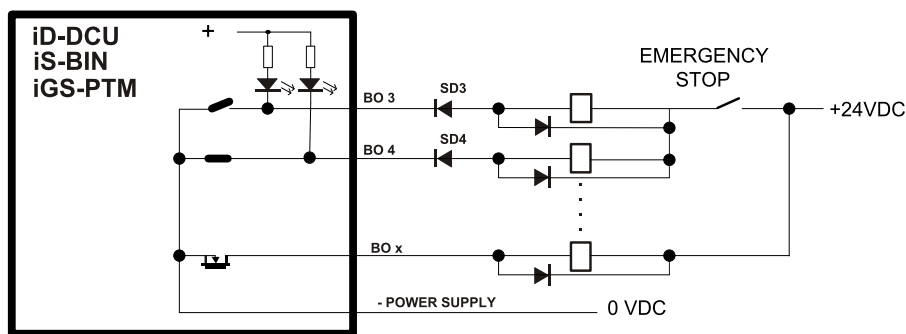


Note: Incorrect polarity of the binary output connection may cause a damage of the binary outputs.

4.3.7 Binary output separation

In some special cases e.g. when Relays plus terminal is disconnected via EMERGENCY STOP contact, the binary outputs must be separated using diodes to avoid false Binary output LED indication.

In the Example below when EMERGENCY STOP contact is opened, the BO3 LED should light (without separating diode SD3) even if the BO3 output is opened.



4.3.8 Connection of ID-DCU Industrial analog inputs

	<p>Standard connection of resistive sensors to ID-DCU Industrial analog inputs AI1 to AI8. The COM terminal must be always connected to the negative power terminal.</p>
	<p>Different sensors connection to ID-DCU Industrial. AI configuration jumpers must be in corresponding position and corresponding DriveConfig configuration according to used sensor.</p> <p>Analog input common terminal COM has to be connected to ID minus Power supply terminal.</p> <p>Mixed connection of ID-DCU Industrial analog inputs:</p> <ul style="list-style-type: none"> AI2, AI7 - current sensor AI1, AI5 - resistive sensor AI3, AI8 - voltage input AI6- thermocouple (voltage) AI4 - Not used
	<p>Mixed connection of IntelliDrive analog inputs:</p> <ul style="list-style-type: none"> AI1, AI2, AI5, AI6 - resistive sensor AI3, AI7 - binary input AI4, AI8 - three state input <p>Analog input common terminal COM has to be connected to ID minus Power supply terminal.</p>

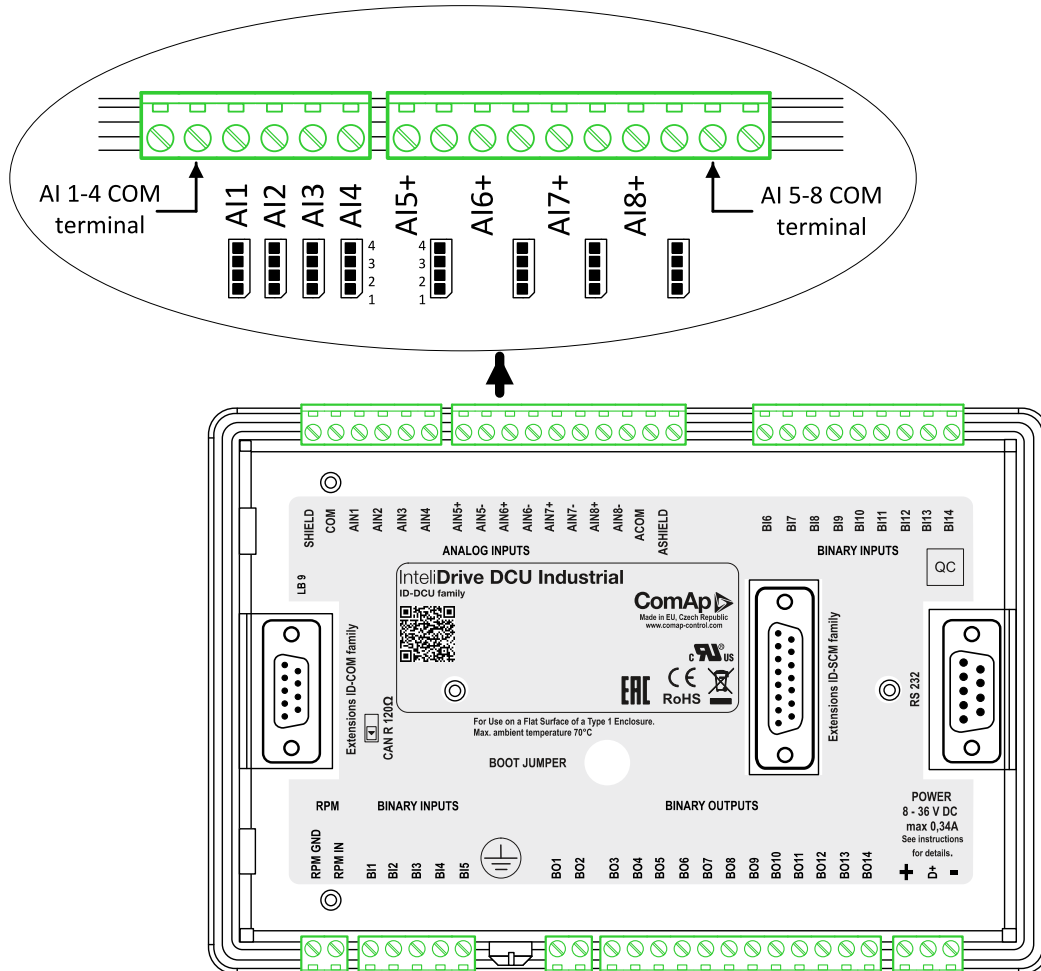
To ensure a proper function use shielded cables, especially for length over >3 m.

4.3.9 ID-DCU Industrial Analog inputs hardware configuration

Configure Analog inputs AI1-AI8 connection by jumpers on PCB (remove cover).

Controller default jumper setting from production

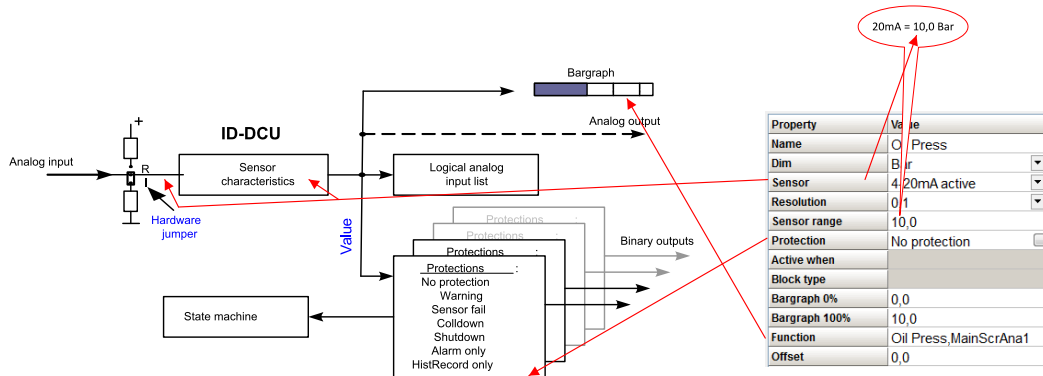
AI1 to AI4	Current sensor
AI5 to AI8	Resistance sensor



	<p>Current Measurement</p> <p>- Jumper on pins 1-2.</p>
	<p>Voltage (thermocouples AI5-AI8) measurement</p> <p>- Jumper on pins 2-3.</p>
	<p>Resistance measurement</p> <p>- Jumper on pins 3-4.</p>

Note: Maximal voltage on controller Differential analog inputs AI5 to AI8 is in the range -2 to $+5$ VDC against minus power supply terminal!

4.3.10 ID-DCU Industrial Analog inputs software configuration



Note: ID-DCU Industrial hardware jumper must correspond with software configuration.

Configuration

See drawing above

Property	Value
Name	Value name is displayed on the screens and in the Alarm list and History record. Enter up to 14 ASCII characters. Name is automatically set to Function name if function is selected from the Logical function list see Function item.
Dim	Dimension is displayed on the screens. Select dimension from the list or add a new one.
Sensor	Select sensor from the list or create a customer sensor characteristics in User sensor window. There must be corresponding analog input hardware jumper setting in IntelliDrive controller. See Sensor availability in table below.
Resolution	Output value (reading) resolution. DriveConfig indicates when Resolution is out of the value range.
Sensor range	Full output value (reading) range for 20 mA (current), 250 Ω, 2400 Ω (resistive), 1 V, 4V, 5V, 100 mV (voltage) sensor.
Protection	Select from the list. Configure two protection levels as standard or more levels (window) protection in Expert mode.
Active when	Configure direction Over or Under limit when protection is activated. Options "Under limit+FIs" and "Over limit+FIs" means that the protection is activated in case of Analog Input value is Under/Over the protection limit or in case that non valid value (####) is indicated on the Analog Input. More details in Protections (page 59)
Block type	Configure protection activity: All the time or Engine running with three different adjustable delays when protection is active after engine start (RPM > Starting RPM).
Bargraph 0%	Bargraph starting value.

Bargraph 100%	Bargraph ending value.
Function	Select from the list if function is required or leave free if input is a protection only.
Offset	Measured value offset.

Note: Some configuration items (e.g. Protection) stay without change when Property - Sensor is changed to None.

Sensors availability

Sensors available on ID-DCU Industrial AI1 - AI4	Resolution	Sensor range	HW jumper
Pt1000/°C, Ni1000/°C, Pt1000/°F, Ni1000/°F	Fix, not configurable		Resistance: 3-4
4-20 mA active, ±20 mA active (measures + only)	Adjustable - see Hint below.	For 20 mA input	Current: 1-2
0-250 Ω, 0-2400 Ω		For 250 or 2400 Ω Input	Resistance: 3-4
Tristate			Resistance: 3-4
0 to 4 VDC	Adjustable		Voltage: 2-3

Sensors available on ID-DCU Industrial AI5 - AI8	Resolution	Sensor range	HW jumper
Pt100/°C, Pt1000/°C, Ni100/°C, Ni1000/°C, Pt100/°F, Pt1000/°F, Ni100/°F, Ni1000/°F	Fix, not configurable		Resistance: 3-4
Thermocpl J/°C, Th K/°C, Th/°C, Thermocpl J/°F, Th. K/°F, ThL/°F	Fix, not configurable		Voltage: 2-3
4-20 mA active, ±20 mA active	Adjustable - see Hint below.	For 20 mA input	Current: 1-2
0-250 Ω, 0-2400 Ω		For 250 or 2400 Ω input	Resistance: 3-4
±1 V, 0-100 mV		For 1V or 100mV	Voltage: 2-3
Tristate			Resistance: 3-4
0 to 5 VDC	Adjustable		Voltage: 2-3

Configuration examples

- Conversion from 4-20 mA to 6.0 Bar Oil pressure sensor (Wm+Sd protection and Oil press function)

Property	Value	Logical function	Used
Name	Oil Press	LCD Brightness	<input type="checkbox"/>
Dim	Bar	Engine Speed	<input type="checkbox"/>
Sensor	4-20mA active	Oil Press	<input checked="" type="checkbox"/>
Resolution	0,1	Coolant Press	<input type="checkbox"/>
Sensor range	10,0	Coolant Temp	<input type="checkbox"/>
Protection	No protection	Requested RPM	<input type="checkbox"/>
Active when		Engine Torque	<input type="checkbox"/>
Block type		Fuel ConsAct	<input type="checkbox"/>
Bargraph 0%	0,0	FuelConsump	<input type="checkbox"/>
Bargraph 100%	10,0	BoatSpeed	<input type="checkbox"/>
Function	Oil Press,MainScrAna1	MainScrAna1	<input checked="" type="checkbox"/>
Offset	0,0	MainScrAna2	<input type="checkbox"/>
		Memory1	<input type="checkbox"/>

- Conversion from $\pm 1V$ input to engine speed request 0 to 100 %

No.	CU 0-1/+1 V (x)	Converted (y)
1.	-1,0000	0,0
2.	1,0000	100,0

No	HW configuration	Name	Resolution
1.	CU 0-1/+1 V	Input sensor 1	0,1

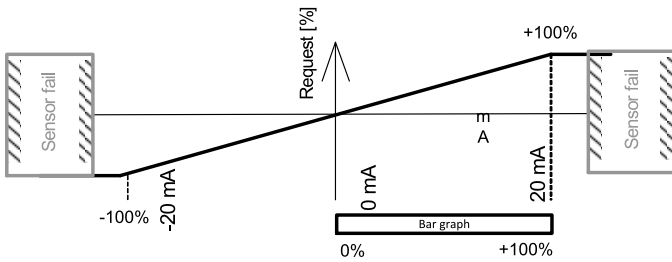
I/O	Name	Property	Value	Logical function	Used
Binary inputs	Used: 14/14	Name	Requested RPM	LCD Brightness	<input type="checkbox"/>
Binary outputs	Used: 14/14	Dim	%	Engine Speed	<input type="checkbox"/>
Analog inputs	Used: 4/8	Sensor	Input sensor 1	Oil Press	<input type="checkbox"/>
ID	Used: 4/8	Resolution	0,1	Coolant Press	<input type="checkbox"/>
AIN1	Oil Press	Sensor range	0,0	Coolant Temp	<input type="checkbox"/>
AIN2	Coolant Temp	Protection	No protection	Requested RPM	<input checked="" type="checkbox"/>
AIN3	CoolantPress	Active when		Engine Torque	<input type="checkbox"/>
AIN4	Ain CU 4	Block type		Fuel ConsAct	<input type="checkbox"/>
AIN5	Requested RPM	Bargraph 0%	0,0	FuelConsump	<input type="checkbox"/>
AIN6	Ain CU 6	Bargraph 100%	200,0	BoatSpeed	<input type="checkbox"/>
AIN7	Ain CU 7	Function	Requested RPM	MainScrAna1	<input type="checkbox"/>
AIN8	Ain CU 8	Offset	0,0	MainScrAna2	<input type="checkbox"/>

Note:

HW configuration: CU 0-1 V can be used for characteristics $\pm 1 V$, but this \pm characteristics can be configured to AI5 to AI8 inputs only!

Sensor range (gray background) automatically follows the User sensor characteristics (zero value at the above picture is not important).

- Conversion from $\pm 20 mA$ to $\pm 100 \%$ request



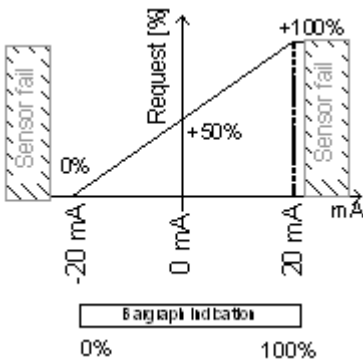
Sensor characteristics $\pm 20\text{mA}$ works in full \pm range on ID-DCU Industrial AI5 to AI8 only. ID-DCU Industrial AI1 to AI4 measures 0 to 20 mA range only.

Default sensor characteristics creates conversion to $\pm 100\%$.

Bar graph indicates only positive values 0 to +100%.

I/O	Name	Property	Value	Logical function	Used
Binary inputs	Used: 14/14	Name	Requested RPM	LCD Brightness	<input type="checkbox"/>
Binary outputs	Used: 14/14	Dim	%	Engine Speed	<input type="checkbox"/>
Analog inputs	Used: 4/8	Sensor	+20mA active	Oil Press	<input type="checkbox"/>
ID	Used: 4/8	Resolution	0,01	Coolant Press	<input type="checkbox"/>
AIN1	Oil Press	Sensor range	100,00	Coolant Temp	<input type="checkbox"/>
AIN2	Coolant Temp	Protection	No protection	Requested RPM	<input checked="" type="checkbox"/>
AIN3	CoolantPress	Active when		Engine Torque	<input type="checkbox"/>
AIN4	Ain CU 4	Block type		Fuel ConsAct	<input type="checkbox"/>
AIN5	Requested RPM	Bargraph 0%	0,00	FuelConsump	<input type="checkbox"/>
AIN6	Ain CU 6	Bargraph 100%	100,00	BoatSpeed	<input type="checkbox"/>
AIN7	Ain CU 7	Function	Requested RPM	MainScrAna1	<input type="checkbox"/>
AIN8	Ain CU 8	Offset	0,00	MainScrAna2	<input type="checkbox"/>

► Conversion from $\pm 20\text{mA}$ to +100% request with User sensor



Sensor characteristics $\pm 20\text{mA}$ works in full \pm range on ID-DCU Industrial AI5 to AI8 only. ID-DCU Industrial AI1 to AI4 measures 0 to 20 mA range only.

1. Create User sensor as below.
2. Configure user sensor instead default $\pm 20\text{mA}$ sensor.
3. Configure Bargraph 100% to correspond User sensor.

Bargraph indicates full 0 to 100% range in this case.

1. Create sensor like below.

No.	CU 0-20/+20mA (x)	Converted (y)
1.	-20,000	0
2.	20,000	100

No.	HW configuration	Name	Resolution
1.	CU 0-20/+20mA	Input sensor 1	1

2. Configure user sensor instead default $\pm 20\text{mA}$ sensor.

I/O		Property		Value	
Binary inputs	Used: 11/14	Name	Ain CU 6		
Binary outputs	Used: 13/14	Dim	%		
Analog inputs	Used: 3/8	Sensor	Input sensor 1		
ID	Used: 3/8	Resolution	1		
AIN1	Oil Press	Sensor range	0		
AIN2	Coolant Temp	Protection	No protection		
AIN3	Ain CU 3	Active when			
AIN4	Ain CU 4	Block type			
AIN5	Ain CU 5	Bargraph 0%	0		
AIN6	Ain CU 6	Bargraph 100%	100		
AIN7	Ain CU 7	Function			
AIN8	Ain CU 8				

User sensor examples

Availability	Configuration
AI1 to AI4 AI5 to AI8 Analog input jumper = 1-2 (current)	0 - 20mA / 600
AI1 to AI4 AI5 to AI8	4 - 20mA / 100,0

<p>AI5 to AI8 Analog input jumper = 2-3 (voltage)</p>	<p>0 - 1V / 10,000</p> <p>Modules I/O Setpoints Commands Protections History User curves Languages Translator PLC Editor Sc</p> <p>Curves <input checked="" type="radio"/> Input sensors <input type="radio"/> PLC curves</p> <table border="1"> <thead> <tr> <th>No.</th> <th>CU 0-1/+1 V (x)</th> <th>Converted (y)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>0,0000</td> <td>0,000</td> </tr> <tr> <td>2.</td> <td>1,0000</td> <td>10,000</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>No</th> <th>HW configuration</th> <th>Name</th> <th>Resolution</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>CU 0-1/+1 V</td> <td>Input sensor 3</td> <td>0,001</td> </tr> </tbody> </table>	No.	CU 0-1/+1 V (x)	Converted (y)	1.	0,0000	0,000	2.	1,0000	10,000	No	HW configuration	Name	Resolution	1.	CU 0-1/+1 V	Input sensor 3	0,001
No.	CU 0-1/+1 V (x)	Converted (y)																
1.	0,0000	0,000																
2.	1,0000	10,000																
No	HW configuration	Name	Resolution															
1.	CU 0-1/+1 V	Input sensor 3	0,001															
<p>AI5 to AI8</p>	<p>0 - 100mV / 100,00</p> <p>Modules I/O Setpoints Commands Protections History User curves Languages Translator PLC Editor Sc</p> <p>Curves <input checked="" type="radio"/> Input sensors <input type="radio"/> PLC curves</p> <table border="1"> <thead> <tr> <th>No.</th> <th>CU 0-100 mV (x)</th> <th>Converted (y)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>0,00</td> <td>0,00</td> </tr> <tr> <td>2.</td> <td>100,00</td> <td>100,00</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>No</th> <th>HW configuration</th> <th>Name</th> <th>Resolution</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>CU 0-100 mV</td> <td>Input sensor 4</td> <td>0,01</td> </tr> </tbody> </table>	No.	CU 0-100 mV (x)	Converted (y)	1.	0,00	0,00	2.	100,00	100,00	No	HW configuration	Name	Resolution	1.	CU 0-100 mV	Input sensor 4	0,01
No.	CU 0-100 mV (x)	Converted (y)																
1.	0,00	0,00																
2.	100,00	100,00																
No	HW configuration	Name	Resolution															
1.	CU 0-100 mV	Input sensor 4	0,01															
<p>AI1 to AI4 AI5 to AI8 Analog input jumper = 3-4 (resistance)</p>	<p>0 - 1200 Ω / 100</p> <p>Modules I/O Setpoints Commands Protections History User curves Languages Translator PLC Editor Scree</p> <p>Curves <input checked="" type="radio"/> Input sensors <input type="radio"/> PLC curves</p> <table border="1"> <thead> <tr> <th>No.</th> <th>CU 0-2500 ohm (x)</th> <th>Converted (y)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>0,0</td> <td>0</td> </tr> <tr> <td>2.</td> <td>1200,0</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>No</th> <th>HW configuration</th> <th>Name</th> <th>Resolution</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>CU 0-2500 ohm</td> <td>Input sensor 5</td> <td>1</td> </tr> </tbody> </table>	No.	CU 0-2500 ohm (x)	Converted (y)	1.	0,0	0	2.	1200,0	100	No	HW configuration	Name	Resolution	1.	CU 0-2500 ohm	Input sensor 5	1
No.	CU 0-2500 ohm (x)	Converted (y)																
1.	0,0	0																
2.	1200,0	100																
No	HW configuration	Name	Resolution															
1.	CU 0-2500 ohm	Input sensor 5	1															

Note:

*It is possible to set up to 30 points non-linear sensor characteristics.
Connect external resistors (voltage divider) to extend input voltage range.*

5 Controller setup

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- 5.3 Shared IO and Virtual IO 79
- 5.4 Multiple ECU modules support 82

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5.1 Function description details

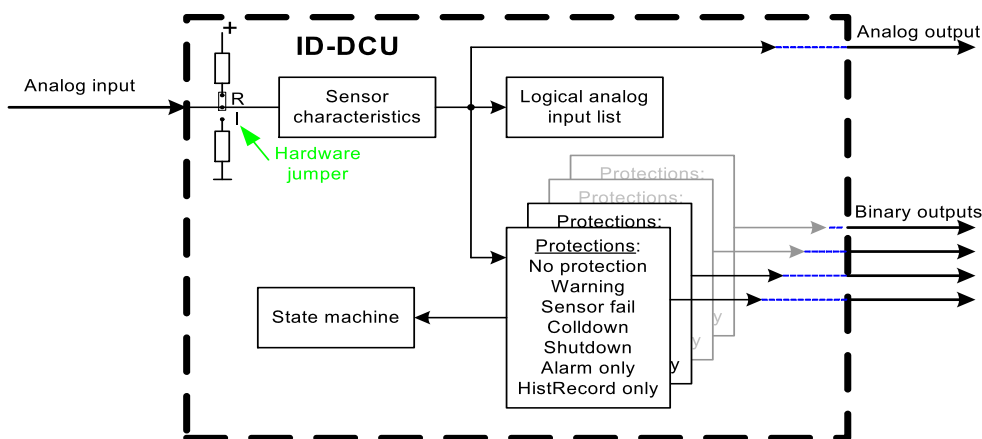
Section describing more detailed settings of selected controller functions.

5.1.1 Engine running state

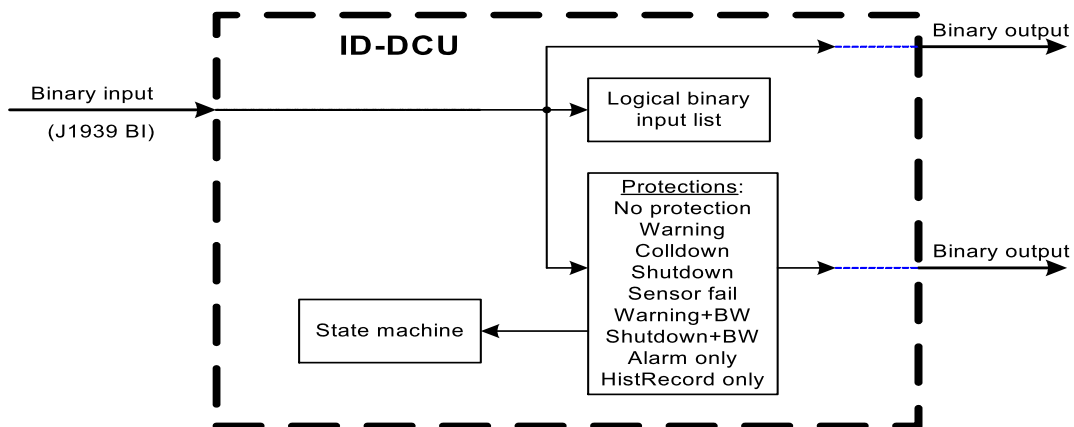
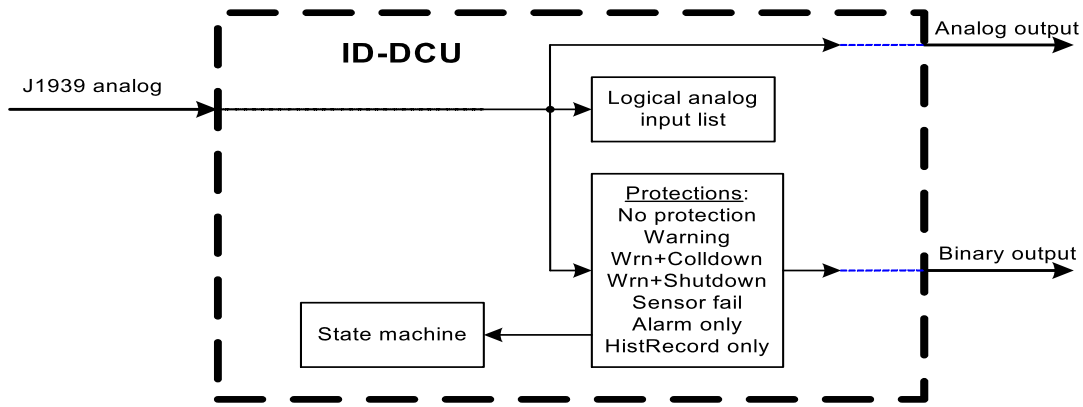
RPM > Engine params: **Starting RPM** or
 Logical Analog Input **Oil Press** > Engine params: **Starting Poil** or
 Logical Analog Input **Coolant Press** > Engine params: **StartPCoolant (PRP only)** or
 active BI **RunIndication1** or
 active BI **RunIndication2** or
 active BI **RunIndication3**.

5.1.2 Protections

Brief description of the controller's protection - basic settings and use cases.

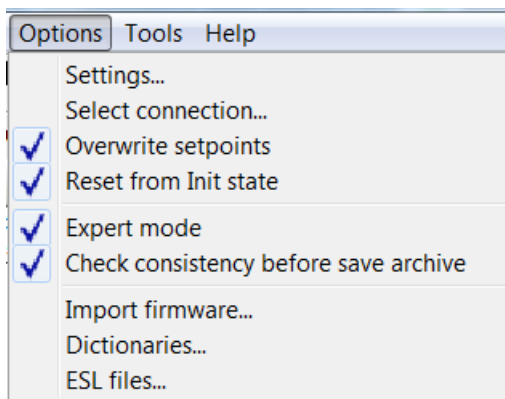


Note: There are visible only the first two bar graph marks for protection limits indication on ID-DCU Industrial screen !!!



How to configure analog input window protection

1. Switch DriveConfig to EXPERT mode.



2. Configure standard two level analog protection

Configure analog protection

Ain CU 3

Protection: Wrn+Shutdown

Active when: Over limit

Block type: RunOnlyBlkDel1

Level 1 Limit Setpoint

Name:	Value:	Low limit:	High limit:
Ain3 overWrn	80	0	200

Level 2 Limit Setpoint

Name:	Value:	Low limit:	High limit:
Ain3 overSd	90	0	200

Delay Setpoint

Name:	Value:
Ain3 Del	5 s

OK Cancel

3. Add another protections in EXPERT window. There can be set the same delay for all four limits.

No.	Protection	Property	Value	Name	Used	Value	Lo limit	Hi limit	Dim
1.	Warning	Protection type	Warning	Ain3 overWrn	<input checked="" type="checkbox"/>	80	0	200	-
2.	Shutdown	Active when	Over limit	Ain3 overSd	<input type="checkbox"/>	90	0	200	-
3.	Warning	Block type	RunOnlyBlkDel1	Ain3 underWrn	<input type="checkbox"/>	60	0	200	-
4.	Shutdown	Univ.state	None	Ain3 underSd	<input type="checkbox"/>	50	0	200	-
		Limit type	Setpoint						
		Limit	Ain3 overWrn						
		Delay type	Setpoint						
		Delay	Ain3 Del						

Set up protection activation

Setting the "Active when" parameter has several options with a specific evaluation.

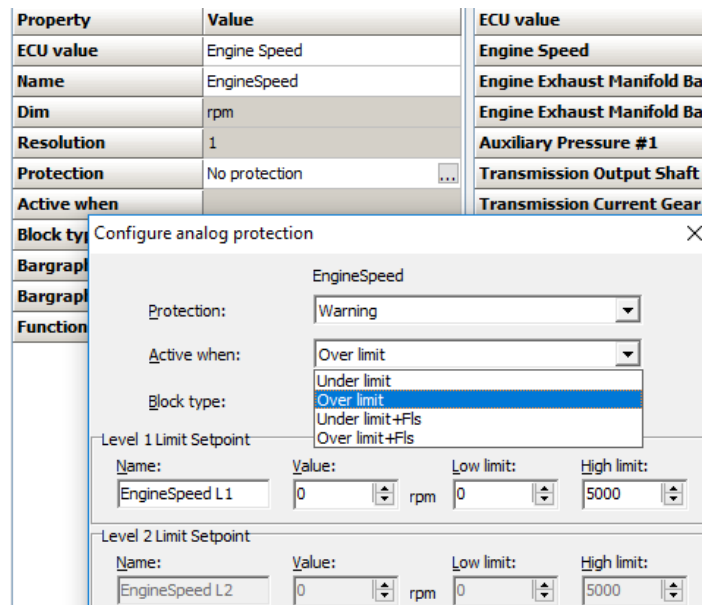


Image 5.1 Select when the protection will be activated - DriveConfig

Under limit

Protection is announced when it gets below the limit *Level 1 (and Level 2) Limit Setpoint: Value*. The delay of *Delay Setpoint: Value* can be applied to the protection. Alarm notification in the alarm list and in history

Sensor defect when receiving invalid or no value, announces the ***FIs Analog input name*** (where Analog input name = will be the specific electronic (ECU, I-CB, shared) value on which the protection is configured)

Over limit

Protection is announced when it gets over the limit *Level 1 (and Level 2) Limit Setpoint: Value*. The delay of *Delay Setpoint: Value* can be applied to the protection. Alarm notification in the alarm list and in history

Sensor defect when receiving invalid or no value, announces the ***FIs Analog input name***

Under limit+FIs

Protection is announced when it gets below the limit *Level 1 (and Level 2) Limit Setpoint: Value*. The delay of *Delay Setpoint: Value* can be applied to the protection. Alarm notification in the alarm list and in history

Sensor defect when receiving invalid or no value, announces the ***FIs Analog input name*** + At the same time the type of configured protection ***Wrn Analog input name*** or ***Sd Analog input name*** (and other types according to Controller options) is also declared

Note: Thus, when the sensor fails, up to 3 alarms can occur for one value = *Wrn, Sd, FIs*

Over limit+FIs

Protection is announced when it gets over the limit *Level 1 (and Level 2) Limit Setpoint: Value*. The delay of *Delay Setpoint: Value* can be applied to the protection. Alarm notification in the alarm list and in history

Sensor defect when receiving invalid or no value, announces the ***FIs Analog input name*** + At the same time the type of configured protection ***Wrn Analog input name*** or ***Sd Analog input name*** (and other types according to Controller options) is also declared

Note: Thus, when the sensor fails, up to 3 alarms can occur for one value = *Wrn, Sd, FIs*

Sensor fail protection

Protection Sensor Fail (often only the FLS prefix is used) can be used with electronic modules and ID-RPU module only. Protection is activate only if there is failure of receiving data and value is in logical 0.

Fls will be triggered based on real failure in logical 0 only for electronic units. Fls will not be triggered if binary is in logical 1 and for physical inputs.

When the Fls is declared (based on an invalid value), the particular value is "hashed" - the user sees ##### and the color graphics terminals are additionally colored (IMON, Intelivision)

The feature of communication with the ECU during a partial failure of the communication

If there is no complete communication failure (Communication error is not detected), the sensor fail is not indicated.

This may not be noticeable when protecting the ECU module Protection = No protection. If a configured data frame is not received, from otherwise functioning electronic communications, its value remains the last valid one. There is no alarm Fls Analog input name, and if the last valid value has triggered a 1st or 2nd level alarm, the alarm is still active.

Delay of Sensor fail notification

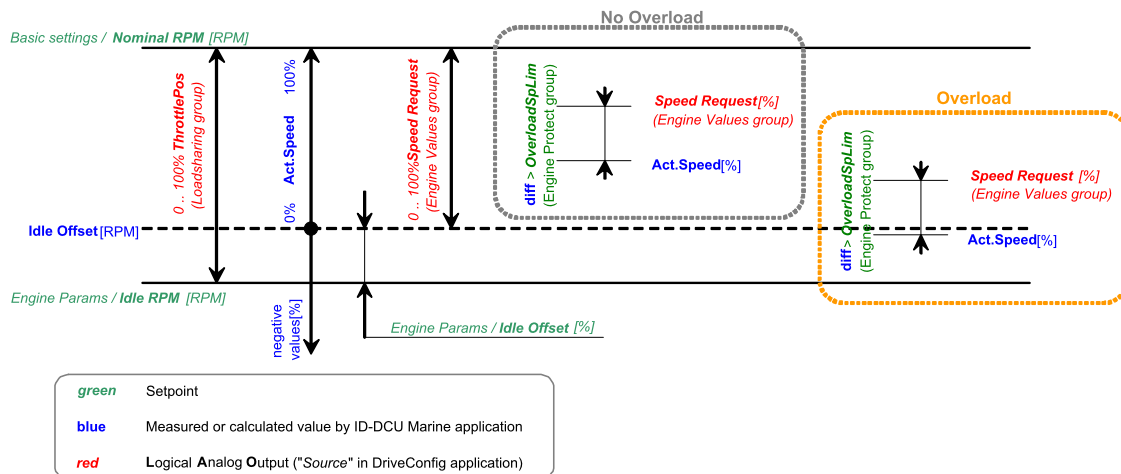
At the beginning of communication (after the state Communication Error), we monitor recieving of the first valid frame, then the timer starts 3000ms during which the announcement of a sensor fail **Fls Analog input name** is blocked.

Other conditions for Sensor fail alarm

Announcement of failure (and other protections) of the ECU value of the type anain is blocked when:

- ▶ ain_idx is not ECU ain_idx
- ▶ when configured ECU is not communicating
- ▶ when evaluation of ECU communication failure is blocked
 - ECU Power Relay (in logical 0) block CommFail alarm and FLS alarm
 - ECUComFailBlok (in logical 1) block only CommFail alarm, FLS alarm will be announced!
- ▶ Announcement of failure (and other protection) of the ECU value of the binin type is blocked if a communication error with ECU is declared in AL
- ▶ activated in the same way as LBO ECU Comm Lost
 - activated after timeout based on ESF (quickest RX frame + 100ms, at least 300ms)
 - activated 3s after controller start if ECU does not communicate
 - deactivated immediately after ECU starts to communicate
 - ECU alarm can be blocked by LBI or by ECU Power relay mechanism
 - LBO ECU Comm. Fail mirroring alarm activity but it is activated even if protection blocked (see above) and even if protection level of module is set to no protection
- ▶ deactivated 3s after deactivation of LBO ECU Comm Lost
- ▶ LBI ECU Comm Fail Block or deactivated ECU power relay (if used) also blocks FLS protection on ECU inputs

Requested RPM, Overload protection (AS only)



$$\text{Idle Offset [RPM]} = \text{Idle RPM [RPM]} + (\text{Idle Offset [\%]} / 100) \times (\text{Nominal RPM [RPM]} - \text{Idle RPM [RPM]})$$

$$\text{Act.Speed [\%]} = \frac{\text{Act.Speed [RPM]} - \text{Idle Offset [RPM]}}{\text{Nominal RPM [RPM]} - \text{Idle Offset [RPM]}} \times 100$$

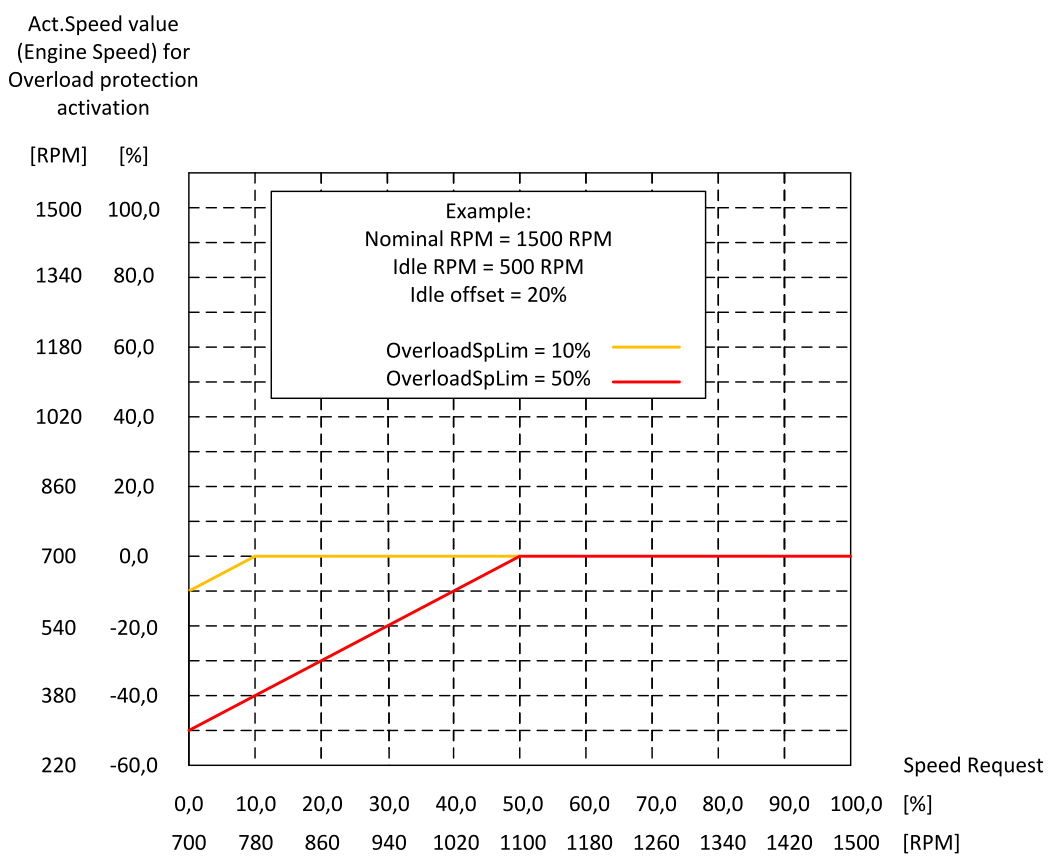
- ▶ **Engine Values:** **Speed Request** is value in the range 0,0 to 100,0%.
- ▶ **Engine Values:** **Speed Request** can be changed
 - From analog input configured as Logical Analog Input Requested RPM.
 - Via binary inputs Speed Up, Speed Down with ramp **BI Speed Ramp**.
 - From ID panel using Fast edit function.
 - See Engine Values: **Speed Request** charts for **Engine Values (page 258)** and **Engine Values (page 258)** modes.
- ▶ When Logical Analog Input Requested RPM indicates sensor fail or it is not configured and Binary input **Back Up Speed** is closed the **Loadsharing: ThrottlePos** value is adjusted to the **Loadsharing: Back Up Speed**, the **ThrottlePos** value change is influenced by ramp **Loadsharing: RQSP Ramp**.
- ▶ When binary input **Fire Speed** is closed the Clutch is disconnected and the **Loadsharing: ThrottlePos** is set to **Engine params: FireAlarmSpeed**, the **ThrottlePos** value change is influenced by ramp **Loadsharing: RQSP Ramp**.
- ▶ For 100% of **Engine Values: Speed Request** the controller sends 100,0% **Loadsharing: ThrottlePos** (TP) to the ECU, for 0,0% of **Engine Values: Speed Request** sends the value of the setpoint **Idle offset**.
- ▶ The setpoints **Nominal speed [RPM]** and **Idle speed [RPM]** have to be set to real values that the engine is running at 100% TP respectively 0% TP

Overload protection (AS only)

- ▶ Overload protection and corresponding Alarm message is activated when Engine RPM gets close to nominal RPM (**SpeedRequest% - ActualSpeed% < 0.5 %**) or when following conditions are valid in period longer than **Overload del**:

$$\begin{aligned}
 & \text{Speed Request [\%]} - \text{Act.Speed [\%]} > \text{OverloadSpLim [\%]} \\
 & \text{and} \\
 & \text{Act.Speed [\%]} < 0 \%
 \end{aligned}$$

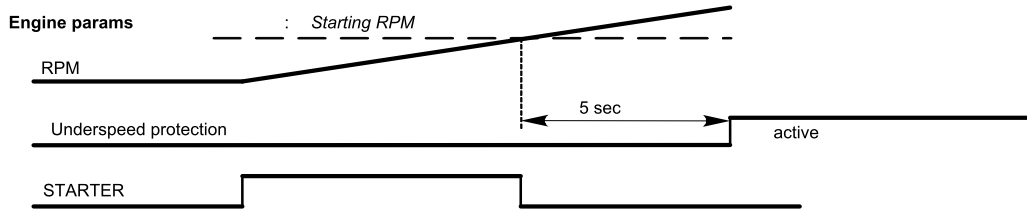
Example describing Overload protection activation, i.e. when the Engine speed falls down below yellow or brown limit.



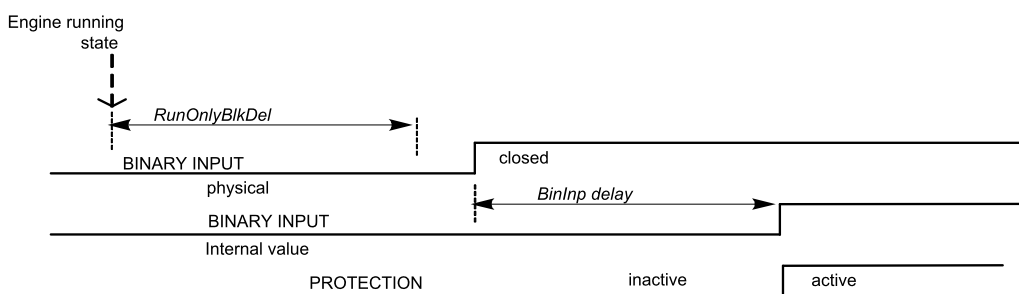
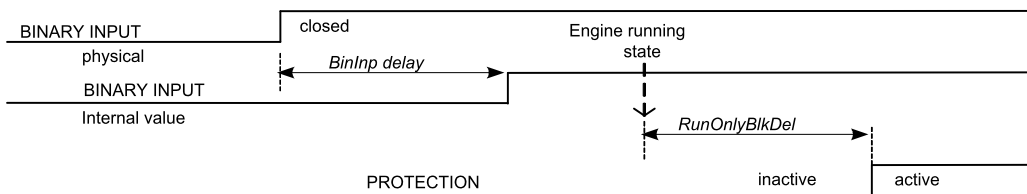
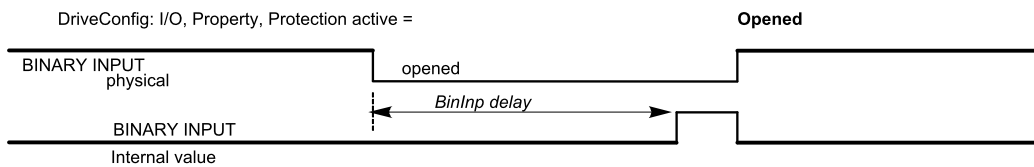
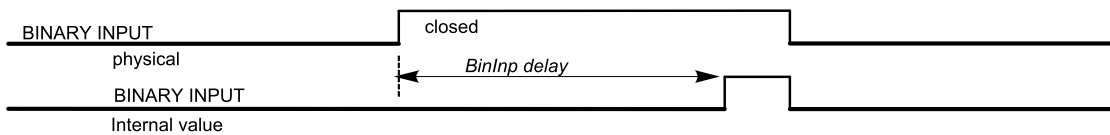
Note: Set **Engine Params: Idle offset** = 0% and **Engine Protect: OverloadSpLim** = 100% to disable Overload protection functionality, i.e. if the protection is not requested by an application.

Under speed protection

Under speed protection is activated 5 sec after RPM > **Engine params: Starting RPM**. Engine underspeed is detected when RPM drops below setpoint **Engine Protect: UnderSpeed**.



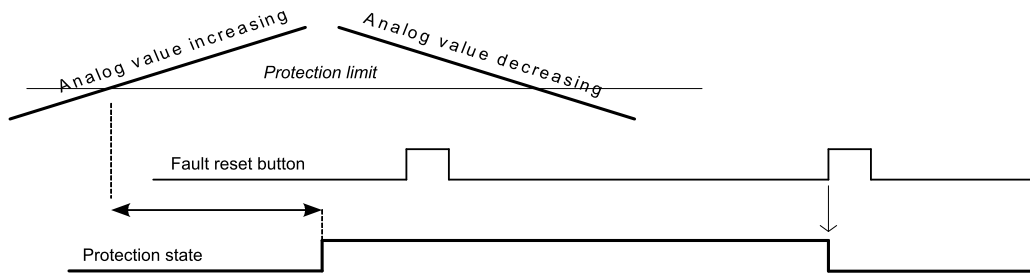
Protection delay and blocking



5.1.3 Universal states

State is a value joined to each Analog input or value. State indicates if any protection configured on corresponding analog input is active or not. When there is any state configured as protection the corresponding Binary output appears in Analog protection list and can be used for selective external indication of the Alarm.

State is resetted (output is opened) when corresponding Alarm is not active and confirmed (Fault reset was pressed).

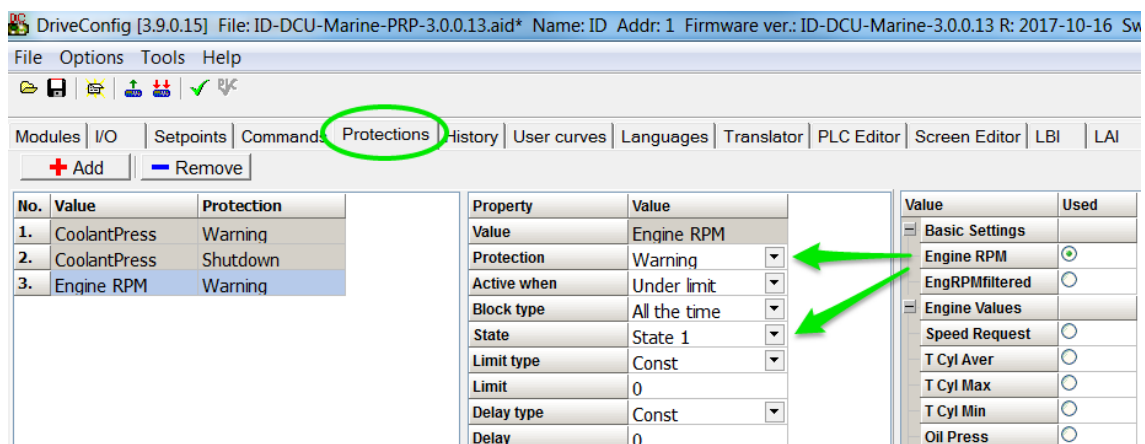


There are seven universal (free) states available in ID-DCU Industrial-3.4.1 that are not joined to any value or input.

They can be used mostly for some values that have not state (e.g. RPM or other that are not measured on Analog input). This way can be configured protection to any ID-DCU Industrial internal value or more levels external indication.

Example of Universal state1 configuration to Engine speed (Warning for Engine speed > 1600RPM, 1s):

This configuration is available in DriveConfig – Expert mode.



5.2 PLC - programmable functions

Following programmable functions are available in ID-DCU Industrial-3.4.1 software.

Use DriveConfig-3.3 or higher software to configure PLC functions.

5.2.1 General specification

► Each function output can be configured to:

- another function input
- any physical terminal (e.g. to controller's physical Binary Output) - DriveConfig I/O sheet

- ▶ Each function limit (parameter) can be configured as:
 - constant limit (fix): just write requested value into the field (-32768 to +32767)
 - setpoint limit (customer adjustable): click on field and select one from PLC setpoint list
 - any value (e.g. from Analog input): click on field and select one from controller or PLC values list
- ▶ All PLC function analog inputs are signed type and that is why the following analog values must not be configured to any comparator and PID analog input:
 - Load Sharing: ThrottlePos.
 - Info: ECU DiagSource, Timer val, PasswordDecode.
 - Statistics: NumSuccStarts, NumUnscStarts, Service time.
- ▶ All function limits and analog outputs must follow input analog value format:
 - e.g. input value is 0,0 to 10,0 bars, then setpoint limit is e.g. 3,2.
- ▶ Any time and delay limit is in 0,1s step in the range 0,1 to 3276,7 sec.
- ▶ PLC consistency check indicates incorrect PLC configuration.


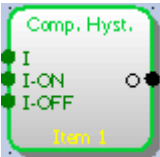


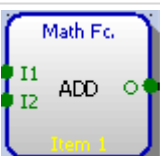
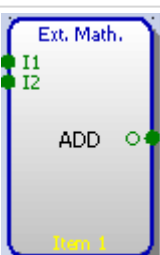
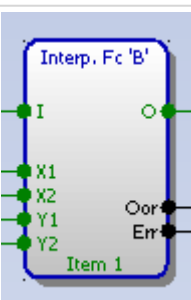
PLC values

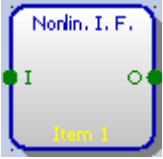
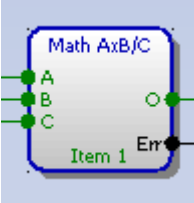
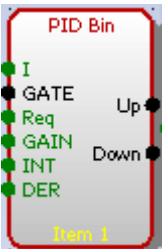
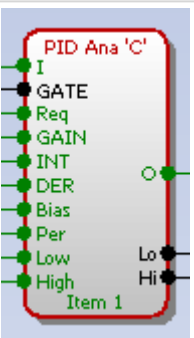
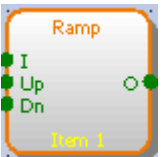
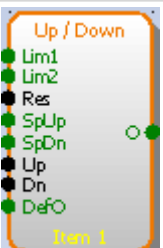

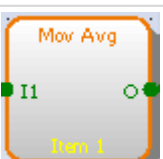
Binary	<p>List contains 128 internal binary values (bits) PLC Bout 1.1 to PLC BOUT 16.8 that can be configured as any PLC function binary input or output.</p> <p>Only used PLC Bout x.x can be configured to ID-DCU Industrial controller or external modules physical terminals.</p> <p>Used values are visible at controller screen.</p>
Analog	<p>There are available 96 internal analog values PLC Aout 1 to PLC Aout 96 that can be configured as any PLC function input or output.</p> <p>Any used PLC Aout x can be configured as physical analog output. Used values are visible at controller screen.</p>
PLC resource	<p>Unsigned value that is automatically used for Counter and Timer functions, 16 PLC resources are available.</p> <p>Values are visible in IntelliMonitor only.</p>

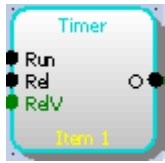
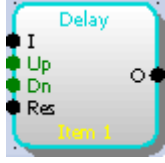
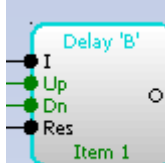
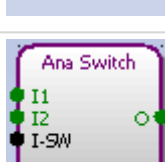

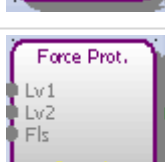
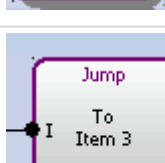
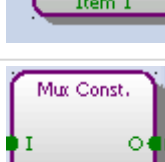

5.2.2 List of available PLC functions

Note: Exact description of all available PLC functions can be found in DriveConfig-3.3 User Guide or in DriveConfig context help (F1 key when a PLC function is selected).

IMPORTANT: Logic for controlling the motor can't be locked in PLC. Certification authority can ask for access to the content locked this way.

PLC Function	Selection Available	Number of available blocks in ID-DCU Industrial 3.4.1
 <p>OR / AND I1 I2 AND Item 1</p>	OR/AND	128x
 <p>XOR / RS I1 I2 XOR Item 1</p>	XOR/RS	128x
 <p>Comp. Hyst. I I-ON I-OFF Item 1</p>	Comp Hyst	24x
 <p>Comp. Time I1 I2 Delay Item 1</p>	Comp Time	16x
 <p>Comp. Win. I HIGH LOW Item 1</p>	Comp Win.	16x
 <p>Math Fc. I1 I2 ADD Item 1</p>	Math Fc	16x
 <p>Ext. Math. I1 I2 ADD Item 1</p>	Ext Math Fc	8x
 <p>Interp. Fc 'B' I X1 X2 Y1 Y2 Oor Err Item 1</p>	Interpol Fc 'B'	16x

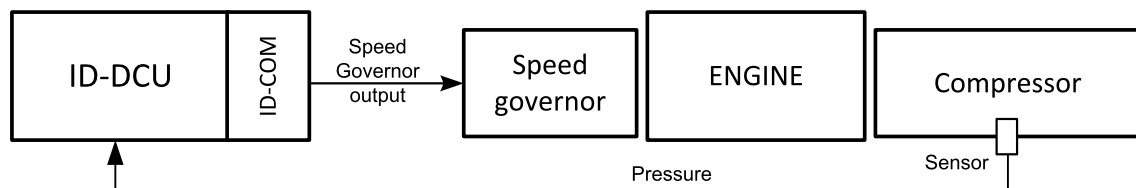
PLC Function	Selection Available	Number of available blocks in ID-DCU Industrial 3.4.1
 <p>Norlin. I. F.</p> <p>Item 1</p>	Nonlin I Fc	4x
 <p>Math AxB/C</p> <p>Item 1 Err</p>	Math AxB/C	8x
 <p>PID Bin</p> <p>Item 1</p>	PID Bin	4x
 <p>PID Ana 'C'</p> <p>Item 1</p>	PID Ana C	8x
 <p>Ramp</p> <p>Item 1</p>	Ramp	4x
 <p>Up / Down</p> <p>Item 1</p>	Up/Down	4x
 <p>Inc / Dec</p> <p>Item 1</p>	Inc/Dec	2x
 <p>Mov Avg</p> <p>Item 1</p>	Mov Avg	4x

PLC Function	Selection Available	Number of available blocks in ID-DCU Industrial 3.4.1
 <p>Timer</p> <ul style="list-style-type: none"> Run Rel RelV <p>Item 1</p>	Timer	4x
 <p>Delay</p> <ul style="list-style-type: none"> I Up Dn Res <p>Item 1</p>	Delay	16x
 <p>Delay 'B'</p> <ul style="list-style-type: none"> I Up Dn Res <p>Item 1</p>	Delay B	8x
 <p>Ana Switch</p> <ul style="list-style-type: none"> I1 I2 I-SW <p>Item 1</p>	Ana Switch	16x
 <p>Force Hist.</p> <ul style="list-style-type: none"> I <p>Item 1</p>	Force Hist	4x
 <p>Force Prot.</p> <ul style="list-style-type: none"> Lv1 Lv2 Fls <p>Item 1</p>	Force Prot	16x
 <p>Jump</p> <p>To Item 3</p> <p>Item 1</p>	Jump	8x
 <p>Mux Const.</p> <ul style="list-style-type: none"> I <p>Item 1</p>	Mux Const.	4x
 <p>Counter</p> <ul style="list-style-type: none"> Cnt Lim Clr <p>Item 1</p>	Counter	16x

PLC Function	Selection Available	Number of available blocks in ID-DCU Industrial 3.4.1
	Decomp	8x
	Convert	16x
	3D Map	2x

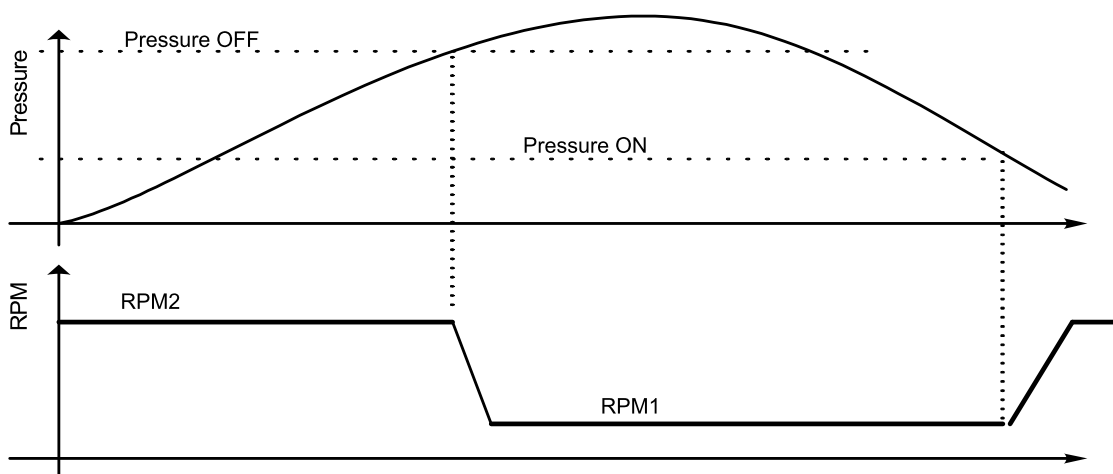
5.2.3 PLC configuration example

Let suppose a diesel compressor. The engine speed is controlled via ID-SCM Speed governor analog output (no data communication). InteliDrive measures output pressure.

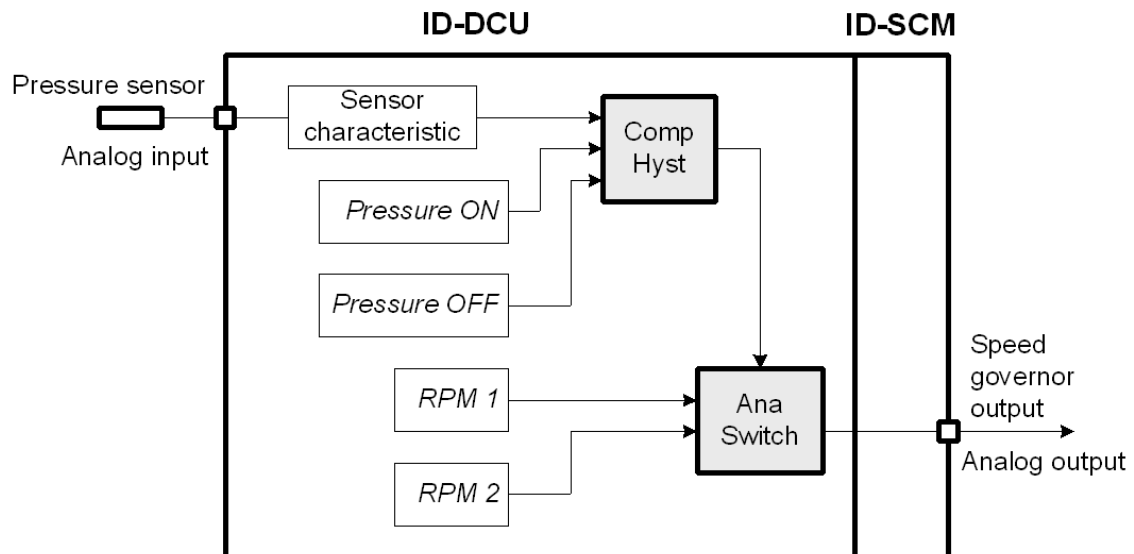


Required function

Based on adjustable pressure limits ID controller switch the engine between RPM1 to RPM2. When Pressure drops below Pressure ON limit engine increases from RPM1 to RPM2 and after Pressure increases above Press OFF limit goes back to RPM1.



Function structure

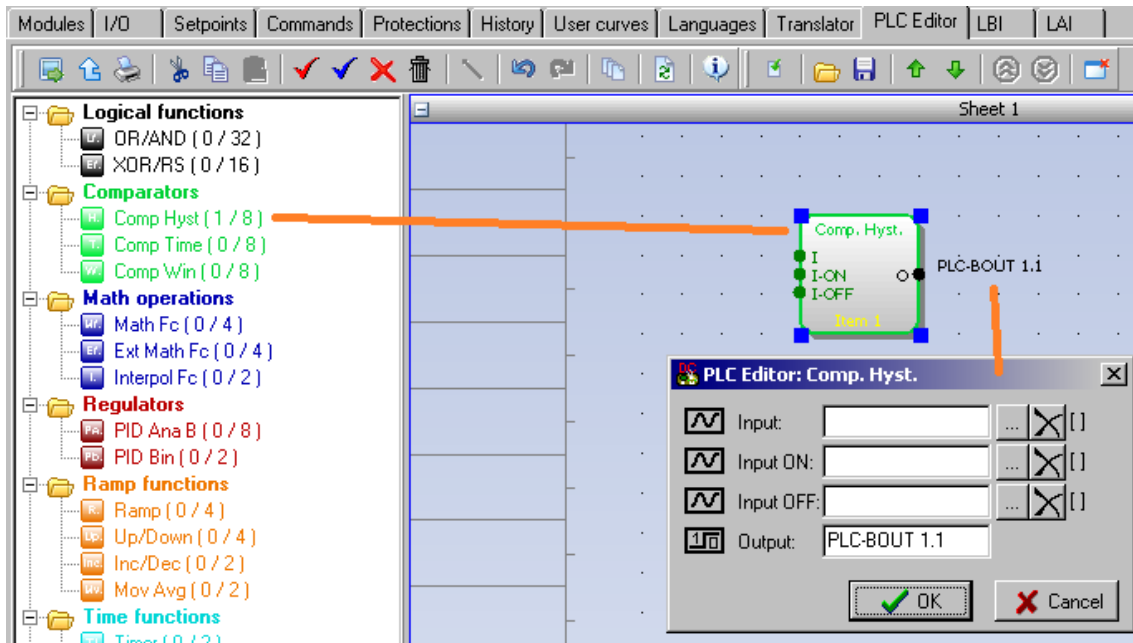


Configuration steps

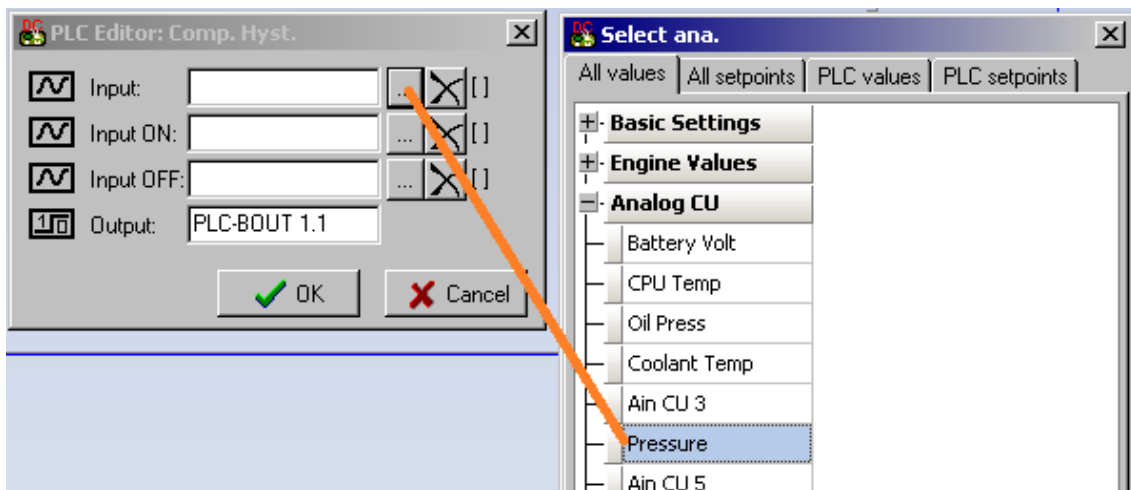
1. Start DriveConfig and open default archive ID-DCU-X.aid.
2. Pressure measuring: configure pressure sensor characteristic – suppose range 0 to 10,0 Bars on ID-DCU Industrial Analog input 4. Wrn and Sd protection limits should be adjusted over Pressure OFF limit.

I/O		Property	
Name	Value	Name	Value
± Binary inputs	Used: 13/14	Name	Pressure
± Binary outputs	Used: 14/14	Dim	Bar
− Analog inputs	Used: 3/8	Sensor	4-20mA active
− ID	Used: 3/8	Resolution	0,1
AIN1	Oil press	Sensor range	10,0
AIN2	Coolant press	Protection type	Wrn+Shutdown
AIN3	Ain CU 3	Active when	Over limit+Fls
AIN4	Pressure	Block type	RunOnlyBlkDel1
AIN5	Ain CU 5	Bargraph 100%	10,0
AIN6	Ain CU 6	Function	

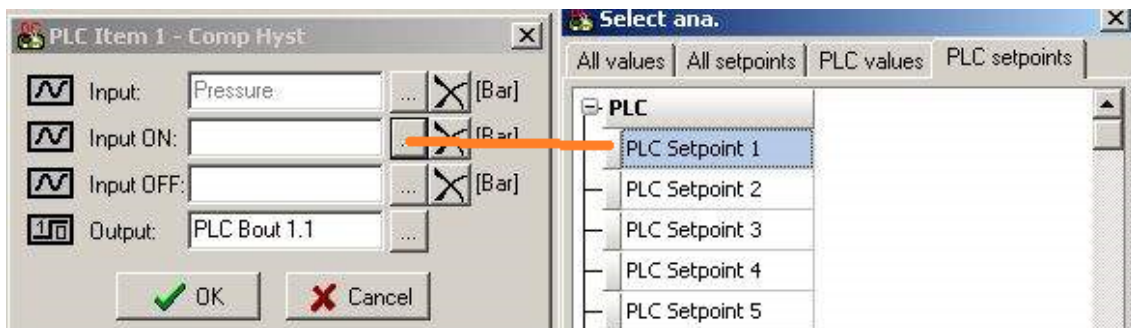
3. Go to PLC window and drag & drop PLC functional block Comp Hyst, double click the block.



4. Configure Comparator Input: click on  button and select input value from the list.



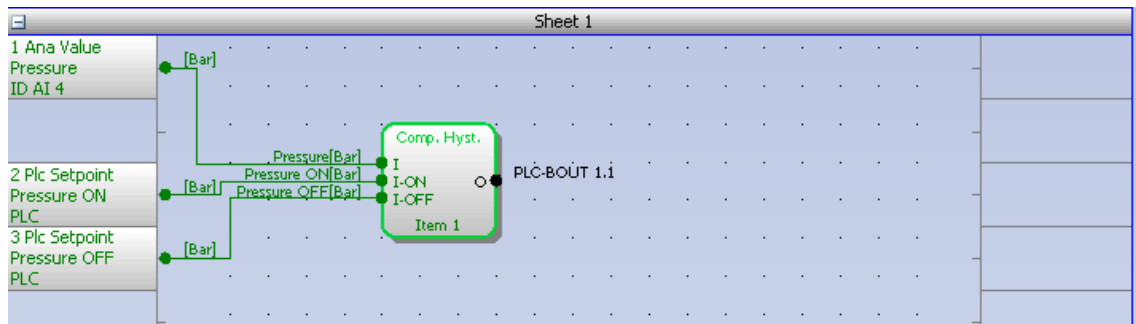
5. Configure comparator limits Input ON, Input OFF as PLC setpoints



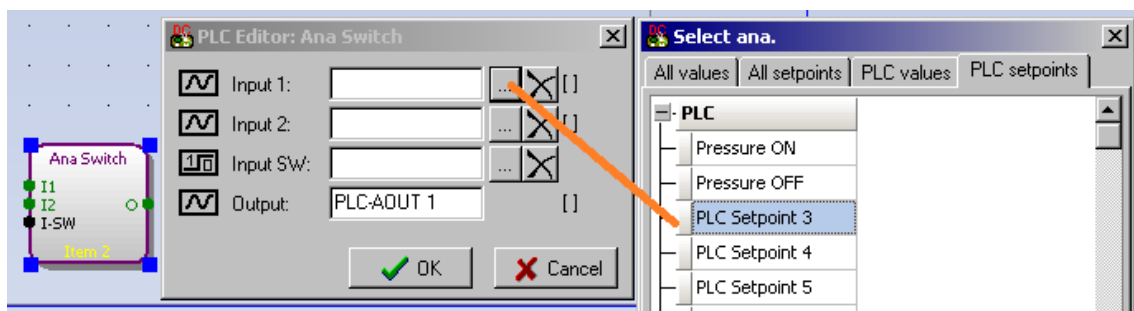
6. Edit setpoint name in PLC setpoints list.



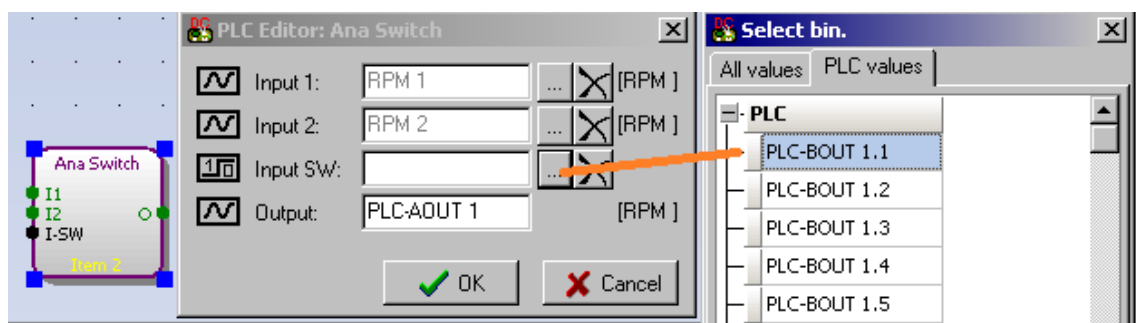
Result look like this



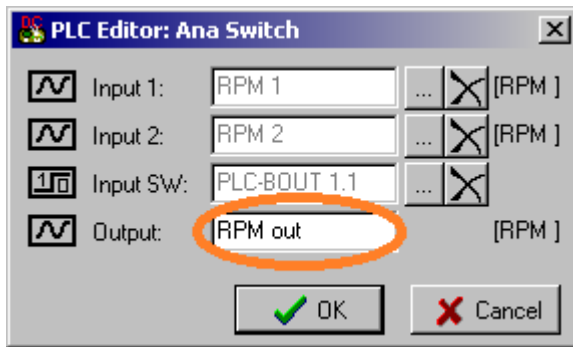
7. Drag & drop PLC functional block Ana Switch, configure Input 1 and Input 2 as PLC setpoints and edit the setpoint names to RPM 1 and RPM 2.



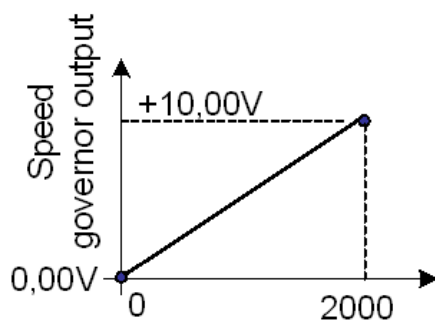
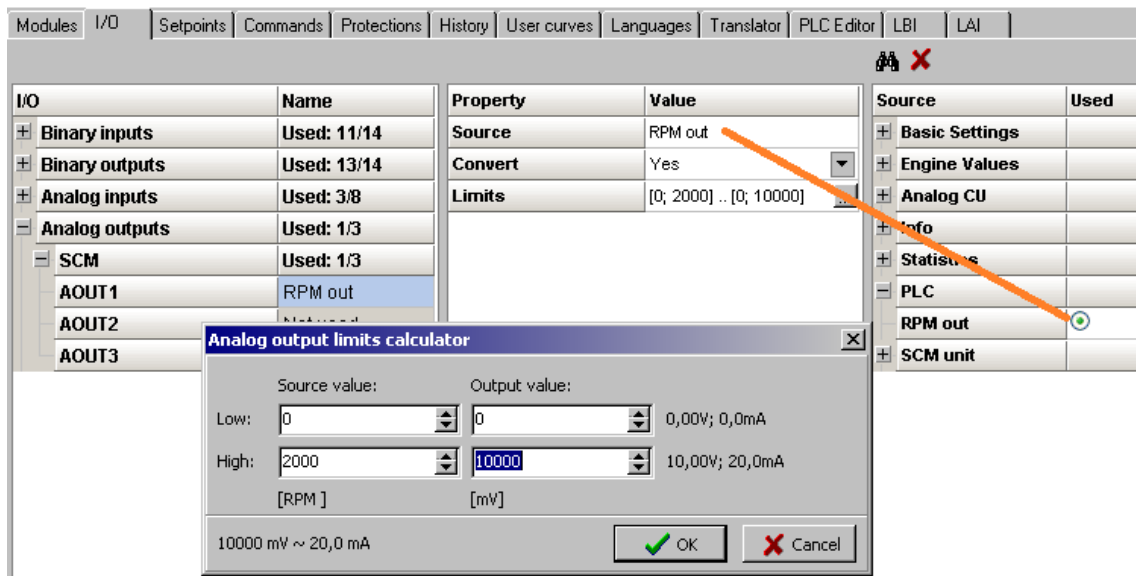
8. Configure binary Input SW: PLC values: PLC Bout 1.1.



9. Rename output to RPM out



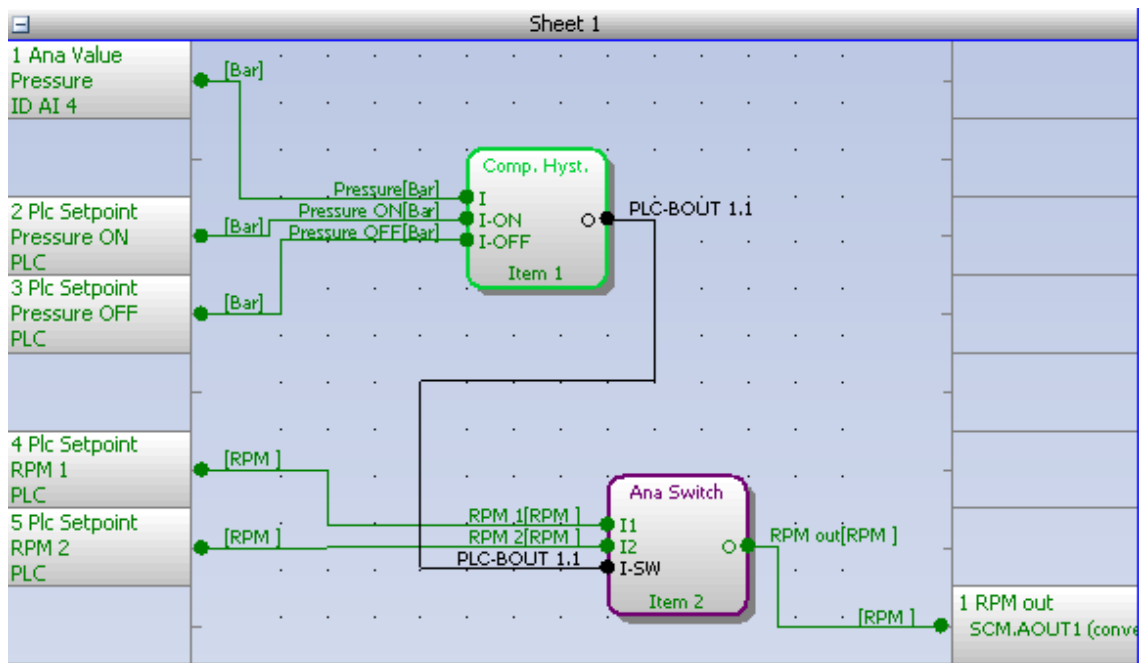
- Go to I/O window and configure analog SCM AOUT1 as RPM out. Then configure output convert Low limit (0 RPM ~ 0.00V output) and High output convert limit (2000 RPM ~ 10.00V output).



Speed governor output characteristics for Lo limit and Hi limit setting above.

Speed governor output voltage in this case (when RPM1= 500 and RPM2=1800) is 9V when pressure is low and 2,5V when pressure is high

- Final PLC layout in DriveConfig



PLC locking sheet by sheet

From DriveConfig version 3.8.0 it is possible to lock PLC Sheets individually in the controllers supporting this feature. Available are 3 passwords, user can assign one of them to each PLC sheet or leave PLC sheet unlocked.

New button on PLC toolbar to access password settings and login/logout. Button has 3 different colours:

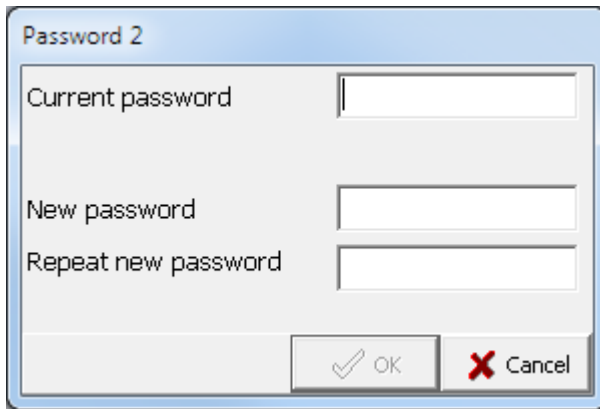
All existing passwords are entered (all PLC sheets with password are unlocked)

Any (but not all) existing passwords are entered (any, but not all PLC sheets with password are unlocked)

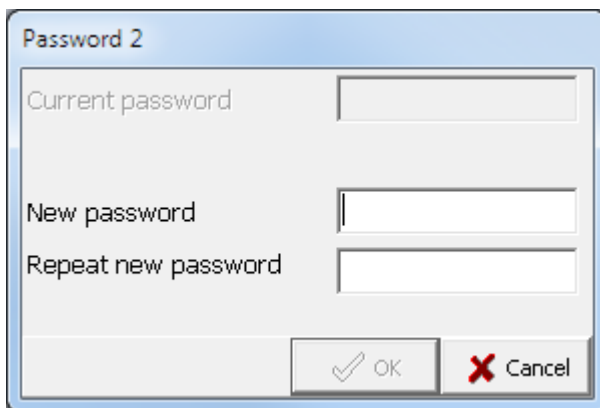
No existing password is entered or no password exists (all PLC sheets with passwords are locked)

In Passwords window user can:

- ▶ Login by entering correct password and clicking red button
- ▶ Logout by clicking green button
- ▶ Create/change password by clicking on "Change" button
 - To change password, current and new password must be entered. New password must be entered twice (match check)

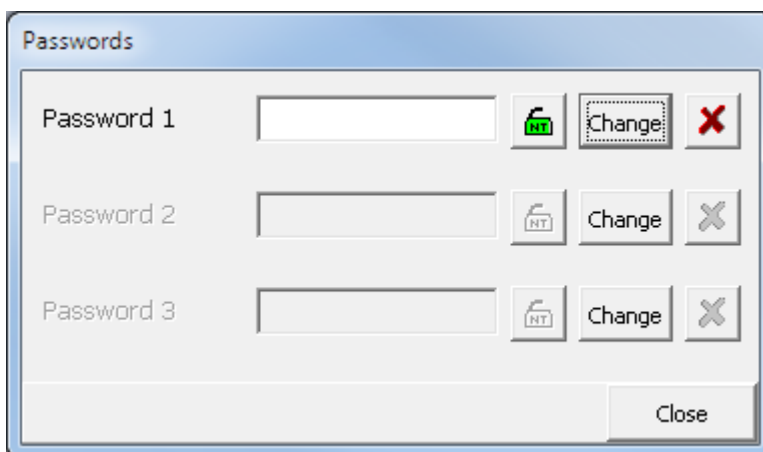


- To create a new password, enter new password twice (match check)



▶ Delete existing password

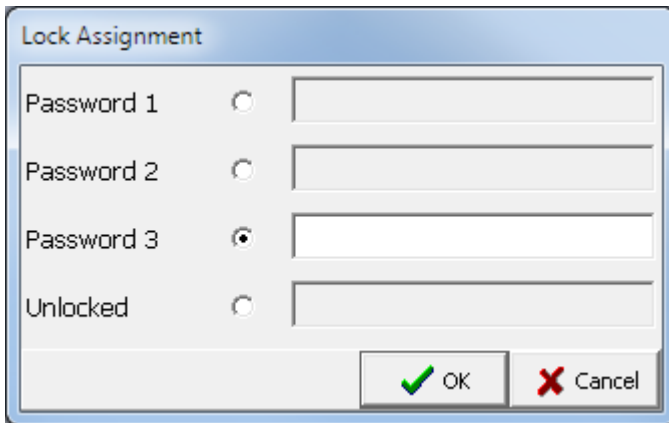
- If password is used for any PLC sheet, password will be removed from appropriate PLC sheets (user has to confirm this). Correct password must be entered.
- If password is not used for any PLC sheet, password is removed immediately without warning. No need to enter correct password.



To assign password to the PLC sheet, click on assign icon in title of PLC sheet:



In configuration window you can assign one of three passwords. It is necessary to enter correct password. If password does not exist, user is asked to create it.



The image shows a dialog box titled "Lock Assignment". It contains four rows, each with a radio button and a text input field:

Password 1	<input type="radio"/>	<input type="text"/>
Password 2	<input type="radio"/>	<input type="text"/>
Password 3	<input checked="" type="radio"/>	<input type="text"/>
Unlocked	<input type="radio"/>	<input type="text"/>

At the bottom right, there are two buttons: "OK" with a green checkmark icon and "Cancel" with a red X icon.

IMPORTANT: Very important parts of the control algorithm must not be locked in PLC sheets. Certification authorities may request their unlocking if necessary.

5.3 Shared IO and Virtual IO

5.3.1 Virtual Binary Outputs (VBOUT) module

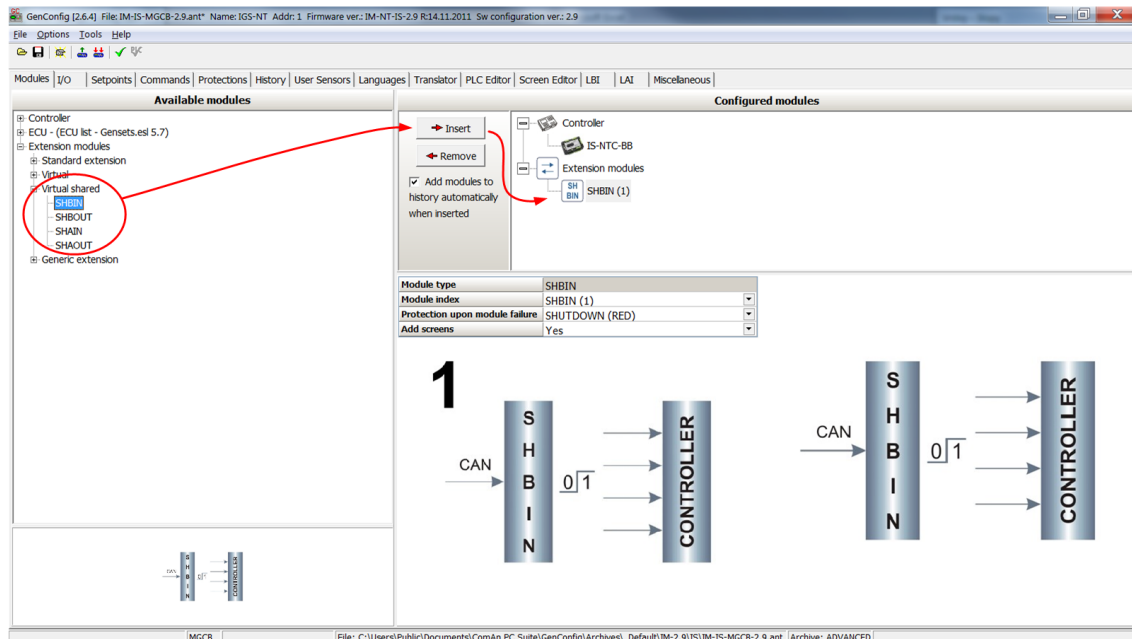
Several virtual modules are available. One of them is Virtual Binary Outputs module (VBOUT) which enables use of Prg. states binary signals with the built-in PLC. Prg. states signal can not be directly configured as a PLC module input. Therefore it is necessary to use VBOUT module as interface between a Prg. state signal and a PLC module.

Up to 4 VBOUT modules are available, each VBOUT modules represents 8 binary output signals.

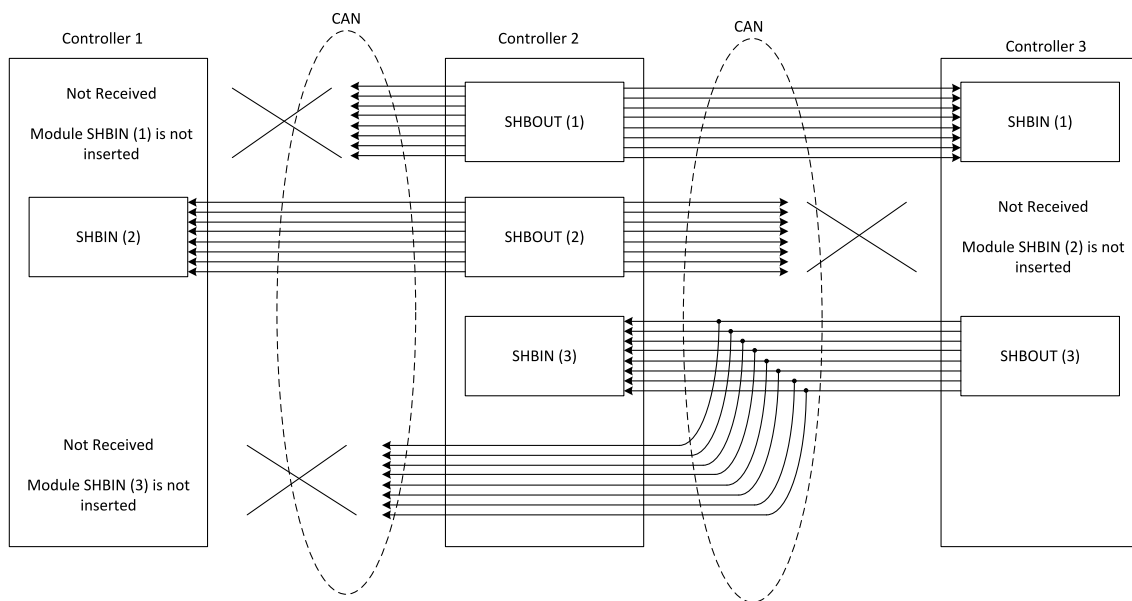
5.3.2 Shared virtual inputs and outputs

It is possible to share Binary and Analog values between all the controllers via CAN bus, thus saving physical Inputs and Outputs and excess wiring.

How to add a virtual module is shown in the following picture.



The principal of how shared Binary inputs and Binary outputs work is shown below.

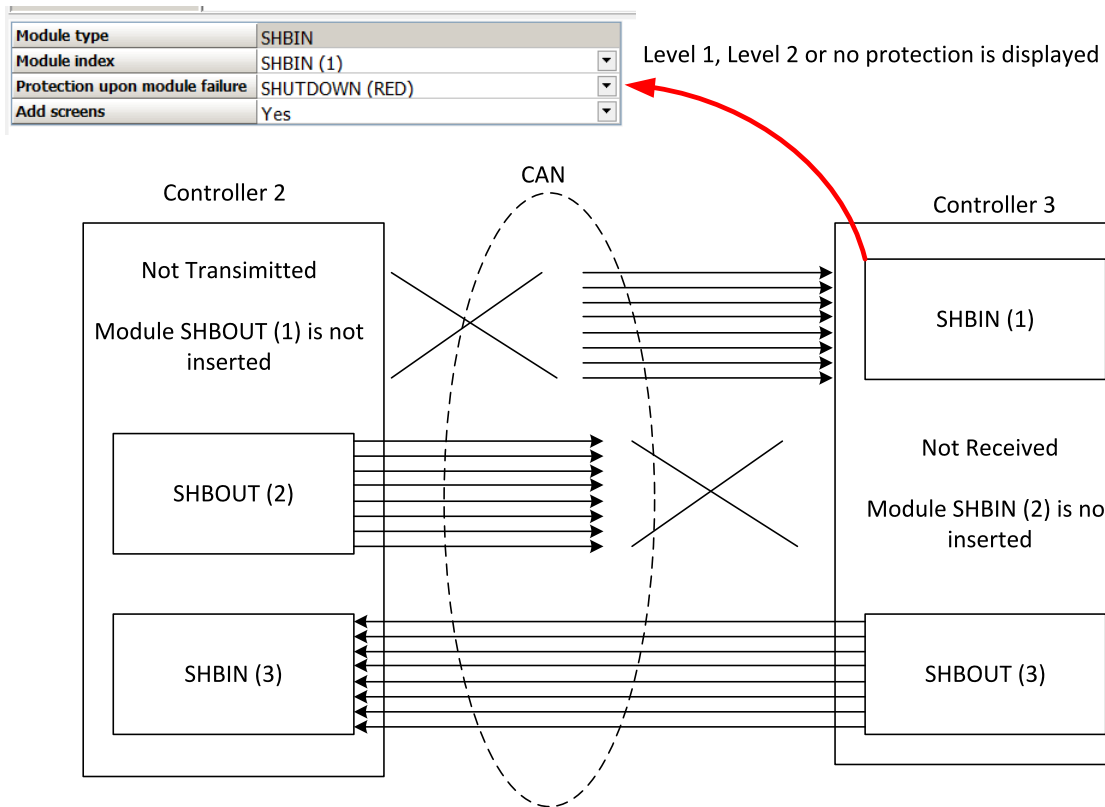


Shared Binary Inputs and Outputs may be used exactly in the same way as standard physical Inputs and Outputs. If SHBIN or SHAIN modules are configured, at least one corresponding module of SHBOUT or SHAOUT (respectively) is needed. If it is not configured, corresponding protection appears because SHBIN or SHAIN will be missing. See the figure below for more information.

IMPORTANT: For proper function of Shared Binary and Analog Inputs and Outputs, only one source of Shared Binary or Analog Outputs must be configured (i.e. it is not possible to configure in one controller SHBOUT1 and to another one as well SHBOUT1).

Note: Controller sends Shared Binary Outputs each 100ms if there are any changes in any bit position. If there are no changes, controller sends the information with period 1s.

A protection upon module failure can be configured in DriveConfig. See the schematic below.



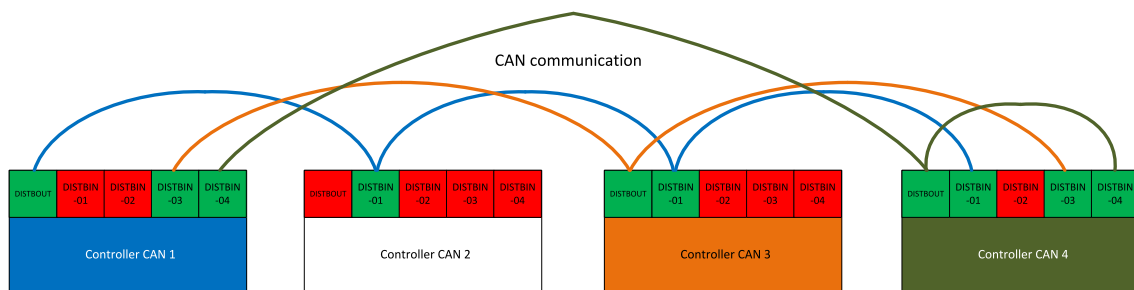
5.3.3 Distributed binary inputs and outputs

It is possible to share Binary and Analog values between all the controllers via CAN bus, thus saving physical Inputs and Outputs and excess wiring.

DISTBIN and DISTBOUT work in a different way than SHBIN and SHBOUT. Each controller has one pack of eight DISTBOUT available (if not configured or no function is assigned to any output, it does not broadcast them). The number of DISTBOUT module is not shown in the configuration and it is always corresponding to the CAN address of the controller (e.g. the controller with address 5 will be broadcasting DISTBOUT-05 which can be received if module DISTBIN-05 is configured in another controller. Up to 32 DISTBIN modules can be configured (meaning that the controller will be receiving all DISTBOUT from all the controller, even his own).

It is not possible to change the name of DISTBIN inputs or add protections.

In the example below you can see 4 controllers with various DISTBIN and DISTBOUT configuration.



Note: Controller sends Distributed Binary Outputs each 100ms if there are any changes in any bit position. If there are no changes, controller sends the information with period 1s.

5.4 Multiple ECU modules support

ID-DCU Industrial supports communication with up to 10 ECU modules. ECU means general Electronic Control Unit and it can be engine control unit, speed governor, voltage regulator, ignition etc.

These interfaces can be used for communication with ECU modules:

- ▶ CAN 1 J1939 for CAN bus communication, usually J1939 protocol based communication
- ▶ RS485 for Modbus communication

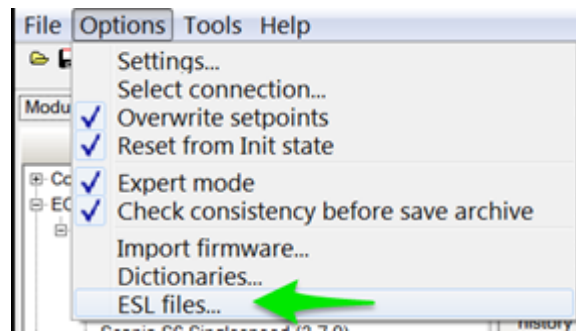
It is possible to combine the interfaces (e.g. engine ECU connected via RS485 with ignition connected via CAN1).

5.4.1 Multi ECU Configuration with DriveConfig

Use Modules card in DriveConfig to configure support of ECU modules with the Insert/Remove buttons:

Module type	Cummins CM850
Module index	3
Module name	ECU-2
Module address	1
Controller address	Default (220)
Protection upon module failure	SHUTDOWN (RED)
Add screens	Yes
Display data as	Bargraph
Analog inputs	8
Analog outputs	4
Binary inputs	16
Binary outputs	8
Analog inputs (4B)	2

IMPORTANT: Be aware that it is necessary to use ECU list, which enables use of multiple ECU modules. Check and select used ECU list using this option:



Configure modules properties using the marked options:

Add modules to history automatically when inserted

Module type	Standard J1939 engine
Module index	1
Module name	ECU-1
Module address	Default (0)
Controller address	Default (3)
Protection upon module failure	SHUTDOWN (RED) <input type="button" value="v"/>
Add screens	Yes <input type="button" value="v"/>
Display data as	Bargraph
Analog inputs	16 <input type="button" value="v"/>
Analog outputs	4 <input type="button" value="v"/>
Binary inputs	16 <input type="button" value="v"/>
Binary outputs	8 <input type="button" value="v"/>
Analog inputs (4B)	2 <input type="button" value="v"/>

- ▶ **Module type** - type of configured module (e.g. Standard J1939 engine support, ECON-4 speed governor support etc.)
- ▶ **Module index** – module identification number. It is used to associate alarms in alarm list and controller history with a particular ECU module.
- ▶ **Module name** - user adjustable string with up to 10 characters. Default values are ECU, ECU-1 to ECU-9, depending on order in which are modules added.
- ▶ **Module address** – user adjustable number from 0 to 255, which defines address of configured module. Default option is Default (X), X stands for actual address value, which comes from ESC and is assigned to module when the default option is used. It is recommended to use this option and use different setting only if the default one does not work.

Example: Set Module address to 5, if engine CAN1 address is 5.

Note: ESC is Engine Specific Code, it contains all necessary information about transmitted values, commands and diagnostic messages.

- ▶ **Controller address** – user adjustable number from 0 to 255, which defines address used by controller for communication with the module. Controller can use different address for communication with different modules. Default option is Default (X), X stands for actual address value, which comes from ESC and is used by controller interface for communication with module, when the default option is used. N/A is displayed as **Controller address**, if Modbus is used for communication with a module.

Note: Do not confuse Controller address with Comms settings: Contr.address, which is different parameter with independent functionality.

Note: ESC is Engine Specific Code, it contains all necessary information about transmitted values, commands and diagnostic messages.

- ▶ **Protection upon module failure** – use it to select type of alarm, which is issued if communication with module fails
- ▶ **Add screens** – use it to display/hide module related screens
- ▶ **Display data as** – information how are analog values displayed
- ▶ **Analog inputs** – Number of analog input values available with module.

Note: Total number of available analog input values is limited to 160 with all configured modules (e.g. 4 modules with 40 inputs would use all available inputs).

- ▶ **Analog outputs** – Number of analog output values available with module.

Note: Total number of available analog output values is limited to 40 with all configured modules (e.g. 5 modules with 8 outputs would use all available outputs).

- ▶ **Binary inputs** – Number of binary input values available with module.

Note: Total number of available binary input values is limited to 160 with all configured modules (e.g. 4 modules with 40 inputs would use all available inputs).

- ▶ **Binary outputs** – Number of binary output values available with module.

Note: Total number of available binary output values is limited to 160 with all configured modules (e.g. 4 modules with 40 outputs would use all available outputs).

- ▶ **Analog inputs (4B)** – Number of 4B analog input values available with module.

Note: Total number of available 4B analog input values is limited to 20 with all configured modules (e.g. 5 modules with 4 inputs would use all available inputs).

 **back to Controller setup**

6 Communication

6.1 IntelliDrive - Engine ECU communication

6.1.1 Example of standard J1939 engine

List of possible J1939 analog data that can be configured to received in ID-DCU Industrial.

Name	Unit
Engine speed	RPM
Actual torque	%
Demand torque	%
Coolant temp	°C
EngineOil temp	°C
Boost Pressure	bar
Intake Manifold Temp	°C
Air Intake pressure	bar
Exhaust Gas Temp	°C
Accelerator Pedal position	%
Percent Load	%
Fuel Rate	L/h
EngOil Filter Diff.Press	bar
Battery Potential (Voltage)	V
Fuel Delivery Pressure	bar
Engine Oil level	%
Crankcase Pressure	bar
Coolant Pressure	bar
Coolant Level	%

Fault reset = accepts (confirms) diagnostic message = removes inactive message form ECU Alarm list only when ECU Alarm list is visible.

Note: *Fault reset* button is “screen sensitive”. It is active only on selected actual controller screen.

6.1.2 Tier 4 Final

Tier 4 Final support generally provides monitoring and control of after-treatment system installed on generators engine. The requirements are defined as:

- ▶ Providing After-Treatment status information by
 - displaying universal lamps (icons)
 - displaying analog and binary values

- ▶ Control of After-Treatment regeneration function by
 - transmitting commands to the ECU

After-Treatment screen

This screen is shown with configured ECU which supports Tier 4 Final. After-Treatment screen is automatically shown, once any of selected lamps gets active or change status. Deactivating of the lamp will not trigger showing the screen. The screen is then shown until operator switch it to another one. Alarm list screen has lower priority so even new alarm appears, After-treatment screen is still displayed. To avoid displaying blank screen, inactive lamps are represented by "dotted" icons. For no active lamp the screen shows all dotted icons. Please see examples below:

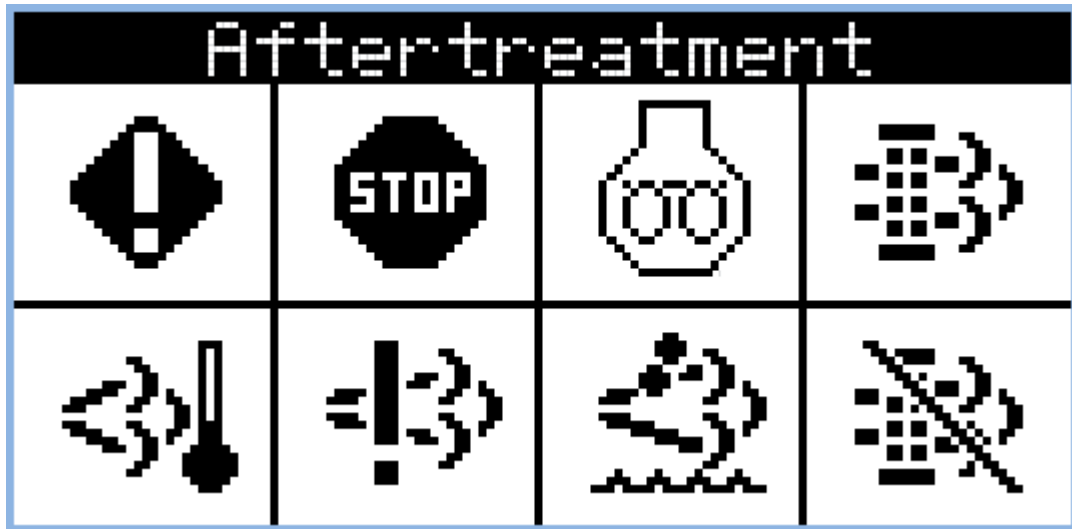


Image 6.1 Example of active Tier 4 Final screen

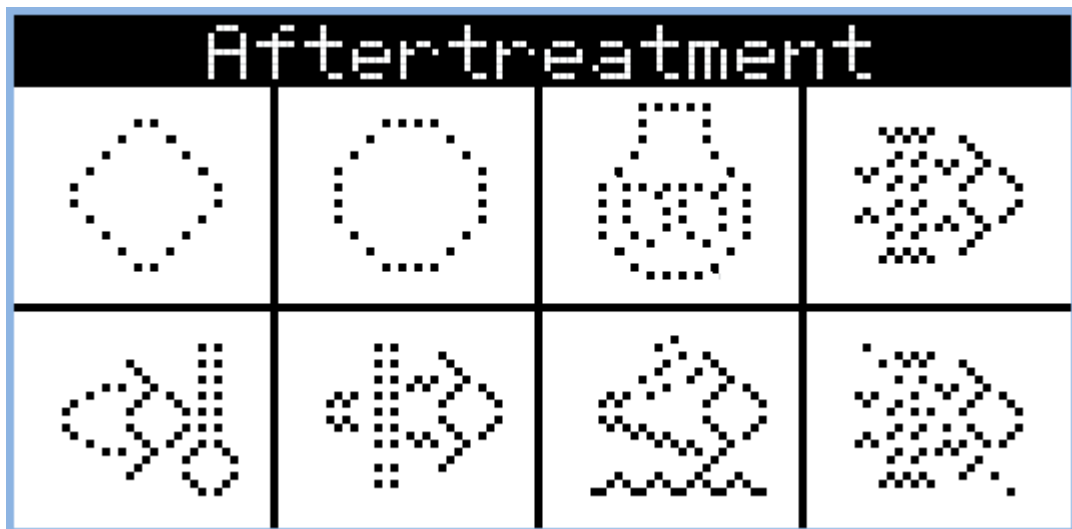



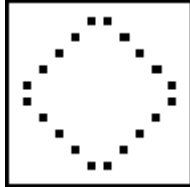

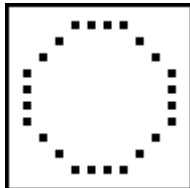

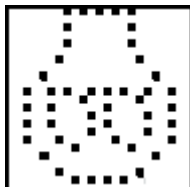
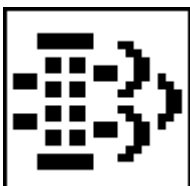
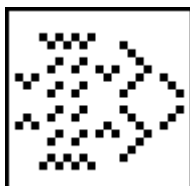

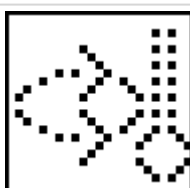
Image 6.2 Example of inactive Tier 4 Final screen


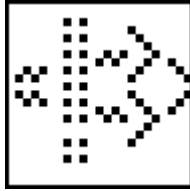

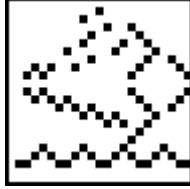

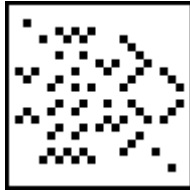
Universal lamps (icons)

Universal lamp icons are shown on the After-Treatment screen. Based on specific value read in specific frame with specific SPN is every lamp icon either:

- ▶ shown
- ▶ hidden
- ▶ blinking slow (1Hz)
- ▶ blinking fast (2Hz)

Note: Lamp icon blinking is defined as displaying active lamp icon and inverse colored active lamp icon in required frequency.

Lamp name	Active icon	Inactive icon	Notes
Amber warning lamp			Note: This value can light or blink on both frequencies.
Red stop lamp			Note: This value can light or blink on both frequencies.
Engine wait to start lamp			
DPF/SCR lamp command			Note: DPF = Diesel Particulate Filter; SCR = Selective Catalytic Reduction. This lamp also activates alarm After-treatment
Exhaust system high temperature lamp command			Note: This lamp also activates alarm After-treatment

Lamp name	Active icon	Inactive icon	Notes
Malfunction indicator lamp			Note: This value can light or blink on both frequencies. This lamp also activates alarm After-treatment
Fluid tank low level indicator			Note: This lamp also activates alarm After-treatment
DPF regeneration inhibited			Note: Indicates the state of diesel particulate filter active regeneration inhibition. This lamp also activates alarm After-treatment

 [back to Communication](#)

7 Technical data

7.1 ID-DCU Industrial

Power supply

Nominal power supply	24 VDC
Power supply range	8 – 36 VDC
Current consumption (depends on supply voltage)	0.34 A at 8 VDC
	0.12 A at 24 VDC
	0.09 A at 36 VDC
Galvanically isolated from controller body	YES
Battery voltage measurement tolerance	2 % at 24 V
RTC battery life-cycle	10 year

Note: RTC battery flat causes wrong Date&Time information only.

Operating conditions

Operating temperature ID-DCU MARINE	-20 to +70 °C
Operating temperature ID-DCU-LT	-40 to +70 °C
Storage temperature	-30 to +80 °C
Humidity	95 % without condensation
Flash memory data retention time	10 years
Protection front panel	IP65
Standard conformity	
Low Voltage Directive	EN 61010-1:95 +A1:97
Electromagnetic Compatibility	EN 61000-6-2, October 2001
	EN 61000-6-4, October 2001
	IEC 60533, Ed. 2; 1999-11
Vibration	5 – 25 Hz, ±1.6mm
	25 – 100 Hz, a = 4 g
Shocks	a = 200 m/s ²
Heat radiation	9 W

Dimensions and weight

Dimensions	(183×123×47 mm)
	See chapter terminals and dimensions
Weight	800 g

Binary open collector outputs

Number of inputs	14
Input impedance	4.7 k Ω
Input range	0-36 VDC
Switching voltage level for close contact indication	0-2 V
Voltage level for open contact indication	8-36 V
Minimal input duration	110 ms

Binary open collector outputs

Number of outputs	14
Maximum current - outputs BO1, BO2	1A
Maximum current - outputs BO3 - BO14	0.5 A
Maximum switching voltage	36 VDC

Speed pick-up input

Type of sensor	magnetic pick-up (connection by shielded cable is recommended)
Input impedance	10 k Ω
Minimum input voltage	2 Vpk-pk (from 4 Hz to 4 kHz)
Maximum input voltage	50 Veff
Minimum measured frequency	4 Hz
Maximum measured frequency	10 kHz (min. input voltage 6Vpk-pk)
Frequency measurement tolerance	1.5 %

D+ function

Max. D+ output current	300 mA
Guaranteed level for signal Charging OK	80 % of supply voltage

Analog inputs (Not electrically separated)

Group 1 AI1 – AI4	
Number of inputs	4 unipolar
Resolution	10 bits
Jumper selectable range	V, Ω , mA
Maximal resistance range	2500 Ω
Maximal voltage range	4.0 V
Maximal current range	0 – 20 mA
Input impedance	180 Ω for mA measuring
Input impedance	>100 k Ω for V measuring
Resistance measurement tolerance	$\pm 2 \% \pm 2 \Omega$ out of measured value

Voltage measurement tolerance	$\pm 1 \% \pm 1 \text{ mV}$ out of measured value
Current measurement tolerance	$\pm 1 \% \pm 0.5 \text{ mA}$ out of measured value
Group 2 AI5 – AI8	
Number of inputs	4 bipolar
Resolution	Up to 16 bits
Jumper selectable range	V, Ω , mA, thermo coupler
Maximal resistance range	2500 Ω
Maximal voltage range	$\pm 1000 \text{ mV}$ or 100 mV or 5 V

Note: The maximal input voltage offset is in the range from -2 to $+5 \text{ VDC}$ against controller minus power supply when AI5 to AI8 is used for differential voltage measuring.

Maximal current range	$\pm 0 - 20 \text{ mA}$ active
	0 – 20 mA passive
Input impedance	50 Ω for mA measuring
Input impedance	>100 k Ω for V measuring
Resistance measurement tolerance	$\pm 0.5 \% \pm 2 \Omega$ out of measured value
Voltage measurement tolerance	$\pm 0.5 \% \pm 1 \text{ mV}$ out of measured value
Current measurement tolerance	$\pm 0.5 \% \pm 0.5 \text{ mA}$ out of measured value

RS232 interface

Maximal distance	10 m
Speed	19.2 kBd

7.2 CAN bus interface

Max. CAN bus length	
Basic setting: CAN bus mode = 250 kBd	200 m
Basic setting: CAN bus mode = 50 kBd	900 m
Nominal impedance	120 Ω
Cable type	twisted pair (shielded)

Following dynamic cable parameters are important especially for maximal 200 meters CAN bus length and 32 ID-COM units connected:

Nominal Velocity of Propagation	min. 75 % (max. 4.4 ns/m)
Wire crosscut	min. 0.25 mm ²
Maximal attenuation (at 1 MHz)	2 dB / 100 m

Recommended Industrial Automation & Process Control Cables:

BELDEN (see <http://www.belden.com>):

- ▶ 3082A DeviceBus for Allen-Bradley DeviceNet
- ▶ 3083A DeviceBus for Allen-Bradley DeviceNet
- ▶ 3086A DeviceBus for Honeywell SDS
- ▶ 3087A DeviceBus for Honeywell SDS
- ▶ 3084A DeviceBus for Allen-Bradley DeviceNet
- ▶ 3085A DeviceBus for Allen-Bradley DeviceNet
- ▶ 3105A Paired EIA Industrial RS485 cable

LAPP CABLE (see <http://www.lappcable.com>)

- ▶ Unitronic BUS DeviceNet Trunk Cable
- ▶ Unitronic BUS DeviceNet Drop Cable
- ▶ Unitronic BUS CAN
- ▶ Unitronic-FD BUS P CAN UL/CSA

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8 Appendix

8.1 Controller objects94

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8.1 Controller objects

8.1.1 List of controller objects types

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8.1.2 Setpoints

What setpoints are:

Setpoints are analog, binary or special data objects which are used for adjusting the controller to the specific environment. Setpoints are organized into groups according to their meaning. Setpoints can be adjusted from the controller front panel, PC, MODBUS, etc.

Each setpoint can be protected by a password against unauthorized changes. Password protection can be assigned to the setpoints during the configuration procedure.

IMPORTANT: Do not perform repeated writing of setpoints (e.g. do NOT have a MODBUS 'watchdog' system where PLC periodically writes down a figure into register and then reads the figure). The setpoints are stored in EEPROM memory, which can be overwritten up to 100 000 times without risk of damage or data loss, however it may become damaged, when allowed number of writing cycles is exceeded!

The issue with EEPROM memory limit is resolved from ID-DCU Industrial firmware version 2.2, setpoint registers were moved into another memory part of the controller.

List of setpoint groups

Password	98
Engine commands and Statistics protection	99
Basic settings	100
Comms settings	107
Engine params	113
Engine protect	124
RPMdep protect (PRP only)	134
Load sharing	141
Analog inputs	149
Act. Calls/SMS	152
Date and Time	159
ID-SCM unit	161
DetCon20	162
Protections	165

For full list of setpoints go to the chapter **List of setpoints (page 96)**

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List of setpoints

Group of setpoints:

Basic settings

Engine Name	100
Mode ID	100
Gear Teeth	101
RPU Gear Teeth	101
Nominal RPM	101
ECU Diag	102
Governor Mode	102
Idle/Nominal	103
Speed Select	104
RunHourSource	104
RHS Index	105
LightTimeOff	105
Timer ON	105
Timer OFF	106
Timer Repeat	106

Group of setpoints:

Communication

Settings

5thRemPan	107
CAN Bus Mode	107
ControllerAddr	108
ECU Diag	108
LB/UART Log	109
RS232 MBCSpd	109
RS232 Mode	110
RS232 TermCSpd	110
RS485 MBCSpd	111
RS485 Mode	111
RS485 TermCSpd	112
SHxOcol Detect	112

Group of setpoints:

Engine parameters

Starting RPM	113
--------------------	-----

Starting POil	114
StartPCoolant	114
Prestart Time	115
MaxCrank Time	115
CrankFailPause	115
Crank Attempts	116
Idle RPM	116
Idle Offset	117
Idle Time	117
PrelubrTime	118
PrelubrPause	118
Stop Time	119
Cooling Time	119
AfterCoolTime	119
D+ function	120
Fuel Solenoid	121
BI Speed Ramp	122
FireAlarmSpeed	122
EnLocalSpeed	122
Local Speed	123

Group of setpoints:

Engine protection

Horn Timeout	124
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Password

There are three levels of password protection.

- ▶ User level allows change of non-protected setpoints only.
- ▶ Operator level allows change of setpoints protected by Operator level.
- ▶ Master level allows change of setpoints protected by Operator and Master level.
- ▶ Supervisor highest level allows all setpoints or configuration changes, firmware upgrade.

Note: The asterisk mark "*" appears before a setpoint name (on controller screen) if the setpoint is password protected.

The asterisk mark is removed only when the password is set from controller's front panel.

The asterisk mark is still visible on controller screen even if the password is set from IntelliMonitor.

Note: Even though one level may have been set from the front panel, the affected setpoints are not accessible from IntelliMonitor (direct or Modem) until this level is set in IntelliMonitor (direct or Modem). Setpoints opened from front panel are automatically closed 15 minutes after the last key has been depressed or when wrong value of setpoint is set.

Note: It is possible to protect remote Start, Stop commands from IntelliMonitor as well. This three level command protection can be configured from DriveConfig.

EnterPassword

Password is a four-digit number. Only setpoints associated with the entered password level can be modified.

Use ↑ or ↓ to select the desired password and then hit enter.

- ▶ ChangePassword 1
- ▶ ChangePassword 2
- ▶ ChangePassword 3

Note:

- ▶ Any password can be changed once that level password or higher has been entered if the change is made from IntelliMonitor PC tool.
- ▶ Password level 3 must be entered at first to change any password if the change is made by controller front panel buttons.

To change password protection of Setpoint or Command:

1. Open DriveConfig
2. Select Setpoints or Commands window
3. Set desired protection level: 0 or 1 or 2 or 3

Access code

- ▶ Can be changed from IntelliMonitor software only (Monitor – Change Access code).
- ▶ Has to be set before remote modem or SMS connection is opened.
- ▶ Can be up to 16 ASCII characters

At first **Password 3** has to be entered before the new Access code can be changed.

Engine commands and Statistics protection

Commands (Engine Cmd) password protection protects Start, Horn reset, Fault reset commands from controller front panel buttons, remote displays, Modbus line or IntelliMonitor.

Selected Command password level 0, 1, 2, 3 is valid for all engine commands except of Stop. Stop command is password protected separately by “Engine Stop” option.

Separately can be also protected statistic commands: ClearStatistics, SetSucc starts, EngRun hours, SetUnsuc starts.

To set commands protection from DriveConfig:

1. Open DriveConfig
2. Select Commands window
3. Set Password = 0 (no protection) or level 1 or 2 or 3

Note: Engine commands password protection works according to the description above from firmware version ID DCU MARINE 2.1 and firmware versions of remote displays listed below. In older firmware versions “Engine Cmd” group contains also Stop command, commands from ID-DCU Industrial local panel (buttons directly on the controller) were not password protected in older versions.

IntelliVision 5 CAN (Backlit) – from 1.3

IntelliVision 8 (Marine) – depends on screen configuration in archive of ID-DCU Industrial controller. Default archives for ID-DCU Industrial version 2.1 and higher support independent password protection of Stop command according to description above.

Note: All setpoints below can be modified from Remote panel or IntelliMonitor as well.

Basic settings

Engine Name

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	[-]		
Default value	ID		
Step	[-]		
Comm object	8637	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
User defined name, used for IntelliDrive controller identification with remote connection.			
Engine name is max 14 characters long and have to be entered manually using IntelliMonitor software.			
<i>Note: Engine name is not changed when new archive is loaded. Check Engine name after firmware upgrade.</i>			

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Mode ID

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	[-]		
Default value	OFF		
Step	[-]		
Comm object	8315	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<ul style="list-style-type: none"> ▶ Mode ID [OFF, AUX] ▶ Mode ID [OFF, EME] ▶ Mode ID [OFF, EME, HRB] ▶ Mode ID [OFF, PRP] 			
Equivalent to Controller mode changes by Mode → or ← Mode buttons.			

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Gear Teeth

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	1 .. 500 [-]		
Default value	120		
Step	1		
Comm object	8252	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Number of teeth on the engines flywheel for the pick-up. Setpoint (RPM pickup measuring) is ignored when RPM is received via J1939.			

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RPU Gear Teeth

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	1 .. 500 [-]		
Default value	120		
Step	1		
Comm object	10920	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Number of teeth on the engines flywheel for the pick-up connected to ID-RPU.			

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Nominal RPM

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	30 .. 4000 [RPM]		
Default value	1500		
Step	1		
Comm object	8253	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Nominal engine speed, base for Overspeed protection limit and Speed Request (page 258) percentage calculation.			
<p>Note: Nominal RPM must correspond to 100 % Throttle position in ECU for correct Load sharing function in PRP application.</p>			

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ECU Diag

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	[ENABLED, DISABLED, EXTERNAL]		
Default value	ENABLED		YES
Step	[-]		
Comm object	10353	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Alarm list indication ECU Diag disabled is indicated when ECU diagnostics is disabled. The ECU Diagnostic is controlled by ECU DiagBick binary input in case of setting to EXTERNAL.			

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Governor Mode

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	[ISOCHRON, DROOP, BIN.INPUT]		
Default value	ISOCHRON		
Step	[-]		
Comm object	10230	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Activates/deactivates the logical binary output Droop Sw, that can be configured as J1939 output to switch ECU mode. BIN.INPUT: ISOCH/DROOP mode is switched via BI DROOP (PAGE 181) (DROOP when closed).			

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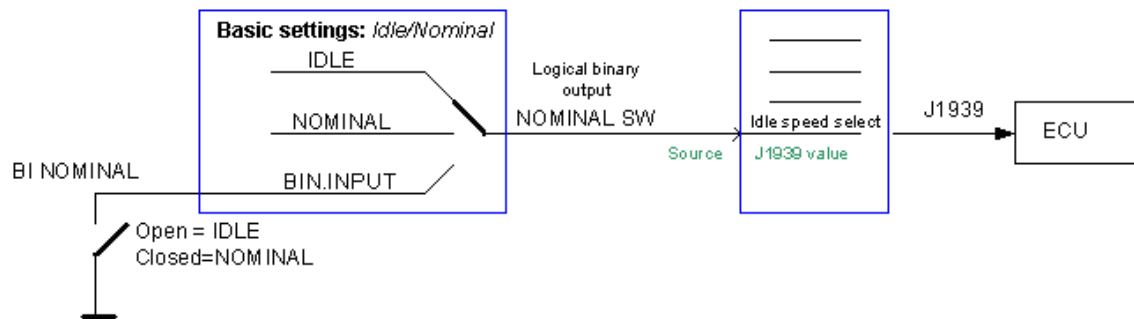
Idle/Nominal

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	[IDLE, NOMINAL, BIN.INPUT]		
Default value	IDLE		
Step	[-]		
Comm object	10336	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

Activates/deactivates the logical binary output Nominal Sw, that can be configured as J1939 output to switch ECU.

BIN.INPUT: IDLE/NOMINAL mode is switched via **BI IDLE (PAGE 181)** (NOMINAL when closed).



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Speed Select

Setpoint group	Basic settings	Related FW	3.4.1																
Range [units]	[PRIMARY, SECONDARY, BIN.INPUT]																		
Default value	PRIMARY																		
Step	[-]																		
Comm object	10231	Related applications	AUX, EME, CMB																
Config level	Standard																		
Setpoint visibility	Always																		
Description																			
<p>Activates/deactivates the logical binary output Secondary Sw. This output can be configured to J1939 output to switch ECU Nominal – RPM. see Logical BI in table below.</p> <p>BIN.INPUT: PRIMARY / SECONDARY Nominal RPM is selected via BI SECOND RPM (PAGE 181) – see Logical BI in table below.</p>																			
<table border="1"> <thead> <tr> <th>Setpoint name</th> <th>Setpoint setting</th> <th>Logical BO</th> <th>Logical BI</th> </tr> </thead> <tbody> <tr> <td>Governor Mode</td> <td>ISOCHR / DROOP / BIN.INPUT</td> <td>Droop Sw</td> <td>BI Droop</td> </tr> <tr> <td>Speed Select</td> <td>PRIMARY / SECONDARY / BIN.INPUT</td> <td>Second RPM Sw</td> <td>BI Secondr RPM</td> </tr> <tr> <td>Idle/Nominal</td> <td>IDLE / NOMINAL / BIN.INPUT</td> <td>Nominal Sw</td> <td>BI Idle</td> </tr> </tbody> </table>				Setpoint name	Setpoint setting	Logical BO	Logical BI	Governor Mode	ISOCHR / DROOP / BIN.INPUT	Droop Sw	BI Droop	Speed Select	PRIMARY / SECONDARY / BIN.INPUT	Second RPM Sw	BI Secondr RPM	Idle/Nominal	IDLE / NOMINAL / BIN.INPUT	Nominal Sw	BI Idle
Setpoint name	Setpoint setting	Logical BO	Logical BI																
Governor Mode	ISOCHR / DROOP / BIN.INPUT	Droop Sw	BI Droop																
Speed Select	PRIMARY / SECONDARY / BIN.INPUT	Second RPM Sw	BI Secondr RPM																
Idle/Nominal	IDLE / NOMINAL / BIN.INPUT	Nominal Sw	BI Idle																
<p>Note: Basic setting: <i>Nominal RPM</i> must correspond to ECU Nominal RPM for 100 % Throttle position in <i>PRP</i> and 50 % in <i>AUX</i>.</p>																			

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RunHourSource

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	[AUTO, INTERNAL, ECU]		
Default value	AUTO		
Step	[-]		
Comm object	8630	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>AUTO – controller displays valid running hours value received from any ECU module. In case of erratic reading use option ECU and parameter RHS Index to define module, which is source of running hours. Running hours value calculated by controller is used, if no valid value is received.</p> <p>INTERNAL – ID-DCU Industrial running hours statistical value is used</p> <p>ECU – controller reads running hours from selected ECU module. Parameter RHS Index is used to select index of module, from which controller reads running hours.</p> <p>In case no ECU support is configured, internal running hours value is used despite RunHoursSource setting.</p>			

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RHS Index

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	1 .. 10 [-]		
Default value	1		
Step	1		
Comm object	15794	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
RHS Index (RHS means Running Hours Souce) is index of ECU module, which is used as source of engine running hours.			

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LightTimeOff

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	0 .. 250 [min]		
Default value	0		
Step	1		
Comm object	10121	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Timeout for ID display backlight automatic switch off. Zero setting disables display backlight switch off. Backlight is automatically switched on after any key press or Alarm activation.			
<i>Note: LightTimerOff setpoint influences the Remote panel not master controller when changed on Remote panel.</i>			

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Timer ON

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	[hh:mm:ss]		
Default value	0:00:00		
Step	[-]		
Comm object	10042	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
See Timer Repeat (page 106) description.			

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Timer OFF

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	[hh:mm:ss]		
Default value	0:00:00		
Step	[-]		
Comm object	10199	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
See Timer Repeat (page 106) description.			

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Timer Repeat

Setpoint group	Basic settings	Related FW	3.4.1
Range [units]	[Never, Mon-Fri, Mon-Sat, Mon-Sun, Sat-Sun]		
Default value	NEVER		
Step	[-]		
Comm object	10045	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Logical binary output Timer Active is closed when actual time is over the Timer ON and opened when actual time is over Timer OFF. The function depends on Timer Repeat settings. The output is closed when controller is switched On and Timer settings corresponds to closed state.			

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Comms settings

5thRemPan

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	[ENABLE, DISABLE]		
Default value	ENABLE		
Step	[-]		
Comm object	24399	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
The parameter switches the address for a 5th ID-DCU Industrial display, the fifth ID-DCU Industrial display occupies a modem address if ENABLE is set. ENABLE is a default value.			

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CAN Bus Mode

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	[32C, 8C]		
Default value	32C		
Step	[-]		
Comm object	24499	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Inter-controller, IG-IB, IB-NT CAN2 bus speed selection.			
32C: High speed CAN (250 kbd) applicable with up to 32 controllers, CAN bus limited up to 200 meters.			
8C: Low speed CAN (50 kbd) applicable with up to 8 controllers, CAN bus limited up to 900 meters.			
Note: Low speed CAN2 bus use for long distance connection only. Set all connected controllers to the same speed. Other units IG-IB, IB-NT detect CAN bus speed automatically.			
Note: If the controller is connected to IB-NT, set the mode to 8C - verified stable communication speed.			

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ControllerAddr

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	1 .. 32 [-]		
Default value	1		
Step	1		
Comm object	24537	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Controller identification number. Each controller in the group has to have its own unique number. Default value is 1.			
<p>Note: The IntelliDrive <i>ControllerAddr</i> must correspond to IntelliMonitor or DriveConfig communication setup setting when opening Direct or Modem connection.</p>			

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ECU Diag

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	[ENABLED, DISABLED, EXTERNAL]		
Default value	ENABLED		
Step	[-]		
Comm object	10353	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is used to disable reading of diagnostic codes from ECU if an external diagnostic tool is connected to engine.			
Message ECU Diag disabled is displayed in the alarm list while ECU diagnostics is disabled.			
The ECU Diagnostic is disabled/enabled using LBI: ECU DiagBick binary input in case of setting to EXTERNAL.			

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LB/UART Log

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	[DISABLED, ENABLED]		
Default value	DISABLED		
Step	[-]		
Comm object	11327	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setpoint enables/disables logging of remote communication activity. If logging is enabled connection and disconnection of each remote terminal as well as entering access code are recorded into the history.</p> <p><i>Note: The terminal is disconnected automatically after 5 min of inactivity and next communication request from the same terminal is considered as a new connection. When logging is enabled in certain conditions the history may be filled up with large number of records related to the communication and important records may be overwritten quite fast.</i></p>			

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RS232 MBCSpd

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	[9600, 19200, 38400, 57600, 115200] [bps]		
Default value	9600		
Step	[-]		
Comm object	24477	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setpoint adjusts communication speed of the RS232 interface when RS232 Mode (page 110) is set to Modbus.</p>			

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RS232 Mode

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	[STANDARD, MODBUS]		
Default value	STANDARD		
Step	[-]		
Comm object	24522	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Communication protocol selection.</p> <ul style="list-style-type: none"> ▶ STANDARD: IntelliDrive (DriveConfig, IntelliMonitor, Remote panel) communication protocol. ▶ MODBUS: Modbus RTU protocol. <p>Note: Detailed description of Modbus protocol include some examples, see in IntelliGen Communication guide.</p>			

🔍 back to List of setpoints

RS232 TermCSpd

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	[19200, 38400, 57600, 115200] [bps]		
Default value	38400		
Step	[-]		
Comm object	24341	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setpoint adjusts communication speed of the RS232 interface when RS232 Mode (page 110) is set to STANDARD.</p> <p>Note: If the controller is connected to IB-NT via the RS232 interface, set the speed to 57600 - the supported communication speed.</p>			

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RS485 MBCSpd

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	[9600, 19200, 38400, 57600, 115200] [bps]		
Default value	9600		
Step	[-]		
Comm object	24420	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint adjusts communication speed of the RS485 interface when RS485 Mode (page 111) is set to Modbus.			

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RS485 Mode

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	[STANDARD, MODBUS, ECU LINK]		
Default value	STANDARD		
Step	[-]		
Comm object	24451	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Communication protocol selection.			
<ul style="list-style-type: none"> ▶ STANDARD: IntelliDrive (DriveConfig, IntelliMonitor, Remote panel) communication protocol. ▶ MODBUS: Modbus RTU protocol. ▶ ECU LINK: Connection to an electronic-controlled engine which uses non-J1939 ECU. The proper ECU type must be also configured with DriveConfig. 			
<p>Note: Detailed description of Modbus protocol include some examples, see in IntelliDrive Communication guide.</p>			

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RS485 TermCSpd

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	[19200, 38400, 57600, 115200] [bps]		
Default value	38400 bps		
Step	[-]		
Comm object	24340	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint adjusts communication speed of the RS485 interface when RS485 Mode (page 111) is set to STANDARD.			

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SHxOcol Detect

Setpoint group	Communication Settings	Related FW	3.4.1
Range [units]	[DISABLED, ENABLED]		
Default value	ENABLED		
Step	[-]		
Comm object	11024	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is used to enable/disable evaluation of collisions of virtual shared peripheral modules. A collision means that there is more than one source (shared outputs module) active on the CAN2 bus.			
<p>Note: In certain situations multiple sites with bus tie breakers may need to have more shared outputs sources as the CAN bus line is in some points interrupted according to bus tie breakers position. Normally a collision would be indicated if there were more sources on the bus and this setpoint can be used to disable the evaluation of collisions in this special case.</p>			

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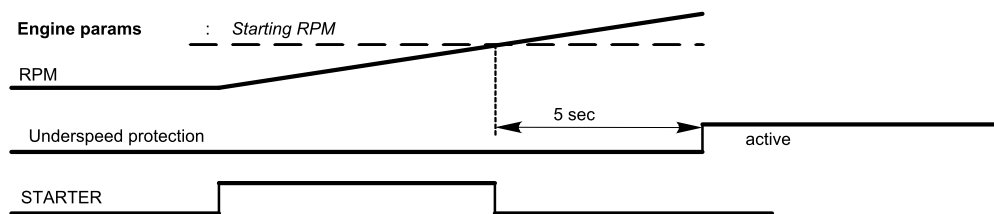
Engine params

Starting RPM

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	30 .. 1500 [RPM]		
Default value	350		
Step	1		
Comm object	9095	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

“Firing” speed when controller stops cranking = one of the engine running indications.



Note: Under speed limit is fix 30 RPM.

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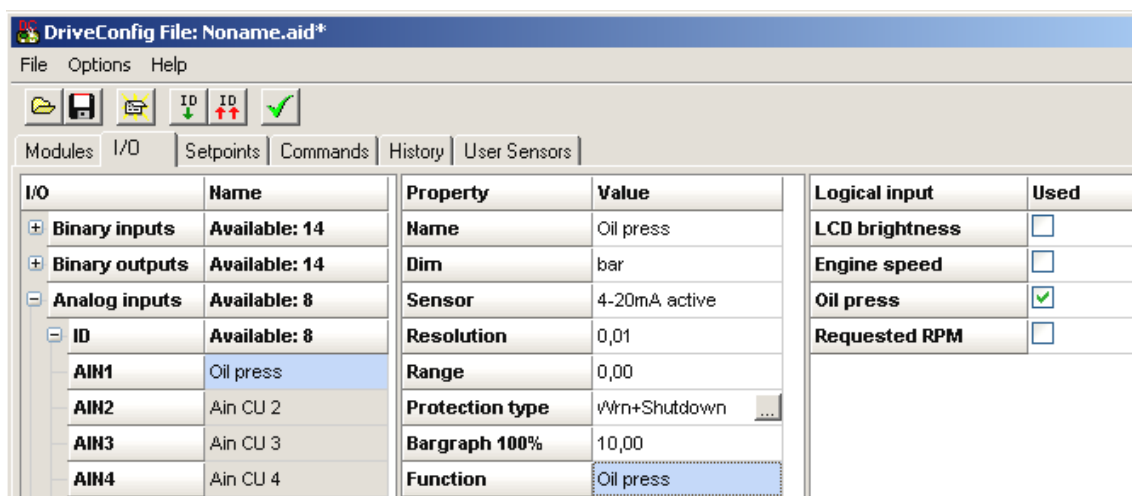
Starting POil

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0.0 .. 10.0 [Bar]		
Default value	10,0		
Step	0.1		
Comm object	9681	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

Oil pressure limit when controller stops cranking = one of the engine running indications.

To activate this function any Analog input must be configured to Analog logical input Oil press.



Note: Step, Range and dimension depend on corresponding Analog input sensor characteristic.

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StartPCoolant

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0.0 .. 10.0 [Bar]		
Default value	10,0		
Step	0.1		
Comm object	10138	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		

Description

Coolant pressure limit = one of the engine running indications. To activate this function any Analog input must be configured to Analog logical input Coolant press.

Note: PRP only

Note: Step, Range and dimension depend on corresponding Analog input sensor characteristic.

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Prestart Time

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0 .. 600 [s]		
Default value	2		
Step	1		
Comm object	8394	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Time the binary output Prestart is active prior to engine start (Start request sending to ECU). Set to zero if you want to start immediately after Start button is pressed (the Prestart output stays opened). RPM must be zero during Prestart time otherwise the Starting procedure is not activated.			

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MaxCrank Time

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	1 .. 200 [s]		
Default value	8		
Step	1		
Comm object	8234	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Amount of time the controller will crank the engine in an attempt to start.			

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CrankFailPause

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	CMB, EME: 3 ..200 [s], AUX, PRP: 0 .. 200 [-]		
Default value	8		
Step	1		
Comm object	8257	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Pause between cranking attempts.			

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Crank Attempts

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	CMB, EME: 0 .. 200 [-], AUX, PRP: 1 .. 200 [-]		
Default value	3		
Step	1		
Comm object	8255	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Max number of crank attempts.			
CMB, EME: Setting to 0 means unlimited number of starting attempts.			
<p>Note: <i>There is one start attempt only in case of panel Start button or REMOTE START (PAGE 172) activation. Number of Cranking attempts based on this setpoint is accepted when start is activated by REMREPSTART (PRP ONLY) (PAGE 173) or BLACKOUT START / REMREPSTART (PAGE 174) (AUX, EME and HRB) only. The setpoint is not followed if Sd Override is active, crank attempts number is then unlimited in case of Blackout Start.</i></p>			
Together with request of unlimited start attempts was created PRESTARTOVRD (PAGE 182) - activation means immediate transition from state Prestart to Cranking.			
Same function was applied to second push of START button. First press of START button activates state Prestart, second press of START button skips prestart period.			

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Idle RPM

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	Starting RPM.. Nominal RPM [RPM]		
Default value	500		
Step	1		
Comm object	9946	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Default Idle speed (should be the same as Idle speed set with engine ECU).			

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Idle Offset

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0.0 .. 100.0 [%]		
Default value	0,0		
Step	0.1		
Comm object	10010	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Offset of Idle speed in % of RPM difference between nominal and idle setpoints (Nominal RPM – Idle RPM) – see Function description details on page 59			
<i>Note: 100 % of Engine Values: Requested Speed is the range between Engine params: Idle RPM and Basic setting: Nominal RPM.</i>			

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Idle Time

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0 .. 600 [s]		
Default value	10		
Step	1		
Comm object	9097	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Idle time delay starts when RPM exceeds Starting RPM.			
During the Idle time the IDLE/NOMINAL (PAGE 195) is opened and after then it is closed. IDLE/NOMINAL (PAGE 195) opens during Cooling period (Cooling Time) again.			

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PrelubrTime

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0 .. 600 [s]		
Default value	0		
Step	1		
Comm object	8780	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>This is the time the binary output Prelubrication is active. The controller will activate binary output Prelubrication for this amount of time, then pause for PrelubrPause, then activate again. This will continue the entire time the engine is not running. Function is not active in controller OFF mode.</p>			

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PrelubrPause

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	1 .. 4000 [min]		
Default value	1		
Step	1		
Comm object	8781	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Time interval between prelubrication cycles –PrelubrTime (page 118).</p> <p>Note: To use Prelubrication, configure Binary output Prelubrication at first. Prelubrication is disabled in controller OFF mode or when PrelubrTime is set to zero. When engine is running Prelubrication binary output is opened. Prelubrication starts PrelubrPause after engine stops. Prelubrication starts immediately when:</p> <ul style="list-style-type: none"> - controller power supply turns on - mode changes from OFF to another - Emergency Stop is released 			

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Stop Time

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0 .. 600 [s]		
Default value	60		
Step	1		
Comm object	9815	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Under normal conditions the engine must certainly stop within this period. The period starts by issuing stop command.			

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Cooling Time

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0 .. 600 [s]		
Default value	30		
Step	1		
Comm object	8258	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Runtime of unloaded engine to cool down engine before stopping.			

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AfterCoolTime

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0 .. 600 [s]		
Default value	120		
Step	1		
Comm object	8662	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
COOLING PUMP (PAGE 198) is closed when engine starts and opens with AfterCoolTime delay after engine stopping.			

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D+ function

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	[ENABLED, CHRGFALL, DISABLED]		
Default value	DISABLED		
Step	[-]		
Comm object	9683	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>ENABLED: The D+ terminal is used for both functions – “running engine” detection and charge fail detection.</p> <p>CHRGFALL: The D+ terminal is used for charge fail detection only</p> <p>DISABLED: The D+ terminal is not used.</p> <p><i>Note: Alternator magnetization current is provided independently from the parameter setting.</i></p>			

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Fuel Solenoid

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	[DIESEL, GAS]		
Default value	DIESEL		
Step	[-]		
Comm object	9100	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

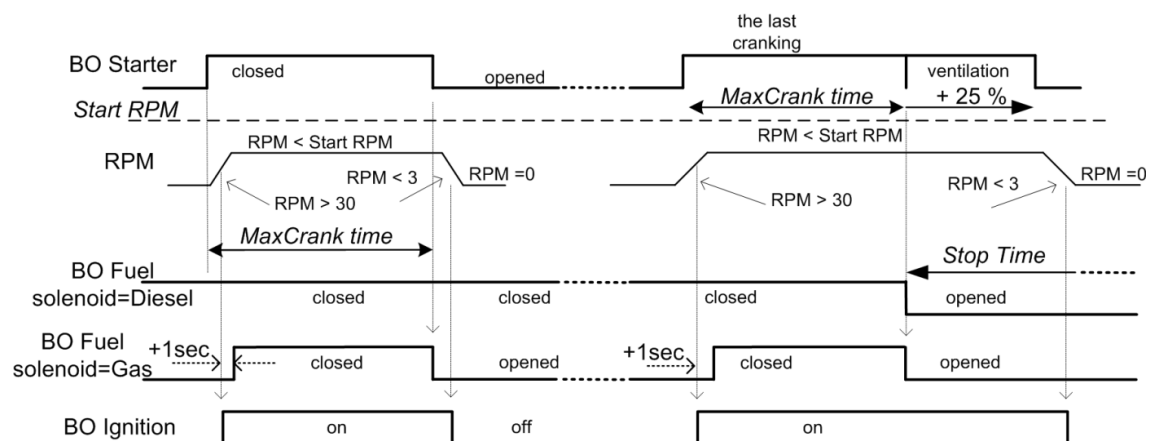
Selection of **FUEL SOLENOID** output function.

DIESEL: The output is still closed except the **Stop Time (page 119)** timer if stop command is sent to an engine.

GAS: Ignition is activated (binary output Ignition is closed) when RPM is over the 30 RPM (fix value). Gas valve (binary output Gas is closed) is opened 1 sec after Ignition output. Gas output opens after stop command or in pause between repeated start.

If the gas engine is unsuccessful in starting the starter output will stay energized 25 % longer in order to vent the remaining gas.

Example of FUEL SOLENOID output behavior during unsuccessful start.



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BI Speed Ramp

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0.0 .. 100.0 [%/s]		
Default value	5		
Step	0.1		
Comm object	9984	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Speed ramp setting for SPEED UP (PAGE 180) / SPEED DOWN (PAGE 179) , not for Analog input request.			

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FireAlarmSpeed

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0.0 .. 100.0 [%]		
Default value	50.0		
Step	0.1 % of Requested RPM range.		
Comm object	10008	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
When FIRE SPEED (PAGE 175) is closed the CLUTCH CONNECT (PRP ONLY) (PAGE 194) opens (this action deactivates loadsharing mode if it was activated before) and ThrottlePos (page 264) is set to Engine params: FireAlarmSpeed value.			

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EnLocalSpeed

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	[ENABLED, DISABLED]		
Default value	DISABLED		
Step	[-]		
Comm object	10098	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
ENABLED: Speed Request (page 258) is defined by Local Speed (page 123) setpoint that can be modified by Fast edit function from front panel (4 sec Enter, / $\bar{}$, Enter).			
DISABLED: Speed Request (page 258) is changed via SPEED UP (PAGE 180) / SPEED DOWN (PAGE 179) or via REQUESTED RPM (PAGE 238) , see Speed Request (page 258) t charts for (page 259) and (page 259) modes.			

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Local Speed

Setpoint group	Engine params	Related FW	3.4.1
Range [units]	0.0 .. 100.0 [%]		
Default value	0.0		
Step	0.1		
Comm object	9948	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Setpoint specifies Speed Request (page 258) when EnLocalSpeed (page 122) = ENABLED. Setpoint can be changed as standard setpoint or by Fast edit function: press Enter for 4 sec, / set value, press Enter to confirm, see Speed Request (page 258) charts for PRP and AUX / EME / HRB modes.</p>			

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Engine protect

Horn Timeout

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 600 [s]		
Default value	10		
Step	1		
Comm object	8264	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
The maximum time for which is the binary output Horn closed (horn, buzzer will sound). If it is requested to sound hound until alarm is cleared, set the parameter to zero.			

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RunOnlyBlkDel1

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 60 [s]		
Default value	10		
Step	1		
Comm object	10023	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
This parameter adjusts delay after engine start when alarms configured as RunOnlyBlkDel1 (i.e. "running only", group #1) are started to be evaluated. The "running only" alarms are not beeing evaluated while the engine is not running or then, after start, while the adjusted delay is running.			
For details see drawing, which is part of RunOnlyBlkDel3 (page 126) description.			

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RunOnlyBlkDel2

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 60 [s]		
Default value	20		
Step	1		
Comm object	10024	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>This parameter adjusts delay after engine start when alarms configured as RunOnlyBlkDel2 (i.e. "running only", group #2) are started to be evaluated. The "running only" alarms are not being evaluated while the engine is not running or then, after start, while the adjusted delay is running.</p> <p>For details see drawing, which is part of RunOnlyBlkDel3 (page 126) description.</p>			

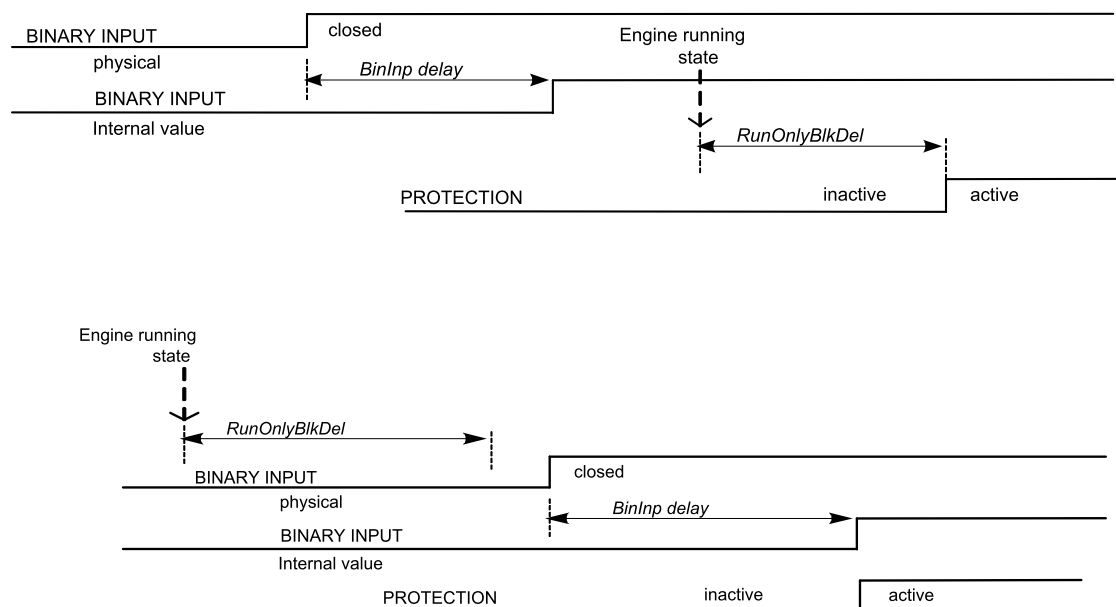
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RunOnlyBlkDel3

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 60 [s]		
Default value	30		
Step	1		
Comm object	10025	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

This parameter adjusts delay after engine start when alarms configured as RunOnlyBlkDel3 (i.e. "running only", group #3) are started to be evaluated. The "running only" alarms are not being evaluated while the engine is not running or then, after start, while the adjusted delay is running.



Note:

Engine running state =

RPM > Starting RPM (page 113) or

Analog input Oil Press > Starting POil (page 114) or

Analog input Coolant Press > StartPCoolant (page 114) (PRP only) or

Active Binary input RunIndication1 or

Active Binary input RunIndication2 or

Active Binary input RunIndication3.

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BinInp Delay 1

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 60 [s]		
Default value	1		
Step	1		
Comm object	10131	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Binary input protection is activated when input is closed for longer time than BinInp delay 1. To use this filter, binary input protection Delay must be configured in DriveConfig to BinInp delay 1. For details see BinInp Delay 3 (page 128) description.			

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BinInp Delay 2

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 60 [s]		
Default value	5		
Step	1		
Comm object	10132	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Binary input protection is activated when input is closed for longer time than BinInp delay 2. To use this filter, binary input protection Delay must be configured in DriveConfig to BinInp delay 2. For details see BinInp Delay 3 (page 128) description.			

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BinInp Delay 3

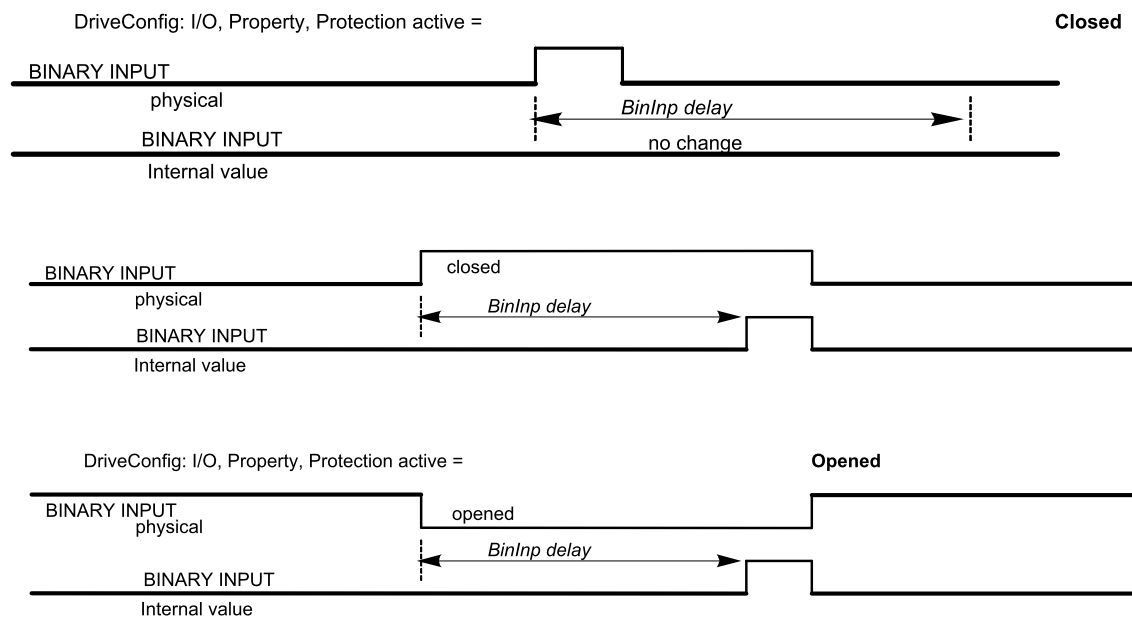
Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 60 [s]		
Default value	10		
Step	1		
Comm object	10133	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

Binary input protection is activated when input is closed for longer time than BinInp delay 3. To use this filter, binary input protection Delay must be configured in DriveConfig to BinInp delay 3.

Note:

BinInp delay x is active only for Binary inputs configured as protection and it is related to protection only. BinInp delay x does not affect optional logical function of an input.



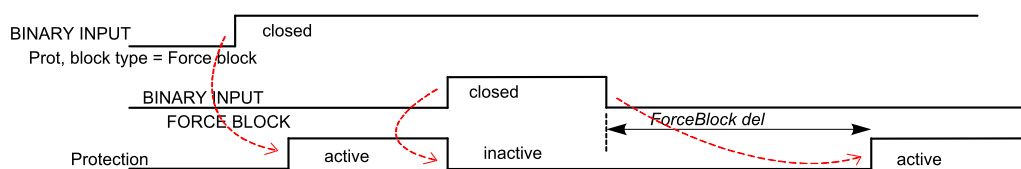
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ForceBlockDel1

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 60 [s]		
Default value	0		
Step	1		
Comm object	10569	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

Delay for Force block protection activation after binary input Force Block 1 is opened. Protection deactivation is without delay. Protection is activated/deactivated independent on engine running or not running state.



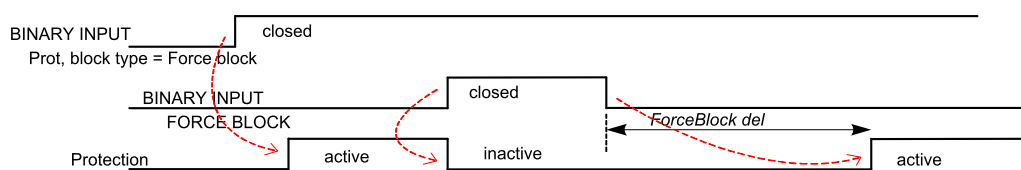
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ForceBlockDel2

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 60 [s]		
Default value	0		
Step	1		
Comm object	10570	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

Delay for Force block protection activation after binary input Force Block 2 is opened. Protection deactivation is without delay. Protection is activated/deactivated independent on engine running or not running state.



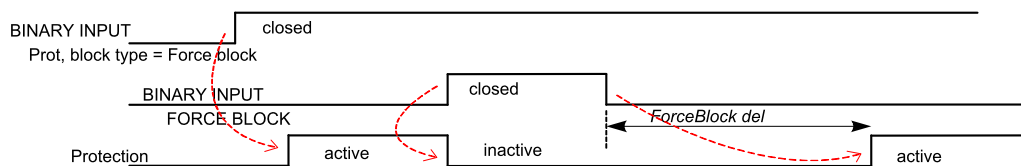
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ForceBlockDel3

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 60 [s]		
Default value	0		
Step	1		
Comm object	10571	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

Delay for Force block protection activation after binary input Force Block 3 is opened. Protection deactivation is without delay. Protection is activated/deactivated independent on engine running or not running state.



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Overspeed

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 200 [%]		
Default value	110		
Step	1 % of Nominal RPM (page 101)		
Comm object	8263	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

Threshold for engine overspeed protection.

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UnderSpeed

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. Starting RPM (page 113) [RPM]		
Default value	30		
Step	1		
Comm object	8260	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Underspeed alarm is activated when engine is running and actual RPM is below the UnderSpeed threshold.			

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MinLoadSpeed

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. Nominal RPM [RPM]		
Default value	500		
Step	1		
Comm object	10139	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Binary output Ready to load is closed if RPM > MinLoadSpeed and engine is in Running state. Use this output to enable/disable connecting of engine load. MinLoadSpeed is a condition to close CLOSE LOAD (PAGE 199) when panel I/O button is used to connect load to engine.			

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Batt > V

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	Batt <V.. 40.0 [V]		
Default value	30.0		
Step	0.1		
Comm object	9587	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning level for battery over voltage.			

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Batt < V

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	8.0 .. Batt >V [V]		
Default value	8.0		
Step	0.1		
Comm object	8387	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning level for low battery voltage.			

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Batt Volt Del

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 600 [s]		
Default value	10		
Step	1		
Comm object	8383	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for battery voltage alarms.			

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OverloadSpLim

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0.0 .. 100.0 [%]		
Default value	20.0		
Step	0.1		
Comm object	9950	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Engine overload protection limit. See Function description details (page 59) .			

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Overload Del

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 600 [s]		
Default value	10		
Step	1		
Comm object	9947	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Overload RPM protection limit.			

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Service Time

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	0 .. 65535 [h]		
Default value	65535		
Step	1		
Comm object	9648	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Running hours count down counter is decremented when engine is running. Service alarm is indicated in Alarm list and History record is done when counter reaches zero. Service time setpoint is initial counter value and it is gradually decrement when engine runs.			
<p>Note: Once the service time has elapsed the Service time will have to be adjusted to non-zero value to clear the alarm and begin a new countdown.</p>			

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ECUAlarmMode

Setpoint group	Engine protect	Related FW	3.4.1
Range [units]	[DEFAULT, ALARM ONLY]		
Default value	DEFAULT		
Step	[-]		
Comm object	15813	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
DEFAULT: COMMON WRN (PAGE 192) is activated , if ECU alarm is received by controller.			
ALARM ONLY: COMMON WRN (PAGE 192) is not activated, if ECU alarm is received by controller.			

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RPMdep protect (PRP only)

Groups	Name	Actual value	Dimension
Basic settings	OPIdleRPMWrn	2,0	Bar
Engine params	OPNomRPMWrn	3,0	Bar
Engine protect	OPIdleRPMscl	1,0	Bar
RPMdep protect	OPNomRPMscl	2,0	Bar
Loadsharing	OilPrRPMdel	5	s
Act. calls/SMS	CPIdleRPMWrn	2,0	Bar
Date/Time	CPNomRPMWrn	3,0	Bar
	CPIdleRPMscl	1,0	Bar
	CPNomRPMscl	2,0	Bar
	CoolPrRPMdel	5	s

RPM dependent Oil pressure and Coolant pressure protections are available in PRP (propulsion) application only. Both protections are by default set to Protection block type = RunOnlyBlkDel1 (Engine running - block delay 1).

There are two setpoints for linear Warning limit, two for Shutdown limit and one for delay. Setpoints adjusting step and range depends on corresponding sensor characteristics.

Note: The particular RPM dependent protection is fully disabled if both `xxxIdlexxx` and `xxxNomxxx` parameters are set to value 0,0. I.e. the protection is not activated even if measured value is negative (e.g. when there is a wrong sensor calibration).

OPIdleRPMWrn

Setpoint group	RPMdep protection (PRP only)	Related FW	3.4.1
Range [units]	0.0 .. 10.0 [Bar]		
Default value	0.0		
Step	0.1		
Comm object	10140	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Linear Warning characteristic is defined by two points for Idle RPM (page 116) and Nominal RPM (page 101) . OPIdleRPMWrn defines oil pressure warning level at idle speed.			

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OPNomRPMWrn

Setpoint group	RPMdep protection (PRP only)	Related FW	3.4.1
Range [units]	0.0 .. 10.0 [Bar]		
Default value	0.0		
Step	0.1		
Comm object	10141	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Linear Warning characteristic is defined by two points for Idle RPM (page 116) and Nominal RPM (page 101) . OPNomRPMWrn defines oil pressure warning level at nominal speed. For details see OiPrRPMdel description.			

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OPIdeRPMSd

Setpoint group	RPMdep protection (PRP only)	Related FW	3.4.1
Range [units]	0.0 .. 10.0 [Bar]		
Default value	0.0		
Step	0.1		
Comm object	10142	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Linear Shutdown characteristic is defined by two points for Idle RPM (page 116) and Nominal RPM (page 101) . OPIdeRPMSd defines oil pressure shutdown level at idle speed. For details see OiPrRPMdel (page 137) description.			

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OPNomRPMSd

Setpoint group	RPMdep protection (PRP only)	Related FW	3.4.1
Range [units]	0.0 .. 10.0 [Bar]		
Default value	0.0		YES
Step	0.1		
Comm object	10143	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Linear Shutdown characteristic is defined by two points for Idle RPM (page 116) and Nominal RPM (page 101) . OPNomRPMSd defines oil pressure shutdown level at nominal speed. For details see OilPrRPMdel (page 137) description.			

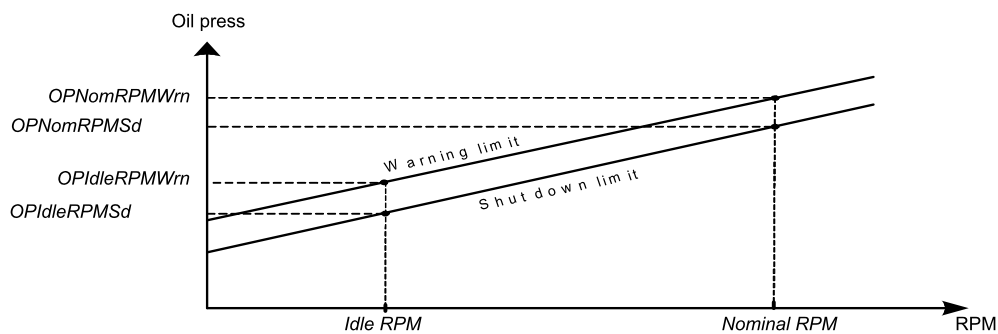
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OilPrRPMdel

Setpoint group	RPMdep protection (PRP only)	Related FW	3.4.1
Range [units]	0.. 600 [s]		
Default value	10		
Step	1		
Comm object	10150	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		

Description

RPM dependent Oil pressure protection delay. Corresponding protection is activated when Oil pressure is below limit for OilPrRPMdel.



To activate RPM dependent oil pressure protection any analog value has to be linked with **OIL PRESS (PAGE 237)**.

Note: RPM dependent oil pressure protection is fix configured Protection block type = Engine running only with RunOnlyBlkDel1 delay.

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CPIdleRPMWrn

Setpoint group	RPMdep protection (PRP only)	Related FW	3.4.1
Range [units]	0.0 .. 10.0 [Bar]		
Default value	0.0		YES
Step	0.1		
Comm object	10144	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Linear Warning characteristic is defined by two points for Idle RPM (page 116) and Nominal RPM (page 101) . CPIdleRPMWrn defines coolant pressure warning level at idle speed. For details see CoolPrRPMdel (page 140) description.			

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CPNomRPMWrn

Setpoint group	RPMdep protection (PRP only)	Related FW	3.4.1
Range [units]	0.0 .. 10.0 [Bar]		
Default value	0.0		YES
Step	0.1		
Comm object	10145	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Linear Warning characteristic is defined by two points for Idle RPM (page 116) and Nominal RPM (page 101) . CPNomRPMWrn defines coolant pressure warning level at nominal speed. For details see CoolPrRPMdel (page 140) description.			

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CPIdleRPMSd

Setpoint group	RPMdep protection (PRP only)	Related FW	3.4.1
Range [units]	0.0 .. 10.0 [Bar]		
Default value	0.0		
Step	0.1		
Comm object	10146	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Linear Shutdown characteristic is defined by two points for Idle RPM (page 116) and Nominal RPM (page 101) . CPIdleRPMSd defines coolant pressure shutdown level at idle speed. For details see CoolPrRPMdel (page 140) description.			

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CPNomRPMSd

Setpoint group	RPMdep protection (PRP only)	Related FW	3.4.1
Range [units]	0.0 .. 10.0 [Bar]		
Default value	0.0		
Step	0.1		
Comm object	10147	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Linear Shutdown characteristic is defined by two points for Idle RPM (page 116) and Nominal RPM (page 101) . CPNomRPMSd defines coolant pressure shutdown level at nominal speed. For details see CoolPrRPMdel (page 140) description.			

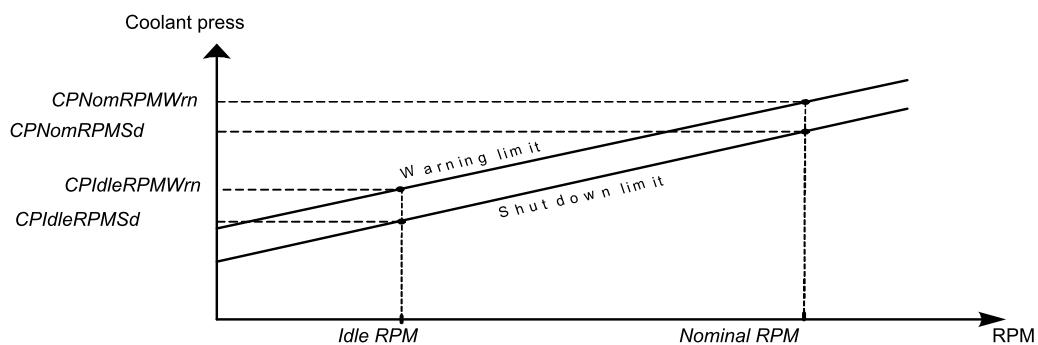
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CoolPrRPMdel

Setpoint group	RPMdep protection (PRP only)	Related FW	3.4.1
Range [units]	0 .. 600 [s]		
Default value	10		
Step	1		
Comm object	10151	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		

Description

RPM dependent Coolant pressure protection delay. Corresponding protection is activated when Coolant pressure is below limit for CoolPrRPMdel.



To activate RPM dependent coolant pressure protection any analog value has to be linked with **COOLANT PRESS (PRP ONLY)** (PAGE 237).

Note: RPM dependent coolant pressure protection is fix configured Protection block type = Engine running only with RunOnlyBlkDel1 delay.

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Load sharing

Load Gain

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	0.0 .. 200.0 [%]		
Default value	5.0		
Step	0.1		
Comm object	8659	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Relative Gain of the load sharing loop.			

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Load Int

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	0.0 .. 100.0 [%]		
Default value	10.0		
Step	0.1		
Comm object	8713	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Relative Integration factor of the load sharing loop.			

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Clutch Del

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	0.0 .. 60.0 [s]		
Default value	5		
Step	0.1		
Comm object	9949	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Time between the clutch is switched on/off and the load sharing function is activated.			

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ClutchMinSpeed

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	0.0 .. ClutchMaxSpeed [%]		
Default value	0.0		
Step	0.1		
Comm object	10096	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Clutch can be switched on if ClutchMinSpeed < RPM < ClutchMaxSpeed . Limits are in % of the Requested speed. See Function description details (page 59)			
<i>Note: 0.0 % corresponds to (Idle speed + Idle offset) value, 100.0 % corresponds to Nominal speed.</i>			

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ClutchMaxSpeed

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	ClutchMinSpeed .. 100.0 [%]		
Default value	100.0		
Step	0.1		
Comm object	10097	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Clutch can be switched on if ClutchMinSpeed < RPM < ClutchMaxSpeed . Limits are in % of Requested speed. See Function description details (page 59) .			
<i>Note: 0.0 % corresponds to (Idle speed + Idle offset) value, 100.0 % corresponds to Nominal speed.</i>			

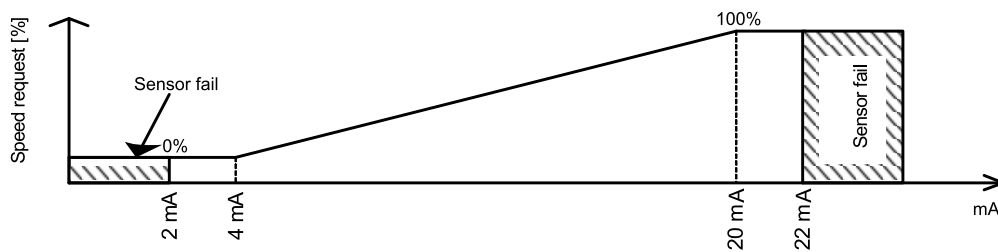
[back to List of setpoints](#)

Back Up Speed1

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	0.0 .. 100.0 [%]		
Default value	50.0		
Step	0.1		
Comm object	10099	Related applications	AUX
Config level	Standard		
Setpoint visibility	Always		

Description

See **Load sharing block diagram (page 148)** - the setpoint value is used instead of **Speed Request (page 258)** in loadsharing state, if **BACK UP SPEED1 (PAGE 174)** is active and **REQUESTED RPM (PAGE 238)** reading via analog input is out of range (sensor fail is detected).



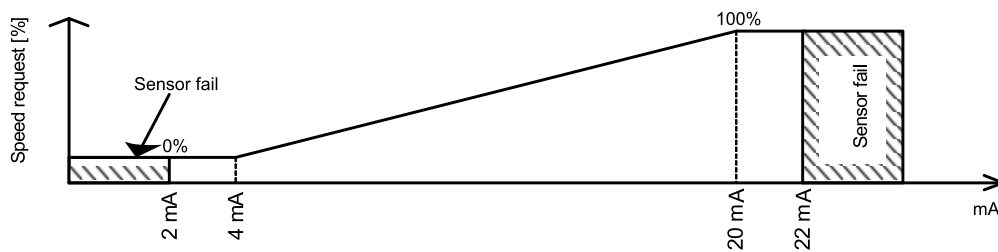
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Back Up Speed2

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	0.0 .. 100.0 [%]		
Default value	50.0		
Step	0.1		
Comm object	10523	Related applications	AUX
Config level	Standard		
Setpoint visibility	Always		

Description

See **Load sharing block diagram (page 148)** - the setpoint value is used instead of **Speed Request (page 258)** in loadsharing state, if **BACK UP SPEED1 (PAGE 174)** is active and **REQUESTED RPM (PAGE 238)** reading via analog input is out of range (sensor fail is detected).



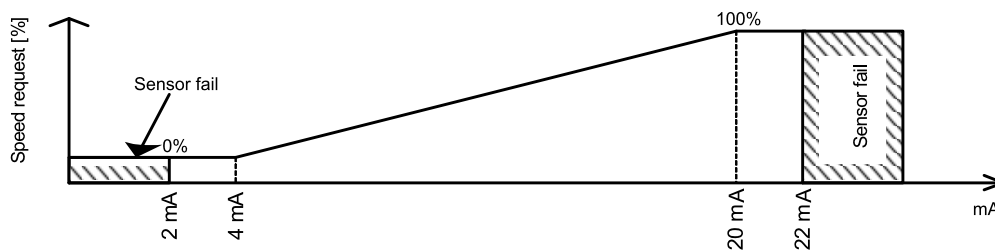
[back to List of setpoints](#)

Back Up Speed3

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	0.0 .. 100.0 [%]		
Default value	50.0		
Step	0.1		
Comm object	10524	Related applications	AUX
Config level	Standard		
Setpoint visibility	Always		

Description

See **Load sharing block diagram (page 148)** - the setpoint value is used instead of **Speed Request (page 258)** in loadsharing state, if **BACK UP SPEED1 (PAGE 174)** is active and **REQUESTED RPM (PAGE 238)** reading via analog input is out of range (sensor fail is detected).



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MaxCIstrtPer

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	0 .. 600 [s]		
Default value	60		
Step	1		
Comm object	10102	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		

Description

Engine clutch start protection. Start fail alarm is activated, if engine running condition is not detected during MaxCIstrtPer delay time after **CLUTCH CONNECT (PRP ONLY) (PAGE 194)** is closed.

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DetectOtherCAN

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	[DISABLED, ENABLED]		
Default value	DISABLED		
Step	[-]		
Comm object	9921	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Enables Wrm OthrCommEr warning message when no other unit is recognized on the CAN bus. OTHRCOMMER (PAGE 224) is closed in this case.			

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RQSP Aver

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	0 .. 1000 [%]		
Default value	5		
Step	1		
Comm object	10136	Related applications	PRP
Config level	Standard		
Setpoint visibility	Always		
Description			
Average value calculated from all Speed Request values of controllers running in Loadsharing mode together (on the same CAN2 bus). See Load sharing block diagram (page 148) .			

🔍 back to List of setpoints

RQSP Ramp

Setpoint group	Load sharing	Related FW	3.4.1
Range [units]	0 .. 100 [%/s]		
Default value	5		
Step	1		
Comm object	10148	Related applications	PRP
Config level	Standard		

Setpoint visibility Always

Description

Requested RPM ramp – see drawing.

Value	Description	Dimension	InteliMonitor	ID-DCU Industrial display
Loadsharing group				
RQSP aver	Average of Requested RPM values calculated from all controllers participating in loadsharing	%	YES	YES
RQSP ramp	RQSP aver value after ramp specified by Loadsharing: RQSP Ramp setpoint	%	YES	YES
ThrottlePos	Throttle position	%	YES	YES
Engine values group				
Speed Request	Speed request	%	YES	NO

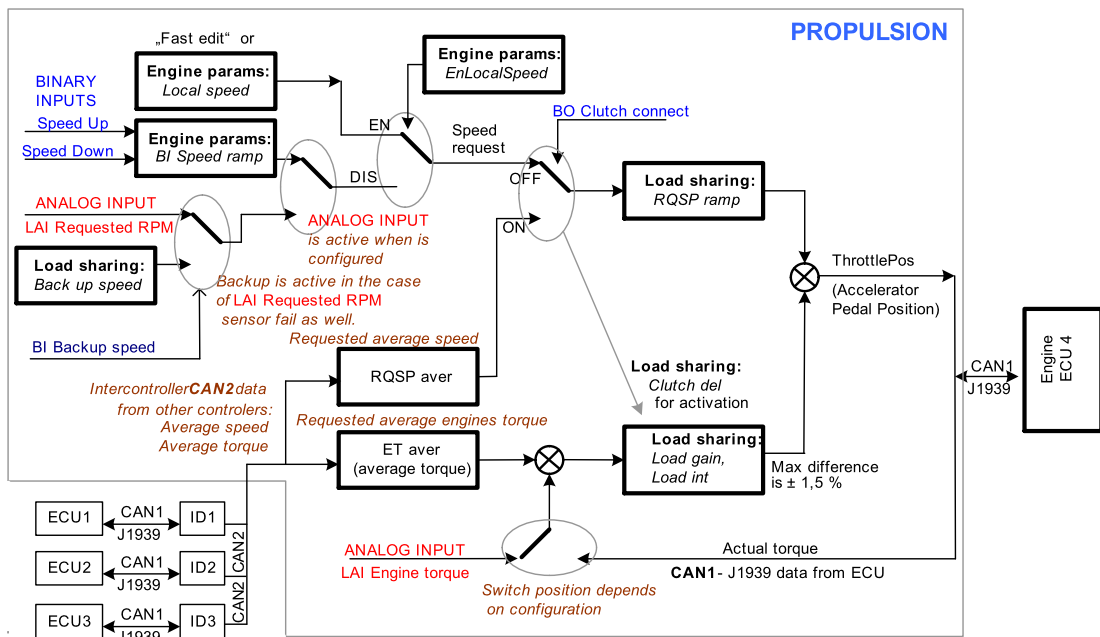


Image 8.1 Load sharing block diagram

Note: The maximal ThrottlePos difference between parallel operating engines (due to Load sharing function) is 1.5%.

ThrottlePos output (request to EMS) is switched to be equal to the Speed Request (page 258) after other engines clutches are disconnected (no load sharing, only one engine powers the shaft).

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Analog inputs

AIN1 Offset

Setpoint group	Analog inputs	Related FW	3.4.1
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	[-]		
Comm object	8431	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for AIN1 for calibrating purposes.			

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AIN2 Offset

Setpoint group	Analog inputs	Related FW	3.4.1
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	[-]		
Comm object	8407	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for AIN2 for calibrating purposes.			

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AIN3 Offset

Setpoint group	Analog inputs	Related FW	3.4.1
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	[-]		
Comm object	8467	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for AIN3 for calibrating purposes.			

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AIN4 Offset

Setpoint group	Analog inputs	Related FW	3.4.1
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	[-]		
Comm object	8793	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for AIN4 for calibrating purposes.			

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AIN5 Offset

Setpoint group	Analog inputs	Related FW	3.4.1
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	[-]		
Comm object	8794	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for AIN5s for calibrating purposes.			

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AIN6 Offset

Setpoint group	Analog inputs	Related FW	3.4.1
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	[-]		
Comm object	8795	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for AIN6 for calibrating purposes.			

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AIN7 Offset

Setpoint group	Analog inputs	Related FW	3.4.1
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	[-]		
Comm object	8796	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for AIN7 for calibrating purposes.			

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AIN8 Offset

Setpoint group	Analog inputs	Related FW	3.4.1
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	[-]		
Comm object	11599	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for AIN8 for calibrating purposes.			

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Act. Calls/SMS

Warning Call

Setpoint group	Act. Calls/SMS	Related FW	3.4.1
Range [units]	[DISABLED, ENABLED]		
Default value	DISABLED		
Step	[-]		
Comm object	8482	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Enables or disables active calls/SMS to selected phone or mobile numbers when a Warning alarm occurs.			

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Shut Down Call

Setpoint group	Act. Calls/SMS	Related FW	3.4.1
Range [units]	[DISABLED, ENABLED]		
Default value	DISABLED		
Step	[-]		
Comm object	8484	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Enables or disables active calls to selected phone or mobile numbers when a Shutdown alarm occurs.			

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Cool Down Call

Setpoint group	Act. Calls/SMS	Related FW	3.4.1
Range [units]	[DISABLED, ENABLED]		
Default value	DISABLED		
Step	[-]		
Comm object	8485	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Enables or disables active calls/SMS to selected phone or mobile numbers when a Cool down alarm occurs.			

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AcallCH1-Type

Setpoint group	Act. Calls/SMS	Related FW	3.4.1
Range [units]	[DISABLED, DATA, SMS, E-MAIL, EML-SMS]		
Default value	DISABLED		
Step	[-]		
Comm object	9594	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

Up to three separate channels are available for any one of the following types of messages:

DISABLED	Channel is disabled.
DATA	Analog, GSM or ISDN modem connection.
SMS	Channel sends SMS message. Use this option only when GSM modem or InteliBridge-NT is connected.
E-MAIL	Channel sends e-mail. Only when InteliBridge-NT is connected.
EML-SMS	Channel sends short e-mail with SMS like content. Only when InteliBridge-NT is connected.

Email contains:

- ▶ header with serial number and application info.
- ▶ Alarm list
- ▶ 20 History records (reason, date, time)

Example: of EML-SMS

AL=(Sd Water Temp,Wrn Water Temp,!Emerg Stop,ActCallCH1Fail)

Note: Both SMS and E-MAIL active call types are supported in conjunction with InteliBridge-NT, if cellular interface is used (WAN connection mode = Cellular). E-MAIL only is supported, if Ethernet interface is used (WAN connection mode = Ethernet).

Note: To receive DATA active call run InteliMonitor – Type of connection = Active call. InteliMonitor Active call window contains list of received AID files. Each list item contains Engine name, Date, Time, ID serial number.

 [back to List of setpoints](#)

AcallCH3-Type

Setpoint group	Act. Calls/SMS	Related FW	3.4.1
Range [units]	[DISABLED, DATA, SMS, E-MAIL, EML-SMS]		
Default value	DISABLED		
Step	[-]		
Comm object	9596	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

Up to three separate channels are available for any one of the following types of messages:

DISABLED	Channel is disabled.
DATA	Analog, GSM or ISDN modem connection.
SMS	Channel sends SMS message. Use this option only when GSM modem or InteliBridge-NT is connected.
E-MAIL	Channel sends e-mail. Only when InteliBridge-NT is connected.
EML-SMS	Channel sends short e-mail with SMS like content. Only when InteliBridge-NT is connected.

Email contains:

- ▶ header with serial number and application info.
- ▶ Alarm list
- ▶ 20 History records (reason, date, time)

Example: of EML-SMS

AL=(Sd Water Temp,Wrn Water Temp,!Emerg Stop,ActCallCH1Fail)

Note: Both SMS and E-MAIL active call types are supported in conjunction with InteliBridge-NT, if cellular interface is used (WAN connection mode = Cellular). E-MAIL only is supported, if Ethernet interface is used (WAN connection mode = Ethernet).

Note: To receive DATA active call run InteliMonitor – Type of connection = Active call. InteliMonitor Active call window contains list of received AID files. Each list item contains Engine name, Date, Time, ID serial number.

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AcallCH1-Addr

Setpoint group	Act. Calls/SMS	Related FW	3.4.1
Range [units]	[-]		
Default value	0		
Step	[-]		
Comm object	9597	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Address for channel 1 active call. Each above message type has either phone number or e-mail address associated with it.			

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AcallCH2-Type

Setpoint group	Act. Calls/SMS	Related FW	3.4.1
Range [units]	[DISABLED, DATA, SMS, E-MAIL, EML-SMS]		
Default value	DISABLED		
Step	[-]		
Comm object	9595	Related applications	All
Config level	Standard		
Setpoint visibility	Always		

Description

Up to three separate channels are available for any one of the following types of messages:

DISABLED	Channel is disabled.
DATA	Analog, GSM or ISDN modem connection.
SMS	Channel sends SMS message. Use this option only when GSM modem or InteliBridge-NT is connected.
E-MAIL	Channel sends e-mail. Only when InteliBridge-NT is connected.
EML-SMS	Channel sends short e-mail with SMS like content. Only when InteliBridge-NT is connected.

Email contains:

- ▶ header with serial number and application info.
- ▶ Alarm list
- ▶ 20 History records (reason, date, time)

Example: of EML-SMS

AL=(Sd Water Temp,Wrn Water Temp,!Emerg Stop,ActCallCH1Fail)

Note: Both SMS and E-MAIL active call types are supported in conjunction with InteliBridge-NT, if cellular interface is used (WAN connection mode = Cellular). E-MAIL only is supported, if Ethernet interface is used (WAN connection mode = Ethernet).

Note: To receive DATA active call run InteliMonitor – Type of connection = Active call. InteliMonitor Active call window contains list of received AID files. Each list item contains Engine name, Date, Time, ID serial number.

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AcallCH2-Addr

Setpoint group	Act. Calls/SMS	Related FW	3.4.1
Range [units]	[-]		
Default value	0		
Step	[-]		
Comm object	9598	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Address for channel 2 active call. Each above message type has either phone number or e-mail address associated with it.			

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AcallCH3-Addr

Setpoint group	Act. Calls/SMS	Related FW	3.4.1
Range [units]	[-]		
Default value	0		
Step	[-]		
Comm object	9599	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Address for channel 3 active call. Each above message type has either phone number or e-mail address associated with it.			

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Num Rings AA

Setpoint group	Act. Calls/SMS	Related FW	3.4.1
Range [units]	1 .. 30 [-]		
Default value	3		
Step	1		
Comm object	24512	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Number of rings prior to open modem connection from PC to controller.			
<p>Note: Num Rings AA change is not accepted immediately, but only after controller is switched on or when modem is connected to controller.</p>			

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A.C.Multiplier

Setpoint group	Act. Calls/SMS	Related FW	3.4.1
Range [units]	1 .. 250 [-]		
Default value	3		
Step	1		
Comm object	24505	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Setpoint specifies number of attempts to open Active call connection when phone line is engaged.			
<i>Note: Timeout for connection is 90 sec and after 120 sec controller starts the next attempt. Incoming calls are blocked when controller is trying to send active call message.</i>			

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Date and Time

Time

Setpoint group	Date/Time	Related FW	3.4.1
Range [units]	[HH:MM:SS]		
Default value	12:00:00		
Step	[-]		
Comm object	24554	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Controller internal Real Time Clock adjustment.			

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Date

Setpoint group	Date/Time	Related FW	3.4.1
Range [units]	[DD:MM:YY]		
Default value	8.6.2006		
Step	[-]		
Comm object	24553	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Actual date adjustment			

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Time Stamp Per

Setpoint group	Date/Time	Related FW	3.4.1
Range [units]	0 .. 240 [min]		
Default value	1		
Step	1		
Comm object	8979	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint adjusts time interval of Time stamp history records.			
<p>Note: No history Time stamp is recorded when TimeStamp Per = 0. RTC and Date is in each History record.</p>			

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SummerTimeMod

Setpoint group	Date/Time	Related FW	3.4.1
Range [units]	[DISABLED, WINTER, SUMMER, WINTER-S, SUMMER-S]		
Default value	DISABLED		
Step	[-]		
Comm object	8727	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setpoint is used to select mode of automatic time change.</p> <p>EST (European Summer Time) started last Sunday in March. EST ends last Sunday in October.</p> <p>Southern hemisphere is roughly the reverse. Time change depends on location and can vary in 8 weeks time.</p>			
DISABLED	The automatic change to daylight saving time and back is disabled.		
WINTER	The automatic change is enabled, the current season is winter and the controller is located in the northern hemisphere.		
SUMMER	The automatic change is enabled, the current season is summer and the controller is located in the northern hemisphere.		
WINTER-S	The automatic change is enabled, the current season is winter and the controller is located in the southern hemisphere.		
SUMMER-S	The automatic change is enabled, the current season is summer and the controller is located in the southern hemisphere.		

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EnTimeSync

Setpoint group	Date/Time	Related FW	3.4.1
Range [units]	[DISABLED, ENABLED]		
Default value	DISABLED		
Step	[-]		
Comm object	24217	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
<ul style="list-style-type: none"> ▶ The setpoint is used to enable Time synchronization function with IntelliGen-NT and IntelliSys-NT controllers over CAN2 bus. ▶ The synchronization is just unidirectional from IntelliGen-NT or IntelliSys-NT controller into IntelliDrive DCU Industrial, not vice versa. 			

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ID-SCM unit

This setpoints are available when the SCM module is configured in DriveConfig / Modules window.

Not possible to use ID-SCM when ID-RPU is used.

FreqRate1

Setpoint group	SCM unit	Related FW	3.4.1
Range [units]	0 .. 500 [-]		
Default value	0		
Step	1		
Comm object	10902	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Conversion constant (number of pulses for one RPM) for ID-SCM RPM1 frequency input - SCM Freq1 value. Frequency range max. 8 kHz.			

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FreqRate2

Setpoint group	SCM unit	Related FW	3.4.1
Range [units]	0 .. 500 [-]		
Default value	0		
Step	1		
Comm object	10903	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Conversion constant (number of pulses for one RPM) for ID-SCM RPM2 frequency input - SCM Freq2 value. Frequency range max. 8 kHz.			

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TransferRate1

Setpoint group	SCM unit	Related FW	3.4.1
Range [units]	0 .. 500 [-]		
Default value	0		
Step	1		
Comm object	10906	Related applications	All
Config level	Standard		
Setpoint visibility	Always		
Description			
Conversion ratio (number of pulses for increase by 1) for ID-SCM IMP 1 impulse input / SCM Imp1 value. Frequency range max. 60 Hz.			

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TransferRate2

Setpoint group	SCM unit	Related FW	3.4.1															
Range [units]	0 .. 500 [-]																	
Default value	0																	
Step	1																	
Comm object	10907	Related applications	All															
Config level	Standard																	
Setpoint visibility	Always																	
Description																		
Conversion ratio (number of pulses for increase by 1) for ID-SCM IMP 2 impulse input / SCM Imp2 value. Frequency range max. 60 Hz.																		
<table border="1"> <thead> <tr> <th>Input</th> <th>Setpoint</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>RPM1</td> <td>FreqRate1</td> <td>SCM Freq1</td> </tr> <tr> <td>RPM2</td> <td>FreqRate2</td> <td>SCM Freq2</td> </tr> <tr> <td>IMP1</td> <td>TransferRate1</td> <td>SCM Imp1</td> </tr> <tr> <td>IMP2</td> <td>TransferRate2</td> <td>SCM Imp2</td> </tr> </tbody> </table>				Input	Setpoint	Value	RPM1	FreqRate1	SCM Freq1	RPM2	FreqRate2	SCM Freq2	IMP1	TransferRate1	SCM Imp1	IMP2	TransferRate2	SCM Imp2
Input	Setpoint	Value																
RPM1	FreqRate1	SCM Freq1																
RPM2	FreqRate2	SCM Freq2																
IMP1	TransferRate1	SCM Imp1																
IMP2	TransferRate2	SCM Imp2																
<p>Example: To measure actual water flow in liters (or cubic meters) per minute set FreqRate = 10 [] when sensor gives 10 pulses per liter (or cubic meters).</p> <p>Example: To measure total water consumption in liters (or cubic meters) set TransferRate = 100 [] when sensor gives 100 pulses per 1 liter (or cubic meter).</p>																		

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DetCon20

IgnRedLimit

Setpoint group	DetCon20	Related FW	3.4.1
Range [units]	0 .. 255 [-]		
Default value	10		
Step	1		
Comm object	10299	Related applications	All
Config level	Standard		
Setpoint visibility	DetCon20 support configured		
Description			
Ignition reduction limit is knocking value above which the engine is considered to be knocking. If the value is exceeded, DetCon20 binary output ENGINE KNOCKING is activated and the values assigned to the timing reduction are altered.			

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ImmStopLimit

Setpoint group	DetCon20	Related FW	3.4.1
Range [units]	0 .. 255 [-]		
Default value	40		
Step	1		
Comm object	10304	Related applications	All
Config level	Standard		
Setpoint visibility	DetCon20 support configured		
Description			
Immediate stop limit is knocking value above which DetCon20 binary output TRIP is activated. This causes engine to shut down if properly wired.			

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DecreaseRamp

Setpoint group	DetCon20	Related FW	3.4.1
Range [units]	0.0 .. 100.0 [%/s]		
Default value	30.0 %/s		
Step	0.1 %/s		
Comm object	10300	Related applications	All
Config level	Standard		
Setpoint visibility	DetCon20 support configured		
Description			
Decrease ramp specifies rate at which is the timing reduction signal (analog output) decreased as soon as knocking drops below the IgnRedLimit (page 162) (ignition reduction limit).			

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TimingRedGain

Setpoint group	DetCon20	Related FW	3.4.1
Range [units]	0.0 .. 100.0 [%]		
Default value	40.0 %		
Step	0.1 %		
Comm object	10301	Related applications	All
Config level	Standard		
Setpoint visibility	DetCon20 support configured		
Description			
Timing reduction gain influences rate at which timing reduction signal (analog output) is amplified when knocking is detected.			

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DelayLoadRed

Setpoint group	DetCon20	Related FW	3.4.1
Range [units]	0.0 .. 25.4 [s]		
Default value	1.0 s		
Step	0.1 s		
Comm object	10303	Related applications	All
Config level	Standard		
Setpoint visibility	DetCon20 support configured		
Description			
Delay after load reduction defines delay of timing signal reduction process after knocking level drops below the IgnRedLimit (page 162).			

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Protections

Protection group contains all Analog inputs and Binary inputs protection limits and delays. List is dynamically created during configuration process.

8.1.3 Binary Inputs

Any IntelliDrive controller extension physical binary input can be configured as “function” or “protection”.

Following chapter contains Logical binary inputs list that can be configured to any physical input.

ID-DCU Industrial binary inputs **Remote Start, Remote Stop, Rem Start/Stop** are not active in LOC (local) mode.

Note: Minimal input pulse duration is 120 ms to be detected as valid (binary inputs sampling rate is 100 ms). Adjustable delay can be configured to any binary input when is used as a protection: Standard = 0,5 sec or one of BinInp delay 1, 2, 3 that can be adjusted by corresponding Setpoint BinInp Delay 1, 2, 3.

Input	BI delay configuration	Setpoint
	Standard (0,5s)	
	BinInp delay 1	BinInp Delay 1
	BinInp delay 2	BinInp Delay 2
	BinInp delay 3	BinInp Delay 3

See setpoints BinInp delay 1 [s] etc...

List of LBI

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 **back to Controller objects**

Access Lock

Related FW	3.4.1	Related applications	All
Comm object	149		
Description			
If the input is closed			
<ul style="list-style-type: none">▶ Panel buttons Start, Stop are inactive▶ No setpoints can be adjusted from controller front panel▶ Controller mode (e.g. OFF-AUX) cannot be changed▶ Fault reset (screen sensitive), Horn reset buttons are still active▶ It is possible to list Values, Setpoints and History▶ Binary inputs function is without change			
Active Access lock is indicated by “L” in the upper right corner of controller screen.			
Note: Access Lock does not protect Setpoints change, Mode change and START, STOP commands from IntelliMonitor (direct or modem). To avoid unqualified changes of the selected setpoints or commands use password protection.			

 [back to List of LBI](#)

Remote Lock

Related FW	3.4.1	Related applications	All	
Comm object	150			
Description				
<p>If the input is closed following commands received via RS232 or CAN2 interface (e.g. from IntelliMonitor or from remote display) are inactive:</p> <ul style="list-style-type: none"> ▶ Remote engine start, stop commands ▶ Fault reset and horn reset ▶ Setpoints change <p>Engine can be started, stopped via Binary inputs (e.g. REMOTE START (PAGE 172)) or via front panel buttons.</p>				
InteliDrive local/remote commands blocking overview				
Note: Y = available, N = blocked				
Device	Command	Access lock	Remote lock	LOC (Local) mode
ID-DCU Industrial panel	START	N	Y	Y
	STOP	N	Y	Y
	FLT RES	Y	Y	Y
	HORN RES	Y	Y	Y
	Setpoint change	N	Y	Y
	Mode change	N	Y	Y
ID-DCU Industrial Bin Inputs	Remote start	Y	Y	N
	Remote stop	Y	Y	N
	Remote OFF	Y	Y	N
External modules Bin Inputs	start/stop	Y	Y	N
	Remote OFF	Y	Y	N
	Remote HBR	Y	Y	N
(RS232 or CAN2)	STOP	Y	N	N
	FLT RES	Y	N	N
	HORN RES	Y	N	N
	Setpoint change	Y	N	N
	Mode change	Y	N	N
InteliMonitor (serial line)	START	Y	N	N
	STOP	Y	N	N
	FLT RES	Y	N	N
	HORN RES	Y	N	N
	Setpoint change	Y	N	N
	Mode change	Y	N	N

Note: When Remote Lock is active, it is still possible to initiate programming of a remotely connected IntelliMonitor.

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Low Brightness

Related FW	3.4.1	Related applications	All
Comm object	5		
Description			
Active Binary input switches ID-DCU Industrial display backlight between two adjustable intensity levels. Alternative intensity of the backlight can be set independently by ID-DCU Industrial panel buttons:			
<ol style="list-style-type: none"> 1. Hold Enter and press Page to switch to ID Info screen (from any measure screen) 2. Hold Enter and pres / $\bar{\text{—}}$ arrow key to increase/decrease display brightness 			
The adjusted intensity is stored in non-volatile memory.			
Note: Both backlight levels are default (from production) set to maximum.			

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Force Block 1

Related FW	3.4.1	Related applications	All
Comm object	16		
Description			
Active input blocks protections that are configured as “Force Block 1” Prot. block type. Corresponding setpoint is ForceBlockDel1.			

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Force Block 2

Related FW	3.4.1	Related applications	All
Comm object	17		
Description			
Active input blocks protections that are configured as “Force Block 2” Prot. block type. Corresponding setpoint is ForceBlockDel2.			

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Force Block 3

Related FW	3.4.1	Related applications	All
Comm object	18		
Description			
Active input blocks protections that are configured as “Force Block 3” Prot. block type. Corresponding setpoint is ForceBlockDel3.			

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Fault Reset

Related FW	3.4.1	Related applications	All
Comm object	152		
Description			
Binary input for Alarm acknowledge (level sensitive) has the same function as controller front panel button Fault reset (i.e. the acknowledge function is screen sensitive).			
<i>Note: There is separated acknowledge for ECU Alarms – see Binary input ECU FLTRESET (PAGE 180)</i>			

⬅ back to List of LBI

Horn Reset

Related FW	3.4.1	Related applications	All
Comm object	153		
Description			
Binary input Horn Reset is level sensitive.			

⬅ back to List of LBI

Remote OFF

Related FW	3.4.1	Related applications	All
Comm object	12		
Description			
Controller is switched to OFF mode if input is closed and back to previous mode after is opened. Input is not active in LOC (Local) mode. Active binary input Remote OFF is indicated by “L” character in the right upper corner on ID-DCU Industrial screen.			
<i>Note: Remote OFF will switch controller to OFF mode even if the ACCESS LOCK (PAGE 167) orREMOTE LOCK (PAGE 168) is active or Controller mode is password protected.</i>			

⬅ back to List of LBI

Remote HRB

Related FW	3.4.1	Related applications	All
Comm object	14		
Description			
Controller is switched to HRB mode if closed and back to previous mode if opened. Input is not active in LOC (Local) mode.			

⬅ back to List of LBI

Remote On/Off

Related FW	3.4.1	Related applications	All
Comm object	161		
Description			
CLOSE LOAD (PAGE 199) is closed/opened depends on the state of Remote On/Off binary input when engine RPM is over MinLoadSpeed (page 131). Remote On/Off is not active in LOC mode.			

⬅ back to List of LBI

ECUComFailBlick

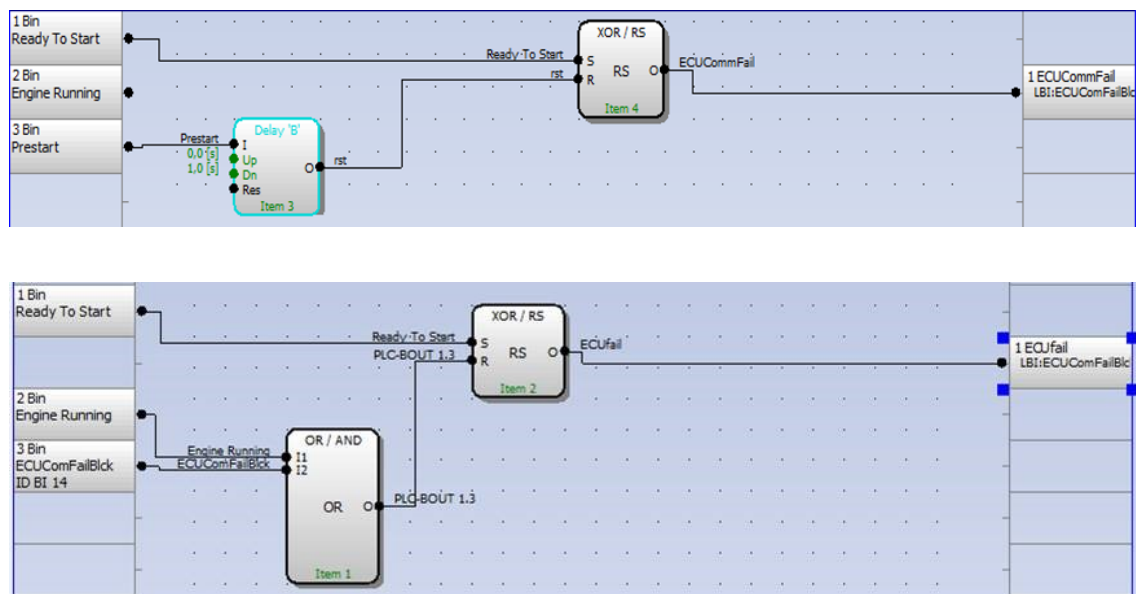
Related FW	3.4.1	Related applications	All
Comm object	141		

Description

Active input blocks indication of ECU communication fail e.g. in the case the ECU is switched off.

Note: LBI:ECUComFailBlick is possible to use during ECU initialization for start of the engine, when ECU POWERRELAY (PAGE 204) is used. By simple logic in PLC editor is possible to avoid alarms while the ECU is getting started. Also at the same time this LBI gives you flexibility to decide, when the communication alarms from ECU are relevant.

Example: of PLC Editor



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EmergencyStop1 / EmergencyStop2

Related FW	3.4.1	Related applications	AMF, MRS
Comm object	286		

Description

If the input is activated, engine shutdown is immediately performed. However, the controller behavior is slightly different compared to other shutdown alarms:

- ▶ Outputs Cooling pump and Prelubrication are deactivated as well.
- ▶ This input cannot be overridden with the input Sd override.

Note: Because of safety reasons it is recommended to configure this input as Normally closed and use a NC switch.

IMPORTANT: This is a software function only. It can be extended by a "hard wired" emergency stop function, which means disconnecting power supply from the controller outputs.

⬅ back to List of LBI

EmergencyStop1

Related FW	3.4.1	Related applications	All
Comm object	927		
Description			
<p>If the input is activated, engine shutdown is immediately performed. However, the controller behavior is slightly different compared to other shutdown alarms:</p> <ul style="list-style-type: none"> ▶ COOLING PUMP (PAGE 198) and PRELUBRICATION (PAGE 196) are deactivated as well. ▶ This input cannot be overridden with the input Sd override. <p><i>Note: Because of safety reasons it is recommended to configure this input as Normally closed and use a NC switch.</i></p> <p>IMPORTANT: This is a software function only. It can be extended by a "hard wired" emergency stop function, which means disconnecting power supply from the controller outputs.</p>			

🔍 back to List of LBI

EmergencyStop2

Related FW	3.4.1	Related applications	All
Comm object	928		
Description			
<p>If the input is activated, engine shutdown is immediately performed. However, the controller behavior is slightly different compared to other shutdown alarms:</p> <ul style="list-style-type: none"> ▶ COOLING PUMP (PAGE 198) and PRELUBRICATION (PAGE 196) are deactivated as well. ▶ This input cannot be overridden with the input Sd override. <p><i>Note: Because of safety reasons it is recommended to configure this input as Normally closed and use a NC switch.</i></p> <p>IMPORTANT: This is a software function only. It can be extended by a "hard wired" emergency stop function, which means disconnecting power supply from the controller outputs.</p>			

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Remote Start

Related FW	3.4.1	Related applications	All
Comm object	156		
Description			
<p>External "edge sensitive" request for engine start. Binary input is active in all AUX, EME, HRB and PRP modes and inactive in LOC (Local) mode. There is only one start attempt, use REMRESTART (PRP ONLY) (PAGE 173) or Blackout Start (AUX, EME and HRB) binary input for repetitive starting procedure using Crank Attempts (page 116) and CrankFailPause (page 115) until the engine does not start. Unsuccessful start is recorded to Alarm list and History. The second edge on Binary input Remote Start skips the Idle time when engine is running in Idle state.</p> <p>Binary input Remote Start signal is equivalent to ID-DCU Industrial front panel Start button.</p>			

🔍 back to List of LBI

Remote Stop

Related FW	3.4.1	Related applications	All
Comm object	157		
Description			
<p>Engine “edge sensitive” stop request. The first edge changes engine state from running to cooling, the second edge stops engine (skip the rest of cooling). Binary input is inactive in LOC (Local) mode.</p> <p>Remote Stop signal is equivalent to ID-DCU Industrial front panel Stop button.</p> <p><i>Note: Binary inputs Remote Start and Remote Stop are edge (not level) sensitive. Minimal pulse duration to safely detect the edge is at least the 120 ms (binary input sampling rate is 100 ms).</i></p>			

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RemRepStart (PRP only)

Related FW	3.4.1	Related applications	PRP
Comm object	158		
Description			
Remote engine start with cranking attempts according to Crank Attempts (page 116).			

⬅ back to List of LBI

Reg Inhib

Related FW	3.4.1	Related applications	All
Comm object	837		
Description			
Active signal inhibits automatic DPF filter regeneration.			

⬅ back to List of LBI

RegenForce

Related FW	3.4.1	Related applications	All
Comm object	836		
Description			
Active signal inhibits automatic DPF filter regeneration.			

⬅ back to List of LBI

Blackout Start / RemRepStart

Related FW	3.4.1	Related applications	SS / AS	
Comm object	158			
Description				
External “edge sensitive” request for engine start. Input is inactive in LOC (Local) mode. Adjustable number of attempts (see setpoints Crank Attempts (page 116) , MaxCrank Time (page 115) and CrankFailPause (page 115)).				
Engine starting signals				
	Remote Start	Blackout Start	RemRepStart	Panel START button
Input sensitive	Edge sensitive; 2nd edge skips Idle	Edge sensitive;	Edge sensitive;	Edge sensitive; 2nd edge skips Idle
Active in MODE	SS; AS	SS	AS	SS; AS LOC
Inactive in MODE	LOC	LOC	LOC	all time active
Number of starting attempts	1 x	Engine params: Crank Attempts	Engine params: Crank Attempts	1 x
Engine stopping signals				
	Remote Stop	Panel STOP button (1 sec holding time for Stop button activation!)		
Input sensitive	Edge sensitive; 2nd edge skips Cooling	Edge sensitive; 2nd edge skips Cooling		
Active in MODE	SS; AS	SS; AS		
Inactive in MODE	LOC	-		
Note: <i>Crank Attempts (page 116) is not followed if Sd Override is active, crank attempts number is then unlimited in case of Blackout/RemRep Start.</i>				

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Back Up Speed1

Related FW	3.4.1	Related applications	All
Comm object	159		
Description			
If input is active and Logical Analog input Requested RPM is not valid (out of range, sensor fail), ThrottlePos (page 264) is set to Back Up Speed1 (page 143) value. ThrottlePos (page 264) = 0.0 % when analog request is out of range and Binary input Back Up Speed is not active.			

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Back Up Speed2

Related FW	3.4.1	Related applications	All
Comm object	170		
Description			
If input is active and Logical Analog input Requested RPM is not valid (out of range, sensor fail), ThrottlePos (page 264) is set to Back Up Speed1 (page 143) value. ThrottlePos (page 264) = 0.0 % when analog request is out of range and Binary input Back Up Speed is not active.			

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Back Up Speed3

Related FW	3.4.1	Related applications	All
Comm object	171		
Description			
If input is active and Logical Analog input Requested RPM is not valid (out of range, sensor fail), ThrottlePos (page 264) is set to Back Up Speed1 (page 143) value. ThrottlePos (page 264) = 0.0 % when analog request is out of range and Binary input Back Up Speed is not active.			

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Fire Speed

Related FW	3.4.1	Related applications	All
Comm object	160		
Description			
If active, clutch is disconnected and ThrottlePos (page 264) is set to FireAlarmSpeed (page 122) , the ThrottlePos value change is influenced by ramp specified by RQSP Ramp (page 147) .			

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Rem Clutch

Related FW	3.4.1	Related applications	PRP
Comm object	183		
Description			
If active closes binary output Clutch Connect – see CLUTCH CONNECT (PRP ONLY) (PAGE 194) .			

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StartBlocking1

Related FW	3.4.1	Related applications	All
Comm object	68		
Description			
OR logical function of all StartBlocking Logical Binary inputs forces controller NotReady state (i.e. disables engine start). It is active in LOC (Local) mode as well.			

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StartBlocking2

Related FW	3.4.1	Related applications	All
Comm object	580		
Description			
OR logical function of all StartBlocking Logical Binary inputs forces controller NotReady state (i.e. disables engine start). It is active in LOC (Local) mode as well.			

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StartBlocking3

Related FW	3.4.1	Related applications	All
Comm object	581		
Description			
OR logical function of all StartBlocking Logical Binary inputs forces controller NotReady state (i.e. disables engine start). It is active in LOC (Local) mode as well.			

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StartBlocking4

Related FW	3.4.1	Related applications	All
Comm object	582		
Description			
OR logical function of all StartBlocking Logical Binary inputs forces controller NotReady state (i.e. disables engine start). It is active in LOC (Local) mode as well.			

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StartBlocking5

Related FW	3.4.1	Related applications	All
Comm object	583		
Description			
OR logical function of all StartBlocking Logical Binary inputs forces controller NotReady state (i.e. disables engine start). It is active in LOC (Local) mode as well.			

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Load Blocking

Related FW	3.4.1	Related applications	All
Comm object	182		
Description			
Active input disables the Close load function. No influence when Binary output Close load is closed.			

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RunIndication1

Related FW	3.4.1	Related applications	All
Comm object	46		
Description			
<p>Binary input can be used for engine running indication e.g. via Oil pressure contact. Active Running indication blocks engine start (to avoid starter damage).</p> <p>Engine running state = RPM > Starting RPM (page 113) or</p> <p>Analog input Oil pressure > Starting POil (page 114) or</p> <p>Active Binary input RunIndication1 or</p> <p>Active Binary input RunIndication2 or</p> <p>Active Binary input RunIndication3.</p>			

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RunIndication2

Related FW	3.4.1	Related applications	All
Comm object	47		
Description			
<p>Binary input can be used for engine running indication e.g. via Oil pressure contact. Active Running indication blocks engine start (to avoid starter damage).</p> <p>Engine running state = RPM > Starting RPM (page 113) or</p> <p>Analog input Oil pressure > Starting POil (page 114) or</p> <p>Active Binary input RunIndication1 or</p> <p>Active Binary input RunIndication2 or</p> <p>Active Binary input RunIndication3.</p>			

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RunIndication3

Related FW	3.4.1	Related applications	All
Comm object	48		
Description			
<p>Binary input can be used for engine running indication e.g. via Oil pressure contact. Active Running indication blocks engine start (to avoid starter damage).</p> <p>Engine running state = RPM > Starting RPM (page 113) or</p> <p>Analog input Oil pressure > Starting POil (page 114) or</p> <p>Active Binary input RunIndication1 or</p> <p>Active Binary input RunIndication2 or</p> <p>Active Binary input RunIndication3.</p>			

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Nominal Speed

Related FW	3.4.1	Related applications	All
Comm object	41		
Description			
Skips Idle Time and switch controller from Idle to Running state when closed before Idle Time is over.			

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Loaded

Related FW	3.4.1	Related applications	All
Comm object	162		
Description			
Binary input function for loaded engine indication.			

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Emerg. Manual

Related FW	3.4.1	Related applications	All
Comm object	45		
Description			
<p>This input is designed to allow the engine to be controlled externally, not by the controller. This feature is especially designed for marine gen-sets, which are supposed to be started manually as the controller has no power supply before the gen-set is started. It may be also useful in case of testing the gen-set or in case of a failure, which does not allow the gen-set to be controlled by the controller, but the gen-set itself is stays operational.</p> <p>The controller behaves following way:</p> <ul style="list-style-type: none"> ▶ Shows the text EmergMan in the engine status on the main screen. ▶ Stops all functions regarding the engine control, deactivates all outputs related to it except Fuel Solenoid. ▶ Stop Fail alarm is not being evaluated and Stop Solenoid is not activated if nonzero speed is detected. ▶ When the input is deactivated, the controller takes control over the engine according to the situation in which the gen-set was in the moment of deactivation. I.e. the engine remains running if it was running in the moment the input was deactivated. 			

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EnClutchStart

Related FW	3.4.1	Related applications	PRP
Comm object	163		
Description			
Binary input activates Engine start via clutch. Engine is started by the other running engine via closed clutch - binary output Clutch Connect . See MaxCIStrtPer (page 145) protection setpoint.			

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Sd Override

Related FW	3.4.1	Related applications	All
Comm object	44		
Description			
<p>Blocks all protections except Overspeed (page 130), Emergency Stop and protections configured as “Sd override” (=Sprinkler).</p> <ul style="list-style-type: none"> ▶ All alarms are detected ▶ Alarms are recorded on the controller Alarm list screen ▶ Alarm are recorded into History ▶ Enabled Active calls remains active ▶ Controller front panel engine RED LED blinks or lights <p>Note: The setpoint Crank Attempts is not followed if Sd Override is active, crank attempts number is then unlimited in case of Blackout Start.</p>			

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Speed Down

Related FW	3.4.1	Related applications	All
Comm object	164		
Description			
<p>Speed Request (page 258) is decreased / increased when the binary input is closed. Speed Down has higher priority when both Up and Down inputs are active. RPM inc/dec rate is defined by BI Speed Ramp (page 122).</p> <p>Engine speed can be set by REQUESTED RPM (PAGE 238) or by SPEED UP (PAGE 180) and SPEED DOWN (PAGE 179).</p> <p>Following Speed Request initialization is valid when REQUESTED RPM (PAGE 238) is not configured.</p> <p>Speed Request (Idle) = 0.0 %. Inputs are active in LOC (Local) mode.</p> <p>Speed Request (Running) = 50.0 % for AUX (ECU 50 % = Nominal RPM).</p> <p>Speed Request (Running) = 0.0 % for PRP.</p> <p>See Engine Values: (page 259) and (page 259) modes.</p>			
Dual rate ramp			
<p>The Binary inputs SpeedUp and SpeedDown ramp function is for the 0.6 sec constant 0.4 %/s and does not depend on BI Speed Ramp (page 122) setting. This function enables fine setting of Engine speed to specific like 1500 RPM value.</p>		<p>The graph plots RequestedSpeed on the y-axis against Time on the x-axis. It shows a piecewise linear function: a first segment with a slope of 5RPM/s, a second segment with a constant slope of 0.6s, and a third segment with a steeper slope labeled 'Engine params: Speed ramp'.</p>	
<p>Note: Minimal Speed Up and Speed Down pulse duration is 110 ms to be accepted by controller.</p>			

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Speed Up

Related FW	3.4.1	Related applications	All
Comm object	165		

Description

Speed Request (page 258) is decreased / increased when the binary input is closed. Speed Down has higher priority when both Up and Down inputs are active. RPM inc/dec rate is defined by **BI Speed Ramp (page 122)**.

Engine speed can be set by Logical Analog Input Requested RPM or by **SPEED UP (PAGE 180)** and **SPEED DOWN (PAGE 179)**.

Following Speed Request initialization is valid when **REQUESTED RPM (PAGE 238)** is not configured.

Speed Request (Idle) = 0.0 %. Inputs are active in LOC (Local) mode.

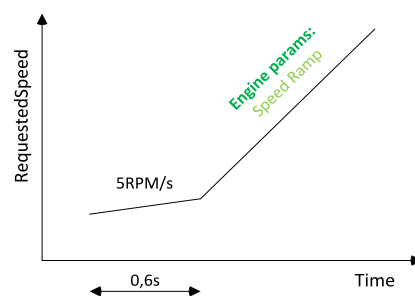
Speed Request (Running) = 50.0 % for AUX (ECU 50 % = Nominal RPM).

Speed Request (Running) = 0.0 % for PRP.

See Engine Values: **(page 259)** and **(page 259)** modes.

Dual rate ramp

The Binary inputs SpeedUp and SpeedDown ramp function is for the 0.6 sec constant 0.4 %/s and does not depend on **BI Speed Ramp (page 122)** setting. This function enables fine setting of Engine speed to specific like 1500 RPM value.



Note: Minimal Speed Up and Speed Down pulse duration is 110 ms to be accepted by controller.

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ECU FltReset

Related FW	3.4.1	Related applications	All
Comm object	166		

Description

Binary input for ECU Alarm acknowledge (level sensitive) has the same function as controller front panel **Fault reset** button (screen sensitive - active only in ECU Alarm list screen).

Note: Activation of ECU Fault reset will affect IntelliDrive DCU Industrial controller only, no reset request is sent to ECU. There is separated acknowledge input for Alarms – see Binary input **FAULT RESET (PAGE 170)**.

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BI Droop

Related FW	3.4.1	Related applications	All
Comm object	167		
Description			
This input changes state of logical binary output Droop Sw that can be configured as J1939 output to change ECU mode. Input is active only when Basic setting : Governor Mode = BIN.INPUT (DROOP when closed).			

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BI Second RPM

Related FW	3.4.1	Related applications	All
Comm object	168		
Description			
This input changes state of SECOND RPM SW (AUX, EME, CMB ONLY) (PAGE 200) that can be configured as J1939 output to change ECU mode. Input is active only when Speed Select (page 104) = BIN.INPUT.			

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BI Idle

Related FW	3.4.1	Related applications	All
Comm object	169		
Description			
This input changes state of IDLE/NOMINAL (PAGE 195) that can be configured as J1939 output to change ECU mode. Input is active only when Idle/Nominal (page 103) = BIN.INPUT.			

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Rem Start/Stop

Related FW	3.4.1	Related applications	All
Comm object	172		
Description			
Rem Start/Stop is level signal that activates engine start when closed and stop after is opened. It is inactive in LOC (Local) mode.			
It is not possible to stop engine by panel Stop button and by Remote Stop (page 173) when Rem Start/Stop is active. Rem Start/Stop input can be configured to Binary output Timer active to enable engine automatic start/stop function – see Timer Repeat (page 106) .			
<p>Note: Engine “Start fail” is Warning (level 1) protection and does not block another start when Rem Start/Stop is still closed. To prevent unlimited number of starts – configure on START FAIL (PAGE 226) Sd protection.</p>			
<p>Note: Engine stays running when Rem Start/Stop is opened in controller LOC (Local) mode.</p>			

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PrestartOvr

Related FW	3.4.1	Related applications	All
Comm object	173		
Description			
<p>PrestartOvr skips the Prestart procedure timing and continues to Cranking. The same effect has repeated press of Start button.</p> <p>Example: Finish engine preheating (prelubrication) based on temperature (pressure) limit.</p>			

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ClutchBlocking

Related FW	3.4.1	Related applications	PRP
Comm object	182		
Description			
<p>ClutchBlocking can block CLUTCH CONNECT (PRP ONLY) (PAGE 194). Active input is indicated in Alarm list as “Clutch Blocking” message.</p>			

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ModeL Button

Related FW	3.4.1	Related applications	All
Comm object	200		
Description			
Input simulates the panel ← Mode button			

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ModeR Button

Related FW	3.4.1	Related applications	All
Comm object	201		
Description			
Input simulates the panel Mode → button.			

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Page Button

Related FW	3.4.1	Related applications	All
Comm object	202		
Description			
Input simulates the panel Page button.			

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Enter Button

Related FW	3.4.1	Related applications	All
Comm object	203		
Description			
Input simulates the panel Enter button.			

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Up Button

Related FW	3.4.1	Related applications	All
Comm object	204		
Description			
Input simulates the panel ↑-button.			

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Down Button

Related FW	3.4.1	Related applications	All
Comm object	205		
Description			
Input simulates the panel ↓ button.			

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ECU DiagBlick

Related FW	3.4.1	Related applications	All
Comm object	269		
Description			
Input controls ECU Diagnostic functionality in case of setting ECU Diag = EXTERNAL.			

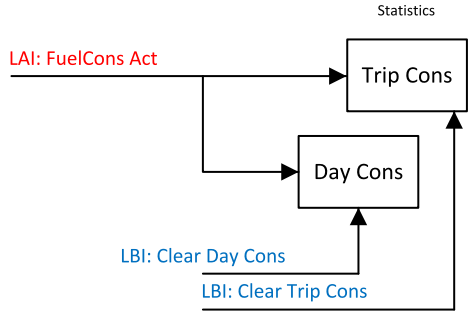
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Clear DayCons

Related FW	3.4.1	Related applications	All
Comm object	220		
Description			
Rising edge clears Day consumption counter.			

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Clear TripCons

Related FW	3.4.1	Related applications	All
Comm object	221		
Description			
Rising edge clears Trip consumption counter.			
			

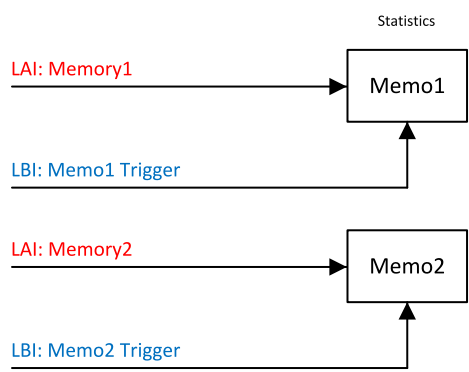
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Memo1 Trigger

Related FW	3.4.1	Related applications	All
Comm object	584		
Description			
Rising edge forces to fill register Statistics: Memo1 by MEMORY1 (PAGE 242) actual value. Memo1 Statistics value can be set or resetted by IntelliMonitor command.			

⬅ back to List of LBI

Memo2 Trigger

Related FW	3.4.1	Related applications	All
Comm object	585		
Description			
Rising edge forces to fill register Statistics: Memo2 by MEMORY2 (PAGE 243) actual value. Memo2 Statistics value can be set or resetted by IntelliMonitor command.			
			

[back to List of LBI](#)

User Mask 1

Related FW	3.4.1	Related applications	All						
Comm object	567								
Description									
<p>This input allows user to activate chosen function in ScreenEditor (tool inside DriveConfig) for particular screen instrument. User may choose from the following functions:</p> <table border="1"> <thead> <tr> <th>None</th> <th>Show</th> <th>Hide</th> </tr> </thead> <tbody> <tr> <td>No action regarding this screen instrument is taken.</td> <td>By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.</td> <td>By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.</td> </tr> </tbody> </table> <p><i>Note: This function can be used to "swap" between two different screen instruments when certain conditions are fulfilled. Logical binary inputs Mask 1..4 can be used to define any custom condition for this "swapping" function.</i></p>				None	Show	Hide	No action regarding this screen instrument is taken.	By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.	By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.
None	Show	Hide							
No action regarding this screen instrument is taken.	By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.	By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.							

[back to List of LBI](#)

User Mask 2

Related FW	3.4.1	Related applications	All						
Comm object	568								
Description									
<p>This input allows user to activate chosen function in ScreenEditor (tool inside DriveConfig) for particular screen instrument. User may choose from the following functions:</p> <table border="1"> <thead> <tr> <th>None</th> <th>Show</th> <th>Hide</th> </tr> </thead> <tbody> <tr> <td>No action regarding this screen instrument is taken.</td> <td>By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.</td> <td>By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.</td> </tr> </tbody> </table> <p><i>Note: This function can be used to "swap" between two different screen instruments when certain conditions are fulfilled. Logical binary inputs Mask 1..4 can be used to define any custom condition for this "swapping" function.</i></p>				None	Show	Hide	No action regarding this screen instrument is taken.	By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.	By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.
None	Show	Hide							
No action regarding this screen instrument is taken.	By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.	By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.							

[back to List of LBI](#)

User Mask 3

Related FW	3.4.1	Related applications	All						
Comm object	569								
Description									
<p>This input allows user to activate chosen function in ScreenEditor (tool inside DriveConfig) for particular screen instrument. User may choose from the following functions:</p> <table border="1"> <thead> <tr> <th>None</th> <th>Show</th> <th>Hide</th> </tr> </thead> <tbody> <tr> <td>No action regarding this screen instrument is taken.</td> <td>By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.</td> <td>By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.</td> </tr> </tbody> </table> <p><i>Note: This function can be used to "swap" between two different screen instruments when certain conditions are fulfilled. Logical binary inputs Mask 1..4 can be used to define any custom condition for this "swapping" function.</i></p>				None	Show	Hide	No action regarding this screen instrument is taken.	By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.	By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.
None	Show	Hide							
No action regarding this screen instrument is taken.	By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.	By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.							

[◀ back to List of LBI](#)

User Mask 4

Related FW	3.4.1	Related applications	All						
Comm object	570								
Description									
<p>This input allows user to activate chosen function in ScreenEditor (tool inside DriveConfig) for particular screen instrument. User may choose from the following functions:</p> <table border="1"> <thead> <tr> <th>None</th> <th>Show</th> <th>Hide</th> </tr> </thead> <tbody> <tr> <td>No action regarding this screen instrument is taken.</td> <td>By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.</td> <td>By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.</td> </tr> </tbody> </table> <p><i>Note: This function can be used to "swap" between two different screen instruments when certain conditions are fulfilled. Logical binary inputs Mask 1..4 can be used to define any custom condition for this "swapping" function.</i></p>				None	Show	Hide	No action regarding this screen instrument is taken.	By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.	By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.
None	Show	Hide							
No action regarding this screen instrument is taken.	By default the screen instrument is hidden. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is shown.	By default the screen instrument is shown. If any of mask inputs (User Mask 1, User Mask 2, User Mask 3, User Mask 4) connected to this particular screen instrument is activated, this screen instrument is hidden.							

[◀ back to List of LBI](#)

Current Gear

Related FW	3.4.1	Related applications	All
Comm object	950		
Description			
Output is designed for applications with transmission, where it is necessary to indicate the engine running and the possibility of gear shifting.			
Usually used as a source for the ECU output value.			

⬅ back to List of LBI

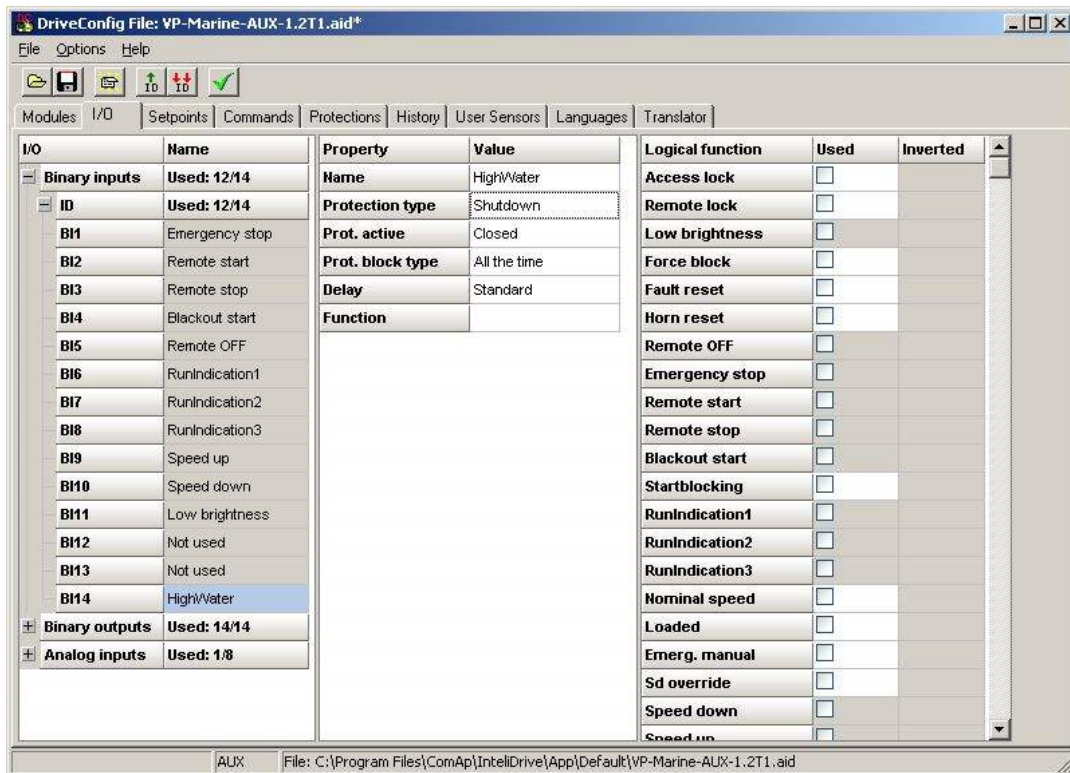
Binary inputs from J1939 configuration

I/O	Name	Property	Value	J1939 value	Used
Binary inputs Used: 23/38					
ID	Used: 13/14	Name	RedStopLamp	Protect Lamp	<input type="checkbox"/>
BIN-1	Used: 1/8	Protection type	Warning	Amber Warning Lamp	<input type="checkbox"/>
J1939-1	Used: 9/16	Prot. active	Closed	Red Stop Lamp	<input checked="" type="checkbox"/>
	Preheat	Prot. block type	All the time	Malfunction Lamp	<input type="checkbox"/>
2	RedStopLamp	Delay	Standard	Water in Fuel	<input type="checkbox"/>
3	Overspeed	Function		Preheat Indication	<input type="checkbox"/>
		J1939 value	Red Stop Lamp	Running Indication	<input type="checkbox"/>

Binary inputs protection

I/O	Name	Property	Value	Logical function	Used	Inverted
Binary inputs Used: 11/14						
ID	Used: 11/14	Name	Not used	Access lock	<input type="checkbox"/>	
BI1	Emergency stop	Protection type	No protection	Remote lock	<input type="checkbox"/>	
BI2	Remote start	Prot. active	No protection	Low brightness	<input type="checkbox"/>	
BI3	Remote stop	Prot. block type	Warning	Force block	<input type="checkbox"/>	
BI4	Blackout start	Delay	Shutdown	Fault reset	<input type="checkbox"/>	
BI5	Remote OFF	Function	Cooldown	Horn reset	<input type="checkbox"/>	
BI6	RunIndication1		Sensor fail	Remote OFF	<input type="checkbox"/>	
BI7	RunIndication2		Warning + BW	Emergency stop	<input type="checkbox"/>	
BI8	RunIndication3		Shutdown + BW	Remote start	<input type="checkbox"/>	
BI9	Speed up		Warning + Fls	Remote stop	<input type="checkbox"/>	
BI10	Speed down			Blackout start	<input type="checkbox"/>	
BI11	Low brightness			Startblocking	<input type="checkbox"/>	
BI12	Not used			RunIndication1	<input type="checkbox"/>	
BI13	Not used			RunIndication2	<input type="checkbox"/>	
BI14	Not used			RunIndication3	<input type="checkbox"/>	
Binary outputs Used: 14/14						
Analog inputs Used: 1/8						

Property: Function line is free, no logical function is (usually) selected.



Watchdog test

Related FW	3.4.1	Related applications	All
Comm object	722		
Description			
Rising edge of this input will provide reset of controller processor.			

back to List of LBI

8.1.4 Binary outputs

Depending on Modules configuration there are exist more groups of binary items that can be configured to any physical binary output.

Source	Used	Level
+ Log Bout		
+ Info		
+ RPU unit		
+ Prg. states		
+ Bin protections		
+ Binary CU		
+ RPU unit		

List of LBO

AmberLamp	191	CMB, only)		User Button 9	208
Aftertreatment	191	Droop Sw	200	User Button 10	209
DPF Lamp	191	Second RPM Sw (AUX, EME, CMB only)	200	User Button 11	209
HEST Lamp	191	Stop Pulse	201	User Button 12	209
Horn	191	Comm AIN Fail	201	User Button 13	209
Alarm	192	Comm BIN Fail	201	User Button 14	209
Common Alarm	192	Comm AOUT Fail	201	User Button 15	210
Common Wrm	192	Comm BOUT Fail	201	User Button 16	210
Common Sd	192	DEF LowLvlamp	201	RegenInhibit	210
Common Cd	192	Nominal/Idle	202	RegenInhibLamp	210
Common Fls	193	Alarm Blink	202	RegenForce	210
CMD RegInhOn	193	Idle Sw	202	WaitToStartLmp	211
OFF Mode	193	Logical 0	202	RemoteControl1	211
Controller mode	193	Logical 1	202	RemoteControl2	211
Not In LOC	193	Operational	203	RemoteControl3	211
In LOC	194	Timer Active	203	RemoteControl4	211
CPU Ready	194	Alarm BlinkAct	203	RemoteControl5	212
Clutch Connect (PRP only)	194	Common SdO	203	RemoteControl6	212
ClutchBtToggle	194	Derating Alarm	203	RemoteControl7	212
Idle/Nominal	195	RdyForRemStart	204	RemoteControl8	212
HEST Lamp	195	ECU PowerRelay	204	FS-Status	213
Starter	195	StartButtEcho	204	FS-Load	213
Stop Solenoid	196	StopButtEcho	205	SS-Status	213
Prelubrication	196	FltResButtEcho	205	SS-Load	214
Prestart	197	HrnResButtEcho	205	BinOut Power	214
Ready To Start	197	ClutchButtEcho	205	Battery Fail	214
Ready To Load	197	HrnResBtToggle	206	RPU control	214
RedStopLamp	197	MalfunctLamp	206	RPU Watchdog	215
Engine Running	197	ActLoadShar	206	ECU Comm Error	216
Ignition	198	AirFlaps	206	ECU1 Comm Fail	216
Unload	198	MCU AckButton	207	ECU2 Comm Fail	216
Cooling	198	User Button 1	207	ECU3 Comm Fail	216
Fuel Solenoid	198	User Button 2	207	ECU4 Comm Fail	216
Cooling Pump	198	User Button 3	207	ECU5 Comm Fail	217
Watchdog	199	User Button 4	207	ECU6 Comm Fail	217
Close Load	199	User Button 5	208	ECU7 Comm Fail	217
Close Load (AUX, EME, CMB, only)	199	User Button 6	208	ECU8 Comm Fail	217
		User Button 7	208	ECU10 Comm Fail	217
		User Button 8	208	CommError 10	217
				ECU11 Comm Fail	218

ECU12 Comm Fail	218	Pickup Fail	225
ECU13 Comm Fail	218	Battery Flat	225
ECU14 Comm Fail	218	Battery Volt	225
ECU15 Comm Fail	218	WrmService Time	225
ECU16 Comm Fail	218	Not Lubricated	225
Bw RPU FuelSol	219	Start Fail	226
Bw RPU StopSol	219	OP RPMdep	226
ECU AlarmList	219	CP RPMdep	226
UnivState 1	219	Battery A volt	226
UnivState 2	219	Battery B volt	226
UnivState 3	219	SwitchToBatt B	227
UnivState 4	220	Start Blocking	227
UnivState 5	220	ClutchBlocking	227
UnivState 6	220	Running	233
UnivState 7	220	Overspeed	233
EcuDiagBlocked	220	OilPress	233
PLC Message 1	220	OilTemp	234
PLC Message 2	221	CoolantLevel	234
PLC Message 3	221		
PLC Message 4	221		
PLC Message 5	221		
PLC Message 6	221		
PLC Message 7	221		
PLC Message 8	222		
PLC Message 9	222		
PLC Message 10	222		
PLC Message 11	222		
PLC Message 12	222		
PLC Message 13	222		
PLC Message 14	223		
PLC Message 15	223		
PLC Message 16	223		
Emergency Stop	223		
Engine RPM	223		
Overload	223		
OthrCommEr	224		
ChrgAlternFail	224		
Stop Fail	224		
Overspeed	224		
Underspeed	224		

▲ back to Controller objects

Source: Log Bout

AmberLamp

Related FW	3.4.1	Related applications	All
Comm object	1828		
Description			
Indicates that engine issued a warning.			

[back to List of LBO](#)

Aftertreatment

Related FW	3.4.1	Related applications	All
Comm object	1842		
Description			
Indicates that Aftertreatment control is available with configured engine support.			

[back to List of LBO](#)

DPF Lamp

Related FW	3.4.1	Related applications	All
Comm object	1831		
Description			
Active signal indicates that DPF (Diesel Particulate Filter) is starting to overfill with soot because the system is unable to undertake an automatic active regeneration. It starts flashing when the DPF is nearly full, engine power may be reduced.			

[back to List of LBO](#)

HEST Lamp

Related FW	3.4.1	Related applications	All
Comm object	1373		
Description			
Indicates High Exhaust System Temperature (HEST). It may be active during DPF regeneration to indicate higher than normal exhaust temperatures.			

[back to List of LBO](#)

Horn

Related FW	3.4.1	Related applications	All
Comm object	1		
Description			
Binary output for Horn, Buzzer alarm acoustic indication. Output is automatically switched off after Horn Timeout (page 124) . Horn is active unlimited time (until Fault reset) when Horn timeout = 0.			

[back to List of LBO](#)

Alarm

Related FW	3.4.1	Related applications	All
Comm object	2		
Description			
The output closes if any alarm is activated and opens after Fault reset even if the Alarm is still active.			

[back to List of LBO](#)

Common Alarm

Related FW	3.4.1	Related applications	All
Comm object	256		
Description			
The output closes if any Wrn, Sd, Cd, Fls, alarm is active and stays closed until all alarms disappear and Fault reset is pressed = output is opened when Alarm list is empty.			

[back to List of LBO](#)

Common Wrn

Related FW	3.4.1	Related applications	All
Comm object	3		
Description			
The output closes when any Warning alarm is active. Output opens when all Wrn alarms disappear and Fault reset is pressed (no Wrn alarm in Alarm list).			

[back to List of LBO](#)

Common Sd

Related FW	3.4.1	Related applications	All
Comm object	4		
Description			
The output closes when any Shut-down alarm is active. Output opens when all Sd alarms disappear and Fault reset is pressed (no Sd alarm in Alarm list).			

[back to List of LBO](#)

Common Cd

Related FW	3.4.1	Related applications	All
Comm object	257		
Description			
The output closes when any Cool-down alarm is active. Output opens when all Cd alarms disappear and Fault reset is pressed (no Cd alarm in Alarm list).			

[back to List of LBO](#)

Common FIs

Related FW	3.4.1	Related applications	All
Comm object	6		
Description			
The output closes when any Sensor fail alarm is active. Output opens when all FIs alarms disappear and Fault reset is pressed (no FIs alarm in Alarm list).			

[back to List of LBO](#)

CMD RegInhOn

Related FW	3.4.1	Related applications	All
Comm object	1942		
Description			
Provides feedback information that command (LBI function) REGENINHIBIT (PAGE 210) is active			

[back to List of LBO](#)

OFF Mode

Related FW	3.4.1	Related applications	All
Comm object	17		
Description			
The output is closed in controller OFF mode.			

[back to List of LBO](#)

Controller mode

Related FW	3.4.1	Related applications	PRP, AUX, HRB
Comm object	9887		
Description			
PRP Mode (PRP only) The output is closed in controller PRP mode.			
AUX Mode (AUX only) The output is closed in controller AUX mode.			
HRB Mode (CMB only) The output is closed in controller HRB mode.			

[back to List of LBO](#)

Not In LOC

Related FW	3.4.1	Related applications	All
Comm object	258		
Description			
The output is closed, if LOC (Local) mode is not selected.			

[back to List of LBO](#)

In LOC

Related FW	3.4.1	Related applications	All
Comm object	259		
Description			
The output is closed, if LOC (Local) mode is selected.			

⬅ back to List of LBO

CPU Ready

Related FW	3.4.1	Related applications	All
Comm object	260		
Description			
CPU indication – output is closed when CPU is ready.			

⬅ back to List of LBO

Clutch Connect (PRP only)

Related FW	3.4.1	Related applications	PRP
Comm object	261		
Description			
Output is closed if REM CLUTCH (PAGE 175) is active or controller front panel I/O button is pressed and actual engine RPM is between: ClutchMinSpeed and ClutchMaxSpeed.			
Output stays closed even if the RPM goes out of limits above. Can't be opened by button when REM CLUTCH (PAGE 175) is closed. BI Rem clutch is not active in LOC (Local) mode.			

⬅ back to List of LBO

ClutchBtToggle

Related FW	3.4.1	Related applications	All
Comm object	1461		
Description			
The first press of 0/1 - panel Close Load button activates the new LBO ClutchBtToggle , the second press deactivates it, The function operates in all engine modes and states and can be used for some independent PLC function when standard Clutch function is not used.			
Existing function of panel Close load button 0/1 (LBO Close Load) is without change.			
Close Load function works for remote access from DriveMonitor, Modbus, Modem, ... as well.			

⬅ back to List of LBO

Idle/Nominal

Related FW	3.4.1	Related applications	All
Comm object	39		
Description			
The output closes during engine start, after Idle time setpoint elapses. The output opens again after Cooling time is finished. The opposite NOMINAL/IDLE (PAGE 202) is available as well.			
<i>Note: Connect NOMINAL/IDLE (PAGE 202) to electronic speed governor to switch the speed: opened = IDLE, closed=RATED.</i>			

[▲ back to List of LBO](#)

HEST Lamp

Related FW	3.4.1	Related applications	All
Comm object	1373		
Description			
Indicates High Exhaust System Temperature (HEST). It may be active during DPF regeneration to indicate higher than normal exhaust temperatures.			

[▲ back to List of LBO](#)

Starter

Related FW	3.4.1	Related applications	All
Comm object	24		
Description			
Closed output energizes the engine starter.			

[▲ back to List of LBO](#)

Stop Solenoid

Related FW	3.4.1	Related applications	All
Comm object	23		

Description

Stop Solenoid is active for Stop Time and further fixed 12 s after stopping Stop Time. Abort the process (and thus deactivate the active Stop Solenoid) by reactivating the Start (local or remote) command.

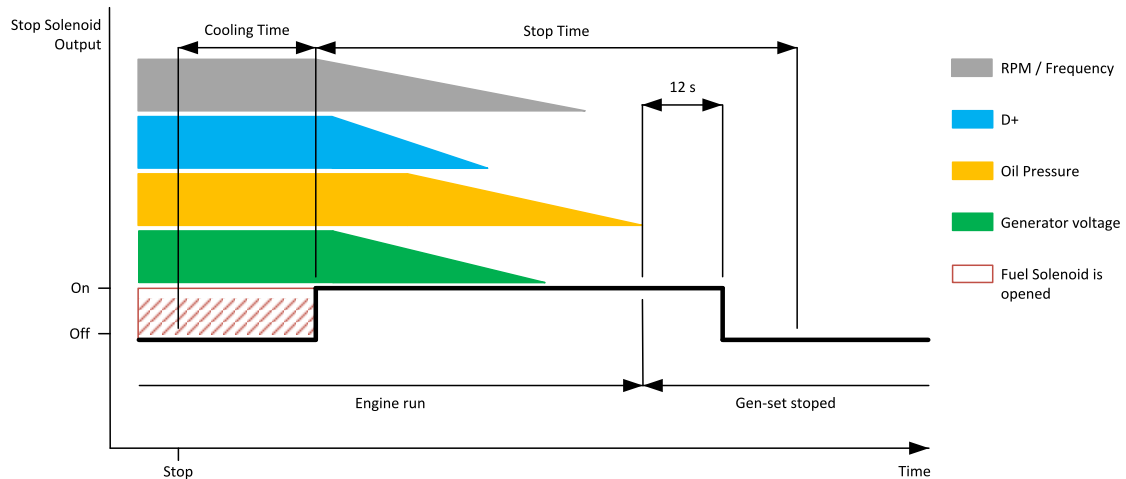


Image 8.2 Stop Solenoid diagram 1

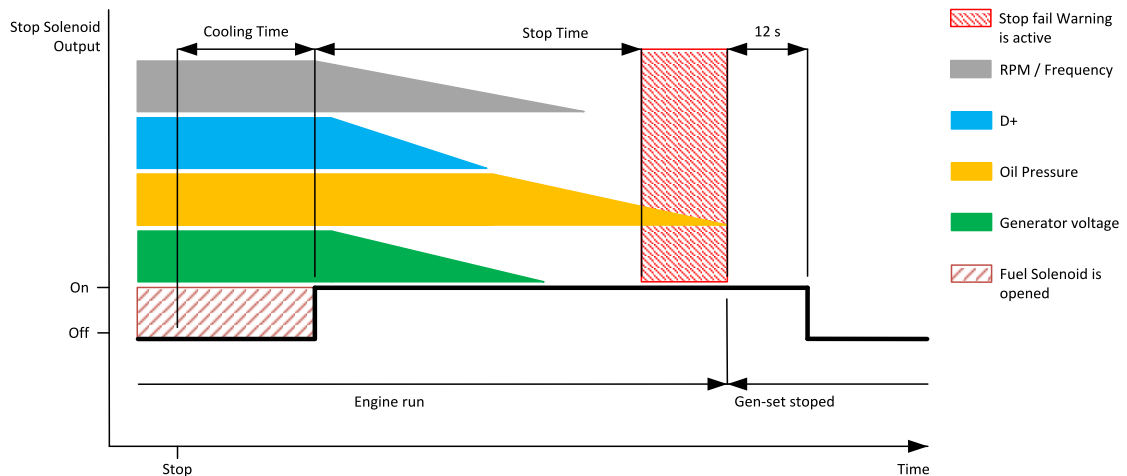


Image 8.3 Stop Solenoid diagram 2

[back to List of LBO](#)

Prelubrication

Related FW	3.4.1	Related applications	All
Comm object	49		

Description

Periodic prelubrication function – see **PrelubrTime** (page 118) and **PrelubrPause** (page 118).

[back to List of LBO](#)

Prestart

Related FW	3.4.1	Related applications	All
Comm object	36		
Description			
Periodic prelubrication function – see PrelubrTime (page 118) and PrelubrPause (page 118) .			

[▲ back to List of LBO](#)

Ready To Start

Related FW	3.4.1	Related applications	All
Comm object	262		
Description			
Engine ready for start indication: no start blocking alarm is active. Output is active in LOC (Local) mode as well (even if can't be started by binary inputs).			

[▲ back to List of LBO](#)

Ready To Load

Related FW	3.4.1	Related applications	All
Comm object	67		
Description			
Output closes if the engine is in Running state and can be loaded. Opens in Cooling state. Active only if RPM > MinLoadSpeed (page 131).			

[▲ back to List of LBO](#)

RedStopLamp

Related FW	3.4.1	Related applications	All
Comm object	1829		
Description			
Active when continued operation could result in damage to exhaust system, but actual reason of the alarm may not be exhaust system related.			

[▲ back to List of LBO](#)

Engine Running

Related FW	3.4.1	Related applications	All
Comm object	263		
Description			
It activates when RPM rises above Starting RPM (page 113) and opens when RPM=0.			

[▲ back to List of LBO](#)

Ignition

Related FW	3.4.1	Related applications	All
Comm object	37		
Description			
Ignition system activation / deactivation during start - stop procedure. The output becomes active during cranking if RPM > 30, becomes inactive during cranking pause and after stop of the engine (RPM = 0).			

⬅ back to List of LBO

Unload

Related FW	3.4.1	Related applications	All
Comm object	264		
Description			
1 sec (fix) pulse prior to transfer from RUNNING (PAGE 233) to COOLING (PAGE 198) state.			

⬅ back to List of LBO

Cooling

Related FW	3.4.1	Related applications	All
Comm object	74		
Description			
Closes in cooling state, opens after engine stop.			

⬅ back to List of LBO

Fuel Solenoid

Related FW	3.4.1	Related applications	All
Comm object	22		
Description			
Closed output opens the fuel solenoid. Adjustable to DIESEL or GAS. See also the Fuel Solenoid (page 121) setpoint description.			

⬅ back to List of LBO

Cooling Pump

Related FW	3.4.1	Related applications	All
Comm object	40		
Description			
The output closes when engine starts and opens AfterCoolTime (page 119) delayed after stop the engine.			

⬅ back to List of LBO

Watchdog

Related FW	3.4.1	Related applications	All
Comm object	81		
Description			
Indicates correctly running firmware when cycling on/off with 0.5 s period.			

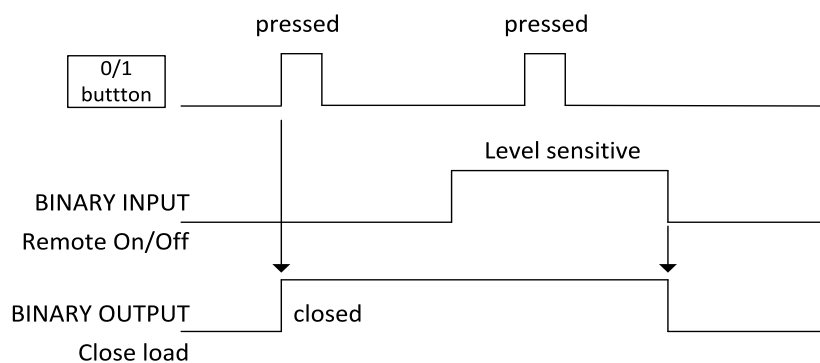
⬅ back to List of LBO

Close Load

Related FW	3.4.1	Related applications	All
Comm object	755		
Description			

Output is closed when panel 0/1 (On/Off) button is pressed or **REM START/STOP (PAGE 181)** is closed and engine RPM is over **MinLoadSpeed (page 131)**.

Output opens when RPM is below **MinLoadSpeed (page 131)**. Close load can't be opened by button when **REM START/STOP (PAGE 181)** (level sensitive) is closed.



Function can be blocked by binary input Load blocking.

⬅ back to List of LBO

Close Load (AUX, EME, CMB, only)

Related FW	3.4.1	Related applications	AUX, EME, CMB
Comm object	265		

Description

The output is closed/opened with rising edge of **REM START/STOP (PAGE 181)** (or I/O front panel button) when engine is in Running state and engine RPM is over **MinLoadSpeed**. Output opens when RPM is below **MinLoadSpeed (page 131)**. Close load can be opened remotely (e.g. from IntelliMonitor) when **REMOTE ON/OFF (PAGE 170)** is closed.

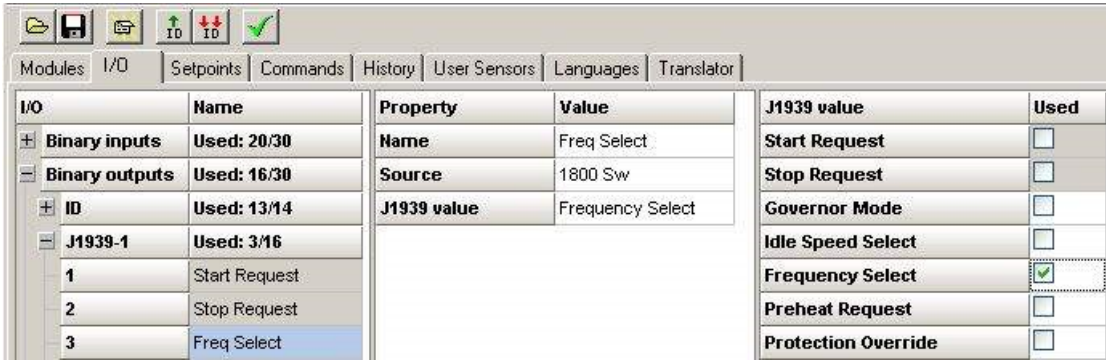
⬅ back to List of LBO

Droop Sw

Related FW	3.4.1	Related applications	All
Comm object	266		
Description			
The output is closed when Governor Mode (page 102) = DROOP or Governor Mode = BIN.INPUT and corresponding BI DROOP (PAGE 181) is closed. This logical output (Source) can be configured to corresponding J1939 output (e.g. Governor Mode in Volvo-IndustrialD12 Aux).			

⬆️ back to List of LBO

Second RPM Sw (AUX, EME, CMB only)

Related FW	3.4.1	Related applications	AUX, EME, CMB
Comm object	267		
Description			
The output is closed when Speed Select (page 104) = Secondary or Speed Select = BIN.INPUT and corresponding BI SECOND RPM (PAGE 181) RPM is closed. This logical output (Source) can be configured to corresponding J1939 output (e.g. Frequency Select in Volvo-IndustrialD12 Aux) see an example below.			
Function of Speed select implemented in IntelliDrive DCU has no influence on Speed Request by default setting. Logical binary output Second RPM Sw is normally used to select the rated speed, where the exact settings depend on the connected ECU. There is still combination of rated speed + additional speed request.			
<p>Example: As a study case, we use controller with ECU protocol Scania S6 where command is through Nominal Speed Offset (proprietary DLN1 message) and for selection of rated speed can be used signal Nominal speed switch 1 and 2.</p> <p>Example: Nominal speed at full load: 1500 rpm Min offset: -50 rpm Max offset: +50 rpm "Nominal speed offset" = $0 \times 3A = 58\%$ => speed offset = +8 rpm Referens speed to governor at full load = $1500 + 8 = 1508$ rpm</p>			
			

⬆️ back to List of LBO

Stop Pulse

Related FW	3.4.1	Related applications	All
Comm object	25		
Description			
1 sec pulse is generated in the beginning of Stop procedure.			

[▲ back to List of LBO](#)

Comm AIN Fail

Related FW	3.4.1	Related applications	All
Comm object	269		
Description			
Communication warning fail when any Analog input module address does not communicate (2 s timeout).			

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Comm BIN Fail

Related FW	3.4.1	Related applications	All
Comm object	270		
Description			
Communication warning fail when any Binary input module address does not communicate (2 s timeout).			

[▲ back to List of LBO](#)

Comm AOUT Fail

Related FW	3.4.1	Related applications	All
Comm object	271		
Description			
Communication warning fail when any Analog output module address does not communicate (2 s timeout).			

[▲ back to List of LBO](#)

Comm BOUT Fail

Related FW	3.4.1	Related applications	All
Comm object	272		
Description			
Communication warning fail when any Binary output module address does not communicate (2 s timeout).			

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DEF LowLvlamp

Related FW	3.4.1	Related applications	All
Comm object	1833		
Description			
Active signal indicates low level of Diesel Exhaust Fluid (DEF). It starts flashing when the DEF tank is nearly empty (e.g. when the level is 10 %), engine power may be reduced.			

[▲ back to List of LBO](#)

Nominal/Idle

Related FW	3.4.1	Related applications	All
Comm object	274		
Description			
Inverted function to IDLE/NOMINAL (PAGE 195) . The output closes during engine start, after Idle Time setpoint elapses. The output closes again after Cooling Time is finished.			

[◀ back to List of LBO](#)

Alarm Blink

Related FW	3.4.1	Related applications	All
Comm object	275		
Description			
Function is based on COMMON ALARM (PAGE 192) - stays closed when any alarm is active (at least one item in Alarm list) and opens for 2 sec when any new Alarm is activated. The first activation is delayed 2 sec. No Fault reset influence when at least one alarm is active. Output opens when Alarm list is empty.			

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Idle Sw

Related FW	3.4.1	Related applications	All
Comm object	276		
Description			
The output is closed when Idle/Nominal (page 103) = NOMINAL or Idle/Nominal = BIN.INPUT and corresponding BI IDLE (PAGE 181) is closed. This logical output (Source) can be configured to corresponding J1939 output (e.g. Idle Speed Select in Volvo-IndustrialD12 Aux).			

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Logical 0

Related FW	3.4.1	Related applications	All
Comm object	26		
Description			
Constant value that can be configured to any output (e.g. CurrentGear in Volvo-PRP).			

[◀ back to List of LBO](#)

Logical 1

Related FW	3.4.1	Related applications	All
Comm object	27		
Description			
Constant value that can be configured to any output (e.g. CurrentGear in Volvo-PRP).			

[◀ back to List of LBO](#)

Operational

Related FW	3.4.1	Related applications	All
Comm object	61		
Description			
Output closes with binary output Prestart and opens with binary output Cooling pump (see AfterCoolTime (page 119))			

[▲ back to List of LBO](#)

Timer Active

Related FW	3.4.1	Related applications	All
Comm object	277		
Description			
Binary output Timer Active is closed and opened according to Timer setpoints setting. Engine starts and stops when this output is connected (configured) to REM START/STOP (PAGE 181) . Timer is active in all controller modes include OFF mode.			

[▲ back to List of LBO](#)

Alarm BlinkAct

Related FW	3.4.1	Related applications	All
Comm object	278		
Description			
It follows the panel Red LED. Starts blink after any (Wrn, Sd) Alarm is activated, light after Fault reset, disappear after Fault reset when no alarm is active.			

[▲ back to List of LBO](#)

Common SdO

Related FW	3.4.1	Related applications	All
Comm object	251		
Description			
Indicates any active protection configured as Shut down Override.			

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Derating Alarm

Related FW	3.4.1	Related applications	All
Comm object	279		
Description			
Power derating indication, information received from communication bus.			

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RdyForRemStart

Related FW	3.4.1	Related applications	All
Comm object	280		
Description			
Indicates Ready state for Remote engine start.			

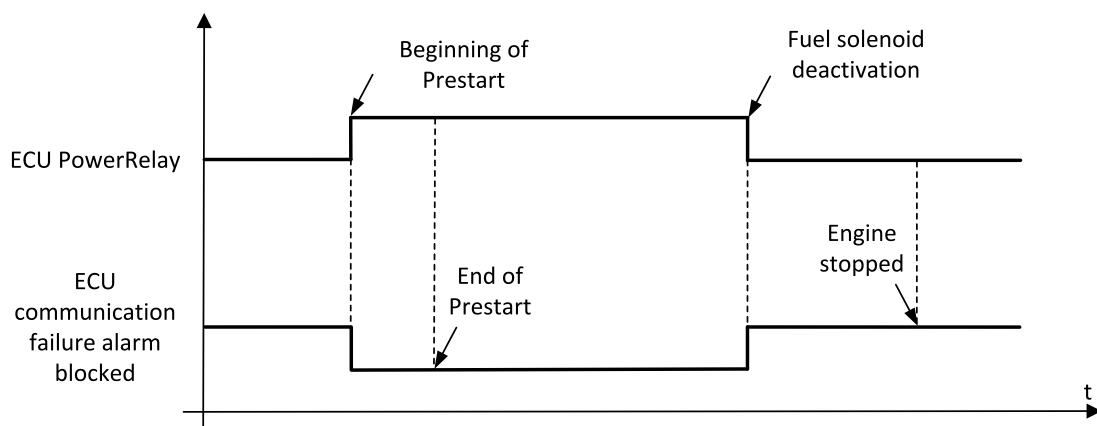
◀ back to List of LBO

ECU PowerRelay

Related FW	3.4.1	Related applications	All
Comm object	116		
Description			

The output closes at the beginning of prestart and opens if the engine shall be stopped. This output can be used to indicate when the ECU should be powered up i.e. only while the engine is running.

This output also influences evaluation of communication failure with ECU and related FLS alarms from analog inputs read from the ECU. If the output is configured (which means configured on physical binary output or VBOU output), announcement of the communication error is blocked if the engine is switched off including the stopping procedure as shown in the figure.



Note: The LBO must be configured on physical binary output or VBOU output. It is not enough to configure it as a PLC input for example.

Note: If the LBO: ECUPowerRelay is used to energize ECU unit during the start procedure, the initialization of the ECU unit might take slightly longer time and Wm CommError(x)/Sd CommError(x) might appear. In this case is recommended to use ECUCOMFAILBLCK (PAGE 171), please see this LBI.

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StartButtEcho

Related FW	3.4.1	Related applications	All
Comm object	281		
Description			
1 sec pulse is generated after panel Start button is pressed.			

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StopButtEcho

Related FW	3.4.1	Related applications	AMF, MRS
Comm object	282		
Description			
1 sec pulse is generated after panel Stop button is pressed.			

[back to List of LBO](#)

FitResButtEcho

Related FW	3.4.1	Related applications	All
Comm object	283		
Description			
1 sec pulse is generated after panel Fault reset button is pressed. The pulse is generated only in case that Alarm List screen is displayed on the controller, i.e. in the time of possibility to acknowledge alarms.			

[back to List of LBO](#)

HrnResButtEcho

Related FW	3.4.1	Related applications	All
Comm object	284		
Description			
1 sec pulse is generated after panel Horn reset button is pressed.			

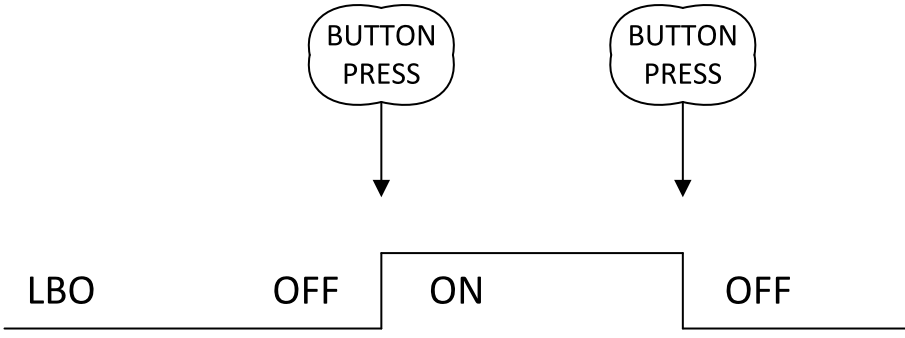
[back to List of LBO](#)

ClutchButtEcho

Related FW	3.4.1	Related applications	All
Comm object	285		
Description			
1 sec pulse is generated after panel I/O button is pressed.			

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HrnResBtToggle

Related FW	3.4.1	Related applications	All
Comm object	1462		
Description			
<p>The first press of Horn Reset panel button activates the new HRNRESBTTOGGLE (PAGE 206), the second deactivates it. The function operates in all engine modes and states. Current Horn reset function of panel button HornReset is still active.</p>			
			
<p><i>Note: Horn reset function works for remote access from DriveMonitor, Modbus, Modem, ... as well</i></p>			

⬅ back to List of LBO

MalfunctLamp

Related FW	3.4.1	Related applications	All
Comm object	1832		
Description			
Indicates that emissions related engine fault code is active.			

⬅ back to List of LBO

ActLoadShar

Related FW	3.4.1	Related applications	All
Comm object	449		
Description			
Indication of active Load sharing.			

⬅ back to List of LBO

AirFlaps

Related FW	3.4.1	Related applications	All
Comm object	620		
Description			
AirFlaps output is activated with engine starting (when controller enters state Cranking) and it is deactivated 5 s after engine stopping.			

⬅ back to List of LBO

MCU AckButton

Related FW	3.4.1	Related applications	All
Comm object	736		
Description			
MCU AckButton provides 1 s pulse, which is generated when controller front panel Fault reset button is pressed. It is not activated in case that fault reset is done in a different way, e.g. using remote display or remote communication.			

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User Button 1

Related FW	3.4.1	Related applications	All
Comm object	726		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

[back to List of LBO](#)

User Button 2

Related FW	3.4.1	Related applications	All
Comm object	727		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

[back to List of LBO](#)

User Button 3

Related FW	3.4.1	Related applications	All
Comm object	728		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

[back to List of LBO](#)

User Button 4

Related FW	3.4.1	Related applications	All
Comm object	729		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

[back to List of LBO](#)

User Button 5

Related FW	3.4.1	Related applications	All
Comm object	730		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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User Button 6

Related FW	3.4.1	Related applications	All
Comm object	751		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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User Button 7

Related FW	3.4.1	Related applications	All
Comm object	752		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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User Button 8

Related FW	3.4.1	Related applications	All
Comm object	1087		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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User Button 9

Related FW	3.4.1	Related applications	All
Comm object	1088		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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User Button 10

Related FW	3.4.1	Related applications	All
Comm object	1089		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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User Button 11

Related FW	3.4.1	Related applications	All
Comm object	1090		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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User Button 12

Related FW	3.4.1	Related applications	All
Comm object	1091		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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User Button 13

Related FW	3.4.1	Related applications	All
Comm object	1092		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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User Button 14

Related FW	3.4.1	Related applications	All
Comm object	1093		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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User Button 15

Related FW	3.4.1	Related applications	All
Comm object	1094		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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User Button 16

Related FW	3.4.1	Related applications	All
Comm object	1095		
Description			
InteliVision function buttons can be assigned to these LBOs User Button 1 .. 16. The configuration of button's functionality is done via ScreenEditor feature in DriveConfig PC application.			

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RegenInhibit

Related FW	3.4.1	Related applications	All
Comm object	960		
Description			
Indicates that automatic DPF filter regeneration is inhibited using REG INHIB (PAGE 173) .			

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RegenInhibLamp

Related FW	3.4.1	Related applications	All
Comm object	1834		
Description			
Indicates that diesel particulate filter regeneration is inhibited.			

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RegenForce

Related FW	3.4.1	Related applications	All
Comm object	961		
Description			
Indicates that automatic DPF filter regeneration is forced using REGENFORCE (PAGE 173) .			

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WaitToStartLmp

Related FW	3.4.1	Related applications	All
Comm object	1830		
Description			
Indicates that engine is too cold to start and operator should wait until the signal becomes inactive.			

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RemoteControl1

Related FW	3.4.1	Related applications	All
Comm object	141		
Description			
Those eight LBOs can be handled from IntelliMonitor Remote switch window. This way can operator directly handle controller binary outputs or other e.g. PLC functions.			

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RemoteControl2

Related FW	3.4.1	Related applications	All
Comm object	142		
Description			
Those eight LBOs can be handled from IntelliMonitor Remote switch window. This way can operator directly handle controller binary outputs or other e.g. PLC functions.			

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RemoteControl3

Related FW	3.4.1	Related applications	All
Comm object	143		
Description			
Those eight LBOs can be handled from IntelliMonitor Remote switch window. This way can operator directly handle controller binary outputs or other e.g. PLC functions.			

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RemoteControl4

Related FW	3.4.1	Related applications	All
Comm object	144		
Description			
Those eight LBOs can be handled from IntelliMonitor Remote switch window. This way can operator directly handle controller binary outputs or other e.g. PLC functions.			

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RemoteControl5

Related FW	3.4.1	Related applications	All
Comm object	145		
Description			
Those eight LBOs can be handled from IntelliMonitor Remote switch window. This way can operator directly handle controller binary outputs or other e.g. PLC functions.			

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RemoteControl6

Related FW	3.4.1	Related applications	All
Comm object	146		
Description			
Those eight LBOs can be handled from IntelliMonitor Remote switch window. This way can operator directly handle controller binary outputs or other e.g. PLC functions.			

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RemoteControl7

Related FW	3.4.1	Related applications	All
Comm object	147		
Description			
Those eight LBOs can be handled from IntelliMonitor Remote switch window. This way can operator directly handle controller binary outputs or other e.g. PLC functions.			

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RemoteControl8

Related FW	3.4.1	Related applications	All
Comm object	148		
Description			
Those eight LBOs can be handled from IntelliMonitor Remote switch window. This way can operator directly handle controller binary outputs or other e.g. PLC functions.			

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Source: RPU unit

Values of ID-RPU unit are available (visible) only when ID-RPU module is selected. States does not activate Alarms.

Following list contains ID-RPU Shut down inputs state that can be configured to Binary outputs.

RPU-SD 1	Indication of ID-RPU Shut down 1 input state.
RPU-SD 2	Indication of ID-RPU Shut down 2 input state.
RPU-SD 3	Indication of ID-RPU Shut down 3 input state.
RPU-SD 4	Indication of ID-RPU Shut down 4 input state.
RPU-SD 5	Indication of ID-RPU Shut down 5 input state.
EmStop RPU	Indication of ID-RPU Emergency stop input state.

FS-Status

Related FW	3.4.1	Related applications	RPU				
Comm object	10213						
Description							
FUEL SOLENOID (PAGE 198) (FS) status when output is opened :							
<table border="1"> <tr> <td>0</td> <td>OK</td> </tr> <tr> <td>1</td> <td>Fail: Broken wire (BW)</td> </tr> </table>				0	OK	1	Fail: Broken wire (BW)
0	OK						
1	Fail: Broken wire (BW)						
Table 8.1 FS-Status							
<i>Note: The High Current is indicated if output current is over 1 A approx.</i>							

⬅ back to List of LBO

FS-Load

Related FW	3.4.1	Related applications	RPU				
Comm object	10213						
Description							
FUEL SOLENOID (PAGE 198) (FS) status when output is opened :							
<table border="1"> <tr> <td>0</td> <td>OK</td> </tr> <tr> <td>1</td> <td>Fail: Broken wire (BW)</td> </tr> </table>				0	OK	1	Fail: Broken wire (BW)
0	OK						
1	Fail: Broken wire (BW)						
Table 8.2 FS-Load							

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SS-Status

Related FW	3.4.1	Related applications	RPU
Comm object	10213		
Description			
STOP SOLENOID (PAGE 196) (SS) status when output is closed – see FS-Status (page 213)			

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SS-Load

Related FW	3.4.1	Related applications	RPU
Comm object	10213		
Description			
STOP SOLENOID (PAGE 196) (SS) status when output is opened – see FS-Load (page 213)			
		FS / SS -Status	FS / SS -Load
	FS / SS is closed , normal operation	1	No meaning
	FS / SS is closed, HC or OT	0	No meaning
	FS / SS is opened , normal operation	No meaning	0
	FS / SS is opened, BW	No meaning	1

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BinOut Power

Related FW	3.4.1	Related applications	RPU
Comm object	10213		
Description			
Status of ID-RPU Fuel solenoid and Stop solenoid power supply terminal. Active when Power supply is NOT connected.			

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Battery Fail

Related FW	3.4.1	Related applications	RPU
Comm object	10213		
Description			
Indicates that system is switched to Battery B.			

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RPU control

Related FW	3.4.1	Related applications	RPU
Comm object	10213		
Description			
When closed ID-RPU module is active (after ID-DCU Industrial fail) for engine Sd and Overspeed protection.			

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RPU Watchdog

Related FW	3.4.1	Related applications	RPU
Comm object	10213		
Description			
ID-RPU watchdog timer is over = ID-DCU Industrial fail when closed.			
<i>Note: Fuel and Stop solenoid Broken wire indications are available in the list of Prg.states</i>			

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Source: Prg.states

Programmable states (protections) list. Any item from the following list activates Alarm list indication.

ECU Comm Error

Related FW	3.4.1	Related applications	All
Comm object	114		
Description			
The output is closed while there is an error in the communication with ECU, i.e. while there is the alarm ECU comm error present in the alarm list.			

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ECU1 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	1998		
Description			
J1939 communication fail indication.			

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ECU2 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	1999		
Description			
J1939 communication fail indication.			

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ECU3 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2000		
Description			
J1939 communication fail indication.			

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ECU4 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2001		
Description			
J1939 communication fail indication.			

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ECU5 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2002		
Description			
J1939 communication fail indication.			

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ECU6 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2003		
Description			
J1939 communication fail indication.			

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ECU7 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2004		
Description			
J1939 communication fail indication.			

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ECU8 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2005		
Description			
J1939 communication fail indication.			

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ECU10 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2006		
Description			
J1939 communication fail indication.			

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CommError 10

Related FW	3.4.1	Related applications	All
Comm object	2007		
Description			
J1939 communication fail indication.			

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ECU11 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2008		
Description			
J1939 communication fail indication.			

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ECU12 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2009		
Description			
J1939 communication fail indication.			

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ECU13 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2010		
Description			
J1939 communication fail indication.			

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ECU14 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2011		
Description			
J1939 communication fail indication.			

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ECU15 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2012		
Description			
J1939 communication fail indication.			

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ECU16 Comm Fail

Related FW	3.4.1	Related applications	All
Comm object	2013		
Description			
J1939 communication fail indication.			

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Bw RPU FuelSol

Related FW	3.4.1	Related applications	All
Comm object	323		
Description			
ID-RPU FUEL SOLENOID (PAGE 198) - Broken wire indication.			

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Bw RPU StopSol

Related FW	3.4.1	Related applications	All
Comm object	324		
Description			
ID-RPU STOP SOLENOID (PAGE 196) - Broken wire indication.			
<i>Note: Binary output Stop solenoid and Fuel solenoid broken wire is indicated in open state.</i>			

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ECU AlarmList

Related FW	3.4.1	Related applications	All
Comm object	303		
Description			
Output is closed when at least one item is in ECU Alarm list.			

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UnivState 1

Related FW	3.4.1	Related applications	All
Comm object	185		
Description			
Universal states 1 to Universal states 7 indication. See Universal states (page 27) description.			

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UnivState 2

Related FW	3.4.1	Related applications	All
Comm object	186		
Description			
Universal states 1 to Universal states 7 indication. See Universal states (page 27) description.			

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UnivState 3

Related FW	3.4.1	Related applications	All
Comm object	187		
Description			
Universal states 1 to Universal states 7 indication. See Universal states (page 27) description.			

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UnivState 4

Related FW	3.4.1	Related applications	All
Comm object	188		
Description			
Universal states 1 to Universal states 7 indication. See Universal states (page 27) description.			

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UnivState 5

Related FW	3.4.1	Related applications	All
Comm object	189		
Description			
Universal states 1 to Universal states 7 indication. See Universal states (page 27) description.			

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UnivState 6

Related FW	3.4.1	Related applications	All
Comm object	190		
Description			
Universal states 1 to Universal states 7 indication. See Universal states (page 27) description.			

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UnivState 7

Related FW	3.4.1	Related applications	All
Comm object	191		
Description			
Universal states 1 to Universal states 7 indication. See Universal states (page 27) description.			

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EcuDiagBlocked

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Output is closed when ECU Diag (page 102) = DISABLED.			

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PLC Message 1

Related FW	3.4.1	Related applications	All
Comm object	181		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

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PLC Message 2

Related FW	3.4.1	Related applications	All
Comm object	182		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

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PLC Message 3

Related FW	3.4.1	Related applications	All
Comm object	183		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

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PLC Message 4

Related FW	3.4.1	Related applications	All
Comm object	184		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

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PLC Message 5

Related FW	3.4.1	Related applications	All
Comm object	372		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

[back to List of LBO](#)

PLC Message 6

Related FW	3.4.1	Related applications	All
Comm object	373		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

[back to List of LBO](#)

PLC Message 7

Related FW	3.4.1	Related applications	All
Comm object	374		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

[back to List of LBO](#)

PLC Message 8

Related FW	3.4.1	Related applications	All
Comm object	375		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

[▲ back to List of LBO](#)

PLC Message 9

Related FW	3.4.1	Related applications	All
Comm object	530		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

[▲ back to List of LBO](#)

PLC Message 10

Related FW	3.4.1	Related applications	All
Comm object	531		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

[▲ back to List of LBO](#)

PLC Message 11

Related FW	3.4.1	Related applications	All
Comm object	532		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

[▲ back to List of LBO](#)

PLC Message 12

Related FW	3.4.1	Related applications	All
Comm object	533		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

[▲ back to List of LBO](#)

PLC Message 13

Related FW	3.4.1	Related applications	All
Comm object	534		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

[▲ back to List of LBO](#)

PLC Message 14

Related FW	3.4.1	Related applications	All
Comm object	535		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

[▲ back to List of LBO](#)

PLC Message 15

Related FW	3.4.1	Related applications	All
Comm object	792		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

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PLC Message 16

Related FW	3.4.1	Related applications	All
Comm object	793		
Description			
The output is closed while the alarm generated by the PLC block Force Prot is present in the alarm list.			

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Emergency Stop

Related FW	3.4.1	Related applications	All
Comm object	260		
Description			
Indication of EMERGENCYSTOP1 / EMERGENCYSTOP2 (PAGE 171) .			

[▲ back to List of LBO](#)

Engine RPM

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Engine speed state indication. Output is closed when no RPM is received from J1939 (sensor fail) or Overspeed or Under speed is detected.			

[▲ back to List of LBO](#)

Overload

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Active overload protection activation.			

[▲ back to List of LBO](#)

OthrCommEr

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Intercontroller communication error.			

[back to List of LBO](#)

ChrgAlternFail

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Charger fail detection. D+ output current is limited to cca 300 mA.			
Guaranteed level for signal Charging OK = 90 % of supply voltage.			
There are three possible conditions for stop engine cranking: Starting RPM , StartingPOil and D+ function (when ENABLED). Starter goes off when any of these conditions becomes valid.			

[back to List of LBO](#)

Stop Fail

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Engine stop fail indication. Stop fail: engine does not reach 0 RPM after stop command within Stop Time (page 119).			

[back to List of LBO](#)

Overspeed

Related FW	3.4.1	Related applications	All
Comm object	779		
Description			
Engine overspeed indication.			

[back to List of LBO](#)

Underspeed

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Under speed indication.			

[back to List of LBO](#)

Pickup Fail

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Pickup fail indication. Pickup fail: lost of RPM signal in running state (other running indication is active).			

[▲ back to List of LBO](#)

Battery Flat

Related FW	3.4.1	Related applications	All
Comm object			
Description			
ID-DCU Industrial controller reset during Cranking state (see Crank Attempts (page 116)).			

[▲ back to List of LBO](#)

Battery Volt

Related FW	3.4.1	Related applications	All
Comm object	1293		
Description			
Indication when battery voltage (ID-DCU Industrial power supply) is out of Batt > V (page 131) and Batt < V (page 132) limits.			

[▲ back to List of LBO](#)

WrnService Time

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Output is closed when Service time (count down) = 0.			
<i>Note: History record and Alarm list indication is activated as well.</i>			

[▲ back to List of LBO](#)

Not Lubricated

Related FW	3.4.1	Related applications	All
Comm object			
Description			
The lubrication cycle (PrelubrTime) is not finished after controller Switch on or return from OFF mode.			

[▲ back to List of LBO](#)

Start Fail

Related FW	3.4.1	Related applications	All
Comm object			
Description			
The last start attempt was unsuccessful.			

[back to List of LBO](#)

OP RPMdep

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Out of Oil pressure RPM dependent limit indication.			

[back to List of LBO](#)

CP RPMdep

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Out of Cooling pressure RPM dependent limit indication.			

[back to List of LBO](#)

Battery A volt

Related FW	3.4.1	Related applications	All
Comm object			
Description			
It is closed when the battery A voltage of RPU is out of limits: Engine protection: Batt >V, Batt <V, Batt V del.			

[back to List of LBO](#)

Battery B volt

Related FW	3.4.1	Related applications	All
Comm object			
Description			
It is closed when the battery B voltage of RPU is out of limits: Engine protection: Batt >V, Batt <V, Batt V del.			

[back to List of LBO](#)

SwitchToBatt B

Related FW	3.4.1	Related applications	All
Comm object			
Description			
It is closed when ID-RPU was switched power supply to the battery B.			

[▲ back to List of LBO](#)

Start Blocking

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Start blocking indication.			

[▲ back to List of LBO](#)

ClutchBlocking

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Clutch blocking indication.			

[▲ back to List of LBO](#)

Source: Ana protections

List of Analog inputs protection indication is dynamic. Any protection configured e.g. on Analog input appears in Source: Ana protection Binary output list.

I/O		Name	Property	Value
+ Binary inputs		Available: 14	Name	Ain CU 2
+ Binary outputs		Available: 14	Dim	-
- Analog inputs		Available: 16	Sensor	4-20mA active
- ID		Available: 8	Resolution	0,01
AIN1		Oil press	Range	10,00
AIN2		Ain CU 2	Protection type	Wtrn+Shutdown
AIN3		Ain CU 3	Bargraph 100%	10,00
AIN4		Ain CU 4	Function	

I/O		Name	Property	Value	Source	Used	Level
+ Binary inputs		Available: 14	Name	Ain CU 2			
- Binary outputs		Available: 14	Source	Ain CU 2			
- ID		Available: 14					
B01		Ain CU 2					
B02		Fuel solenoid					
					+	Log Bout	
					+	Prg. states	
					-	Ana protections	
						Ain CU 2	<input checked="" type="checkbox"/>
							Wtrn+Sd/Cd
					+	Binary Cu	

Source: Bin protections

List of Binary inputs protection - indication is dynamic. Any protection configured on Binary input appears in Source: Bin protection.

Source: Binary Inputs CU

Binary CU list contains all ID-DCU Industrial binary inputs that can be configured to Binary outputs. This source contains binary inputs physical states (no protection activity).

Source: RPU unit

Values of ID-RPU unit are available (visible) only when ID-RPU module is selected. States does not activate Alarms.

Following list contains ID-RPU Shut down inputs state that can be configured to Binary outputs.

RPU-SD 1	Indication of ID-RPU Shut down 1 input state.
RPU-SD 2	Indication of ID-RPU Shut down 2 input state.
RPU-SD 3	Indication of ID-RPU Shut down 3 input state.
RPU-SD 4	Indication of ID-RPU Shut down 4 input state.
RPU-SD 5	Indication of ID-RPU Shut down 5 input state.
EmStop RPU	Indication of ID-RPU Emergency stop input state.

Source: Binary Inputs

List (depend on modules configuration) contains all Extension modules binary inputs that can be configured to any Binary outputs. This source contains binary inputs physical states (no protection activity).

Source: J1939

Following list contains all binary values received from J1939 that can be configured to Binary outputs. This list depends on selected ESF file. For more detail see corresponding engine specification.

Running

Engine running state indication.

Overspeed

Engine overspeed indication.

OilPress

Oil pressure out of limit indication.

OilTemp

Oil temperature out of limit indication.

CoolantTemp

Coolant temperature out of limit indication.

Coolant Level

Coolant level out of limit indication.

Running

Related FW	3.4.1	Related applications	All
Comm object	67		
Description			
Engine running state indication.			

[↶ back to List of LBO](#)

Overspeed

Related FW	3.4.1	Related applications	All
Comm object	779		
Description			
Engine overspeed indication.			

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OilPress

Related FW	3.4.1	Related applications	All
Comm object	521		
Description			
Oil pressure out of limit indication.			

[↶ back to List of LBO](#)

OilTemp

Related FW	3.4.1	Related applications	All
Comm object	435		
Description			
Oil temperature out of limit indication.			

[◀ back to List of LBO](#)

CoolantLevel

Related FW	3.4.1	Related applications	All
Comm object			
Description			
Coolant level out of limit indication.			

[◀ back to List of LBO](#)

Binary output to J1939 configuration: Source-Value

I/O		Name	Property	Value	J1939 value	Used
Binary inputs		Used: 23/38		Name	Droop Sw	
Binary outputs		Used: 17/30		Source		
ID		Used: 14/14		J1939 value	Governor Mode	
J1939-1		Used: 3/16				
1		Start Request				<input type="checkbox"/>
2		Stop Request				<input type="checkbox"/>
3		Droop Sw				<input checked="" type="checkbox"/>
					Idle Speed Select	<input type="checkbox"/>
					Frequency Select	<input type="checkbox"/>
					Preheat Request	<input type="checkbox"/>
					Protection Override	<input type="checkbox"/>

I/O		Name	Property	Value	Source	Used
Binary inputs		Used: 23/38		Name	Droop Sw	
Binary outputs		Used: 17/30		Source	Droop Sw	
ID		Used: 14/14		J1939 value	Governor Mode	
J1939-1		Used: 3/16				
1		Start Request				<input type="checkbox"/>
2		Stop Request				<input type="checkbox"/>
3		Droop Sw				<input checked="" type="checkbox"/>
					Not used	<input type="checkbox"/>
					Droop Sw	<input checked="" type="checkbox"/>
					Not used	<input type="checkbox"/>
					Stop pulse	<input type="checkbox"/>
					FaultResetPuls	<input type="checkbox"/>
					Comm AIN fail	<input type="checkbox"/>
					Comm BIN fail	<input type="checkbox"/>

8.1.5 Analog Inputs

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LCD Brightness

Related FW	3.4.1	Related applications	All
Comm object	7		
Description			
Analog input for external LCD brightness setting (e.g. via potentiometer). Keyboard LCD brightness setting does not work when input is configured. Expected value is in the range 0 to 100 %.			

[back to List of LAI](#)

Engine Speed

Related FW	3.4.1	Related applications	All
Comm object	8		
Description			
RPM value from ECU - J1939.			

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Oil Press

Related FW	3.4.1	Related applications	All
Comm object	9		
Description			
Engine oil pressure, which is displayed at the first controller screen.			
<p><i>Note: Configure OIL PRESS (PAGE 237) (LAI card in DriveConfig) to display the value at the first controller screen.</i></p>			

[back to List of LAI](#)

Oil Temp

Related FW	3.4.1	Related applications	All
Comm object	77		
Description			
Universal input for engine oil temperature.			

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Coolant Press (PRP only)

Related FW	3.4.1	Related applications	PRP
Comm object	66		
Description			
Running indication and speed dependable protection in PRP .			

[back to List of LAI](#)

Coolant Temp

Related FW	3.4.1	Related applications	All
Comm object	67		
Description			
Engine coolant temperature, which is displayed at the first controller screen.			
<i>Note: Configure COOLANT TEMP (PAGE 238) (LAI card in DriveConfig) to display the value at the first controller screen.</i>			

⬅ back to List of LAI

Fuel Level

Related FW	3.4.1	Related applications	All
Comm object	78		
Description			
Analog input for fuel level in percentage.			

⬅ back to List of LAI

Requested RPM

Related FW	3.4.1	Related applications	All
Comm object	68		
Description			
AI influences directly Speed Request (page 258) register when configured without ramp. In the case of sensor fail (out of range) is Speed request = 0.0 % for PRP and 50.0 % (=Nominal RPM) for AUX. There is expected range of values 0.0 ... 100.0 % for this Logical Analog input.			
See Speed Request (page 258) charts for (page 259) and (page 259) modes.			

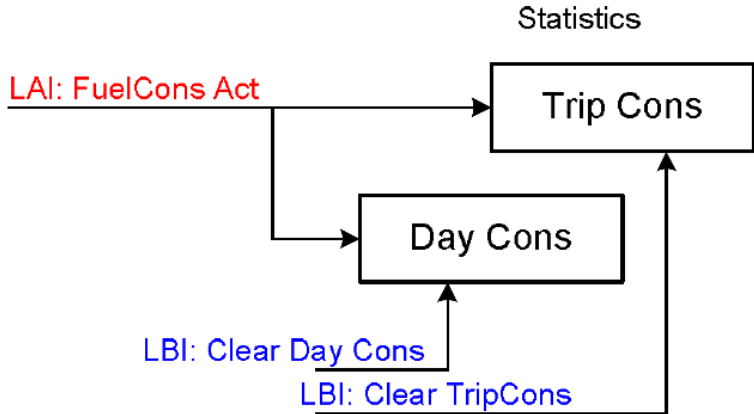
⬅ back to List of LAI

Engine Torque (PRP only)

Related FW	3.4.1	Related applications	PRP
Comm object	69		
Description			
Actual engine torque in %, received from J1939.			

⬅ back to List of LAI

Fuel ConsAct

Related FW	3.4.1	Related applications	All
Comm object	82		
Description			
<p>There are two cumulative Statistics registers - values TripCons and DayCons. Those statistic values increment value based on sampling of FUEL CONSACT (PAGE 239). LAI can be sourced from ECU Fuel Rate [l/h] or separate Actual Fuel consumption sensor connected to physical Analog input.</p> <p>Both statistics values is possible to modify in IntelliMonitor – Set Statistics command or clear by CLEAR DAYCONS (PAGE 183) or CLEAR TRIPCONS (PAGE 184)s.</p>			
 <pre> graph TD LAI[LAI: FuelCons Act] --> DayCons[Day Cons] LAI --> TripCons[Trip Cons] DayCons --> TripCons LBI1[LBI: Clear Day Cons] --> DayCons LBI2[LBI: Clear TripCons] --> TripCons </pre>			

⬅ back to List of LAI

FuelConsump

Related FW	3.4.1	Related applications	All
Comm object	116		
Description			
<p>Analog input for engine fuel consumption value [L/h], which is used for MomAvgFICon L (page 280) calculation</p>			

⬅ back to List of LAI

BoatSpeed

Related FW	3.4.1	Related applications	All
Comm object	117		
Description			
<p>Analog input for boat speed value [kts], which is used for MomAvgFICon L (page 280) calculation</p>			

⬅ back to List of LAI

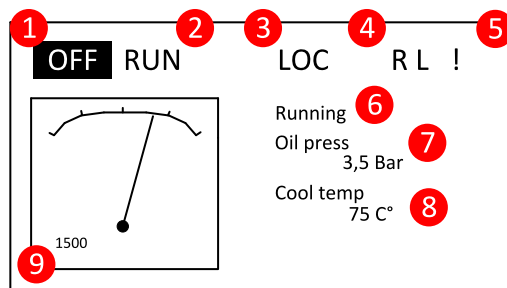
MainScrAna1

Related FW	3.4.1	Related applications	All
Comm object	120		

Description

Logical Analog Inputs MainScrAna1 or MainScrAna2 enables to redirect any Analog input value on the ID-DCU Industrial main screen on “OilPress” and “CoolTemp” position.

Note: Default names “OilPress” and “CoolTemp” will not change when the Logical Analog Inputs MainScrAna1 or MainScrAna2 are connected to other source values and has to be changed by translator.



1. Default configuration
 - ▶ ID / AIN_Function = Oil Press; MainScrAna1
 - ▶ ID / AIN2_Function = Coolant Temp; MainScrAna2
2. To display e.g. value from AIN3 “AirTemp1” instead “OilPress” (the first position) and AIN4 “AirTemp2” instead “CoolTemp” value:
 - a. Select AIN3 Property Function = MainScrAna1
 - b. Select AIN4 Property Function = MainScrAna2
 - c. Create new language (in DriveConfig Languages) based on English
 - d. Rename (in DriveConfig Translator / Other texts) text “OilPress” to “AirTemp1” in the newly created language
 - e. Rename (in DriveConfig Translator / Other texts) text “CoolTemp” (no space between) to “AirTemp2” in the newly created language
 - f. Switch the ID-DCU Industrial controller into newly created and modified language (Enter + Page, Page, select the new language by up/down arrows, Enter)

Note: Translate text “OilPress” and “CoolTemp” - no space between words because of similar texts (e.g. Coolant Temp, etc. are located on other screens).

🔍 back to List of LAI

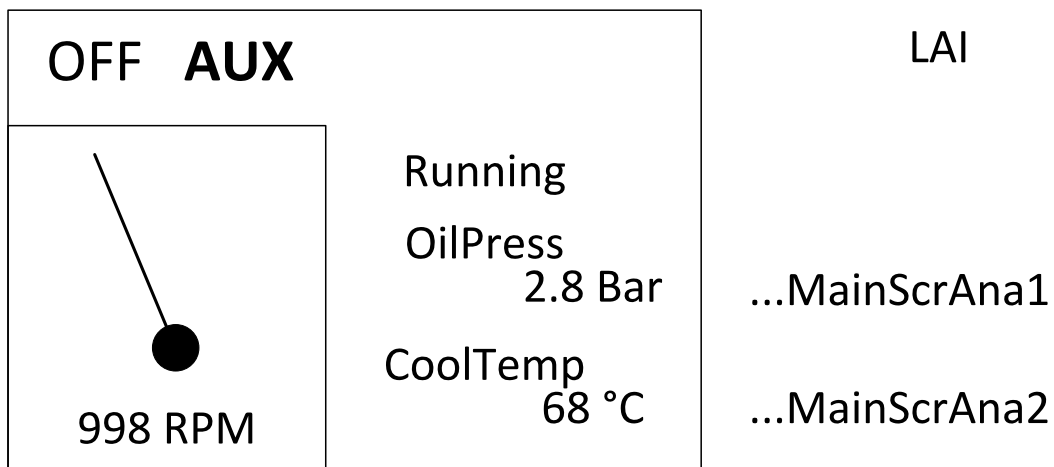
MainScrAna2

Related FW	3.4.1	Related applications	All
Comm object	121		

Description

Logical Analog Inputs MainScrAna1 or MainScrAna2 enables to redirect any Analog input value on the ID-DCU Industrial main screen on “OilPress” and “CoolTemp” position.

Note: Default names “OilPress” and “CoolTemp” do not change when the Logical Analog Inputs MainScrAna1 or MainScrAna2 are connected to other source values and has to be changed by translator.



1. Default configuration
 - ▶ ID / AIN_Function = Oil Press; MainScrAna1
 - ▶ ID / AIN2_Function = Coolant Temp; MainScrAna2
2. To display e.g. value from AIN3 “AirTemp1” instead “OilPress” (the first position) and AIN4 “AirTemp2” instead “CoolTemp” value:
 - a. Select AIN3 Property Function = MainScrAna1
 - b. Select AIN4 Property Function = MainScrAna2
 - c. Create new language (in DriveConfig Languages) based on English
 - d. Rename (in DriveConfig Translator / Other texts) text “OilPress” to “AirTemp1” in the newly created language
 - e. Rename (in DriveConfig Translator / Other texts) text “CoolTemp” (no space between) to “AirTemp2” in the newly created language
 - f. Switch the ID-DCU Industrial controller into newly created and modified language (Enter + Page, Page, select the new language by up/down arrows, Enter)

Note: Translate text “OilPress” and “CoolTemp” - no space between words because of similar texts (e.g. Coolant Temp, etc. are located on other screens).

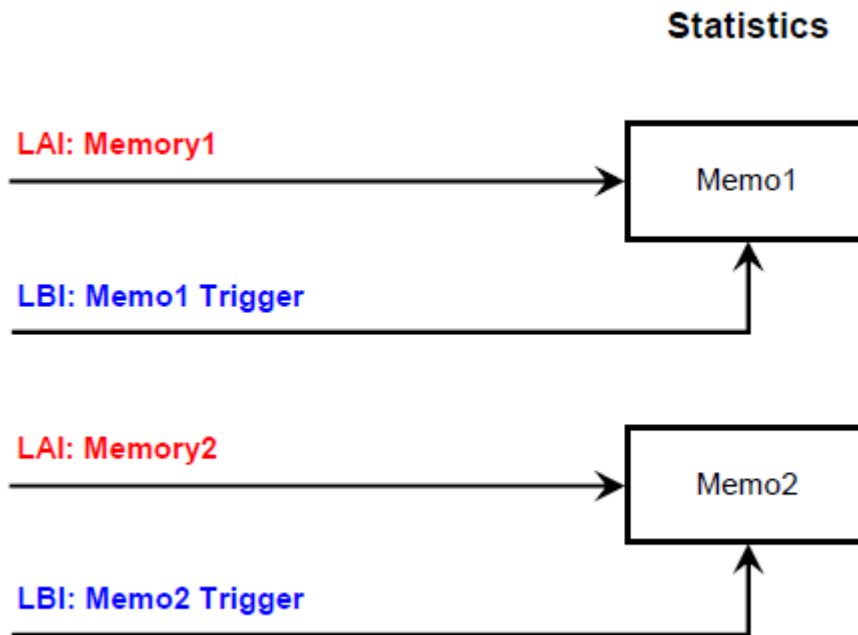
 [back to List of LAI](#)

Memory1

Related FW	3.4.1	Related applications	All
Comm object	181		

Description

There are two Statistics registers Memo1 and Memo2. Those statistic values are based on Logical Analog Input Memory1 or Memory2 value in the time of Logical Binary input Memo1 Trigger or Memo2 Trigger rising edge. Both statistics values is possible to modify in IntelliMonitor – Set Statistics command.



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Memory2

Related FW	3.4.1	Related applications	All
Comm object	182		
Description			
<p>There are two Statistics registers Memo1 and Memo2. Those statistic values are based on Logical Analog Input Memory1 or Memory2 value in the time of Logical Binary input Memo1 Trigger or Memo2 Trigger rising edge. Both statistics values is possible to modify in IntelliMonitor – Set Statistics command.</p>			
<pre> graph TD subgraph Statistics M1[Memo1] M2[Memo2] end LAI1[LAI: Memory1] --> M1 LBI1[LBI: Memo1 Trigger] --> M1 LAI2[LAI: Memory2] --> M2 LBI2[LBI: Memo2 Trigger] --> M2 </pre>			

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Cold Temp 1

Related FW	3.4.1	Related applications	All
Comm object	56		
Description			
<p>If there is an additional terminal board between a thermocouple sensor and the IS-AIN8 (TC) module and there is a significant temperature difference between this terminal board and the module, it is necessary to measure the temperature at this terminal board and use this temperature for the thermocouple compensation instead of the internal temperature of the module.</p> <p>Cold Temp 1 Logical Analog input is intended for measurement of this thermocouple compensation temperature for the IS-AIN8 (TC) module with index #1, Cold Temp 2 corresponds to IS-AIN8 (TC) module with index #2 etc.</p> <p>Note: <i>Thermocouples without internal compensation "Thermo(nc)..." must be used for this case.</i></p>			

[back to List of LAI](#)

Cold Temp 2

Related FW	3.4.1	Related applications	All
Comm object	57		
Description			
<p>If there is an additional terminal board between a thermocouple sensor and the IS-AIN8 (TC) module and there is a significant temperature difference between this terminal board and the module, it is necessary to measure the temperature at this terminal board and use this temperature for the thermocouple compensation instead of the internal temperature of the module.</p> <p>Cold Temp 1 Logical Analog input is intended for measurement of this thermocouple compensation temperature for the IS-AIN8 (TC) module with index #1, Cold Temp 2 corresponds to IS-AIN8 (TC) module with index #2 etc.</p> <p><i>Note: Thermocouples without internal compensation "Thermo(nc)..." must be used for this case.</i></p>			

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Cold Temp 3

Related FW	3.4.1	Related applications	All
Comm object	58		
Description			
<p>If there is an additional terminal board between a thermocouple sensor and the IS-AIN8 (TC) module and there is a significant temperature difference between this terminal board and the module, it is necessary to measure the temperature at this terminal board and use this temperature for the thermocouple compensation instead of the internal temperature of the module.</p> <p>Cold Temp 1 Logical Analog input is intended for measurement of this thermocouple compensation temperature for the IS-AIN8 (TC) module with index #1, Cold Temp 2 corresponds to IS-AIN8 (TC) module with index #2 etc.</p> <p><i>Note: Thermocouples without internal compensation "Thermo(nc)..." must be used for this case.</i></p>			

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Cold Temp 4

Related FW	3.4.1	Related applications	All
Comm object	59		
Description			
<p>If there is an additional terminal board between a thermocouple sensor and the IS-AIN8 (TC) module and there is a significant temperature difference between this terminal board and the module, it is necessary to measure the temperature at this terminal board and use this temperature for the thermocouple compensation instead of the internal temperature of the module.</p> <p>Cold Temp 1 Logical Analog input is intended for measurement of this thermocouple compensation temperature for the IS-AIN8 (TC) module with index #1, Cold Temp 2 corresponds to IS-AIN8 (TC) module with index #2 etc.</p> <p><i>Note: Thermocouples without internal compensation "Thermo(nc)..." must be used for this case.</i></p>			

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Cyl Temp 1

Related FW	3.4.1	Related applications	All
Comm object	16		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 2

Related FW	3.4.1	Related applications	All
Comm object	18		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 3

Related FW	3.4.1	Related applications	All
Comm object	19		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 4

Related FW	3.4.1	Related applications	All
Comm object	20		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 5

Related FW	3.4.1	Related applications	All
Comm object	21		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 6

Related FW	3.4.1	Related applications	All
Comm object	22		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 7

Related FW	3.4.1	Related applications	All
Comm object	23		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 8

Related FW	3.4.1	Related applications	All
Comm object	24		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 9

Related FW	3.4.1	Related applications	All
Comm object	25		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 10

Related FW	3.4.1	Related applications	All
Comm object	26		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 11

Related FW	3.4.1	Related applications	All
Comm object	27		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 12

Related FW	3.4.1	Related applications	All
Comm object	28		
Description			
Analog inputs for engine Cylinder temperature measuring.			

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Cyl Temp 13

Related FW	3.4.1	Related applications	All
Comm object	29		
Description			
Analog inputs for engine Cylinder temperature measuring.			

[back to List of LAI](#)

Cyl Temp 14

Related FW	3.4.1	Related applications	All
Comm object	30		
Description			
Analog inputs for engine Cylinder temperature measuring.			

[back to List of LAI](#)

Cyl Temp 15

Related FW	3.4.1	Related applications	All
Comm object	31		
Description			
Analog inputs for engine Cylinder temperature measuring.			

[back to List of LAI](#)

Cyl Temp 16

Related FW	3.4.1	Related applications	All
Comm object	32		
Description			
Analog inputs for engine Cylinder temperature measuring.			

[back to List of LAI](#)

Analog inputs from J1939 configuration

The image displays two screenshots of the ComAp configuration interface, illustrating the setup for analog inputs from a J1939 configuration. The top screenshot shows the 'Analog inputs' section with 'J1939-1' selected, and the 'J1939 value' dropdown set to 'Coolant Temp'. The bottom screenshot shows the 'Logical function' dropdown set to 'Coolant temp'. Orange circles and arrows highlight the configuration steps.

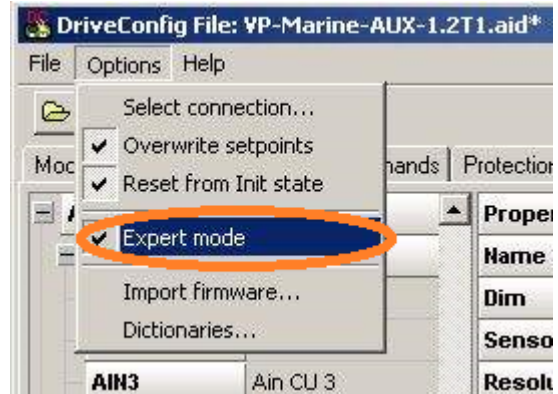
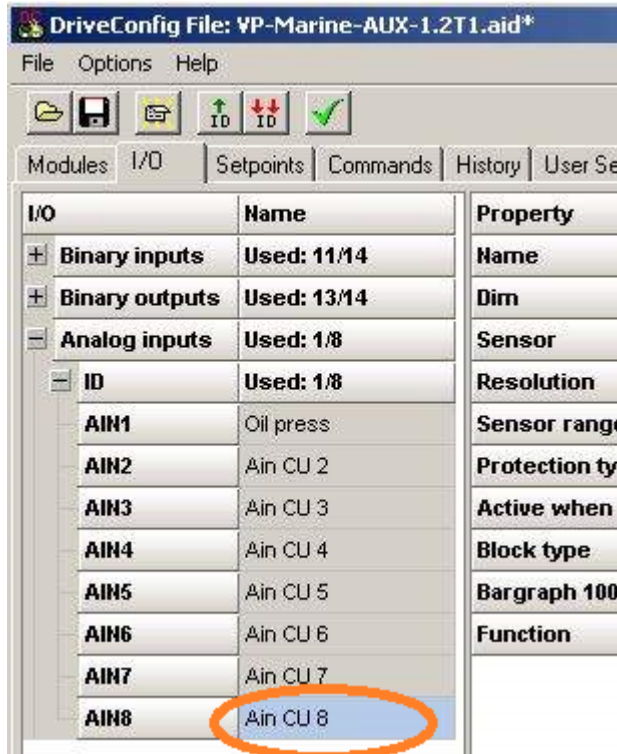
I/O	Name	Property	Value	J1939 value	Used	Dim
+	Binary inputs	Used:	23/38			
+	Binary outputs	Used:	17/30			
-	Analog inputs	Used:	9/24			
-	ID	Used:	2/8			
-	J1939-1	Used:	7/16			
	1		RPM	Engine speed	<input type="checkbox"/>	RPM
	2		Coolant temp	Actual Torque	<input type="checkbox"/>	%
	3		Boost Press	Requested Torque	<input type="checkbox"/>	%
	4		Intake Temp	Coolant Temp	<input checked="" type="checkbox"/>	*C
				EngineOil Temp	<input type="checkbox"/>	*C
				Boost Pressure	<input type="checkbox"/>	bar
				Intake Manifold Temp	<input type="checkbox"/>	*C
				Air Intake Pressure	<input type="checkbox"/>	bar

I/O	Name	Property	Value	Logical function	Used
+	Binary inputs	Used:	23/38		
+	Binary outputs	Used:	17/30		
-	Analog inputs	Used:	9/24		
-	ID	Used:	2/8		
-	J1939-1	Used:	7/16		
	1		RPM	LCD brightness	<input type="checkbox"/>
	2		Coolant temp	Engine speed	<input type="checkbox"/>
	3		Boost Press	Oil press	<input type="checkbox"/>
	4		Intake Temp	Coolant press	<input type="checkbox"/>
				Coolant temp	<input checked="" type="checkbox"/>
				Requested Torque	<input type="checkbox"/>
				Engine torque	<input type="checkbox"/>
				Cyl temp 1	<input type="checkbox"/>
				Cyl temp 2	<input type="checkbox"/>

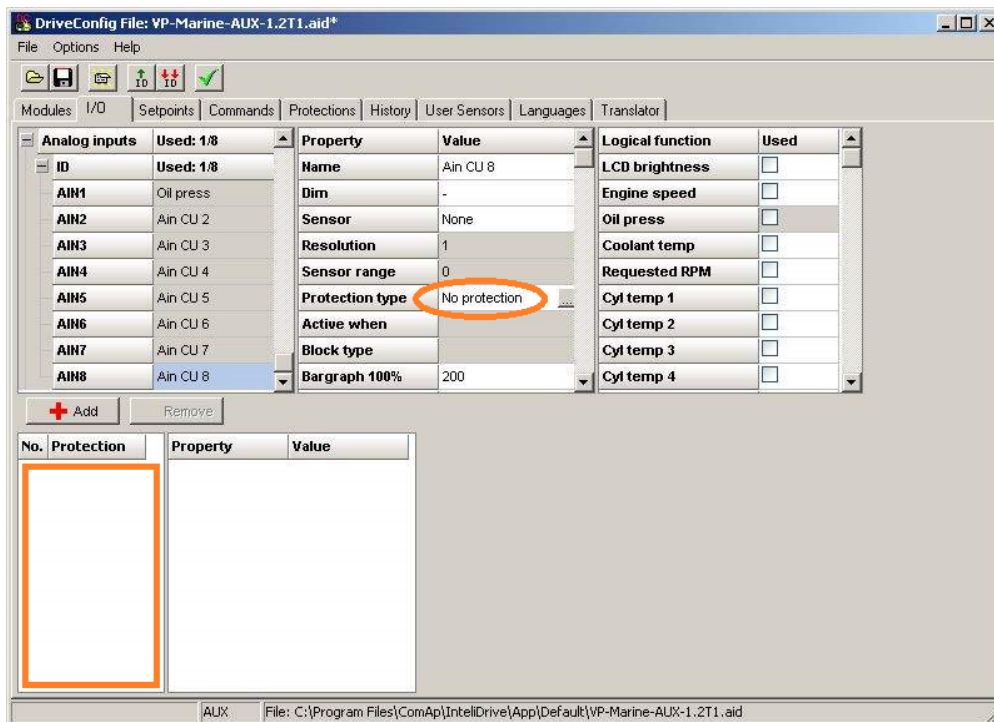
Analog inputs protection

Three level protection configuration

1. Switch to I-O , analog inputs, e.g. ID-AIN8
2. Switch to Expert mode

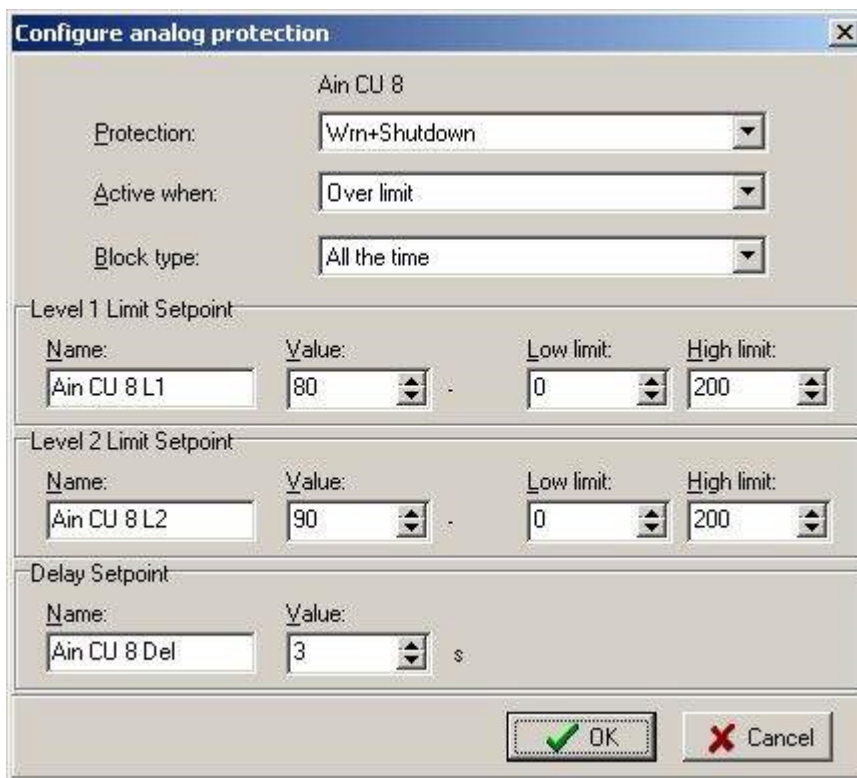


3. Configure standard two level protection

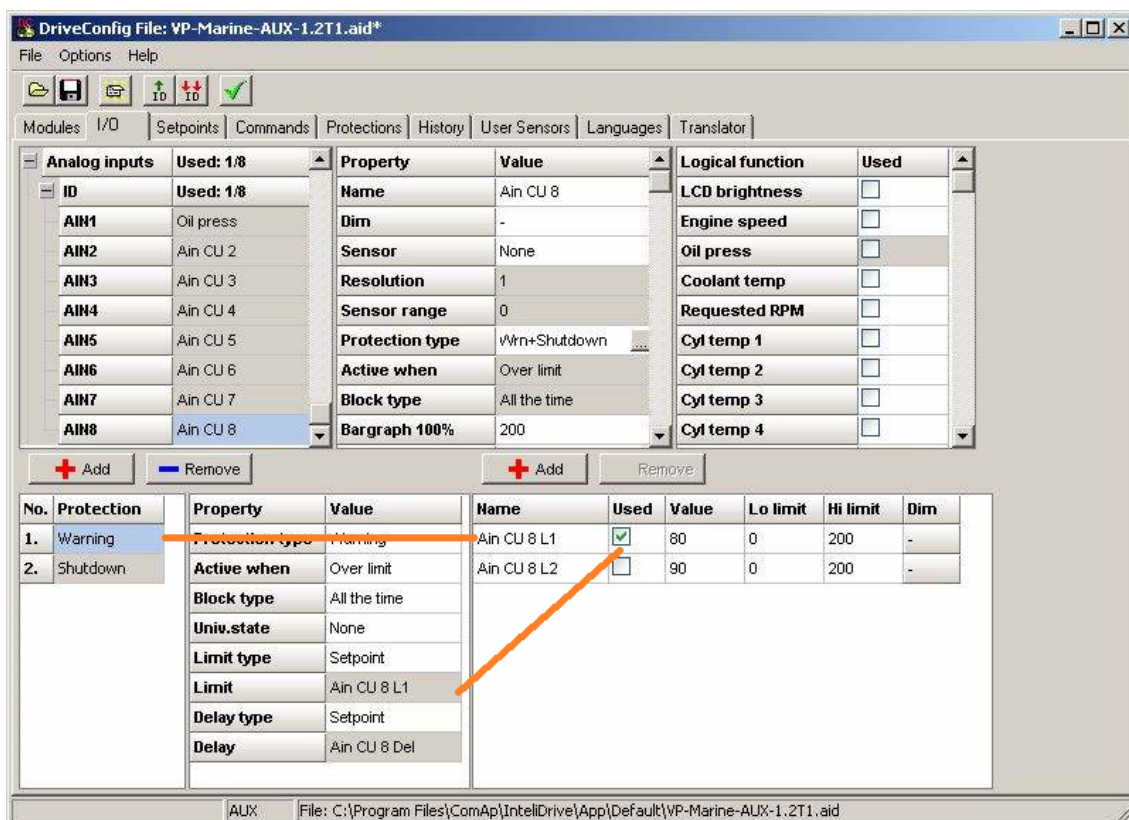


Expert field is now empty. This field is visible in Expert mode only.

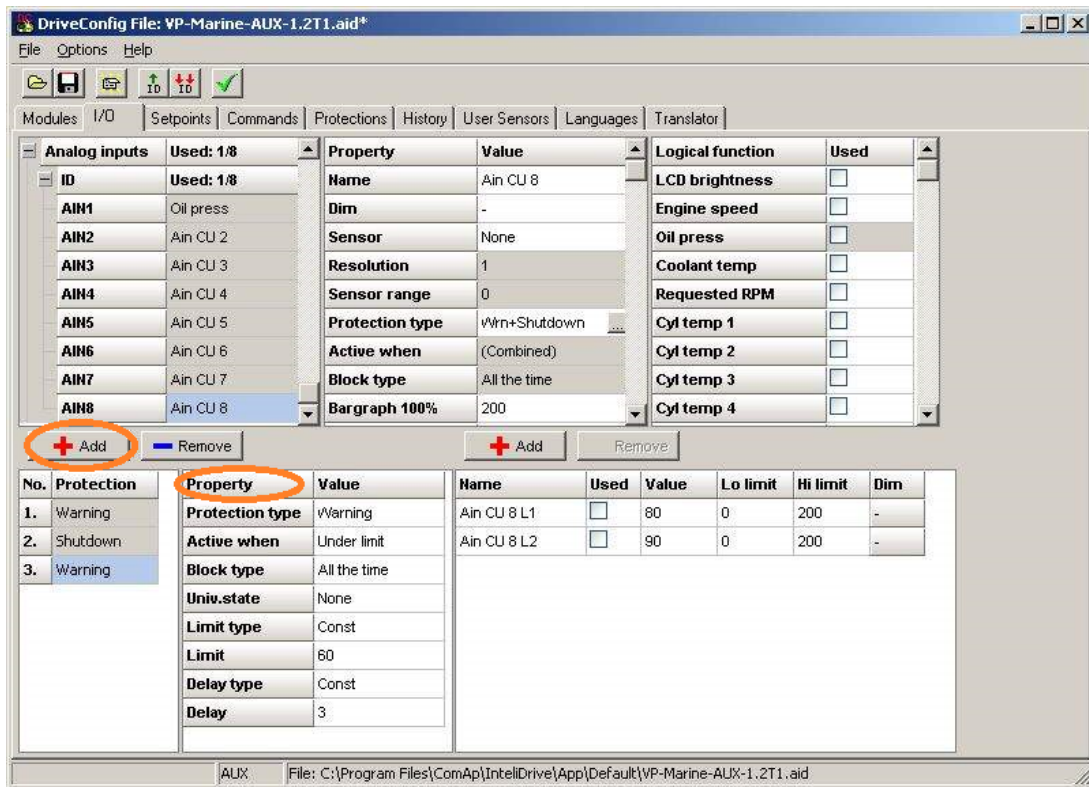
Standard two level protection (ID-AIN8) example:



4. Above step configured protection are now visible in Expert field and corresponding limits as well.

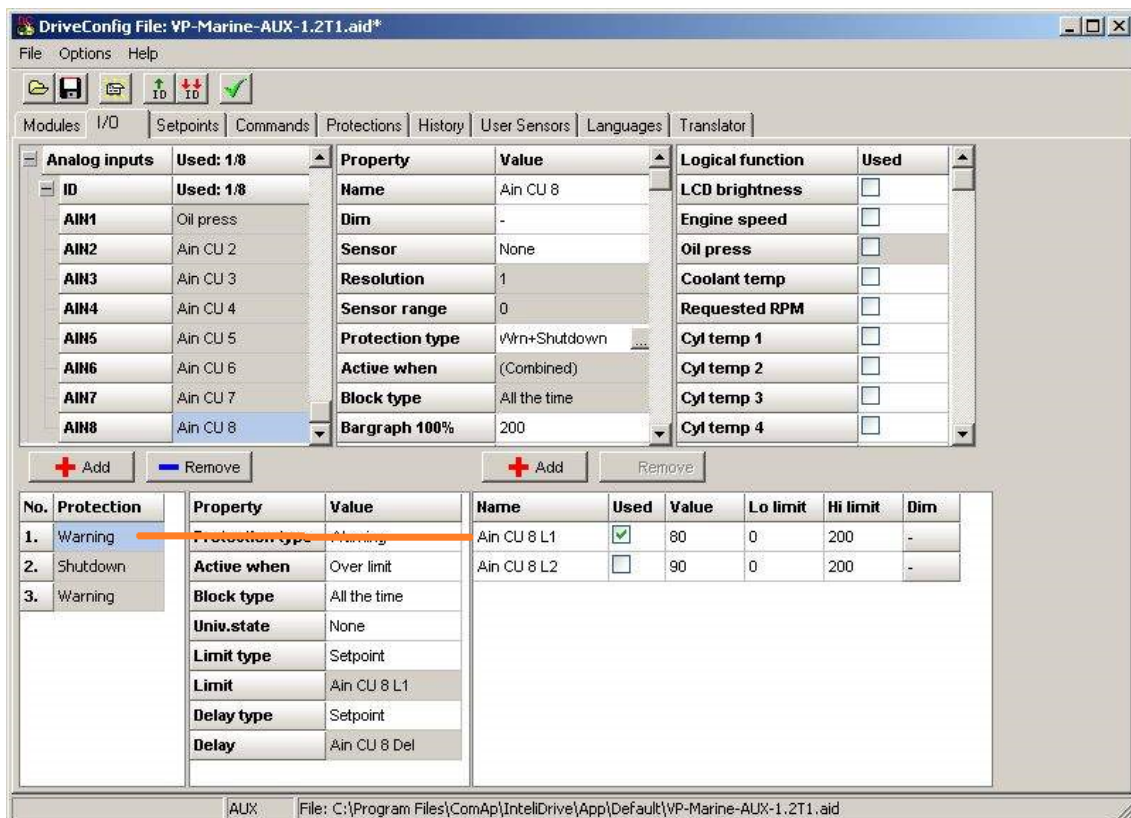


5. Add the third protection: "+" button, and edit Property (e.g. Wrn, Under,) Any protection limit/delay can be set to Constant (then value is fixed, specified in line below) and can not be changed by customer (not included in setpoint list) ... or ...

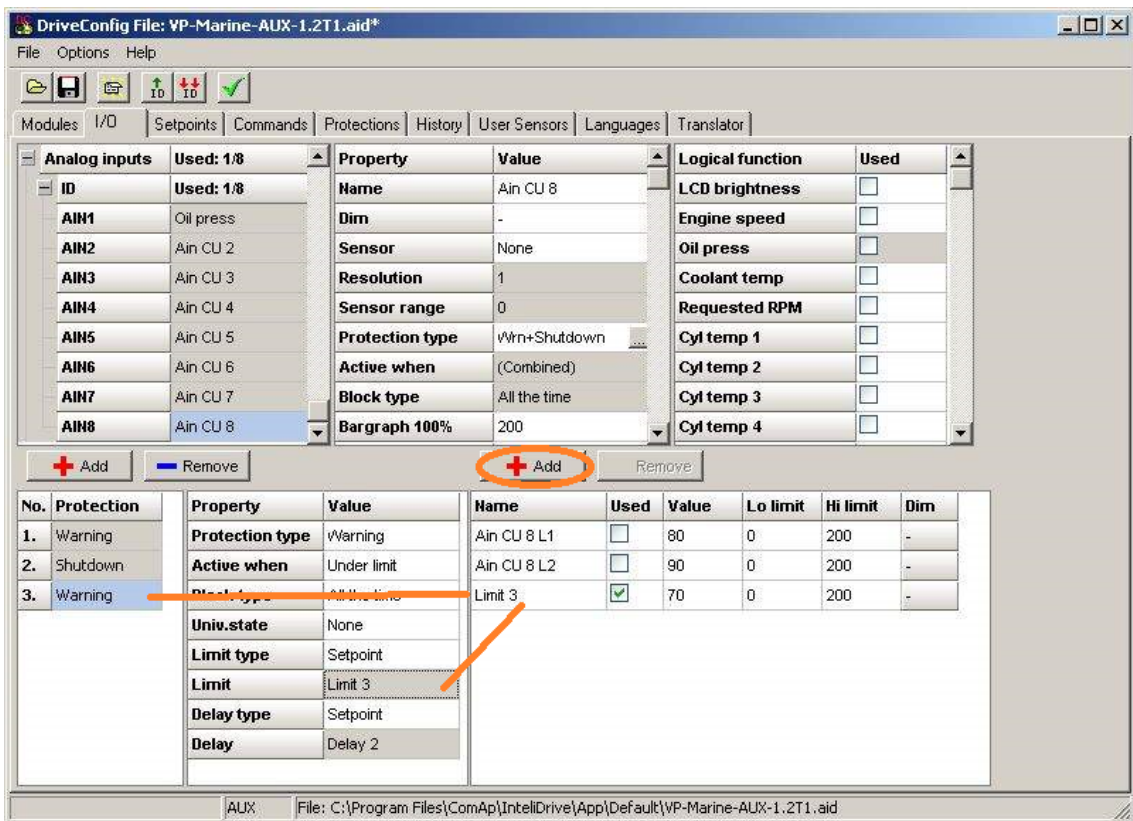


In example above there is Wm limit type set to Const = 60.

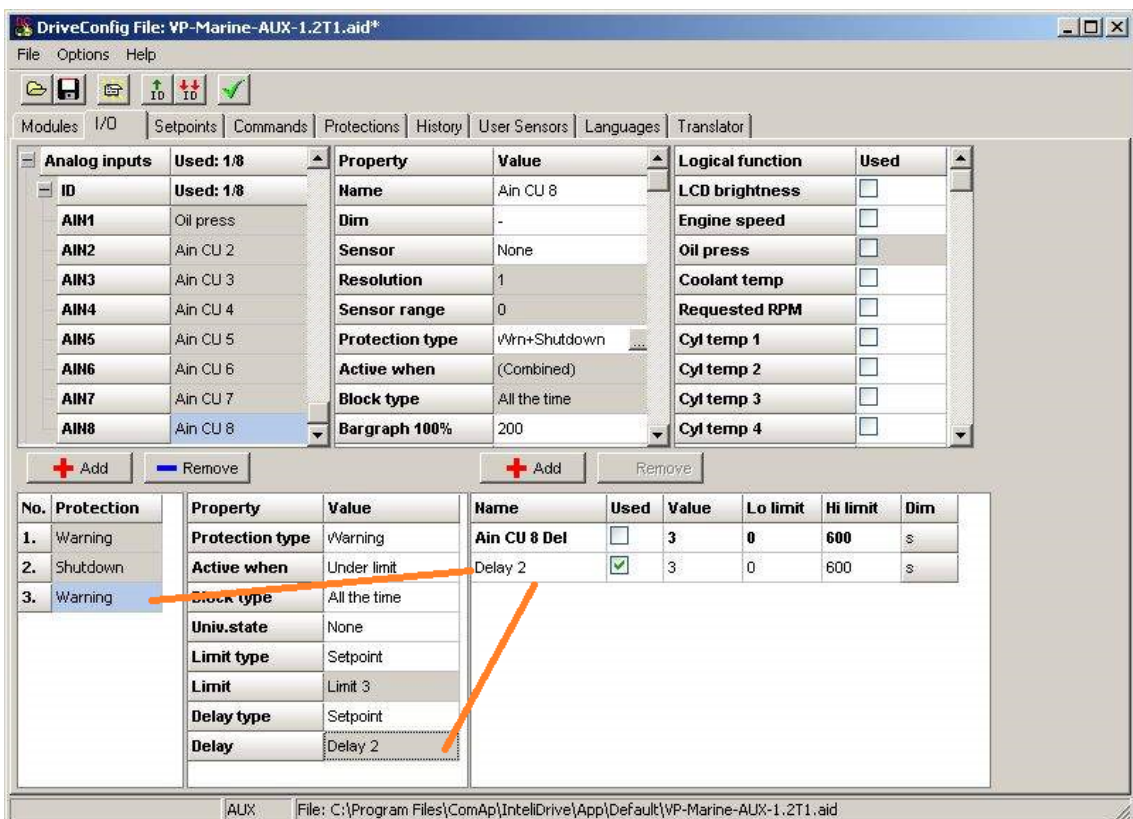
There is visible setpoint corresponding to Wm, Over protection. It is possible to change limit name, value and limits.



Use “+” button to add new limit for the third (Wrn, Under) protection. Name “Limit3” can be changed. Limit and Delay type must be in this case set to “Setpoint”

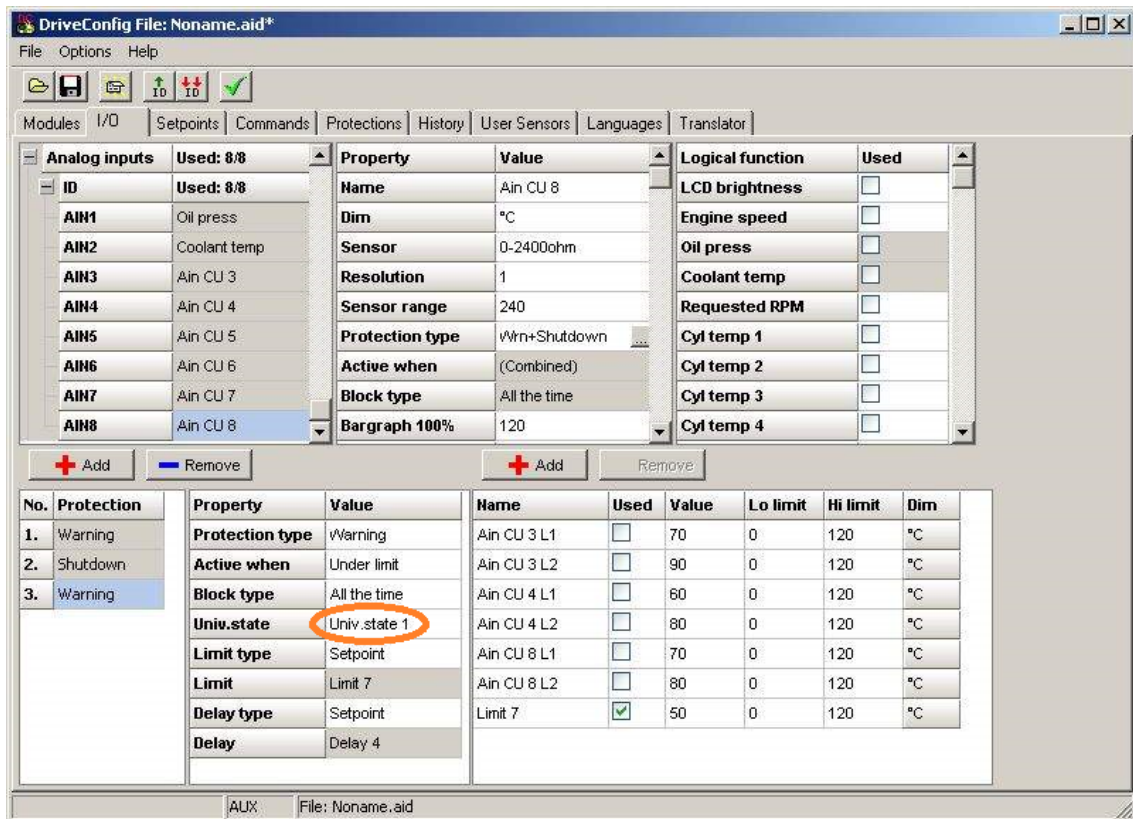


Use “+” button to add Delay setpoint and set/change name value and limits.



How to indicate AIN8 protection on BO?

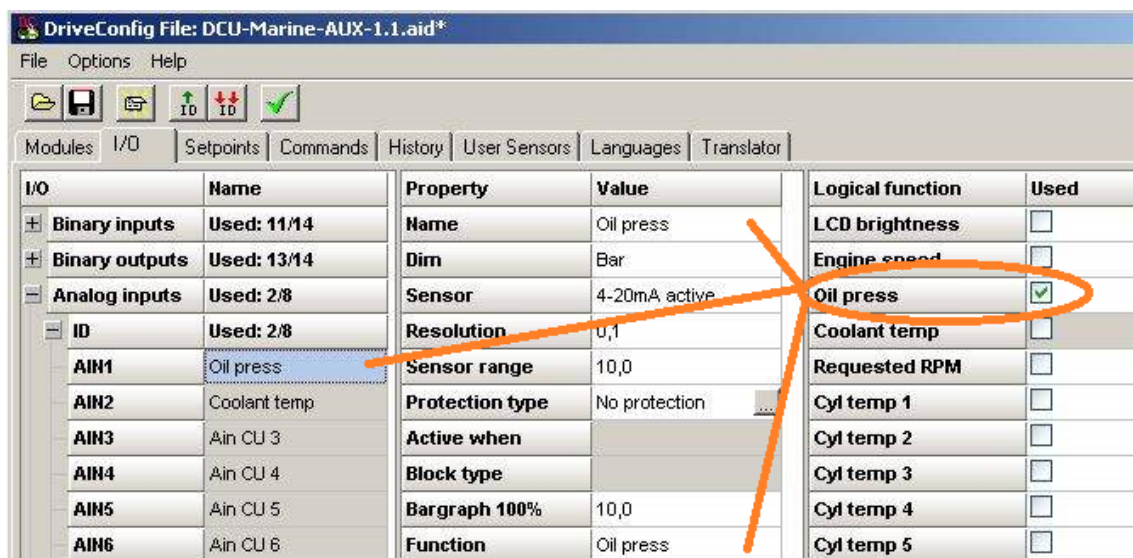
1. Select free universal state for selected protection



Note: Configure this UnivState to some Binary output and modify Bin output Name.

Oil pressure and Water temperature on the first ID controller screen indication

1. Reading from ID-DCU Industrial analog inputs



DriveConfig File: DCU-Marine-AUX-1.1.aid*

File Options Help

Modules I/O Setpoints Commands History User Sensors Languages Translator

I/O	Name	Property	Value	Logical function	Used
Binary inputs	Used: 11/14	Name	Coolant temp	LCD brightness	<input type="checkbox"/>
Binary outputs	Used: 13/14	Dim	°F	Engine speed	<input type="checkbox"/>
Analog inputs	Used: 2/8	Sensor	4-20mA active	Oil press	<input type="checkbox"/>
ID	Used: 2/8	Resolution	1	Coolant temp	<input checked="" type="checkbox"/>
AIN1	Oil press	Sensor range	120	Requested RPM	<input type="checkbox"/>
AIN2	Coolant temp	Protection type	Wrn+Shutdown	Cyl temp 1	<input type="checkbox"/>
AIN3	Ain CU 3	Active when	Over limit	Cyl temp 2	<input type="checkbox"/>
AIN4	Ain CU 4	Block type	All the time	Cyl temp 3	<input type="checkbox"/>
AIN5	Ain CU 5	Bargraph 100%	120	Cyl temp 4	<input type="checkbox"/>
AIN6	Ain CU 6	Function	Coolant temp	Cyl temp 5	<input type="checkbox"/>

2. Reading from J1939

DriveConfig File: DCU-Marine-AUX-1.1.aid*

File Options Help

Modules I/O Setpoints Commands History User Sensors Languages Translator

I/O	Name	Property	Value	J1939 value	Used	Dim
Binary inputs	Used: 20/30	Name	Coolant temp	Engine speed	<input type="checkbox"/>	RPM
Binary outputs	Used: 15/30	Dim	°C	Actual Torque	<input type="checkbox"/>	%
Analog inputs	Used: 10/24	Resolution	1	Demand Torque	<input type="checkbox"/>	%
ID	Used: 2/8	Protection type	No protection	Coolant Temp	<input checked="" type="checkbox"/>	°C
J1939-1	Used: 8/16	Active when		Fuel Temp	<input type="checkbox"/>	°C
1	RPM	Block type		EngineOil Temp	<input type="checkbox"/>	°C
2	Coolant temp	Bargraph 100%	150	Boost Pressure	<input type="checkbox"/>	bar
3	Boost Press	Function	Coolant temp	Intake Manifold Temp	<input type="checkbox"/>	°C
4	Intake Temp	J1939 value	Coolant Temp	Air Intake Pressure	<input type="checkbox"/>	bar

logical function

DriveConfig File: DCU-Marine-AUX-1.1.aid*

File Options Help

Modules I/O Setpoints Commands History User Sensors Languages Translator

I/O	Name	Property	Value	Logical function	Used
Binary inputs	Used: 20/30	Name	Coolant temp	LCD brightness	<input type="checkbox"/>
Binary outputs	Used: 15/30	Dim	°C	Engine speed	<input type="checkbox"/>
Analog inputs	Used: 10/24	Resolution	1	Oil press	<input type="checkbox"/>
ID	Used: 2/8	Protection type	No protection	Coolant temp	<input checked="" type="checkbox"/>
J1939-1	Used: 8/16	Active when		Requested RPM	<input type="checkbox"/>
1	RPM	Block type		Cyl temp 1	<input type="checkbox"/>
2	Coolant temp	Bargraph 100%	150	Cyl temp 2	<input type="checkbox"/>
3	Boost Press	Function	Coolant temp	Cyl temp 3	<input type="checkbox"/>
4	Intake Temp	J1939 value	Coolant Temp	Cyl temp 4	<input type="checkbox"/>

Please note that Protections can be configured as well.

Protection types

Warning	Indication only (no engine stop)
Shutdown	Fast engine stop
Cooldown	Engine stop with cooling period
Fail sensor	Measured value is out of sensor characteristics.
Warning+BW	Indication + Broken wire detection
Shutdown+BW	Shut down + Broken wire detection
Warning + Fls	Warning is activated in the case of sensor fail as well
Shutdown + Fls	Shut down is activated in the case of sensor fail as well
Sd override	This protection stays active in the case of Sd override is activated.
Alarm only	Only Alarm list indication, disappear without confirmation
HistRecOnly	History record only

8.1.6 Values

What values are:

Values (or quantities) are analog or binary data objects, measured or computed by the controller, that are intended for reading from the controller screen, PC, MODBUS, etc. Values are organized into groups according to their meaning.

List of value groups

Basic Settings	257
Engine Values	258
Analog CU	266
Binary CU	269
Log Bout	270
Info	272
Statistics	278
Aftertreatment	281

For full list of values go to the chapter **List of values (page 256)**.

List of values

Group of values: Basic settings

Engine RPM	257
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Group of values: Engine

Speed Request	258
SpeedReq RPM	260
T Cyl Aver	261
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Oil Press	261
Cool Temp	261
Oil Temp	262
Fuel Level	262
PM Status	262
Pri Battery	263
Sec Battery	263
RQSP Aver	263
RQSP Ramp	263

Group of values: Analog CU

Battery Volt	266
CPU Temp	266
D+	266
Oil Press	266
AIN CU 2	266
AIN CU 3	267
AIN CU 4	267
AIN CU 5	267
AIN CU 6	267
AIN CU 7	268
AIN CU 8	268

Group of values:

Binary CU

ID BIN	269
ID BOUT	269
LogBout 4	270

Group of values: Log Bout

LogBout1	270
LogBout 2	270
LogBout 3	270
LogBout 6	271
LogBout 7	271
LogBout 8	271
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Group of values: Info

Engine State	272
PasswordDecode	272
Build date	272
SW version	272
Application	273
SW Branch	273
Mode ID	273
Timer Text	273
Timer Val	273
CAN16	274
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ECU Alarms 1	275
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ECU Alarms 3	276
ECU Alarms 4	276
RS485 Detected	276
Latitude	276
Longitude	277
GPS Speed	277
ECU State	277

Group of values:

Statistics

RunHours	278
NumSuccStarts	278
NumUnscStarts	278
Service Time	278
DayCons	279
TripCons	279
Memo1	279
Memo2	280
MomAvgFICon L	280

Group of values:

Aftertreatment

DEF Level	281
DPF Soot Load	281
DPF Ash Load	281

[🔍 back to Controller objects](#)

Basic Settings

Engine RPM

Value group	Basic settings	Related FW	3.4.1
Resolution [units]	1 [RPM]		
Comm object	10123	Related applications	All
Description			
Current engine speed.			
<i>Note: Limit is defined by the value of the communication object of specified number</i>			

[back to List of values](#)

EngRPMfiltered

Value group	Basic settings	Related FW	3.4.1
Resolution [units]	1 [RPM]		
Comm object	11401	Related applications	All
Description			
Filtered current engine speed for nice displaying without nozzle oscillations.			
<i>Note: limit is defined by the value of the communication object of specified number</i>			

[back to List of values](#)

Mode Loc

Value group	Basic settings	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	10135	Related applications	All
Description			
Text string value containing "LOC" or empty text string depending on Activated or Deactivated LOC mode.			

[back to List of values](#)

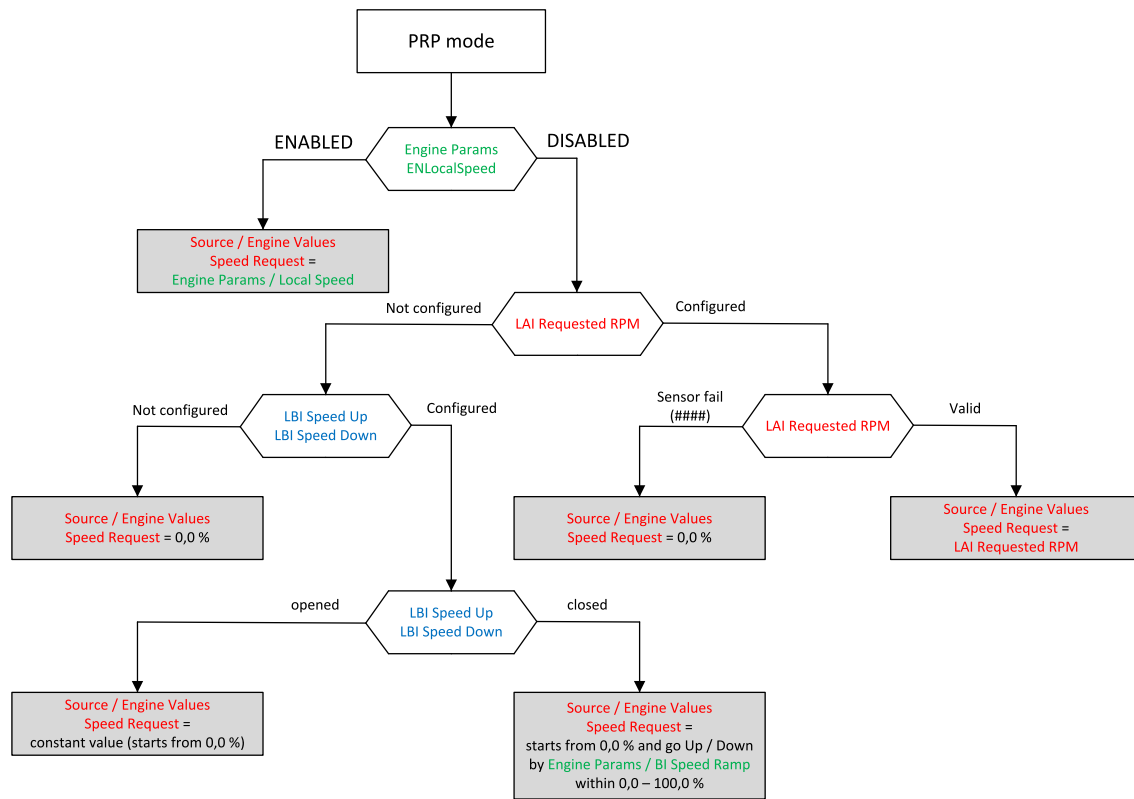
Engine Values

Speed Request

Value group	Engine values	Related FW	3.4.1
Resolution [units]	1 [%]		
Comm object	10137	Related applications	All

Description

Internal Speed Request value which can be used to control engine speed. See following flow charts how the Speed Request value is generated in case of PRP or AUX/EME/HRB mode.

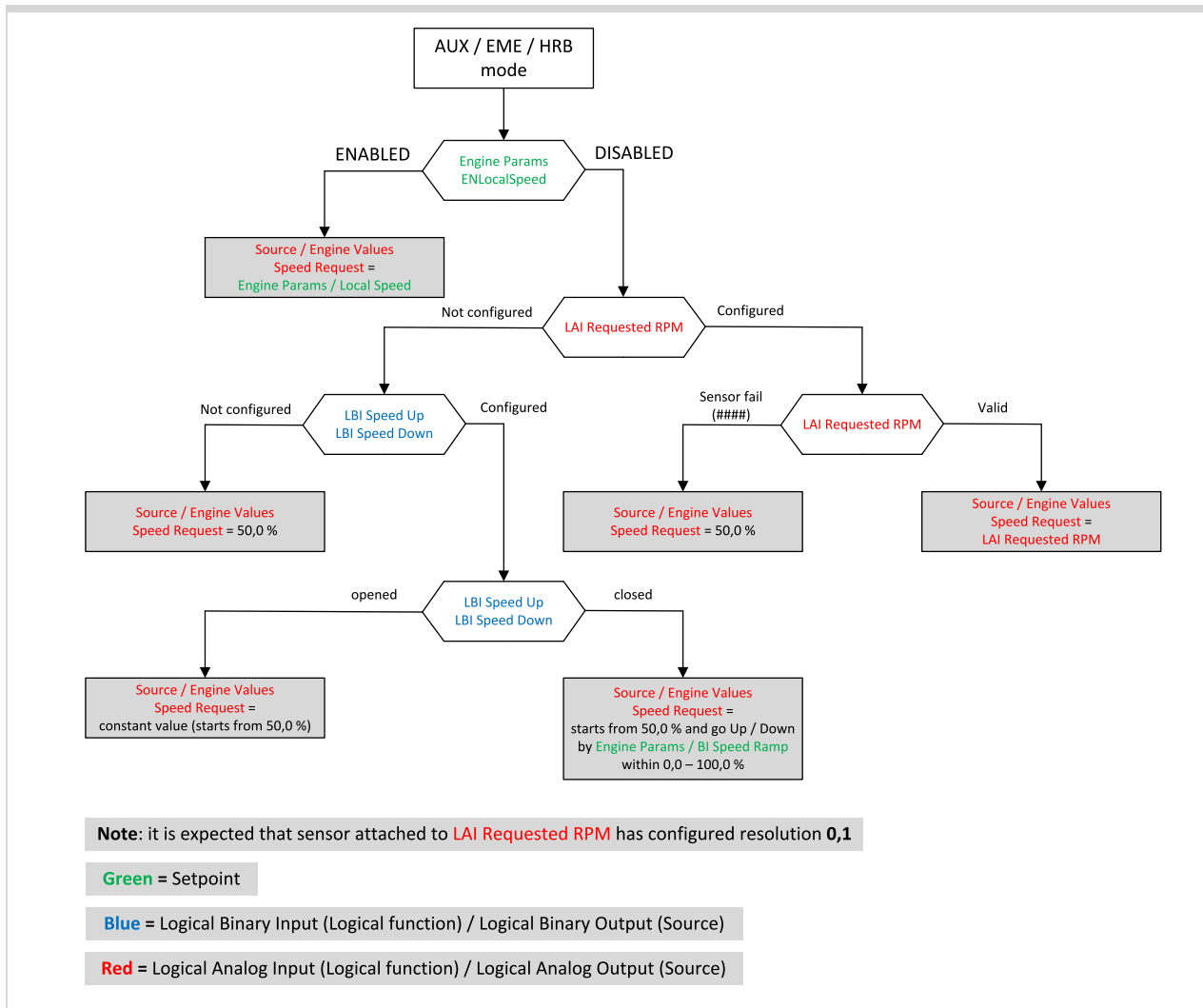


Note: it is expected that sensor attached to **LAI Requested RPM** has configured resolution **0,1**

Green = Setpoint

Blue = Logical Binary Input (Logical function) / Logical Binary Output (Source)

Red = Logical Analog Input (Logical function) / Logical Analog Output (Source)



🔍 back to List of values

SpeedReq RPM

Value group	Engine values	Related FW	3.4.1
Resolution [units]	1 [RPM]		
Comm object	10006	Related applications	All
Description			
<ul style="list-style-type: none"> ▶ Application PROP conversion 0.0 % = 0.3 * NominalRPM, 100.0 % = 1.1 * NominalRPM ▶ Application AUX/CMB/EME conversion 0.0 % = 0.9 * NominalRPM, 100.0 % = 1.1 * NominalRPM 			
In the case of sensor fail (out of range) is Sped request = 0 for PRP and 50 % (=Nominal RPM) for AUX configuration.			

🔍 back to List of values

T Cyl Aver

Value group	Engine values	Related FW	3.4.1
Resolution [units]	1 [°C]		
Comm object	9620	Related applications	All
Description			
Calculated Average temperature value from CYL TEMP 1 (PAGE 245) .. CYL TEMP 16 (PAGE 247) .			

[back to List of values](#)

T Cyl Max

Value group	Engine values	Related FW	3.4.1
Resolution [units]	1 [°C]		
Comm object	10526	Related applications	All
Description			
Detected maximal temperature value from CYL TEMP 1 (PAGE 245) .. CYL TEMP 16 (PAGE 247) .			

[back to List of values](#)

T Cyl Min

Value group	Engine values	Related FW	3.4.1
Resolution [units]	1 [°C]		
Comm object	10527	Related applications	All
Description			
Detected minimal temperature value from CYL TEMP 1 (PAGE 245) .. CYL TEMP 16 (PAGE 247) .			

[back to List of values](#)

Oil Press

Value group	Engine values	Related FW	3.4.1
Resolution [units]	1 [Bar]		
Comm object	10268	Related applications	All
Description			
Internal value corresponding to OIL PRESS (PAGE 237) .			

[back to List of values](#)

Cool Temp

Value group	Engine values	Related FW	3.4.1
Resolution [units]	1 [°C]		
Comm object	10267	Related applications	All
Description			
Internal value corresponding to COOLANT TEMP (PAGE 238) .			

[back to List of values](#)

Oil Temp

Value group	Engine values	Related FW	3.4.1
Resolution [units]	1 [°C]		
Comm object	11569	Related applications	All
Description			
Internal value corresponding to logical input OIL TEMP (PAGE 237) .			

[◀ back to List of values](#)

Fuel Level

Value group	Engine values	Related FW	3.4.1
Resolution [units]	0,1 [%]		
Comm object	11570	Related applications	All
Description			
Internal value corresponding to logical input FUEL LEVEL (PAGE 238) .			

[◀ back to List of values](#)

PM Status

Value group	Engine values	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	16071	Related applications	All
Description			
A value belonging to a particular Volvo Penta device - Power Module. Communication over the J1587 interface.			
Data message PID 150 - PTO Engagement Control Status			
Identifies the current state of the input and output functions used to control the engagement of PTO devices.			
<ul style="list-style-type: none"> ▶ PrimBatActive binary status ▶ SecBatActive binary status ▶ D12ExhTemp binary status ▶ D12SeaWatPres binary status ▶ EMSSupply10A binary status ▶ ExtraSupply7A binary status ▶ 30Supply7A binary status 			

[◀ back to List of values](#)

Pri Battery

Value group	Engine values	Related FW	3.4.1
Resolution [units]	0,1 [V]		
Comm object	12153	Related applications	All
Description			
A value belonging to a particular Volvo Penta device - Power Module. Communication over the J1587 interface.			
Data message PID 168 Battery Potential (Voltage)			
Measured electrical potential of the primary battery.			

[back to List of values](#)

Sec Battery

Value group	Engine values	Related FW	3.4.1
Resolution [units]	0,1 [V]		
Comm object	12154	Related applications	All
Description			
A value belonging to a particular Volvo Penta device - Power Module. Communication over the J1587 interface.			
Data message PID 444 Battery #2 Potential (Voltage)			
Measured electrical of the isolated battery #2.			

[back to List of values](#)

Loadsharing

RQSP Aver

Value group	Loadsharing	Related FW	3.4.1
Resolution [units]	1 [%]		
Comm object	10136	Related applications	PRP, AS
Description			
Average value calculated from all Speed Request values of controllers running in Loadsharing mode together (on the same CAN2 bus). See Load sharing block diagram.			

[back to List of values](#)

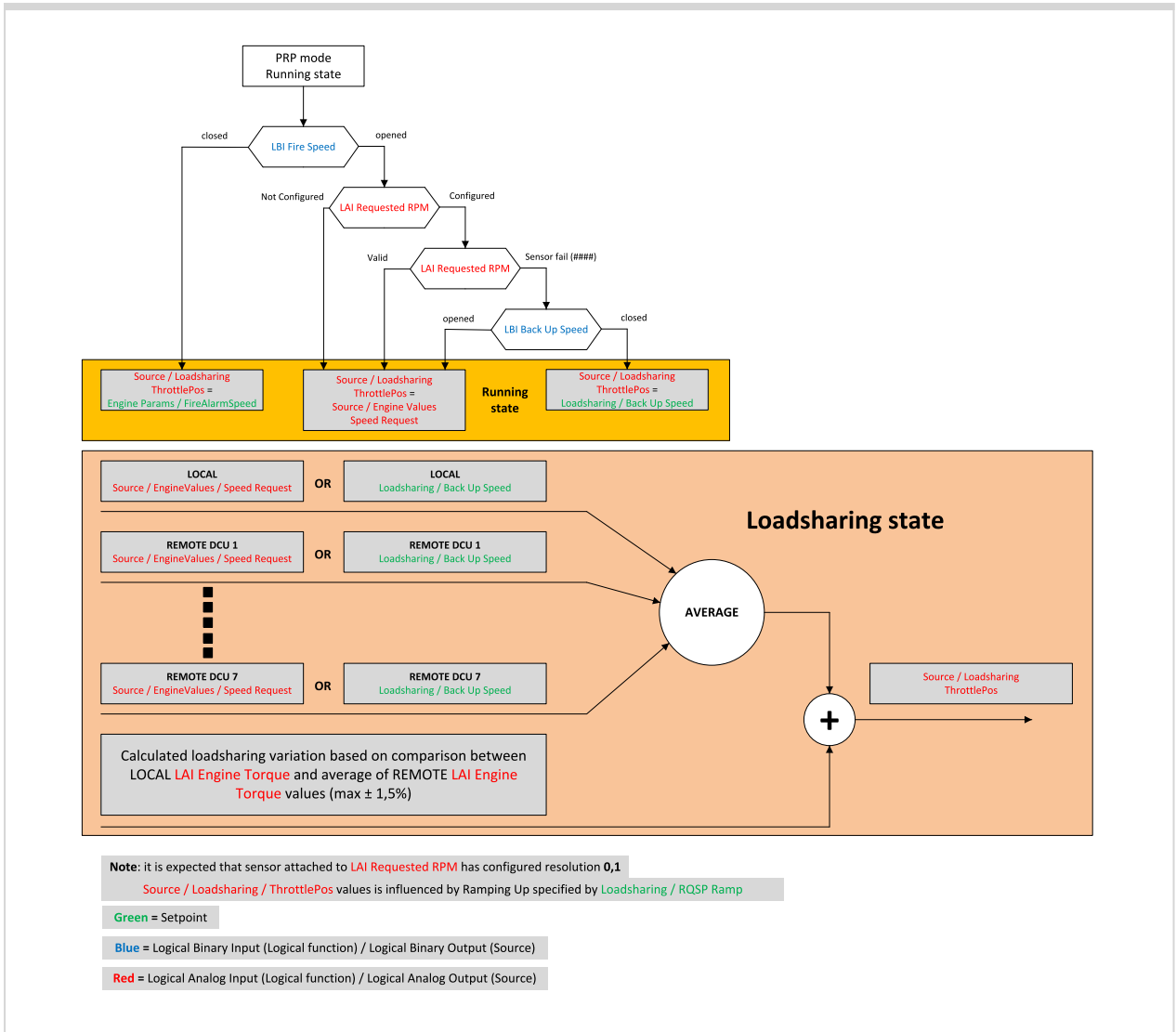
RQSP Ramp

Value group	Loadsharing	Related FW	3.4.1
Resolution [units]	1 [%]		
Comm object	10181	Related applications	PRP, AS
Description			
Ramped Loadsharing: RQSP Aver Value (in Loadsharing mode) or ramped Engine Values: Speed Request value (in Running mode). The Ramp speed is specified by setpoint Loadsharing: RQSP Ramp. See Loadsharing block diagram.			

[back to List of values](#)

ThrottlePos

Related FW	3.4.1	Related applications	PRP
Comm object	10000		
Description			
<p>Output Value of Loadsharing functional block inside ID-DCU Industrial controller. It is RQSP Ramp (page 263) influenced by loadsharing variation signal (this signal can increase / decrease the RQSP Ramp value by $\pm 1.5\%$). The ThrottlePos value is intended to send as required speed to an engine. Load sharing block diagram.</p> <p>See following chart describing ThrottlePos value in Running and Loadsharing state.</p> <p>Note: The regulation speed of loadsharing variation signal (max 1.5 %) is given by PI loop parameters Load Gain (page 141) and Load Int (page 141). The Loadsharing: ThrottlePos value is influenced by ramping specified by Loadsharing: RQSP Ramp setpoint.</p> <p>Note: The Loadsharing state can be activated from Running state and if both following conditions are met:</p> <ul style="list-style-type: none"> ▶ Actual Engine speed is in range specified by setpoints ClutchMinSpeed (page 142) and ClutchMaxSpeed (page 142) ▶ REM CLUTCH (PAGE 175) is active (or I/O front panel button is pressed) <p>There is loadsharing activation delay specified by setpoint Loadsharing: Clutch Del to postpone loadsharing regulation after transient events after engine mechanical connection to gear-box.</p> <p>Note: It is essential requirement to configure engine load information (ECU value "actual load", physical analog input reading actuator position feedback or boost pressure etc.) into ENGINE TORQUE (PRP ONLY) (PAGE 238) for loadsharing functionality.</p> <p>Note: All ID-DCU Industrial controllers working in the same loadsharing group have to be interconnected on CAN2 bus, controllers must have different controller addresses.</p> <p>Note: Loadsharing state - the Loadsharing: Back Up Speed value is taken into account instead of Speed Request (page 258) if the REQUESTED RPM (PAGE 238) indicates Sensor Fail (#####) and BACK UP SPEED1 (PAGE 174) is active.</p>			



back to List of setpoints

Analog CU

Battery Volt

Value group	Analog CU	Related FW	3.4.1
Resolution [units]	1 [V]		
Comm object	8213	Related applications	All
Description			
Internal Voltage measured on controller board.			

[back to List of values](#)

CPU Temp

Value group	Analog CU	Related FW	3.4.1
Resolution [units]	1 [°C]		
Comm object	10124	Related applications	All
Description			
Internal Temperature measured on controller board.			

[back to List of values](#)

D+

Value group	Analog CU	Related FW	3.4.1
Resolution [units]	1 [V]		
Comm object	10603	Related applications	All
Description			
Engine alternator output voltage detected at D+ controller terminal.			

[back to List of values](#)

Oil Press

Value group	Analog CU	Related FW	3.4.1
Resolution [units]	1 [Bar]		
Comm object	9155	Related applications	All
Description			

[back to List of values](#)

AIN CU 2

Value group	Analog CU	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9156	Related applications	All
Description			
Analog input value corresponding to analog input located directly on ID-DCU controller.			
Note: The name "Ain CU 2" is just default value which can be changed in analog input Property: Name.			

[back to List of values](#)

AIN CU 3

Value group	Analog CU	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9157	Related applications	All
Description			
Analog input value corresponding to analog input located directly on ID-DCU controller.			
<i>Note: The name "Ain CU 3" is just default value which can be changed in analog input Property: Name.</i>			

[back to List of values](#)

AIN CU 4

Value group	Analog CU	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9158	Related applications	All
Description			
Analog input value corresponding to analog input located directly on ID-DCU controller.			
<i>Note: The name "Ain CU 4" is just default value which can be changed in analog input Property: Name.</i>			

[back to List of values](#)

AIN CU 5

Value group	Analog CU	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9159	Related applications	All
Description			
Analog input value corresponding to analog input located directly on ID-DCU controller.			
<i>Note: The name "Ain CU 5" is just default value which can be changed in analog input Property: Name.</i>			

[back to List of values](#)

AIN CU 6

Value group	Analog CU	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9160	Related applications	All
Description			
Analog input value corresponding to analog input located directly on ID-DCU controller.			
<i>Note: The name "Ain CU 6" is just default value which can be changed in analog input Property: Name.</i>			

[back to List of values](#)

AIN CU 7

Value group	Analog CU	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9161	Related applications	All
Description			
Analog input value corresponding to analog input located directly on ID-DCU controller.			
<i>Note: The name "Ain CU 7" is just default value which can be changed in analog input Property: Name.</i>			

[▲ back to List of values](#)

AIN CU 8

Value group	Analog CU	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9162	Related applications	All
Description			
Analog input value corresponding to analog input located directly on ID-DCU controller.			
<i>Note: The name "Ain CU 8" is just default value which can be changed in analog input Property: Name.</i>			

[▲ back to List of values](#)

Binary CU

ID BIN

Value group	Binary CU	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	8235	Related applications	All
Description			
Controller binary inputs state indication.			

[◀ back to List of values](#)

ID BOUT

Value group	Binary CU	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	8239	Related applications	All
Description			
Controller binary outputs state indication.			

[◀ back to List of values](#)

Log Bout

LogBout1

Value group	Log Bout	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	9143	Related applications	All
Description			
List of logical binary outputs.			

[back to List of values](#)

LogBout 2

Value group	Log Bout	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	9144	Related applications	All
Description			
List of logical binary outputs.			

[back to List of values](#)

LogBout 3

Value group	Log Bout	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	9145	Related applications	All
Description			
List of logical binary outputs.			

[back to List of values](#)

LogBout 4

Value group	Log Bout	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	9146	Related applications	All
Description			
List of logical binary outputs.			

[back to List of values](#)

LogBout 5

Value group	Log Bout	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	9147	Related applications	All
Description			
List of logical binary outputs.			

[back to List of values](#)

LogBout 6

Value group	Log Bout	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	9148	Related applications	All
Description			
List of logical binary outputs.			

[back to List of values](#)

LogBout 7

Value group	Log Bout	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	9149	Related applications	All
Description			
List of logical binary outputs.			

[back to List of values](#)

LogBout 8

Value group	Log Bout	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	9150	Related applications	All
Description			
List of logical binary outputs.			

[back to List of values](#)

RemoteControl

Value group	Log Bout	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	10627	Related applications	All
Description			
List of logical binary outputs, which can be closed and opened remotely, e.g. from IntelliMonitor using the "Remote switches" tool or using Modbus communication.			

[back to List of values](#)

Info

Engine State

Value group	Info	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9244	Related applications	
Description			
Code of the current state of the engine control. The text representation of each code can be obtained following way:			
<ol style="list-style-type: none"> 1. Open the archive in DriveConfig and use the function File -> Generate Cfg Image -> Comm. objects to create a list of all communication objects. 2. Open the file, find the row containing „Engine State“ value and look for the column "Type". The column "Type" contains reference to a list of codes and their representations located in the bottom part of the file. 			

[back to List of values](#)

PasswordDecode

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	9090	Related applications	All
Description			
This value contains encrypted serial number of the controller and administrator password and is intended for retrieving of the lost password. Send this number together with controller serial number to your distributor if you need to retrieve your password.			

[back to List of values](#)

Build date

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	24211	Related applications	All
Description			
Date of controller firmware creation.			

[back to List of values](#)

SW version

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	24339	Related applications	
Description			
Major and minor firmware version number. E.g. value "2,2" means version 2.2. Release version number is not included.			

[back to List of values](#)

Application

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	8480	Related applications	All
Description			
Type of application / configuration used with controller.			

[back to List of values](#)

SW Branch

Value group	Info	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	8707	Related applications	
Description			
Firmware branch code. Contains 1 in case of standard branches.			

[back to List of values](#)

Mode ID

Value group	Info	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9887	Related applications	
Description			
This value contains actual controller mode. The controller mode is selected by Mode ID (page 100) but the setpoint can be overridden by REMOTE OFF (PAGE 170) .			

[back to List of values](#)

Timer Text

Value group	Info	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	10040	Related applications	
Description			
Code of the currently running system process timer. The text representation of each code can be obtained by the procedure described at the value Engine state.			

[back to List of values](#)

Timer Val

Value group	Info	Related FW	3.4.1
Resolution [units]	1 [s]		
Comm object	8955	Related applications	
Description			
The value contains remaining time of the currently running system process timer.			

[back to List of values](#)

CAN16

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	8546	Related applications	All
Description			
<p>Bits of this value show "1" if the controller receives messages from the controller which has address corresponding with the bit position. Bit 0 represents address 1 etc. This value contains information about controllers with addresses 1-16.</p> <p>Note: The bit which corresponds to the own controller is always set to "1".</p>			

⬅ back to List of values

CAN32

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	8827	Related applications	All
Description			
<p>Bits of this value show "1" if the controller receives messages from the controller which has address corresponding with the bit position. Bit 0 represents address 17 etc. This value contains information about controllers with addresses 17-32.</p> <p>Note: The bit which corresponds to the own controller is always set to "1".</p>			

⬅ back to List of values

Diag Code

Value group	Info	Related FW	3.4.1																				
Resolution [units]	[-]																						
Comm object	9654	Related applications	All																				
Description																							
<p>Displays the source (protocol) of the currently received DTC error message. Diag Code is currently used only for information in History. After writing to History Diag Code is reset back to #####.</p> <p>List of possible values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Source / protocol</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>#####</td> </tr> <tr> <td>1</td> <td>J1939-DM1</td> </tr> <tr> <td>2</td> <td>J1939-KWP2000</td> </tr> <tr> <td>3</td> <td>J1587-PID</td> </tr> <tr> <td>4</td> <td>J1587-SID</td> </tr> <tr> <td>5</td> <td>J1587-PPID</td> </tr> <tr> <td>6</td> <td>J1587-PSID</td> </tr> <tr> <td>7</td> <td>MODBUS</td> </tr> <tr> <td>8</td> <td>J1939-MTU</td> </tr> </tbody> </table>				Code	Source / protocol	0	#####	1	J1939-DM1	2	J1939-KWP2000	3	J1587-PID	4	J1587-SID	5	J1587-PPID	6	J1587-PSID	7	MODBUS	8	J1939-MTU
Code	Source / protocol																						
0	#####																						
1	J1939-DM1																						
2	J1939-KWP2000																						
3	J1587-PID																						
4	J1587-SID																						
5	J1587-PPID																						
6	J1587-PSID																						
7	MODBUS																						
8	J1939-MTU																						

⬅ back to List of values

MID

Value group	Info	Related FW	3.4.1								
Resolution [units]	0 .. 255 [-]										
Comm object	11873	Related applications	All								
Description											
<p>The address of the Electronic control Unit (ECU) from which the DTC error message came. Applies to the J1587 protocol in connection with the Volvo Penta systems.</p> <p>Related to the Diag Code (page 274).</p> <p>Typical addresses are:</p> <table border="1"> <thead> <tr> <th>Address</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>broadcast</td> </tr> <tr> <td>128</td> <td>Engine ECU</td> </tr> <tr> <td>158</td> <td>Power Module</td> </tr> </tbody> </table>				Address	Unit	0	broadcast	128	Engine ECU	158	Power Module
Address	Unit										
0	broadcast										
128	Engine ECU										
158	Power Module										

⬅ back to List of values

ECU Alarms 1

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	10916	Related applications	All
Description			
<p>States of predefined ECU alarms, which are available with Modbusreading.</p> <p>Note: Alarm linked with a specific bit is defined in ESC (Engine Specific Code) and is not user configurable.</p>			

⬅ back to List of values

ECU Alarms 2

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	10917	Related applications	All
Description			
<p>States of predefined ECU alarms, which are available with Modbus reading.</p> <p>Note: Alarm linked with a specific bit is defined in ESC (Engine Specific Code) and is not user configurable.</p>			

⬅ back to List of values

ECU Alarms 3

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	10918	Related applications	All
Description			
States of predefined ECU alarms, which are available with Modbus reading.			
<i>Note: Alarm linked with a specific bit is defined in ESC (Engine Specific Code) and is not user configurable.</i>			

[back to List of values](#)

ECU Alarms 4

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	10919	Related applications	All
Description			
States of predefined ECU alarms, which are available with Modbus reading.			
<i>Note: Alarm linked with a specific bit is defined in ESC (Engine Specific Code) and is not user configurable.</i>			

[back to List of values](#)

RS485 Detected

Value group	Info	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	24118	Related applications	All
Description			
<ul style="list-style-type: none"> ▶ Detecting the presence of the ID-COM module with the RS485 interface occurs only when the controller is initialized (when the controller is switched on or during reboot) ▶ Only informative data for configuration analysis (use for technical support). 			
<i>Note: Not intended to be used in the PLC or history (specific data structure).</i>			

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Latitude

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	11678	Related applications	All
Description			
GPS coordinate received from IntelliBridge-NT (IB-NT).			

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Longitude

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	11679	Related applications	All
Description			
GPS coordinate received from IntelliBridge-NT (IB-NT).			

[↶ back to List of values](#)

GPS Speed

Value group	Info	Related FW	3.4.1
Resolution [units]	0.1 [kts]		
Comm object	12165	Related applications	All
Description			
Speed in knots received from IB-NT (1 knot = 1.852 km/h).			

[↶ back to List of values](#)

ECU State

Value group	Info	Related FW	3.4.1
Resolution [units]	[-]		
Comm object	10034	Related applications	All
Description			
Diagnostic states of the main ECU (i.e. ECU, which has automatically connected inputs to logical functions).			
Indicates 4 basic "lamps":			
Yellow Warning Lamp			
Red Stop Lamp			
Wait To Start Lamp			
Malfunction Lamp			

[↶ back to List of values](#)

Statistics

RunHours

Value group	Statistics	Related FW	3.4.1
Resolution [units]	1 [h]		
Comm object	8206	Related applications	All
Description			
Engine running hours value.			

[back to List of values](#)

NumSuccStarts

Value group	Statistics	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	8207	Related applications	All
Description			
Successful engine start number counter. The counter is increased by 1 even if the particular start command will take more than one attempt.			
<i>Note: The counter can be readjusted / reset from IntelliMonitor menu Monitor -> Set statistics.</i>			

[back to List of values](#)

NumUnscStarts

Value group	Statistics	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	10149	Related applications	All
Description			
Unsuccessful starts counter. The counter is incremented always when Start fail alarm is issued.			
<i>Note: The counter can be readjusted / reset from IntelliMonitor menu Monitor -> Set statistics.</i>			

[back to List of values](#)

Service Time

Value group	Statistics	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9648	Related applications	All
Description			
This is maintenance countdown timer. The timer is located in setpoints group Engine protect as well as in Statistics values. Adjust the timer to the requested maintenance interval. It will be decremented while the engine is running. The alarm WrmServiceTime is issued as soon as the timer counts down to zero.			

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DayCons

Value group	Statistics	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9040	Related applications	All
Description			
Daily fuel consumption calculated by controller from FUEL CONSACT (PAGE 239) .			

⬅ back to List of values

TripCons

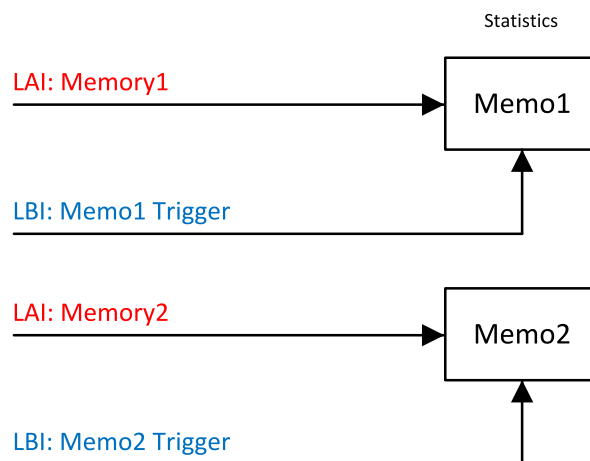
Value group	Statistics	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	9817	Related applications	All
Description			
Trip fuel consumption calculated by controller from FUEL CONSACT (PAGE 239) .			

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Memo1

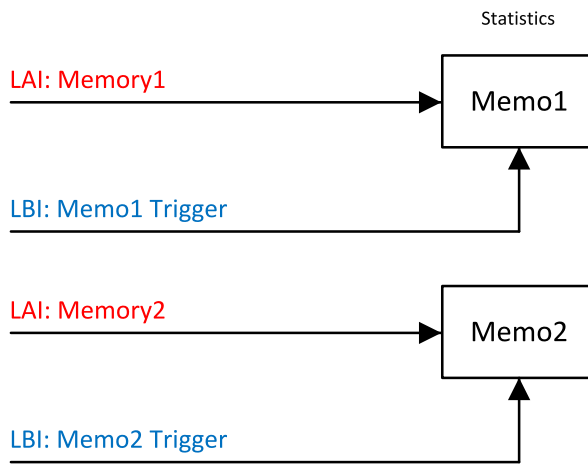
Value group	Statistics	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	8230	Related applications	All
Description			

There are two Statistics registers Memo1 and Memo2. Those statistic values are based on Logical Analog Input Memory1 or Memory2 value in the time of Logical Binary input **Memo1 Trigger** or **Memo2 Trigger** rising edge. Both statistics values is possible to modify in IntelliMonitor – Set Statistics command.



⬅ back to List of values

Memo2

Value group	Statistics	Related FW	3.4.1
Resolution [units]	1 [-]		
Comm object	8231	Related applications	All
Description			
<p>There are two Statistics registers Memo1 and Memo2. Those statistic values are based on Logical Analog Input Memory1 or Memory2 value in the time of Logical Binary input Memo1 Trigger or Memo2 Trigger rising edge. Both statistics values is possible to modify in IntelliMonitor – Set Statistics command.</p>			
 <pre> graph TD subgraph Statistics Memo1 Memo2 end LAI1[LAI: Memory1] --> Memo1 LBI1[LBI: Memo1 Trigger] --> Memo1 LAI2[LAI: Memory2] --> Memo2 LBI2[LBI: Memo2 Trigger] --> Memo2 </pre>			

[back to List of values](#)

MomAvgFICon L

Value group	Statistics	Related FW	3.4.1
Resolution [units]	0.1 [/nm]		
Comm object	11321	Related applications	All
Description			
<p>Momentary average fuel consumption per nautical mile. It is available, if both FUELCONSUMP (PAGE 239) and BOATSPEED (PAGE 239) are configured.</p>			

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Aftertreatment

DEF Level

Value group	Aftertreatment	Related FW	3.4.1
Resolution [units]	1 [%]		
Comm object	14522	Related applications	All
Description			
Indicates aftertreatment Diesel Exhaust Fluid tank level in percent.			

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DPF Soot Load

Value group	Aftertreatment	Related FW	3.4.1
Resolution [units]	[%]		
Comm object	15765	Related applications	All
Description			
The rate of soot in DPF (Diesel particulate filter).			

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DPF Ash Load

Value group	Aftertreatment	Related FW	3.4.1
Resolution [units]	[%]		
Comm object	12483	Related applications	All
Description			
The rate of ash in DPF (Diesel particulate filter).			

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Analog output (values) configuration

Any of values from the Source list can be configured to any physical or ECU / J1939 (virtual) Analog output.

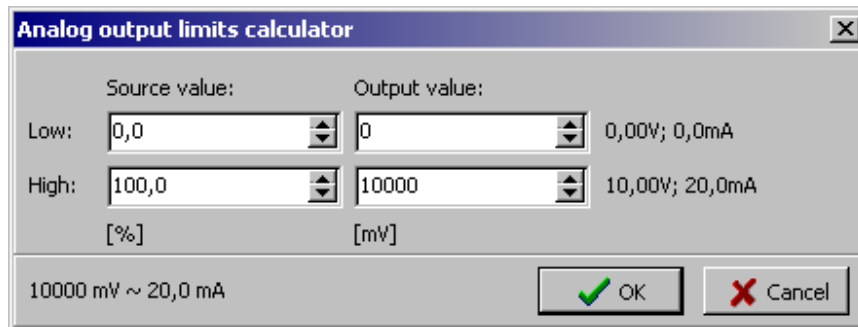
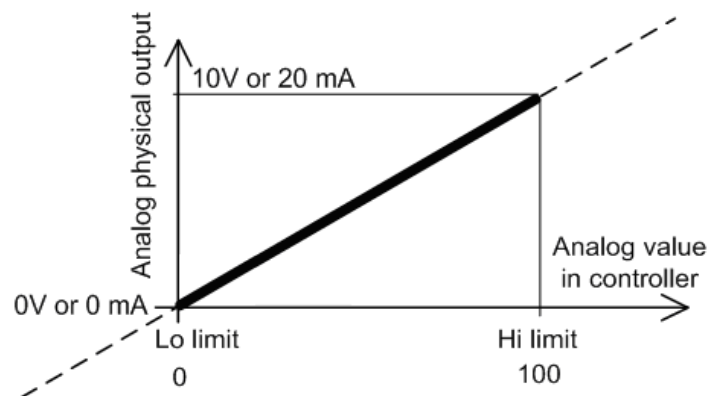
Analog outputs availability

Module	Number of outputs	Note
ID-SCM	3	10 V or 20 mA or 10 V / 10 kΩ
IGS-PTM	1	10 V or 20 mA
I-AOUT8	8	10 V or 20 mA or pwm
I-IO8/8	2	20 mA (10 V or pwm not supported by ID-DCU Marine 2.2)
ECU (J1939)	4 (virtual)	Format depends on ECU

Analog output configuration

It is possible to convert Source analog value by linear interpolation (conversion). The conversion is given by definition of two points, Low and High one.

Following is example of transfer characteristics 0 – 100 % to 0 – 20 mA.

Following are examples of transfer characteristics 0 – 100 % to 4 – 20 mA. The first case is transfer characteristics -25 – 100 % to 0 – 20 mA, it contains the needed conversion to 4 – 20 mA.

Analog output limits calculator

Source value: Output value:

Low: -25,0 0 0,00V; 0,0mA

High: 100,0 10000 10,00V; 20,0mA

[%] [mV]

10000 mV ~ 20,0 mA

Analog output limits calculator

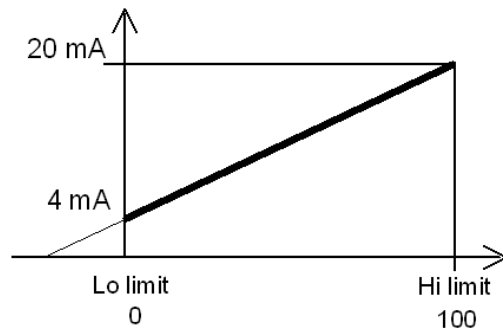
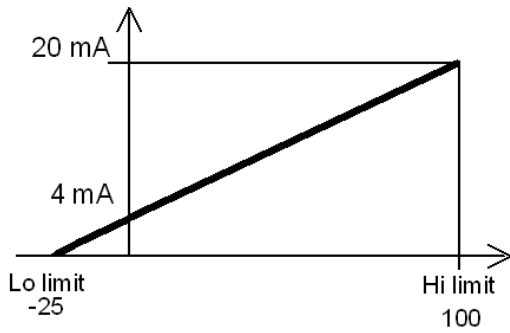
Source value: Output value:

Low: 0 2000 2,00V; 4,0mA

High: 100 10000 10,00V; 20,0mA

[%] [mV]

10000 mV ~ 20,0 mA



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8.2 Extensional modules

More technical details, wiring and settings about extensional modules can be found in Accessory Modules for IG-NT, IS-NT and ID-DCU.

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8.2.1 Intel AIN8 (I-AIN8)



Description

Intel AIN8 module is extension module equipped with analog inputs and impulse input.

The module can be used for ID-DCU, IntelMains-NT, IntelGen-NT and IntelSys-NT controllers.

This module is compatible with MTU ECU-7 at communication speed 125 kbps when uploaded with firmware 1.2.0 and higher.

The detection of communication speed is indicated by fast flashing of status LED. Once the speed is detected the module remains set for the speed even when the communication is lost. Renewal of communication speed detection is done by reset of the module.

Available inputs/outputs

Analog inputs

- ▶ 8 channels
- ▶ Can be configured as
 - Resistor three wire input
 - Current input
 - Voltage input

Impulse input

- ▶ 1 channel
- ▶ Can be configured as
 - Impulse
 - Impulse/time
 - RPM

All inputs can be configured to any logical function or protection.

It is possible to connect up to 10 modules to the IntelliGen-NT, IntelliSys-NT or IntelliMains-NT controllers or up to 4 modules to the ID-DCU.

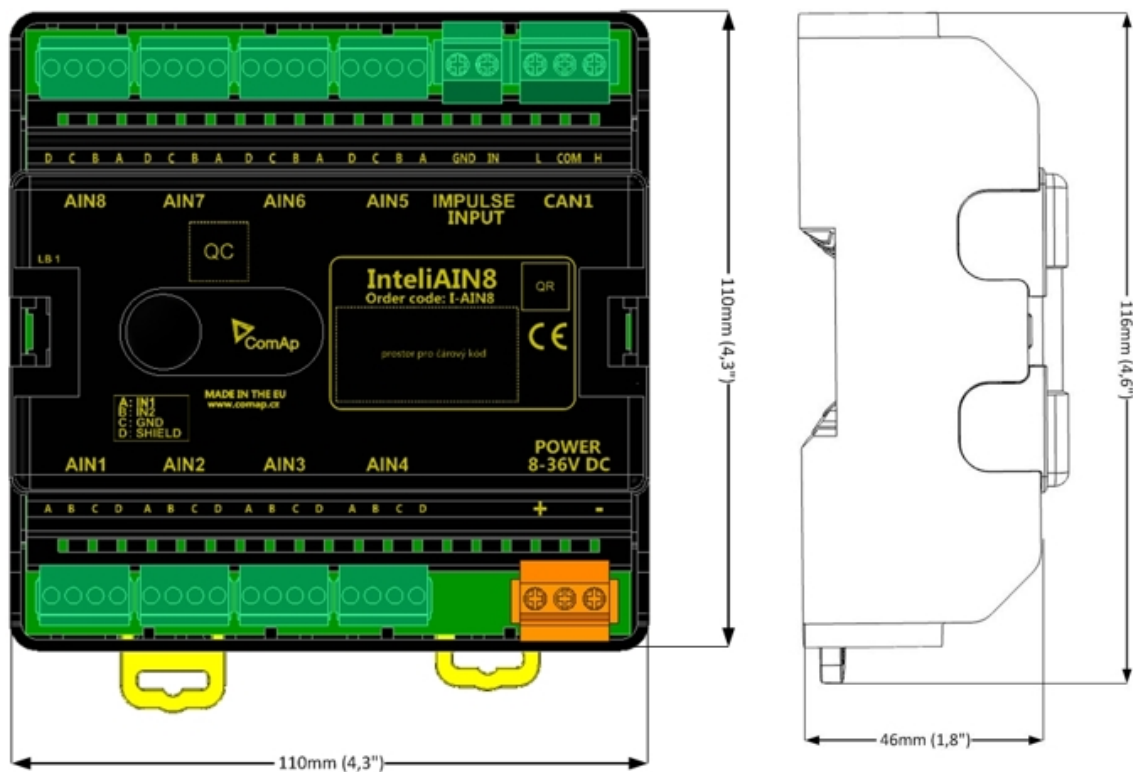
Inteli AIN8 module is connected to controller CAN1 bus.

Supported sensors

Sensors
User curves
PT100 [°C] (fix)
PT1000 [°C] (fix)
NI100 [°C] (fix)
NI1000 [°C] (fix)
PT100 [°F] (fix)
PT1000 [°F] (fix)
NI100 [°F] (fix)
NI1000 [°F] (fix)
0-250ohm (fix linear)
0-2400ohm (fix linear)
0-10k ohm (fix linear)
+/-1V (fix linear)

Sensors
0-2.4V (fix linear)
0-5V (fix linear)
0-10V (fix linear)
4-20mA passive (fix linear)
4-20mA active (fix linear)
0-20mA passive (fix linear)
+/-20mA active (fix linear)

Dimensions



Unit is 35 mm DIN rail mounted.

Terminals



ANALOG INPUT	8 analog Inputs
IMPULSE INPUT	1 impulse input
CAN	CAN1 line
POWER	Power supply
CAN LED Tx, Rx	Indication transmitted or received data
Status LED	LED indication of correct function
CAN terminator	Terminating CAN resistor (active in position "ON")
TEST jumper	Upgrade of sw
AT-LINK	Connector for AT-LINK

Address and DIP switch setting

Address configuration

DIP switch determines CAN address for analog inputs and impulse input too.

Programming Firmware

Firmware upgrade is via AT-link (TTL). For programming it is necessary to close jumper TEST.

For programming use FlashProg PC tool version 4.2 or higher.

LED indication

LED at power connector – status LED

LED status	Description
Dark	Fw in module does not work correctly.
Flashing	Module does not communicate with controller (in case non-zero CAN address)
Fast flashing	Detection of CAN communication speed
Lights	Power supply is in the range and the communication between Intel AIN8TC and controller works properly. Or power supply is in range and zero CAN address is set. (in case zero CAN address module doesn't communicate with the controller)

Impulse input configuration

(This input is supported in sw IGS-NT3.0 and higher)

(InteliGen-NT and InteliSys-NT support 1 impulse input (type Impulse or Impulse/time or Impulse+Impulse/time) and 1 RPM input or 2 RPM inputs)

After adding Inteli AIN8 module to configuration in DriveConfig / card Modules, you choose type of impulse input:

Module type	InteliAIN8
Module index	InteliAIN8 (1) ▼
Protection upon module failure	SHUTDOWN (RED) ▼
Module failure prefix	IAIN8(1)
Add screens	Yes ▼
Display data as	Number ▼
Impulse input type	None ▼
	None Impulse Impulse/time Impulse+Impulse/time RPM

After selection you configure input - in card "I/O", group "Impulse input"

RPM

In this case you can set name of this input and set the number of gear teeth.

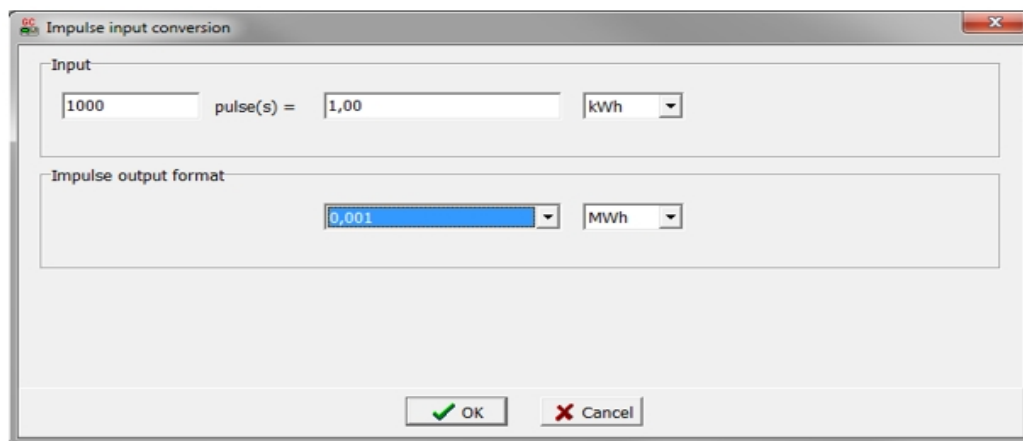
Value of RPM is placed in value group: "RPM & Imp/time"

Impulse

This setting is designed for reading of pulses from electricity meter or flow meter.

Configuration:

Property	Value
Conversion	1000 pulses = 1 kWh
Impulse input name	Imp 1
Impulse output format	0,001 MWh
Type of pulses	Electric meter
Ton min [ms]	30
Toff min [ms]	30



Example

We have electric meter, which gives 1000 pulses/ 1kWh.

Value, which is saved to statistic will be calculate to three decimal places and will be in MWh value. In case electricity meter is used, the valid pulse from electricity meter is defined by norm DIN 43864 and norm IEC 62053-31 – for equipment class A. In these norms the valid pulses are defined with these parameters: minimal $T_{on} \geq 30ms$, min $T_{off} \geq 30ms$.

In case flow meters you can use $T_{on} \geq 10ms$, min $T_{off} \geq 10ms$, or you can use option “Custom meter” where you can define any T_{on} and T_{off} .

Value is placed in value groupe: “Statistic“ This type of impulse input is designed for measurement of total electricity consumption – in this case.

Internal counter for this value

Example:

Property	Value
Conversion	1 pulse = 0,01 kWh
Impulse input name	Imp 1
Impulse output format	0,001 MWh
Type of pulses	Electric meter
Ton min [ms]	30
Toff min [ms]	30

Counter value for counting of value from input is with range **4 294 967 295**.

So, 100 pulses=0.01kWh => range is 4 294 967 2.95 kWh.

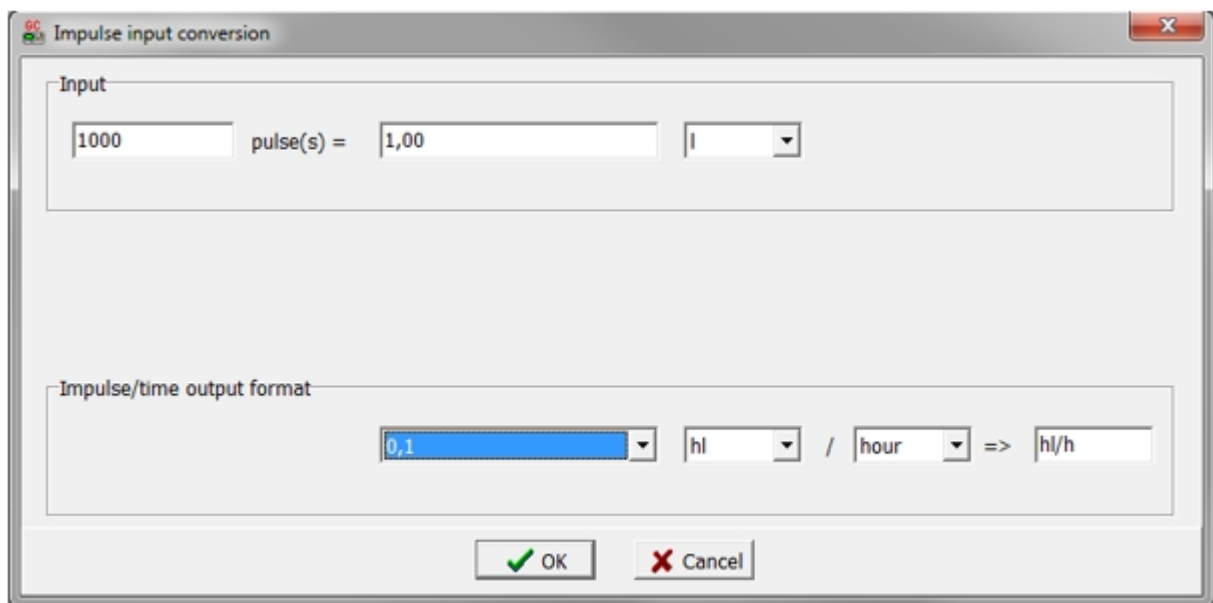
Output value is in MWh, so range is 4 294 9.67 295 MWh. [kWh ->MWh]

If counter value achieves this number (4 294 9.67 295 MWh), then it is cleared and count from 0 value again.

Impulse/time

This option counts pulses for any period and value says, how many pulses came in last defined period.

Property	Value
Conversion	1000 pulses = 1,00 l
Imp/time input name	Imp/time 1
Imp/time output format	0,1 h/lh
Type of pulses	Flowmeter
Ton min [ms]	10
Toff min [ms]	10



Example

We connected output from the flow meter to the impulse input and we want to measure volume of cooling water.

Flow meter gives 1000 pulses per 1 litre.

Our resulting value will be calculated to one decimal place and will be in hectoliters.

This value is placed in group value "RPM & Imp/time".

The value shows the flow of the cooling water in the last hour. Value is perpetually recounted.

Impulse+Impulse/time

In this option you can choose the combination of Impuls and Impuls/Time inputs.

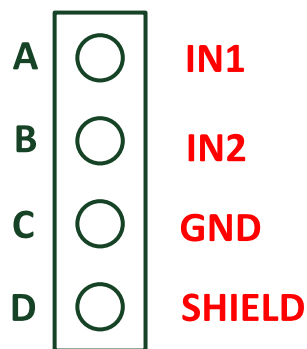
There are two value – total number of "pulses" and number of "pulses" per last period.

Description of both you can see higher.

Wiring

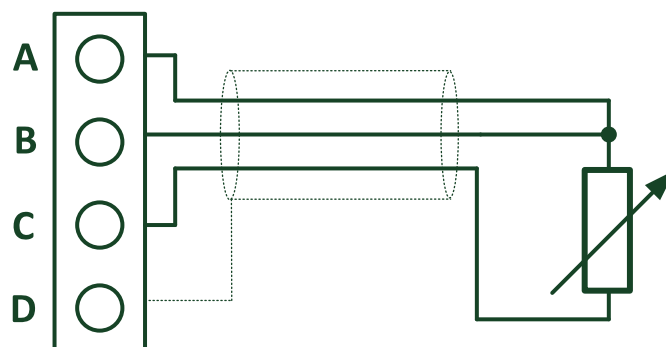
The following diagrams show the correct connection of sensors.

Terminator



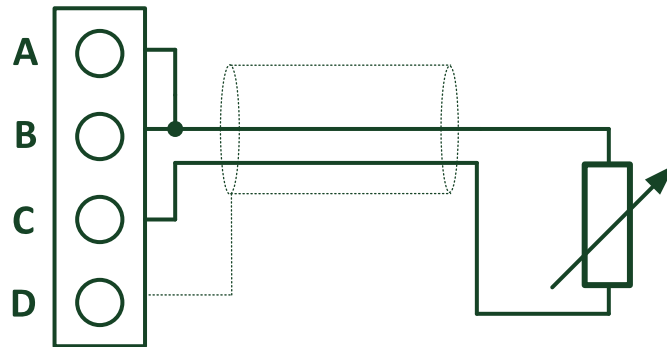
Measuring resistance

▶ 3 – wire measurement



Ranges: Pt100, Pt1000, Ni100, Ni1000, 0 – 250Ω, 0 – 2400Ω, 0 – 10kΩ

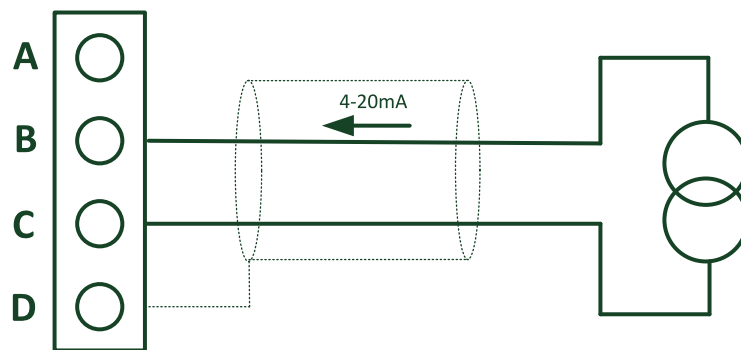
▶ 2 – wire measurement



Ranges: Pt100, Pt1000, Ni100, Ni1000, 0 – 250Ω, 0 – 2400Ω, 0 – 10kΩ

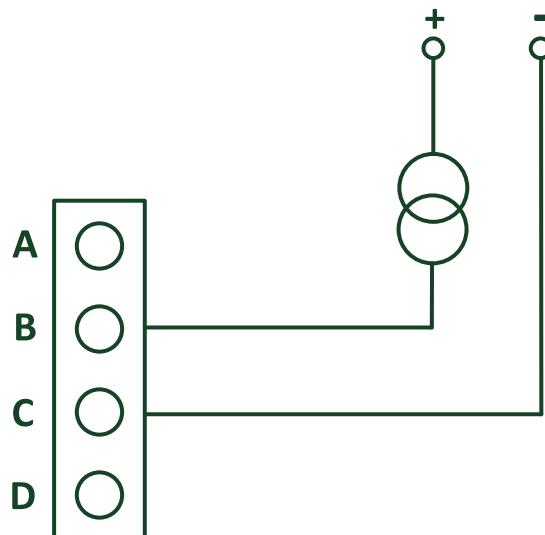
Measuring current

- ▶ Active sensor



Ranges: ±20mA, 4 – 20mA

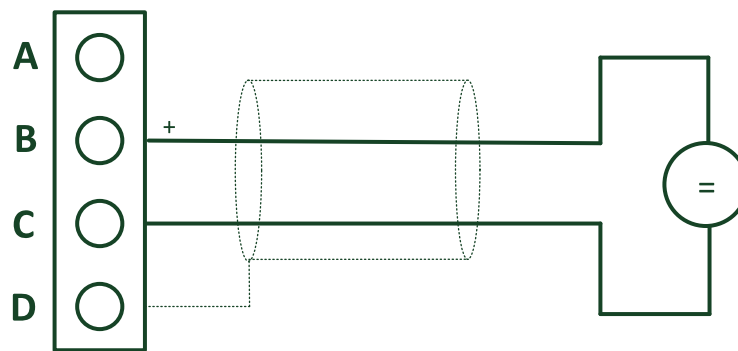
- ▶ Passive sensor



Ranges: 0 – 20mA, 4 – 20mA

Note: In case of power supply of sensor from the same source like power supply of Inteli AIN8 module – galvanic separation is lost.

Measuring voltage



Ranges: ± 1 V, 0–2,5 V, 0–5 V, 0–10 V

Impulse input

- ▶ 1 channel
- ▶ Can be configured as
 - Impulse
 - Impulse/time
 - RPM

All inputs can be configured to any logical function or protection.

It is possible to connect up to 10 modules to the IntelliGen-NT, IntelliSys-NT or IntelliMains-NT controllers or up to 4 modules to the ID-DCU.

Inteli AIN8 module is connected to controller CAN1 bus.

Technical data

Dimension (W × H × D)	110 × 110 × 46 mm (4,3" × 4,3" × 1,8")
Weight	221.5 grams
Interface to controller	CAN1

Analog inputs (not electric separated)		8 channels
*Voltage	Range	0-10 V
	Accuracy	$\pm 0,25$ % of actual value + ± 25 mV
Current	Range	± 20 mA
	Accuracy	± 0.25 % of actual value + ± 50 μ A
Resistance	Range	0- 10 k Ω
	Accuracy	± 0.5 % of actual value + ± 2 Ω
	Resistance	Pt100, Pt1000, Ni100, Ni1000 $\pm 2,5$ °C

Impulse input		
*RPM	Level of signal	2 Vpk-pk ÷ 70 Vpk-pk
	Frequency range	4 Hz ÷ 10 kHz

Impulse	Measurement of pulses by norm DIN 43864 and norm IEC 62053-31– equipment class A. For flow meter pulses: UH=30V, I _{max} =30mA, T _{on min} =10ms, T _{off min} = 10ms , OC
----------------	---

Galvanic separation	CAN bus is galvanic separated from the measurement and power supply. All analog inputs are galvanic separated from power supply. Analog inputs are not galvanic separated between channels
----------------------------	--

Power supply	8 to 36 V DC
Protection	IP20
Current consumption	35 mA at 24 V ÷ 100 mA at 8 V
Storage temperature	- 40 °C to + 80 °C
Operating temperature	- 30 °C to + 70 °C
Heat radiation	3 W

*RPM input – required level of signal for correct sensing

- ▶ Minimum input voltage 2 V_{pk-pk} (from 4 Hz to 4 kHz)
- ▶ Minimum input voltage 6 V_{pk-pk} (from 4 kHz to 10 kHz)

*Voltage measurement circuit was designed for lambda probe, for measurement thermocouples please use Inteli AIN8TC.

The product is fully supported in fw IGS-NT 3.0 or higher and in IGS-NT-branches based on this fw.

🔍 back to Extensional modules

8.2.2 Inteli AIN8TC

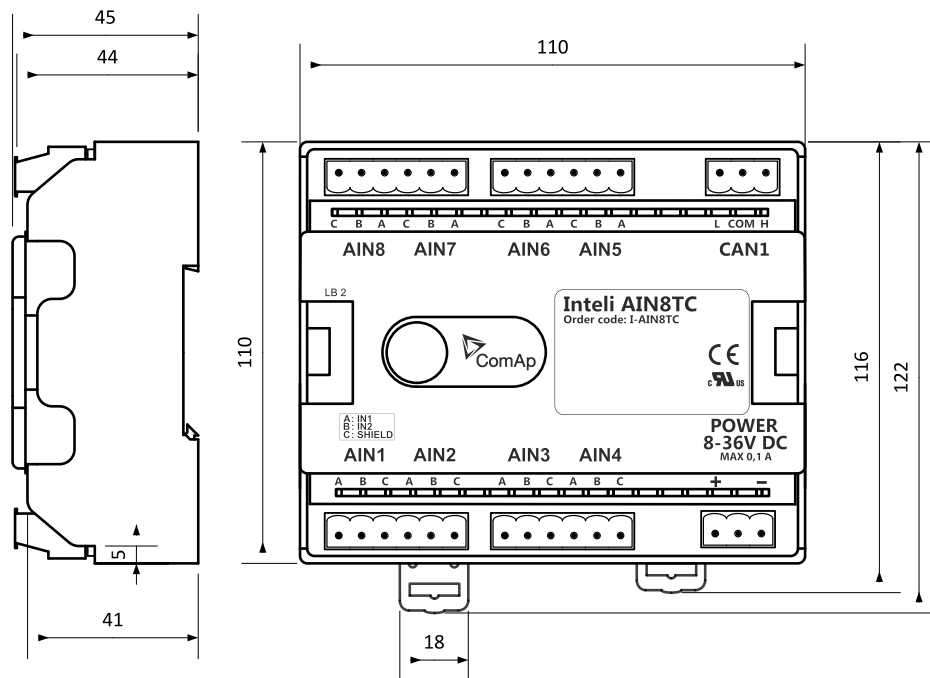


Image 8.4 Dimensions of Inteli AIN8TC

Inteli AIN8TC unit can be mounted on **DIN rail (35 mm)**.

All dimensions are in mm.

Available inputs

Analog inputs

- ▶ 8 channels
- ▶ can be configured as thermocouple sensors only

All inputs can be configured to any logical function or protection.

It is possible to connect up to 10 modules to the IntelliGen-NT, IntelliSys-NT or IntelliMains-NT controllers or up to 4 modules to the ID-DCU.

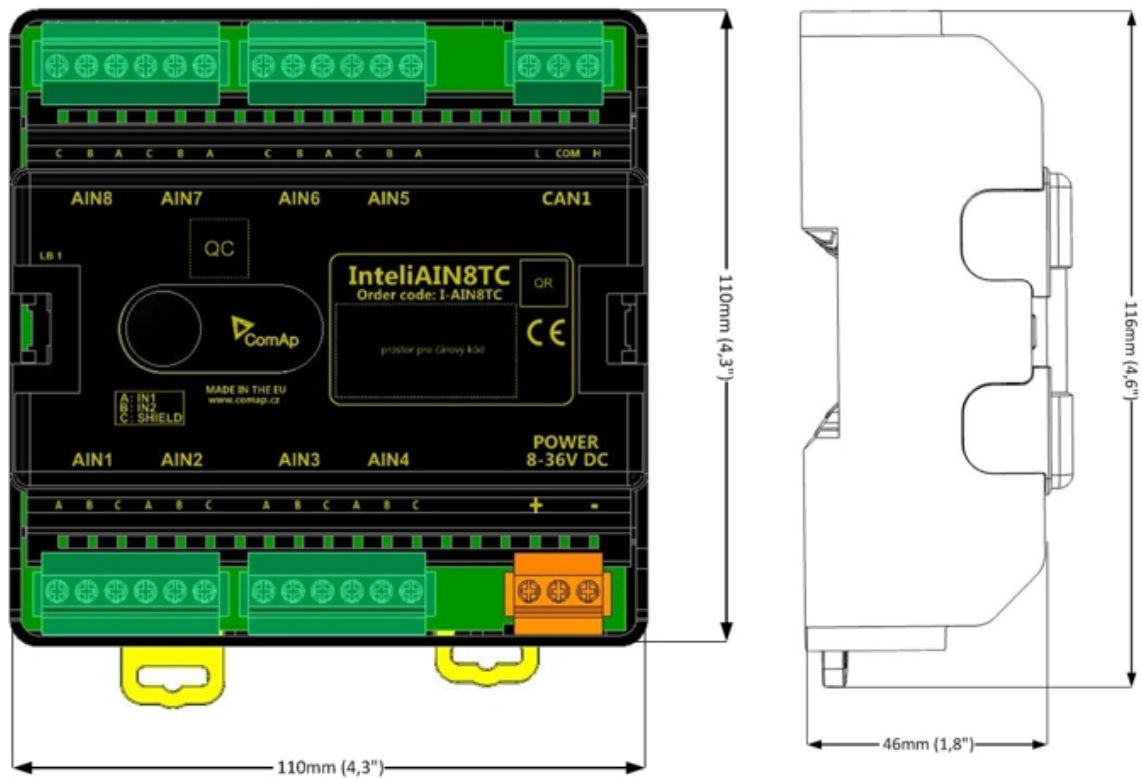
Inteli AIN8TC module is connected to controller CAN1 bus.

Supported sensors

Sensors
Thermocpl J [°C] (fix)
Thermocpl K [°C] (fix)
Thermocpl L [°C] (fix)
Thermocpl J [°F] (fix)
Thermocpl K [°F] (fix)
Thermocpl L [°F] (fix)
Thermocpl (nc) J [°C] (fix)
Thermocpl (nc) K [°C] (fix)
Thermocpl (nc) L [°C] (fix)
Thermocpl (nc) J [°F] (fix)
Thermocpl (nc) K [°F] (fix)
Thermocpl (nc) L [°F] (fix)

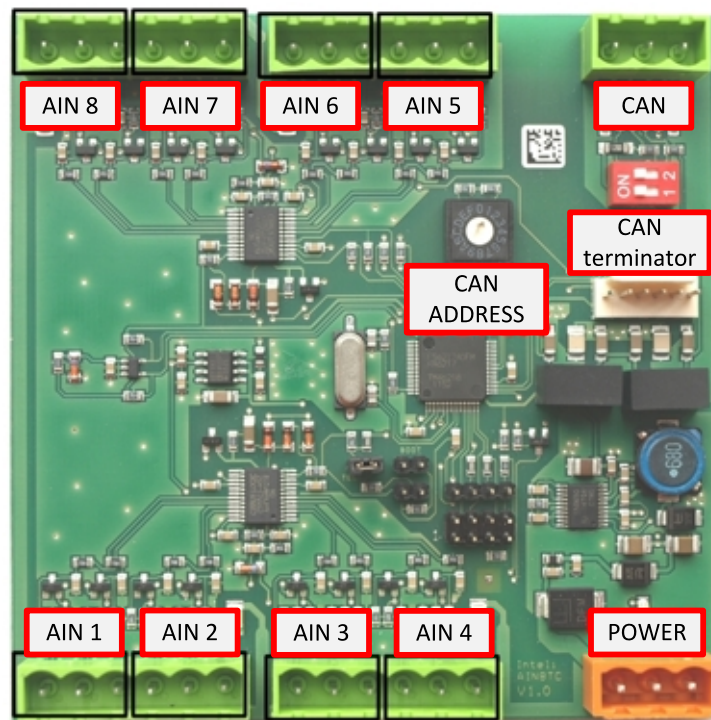
Note: “nc” means “not cold junction compensation (by external sensor). In this case is used internal temperature sensor on the PCB

Dimensions



Note: Unit is 35 mm DIN rail mounted.

Terminals



ANALOG INPUT	8 analog Inputs
CAN	CAN1 line
POWER	Power supply
CAN LED Tx, Rx	Indication transmitted or received data
Status LED	LED indication of correct function
CAN terminator	Terminating CAN resistor (active in position "ON")
TEST jumper	Upgrade of sw
AT-LINK	Connector for AT-LINK

Address and DIP switch setting

Address configuration

DIP switch determinates CAN address for analog inputs.

Programming firmware

Firmware is upgraded via AT-link (TTL). For programming it is necessary to close jumper TEST.

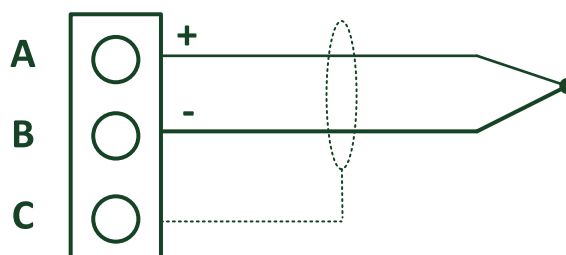
For programming FlashProg PC tool version 4.2 or higher must be used.

LED indication

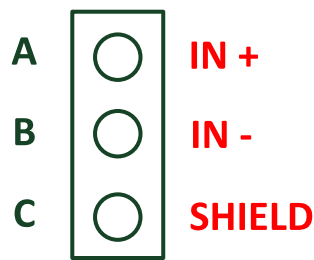
LED at power connector – status LED

LED status	Description
Dark	Fw in module does not work correctly.
Flashing	Module does not communicate with controller (in case non-zero CAN address)
Fast flashing	Detection of CAN communication speed
Lights	Power supply is in the range and the communication between Inteli AIN8TC and controller works properly. Or power supply is in range and zero CAN address is set. (in case zero CAN address module doesn't communicate with the controller)

Wiring



Terminator



Cold Junction Compensation (CJC) settings

Please have a look at Cold junction compensation in **Cold Junction Compensation (CJC)** (page 325) chapter.

Technical data

Dimension (W × H × D)	110 × 110 × 46 mm (4.3" × 4.3" × 1.8")
Weight	237.5 grams
Interface to controller	CAN1

Analog inputs (not electric separated)	8, no galvanic separated
Measuring Accuracy	±100 mV ± 0.1 % of actual value + ± 100 µV (± 3 °C)
Internal sensor for measuring cold junction - Accuracy	±1 °C in temperature range -20 °C ÷ +70 °C
Galvanic separation	CANbus is galvanic separated from the measurement and power supply. All analog inputs are galvanic separated from power supply. Analog inputs are not galvanic separated between channels

Power supply	8 to 36 V DC
Protection	IP20
Current consumption	35 mA at 24 V ÷ 100 mA at 8 V
Storage temperature	- 40 °C to + 80 °C
Operating temperature	- 30 °C to + 70 °C
Heat radiation	2 W

Thermocouples galvanically separated and galvanically non-separated are supported.

[◀ back to Extensional modules](#)

8.2.3 IntelI IO8/8 (I-IO8/8)



Description

IntelI IO8/8 module is an extension module equipped with binary inputs, binary outputs and analog outputs. The module can be used for ID-DCU, IntelIMains-NT, IntelIGen-NT and IntelISys-NT controllers.

“IntelI IO8/8” is the name of the module, but it is possible to configure the module (by internal switch) to two configurations:

- ▶ IntelI IO8/8 (8 binary inputs, 8 binary outputs and 2 analog outputs)
- ▶ IntelI IO16/0 (16 binary inputs, 0 binary outputs and 2 analog outputs)

This module is compatible with MTU ECU-7 at communication speed 125 kbps when uploaded with firmware 1.1.0 and higher.

The detection of communication speed is indicated by fast flashing of status LED. Once the speed is detected the module remains set for the speed even when the communication is lost. Renewal of communication speed detection is done by reset of the module.

Available inputs/outputs

Binary inputs

- ▶ 8 channels
- ▶ Can be configured as:
 - Pull up
 - Pull down

All 8 inputs are configured to one type together.

Binary outputs

- ▶ 8 channels
- ▶ Can be configured as:
 - High side switch
 - Low side switch

Always all 8 inputs are configured to one type (HSS/LSS) together.

All 8 outputs can be modified to inputs by switch on the PCB (IO 8/8 to IO 16/0).

New function “output state check” can be switched on for all 8 binary outputs.

Note: *Theory of binary inputs and outputs (page 349) (Pull Up, Pull Down, High side switch, Low side switch)*

“**Output state check**” function evaluates in real time the state of binary outputs and adjusted (required) state. In case of failure (different state of required state and real state) history record and alarm are issued (type of the alarm is set by “Protection upon module failure” - (no alarm/warning/SD)).

This function is designed for short-circuit or other failure, which causes change of set state of binary output.

Module type	IntelIO8/8
Module index	IntelIO8/8(1) ▼
Protection upon module failure	SHUTDOWN (RED) ▼
Module failure prefix	II08/8(1)
Add screens	Yes ▼
Output type	High side ▼
Output state check	Activated ▼
Input type	Pull up ▼

Analog outputs

- ▶ 2 channels
- ▶ Can be configured as:
 - Voltage 0-10V
 - Current 0-20mA
 - PWM (level 5V, with adjustable frequency from 200Hz to 2400Hz, with step 1Hz)

All inputs/outputs can be configured to any logical function or protection.

It is possible to connect up to 12 modules (in configuration 8inputs/8outputs) to the IntelliGen-NT, IntelliSys-NT or IntelliMains-NT controllers or up to 4 modules to the ID-DCU.

Intel IO8/8 module is connected to controller CAN1 bus.

Default configuration of module

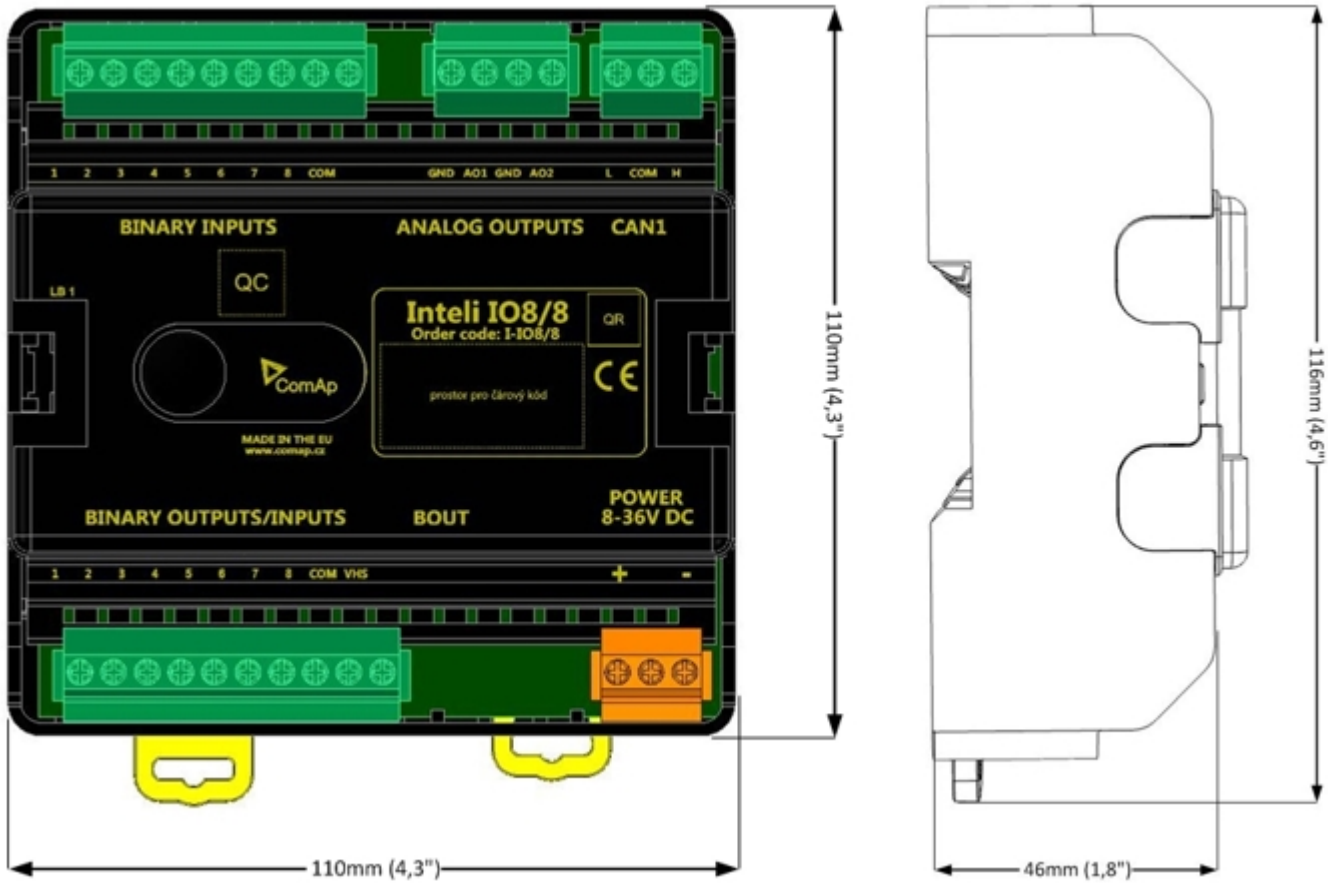
If the software of the controller supports this module, then you can configure inputs/output to all options.

In case that the software of the controller doesn't support this module, you can add this module to the configuration by generic extension (as group of 8 signals).

In this case you cannot define the type of Inputs/outputs, all inputs/outputs are configured as:

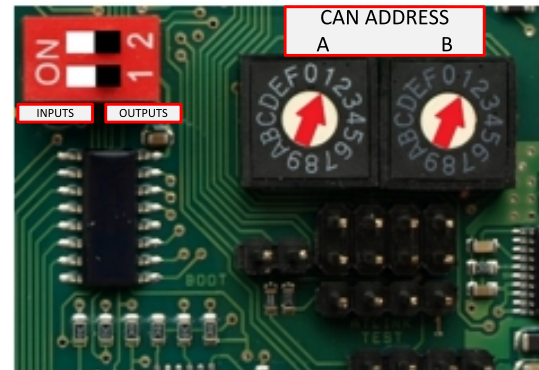
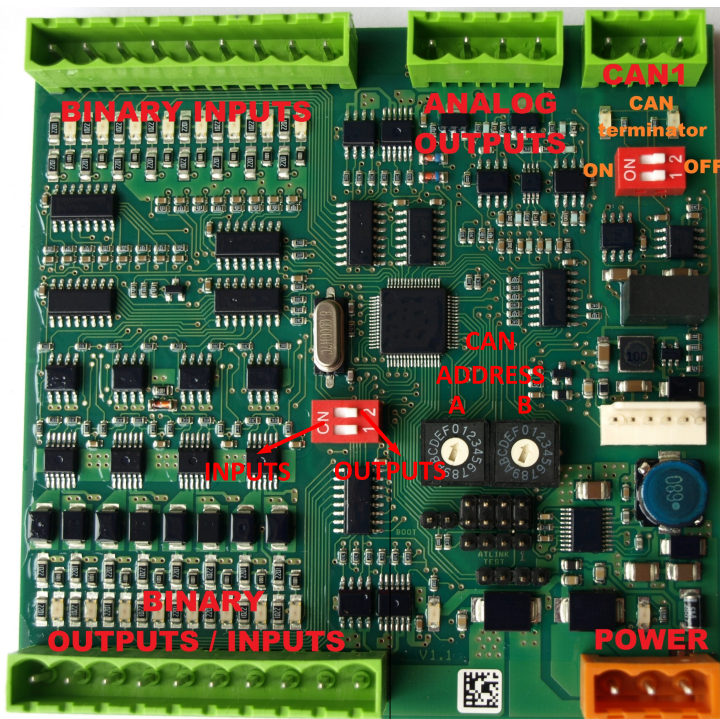
- ▶ Binary inputs - pull up
- ▶ Binary outputs - low side
- ▶ Analog output – current, range 0-20mA

Dimensions



Note: Unit is 35 mm DIN rail mounted.

Terminals



BINARY INPUTS	8 binary inputs
BINARY OUTPUT	8 binary outputs (8 binary inputs)
ANALOG OUTPUT	2 analog outputs
CAN	CAN1 line
POWER	Power supply
BINARY INPUTS LED	8 LEDs for binary input indication
BINARY OUTPUT LED	8 LEDs for binary output indication
CAN LED Tx, Rx	Indication transmitted or received data
Status LED	LED indication of correct function
Bout LED	Indicate binary outputs active (non-active = 16 binary inputs are active)
CAN terminator	Terminating CAN resistor (active in position "ON")
TEST jumper Upgrade of sw	Upgrade of sw
AT-LINK	Connector for AT-LINK

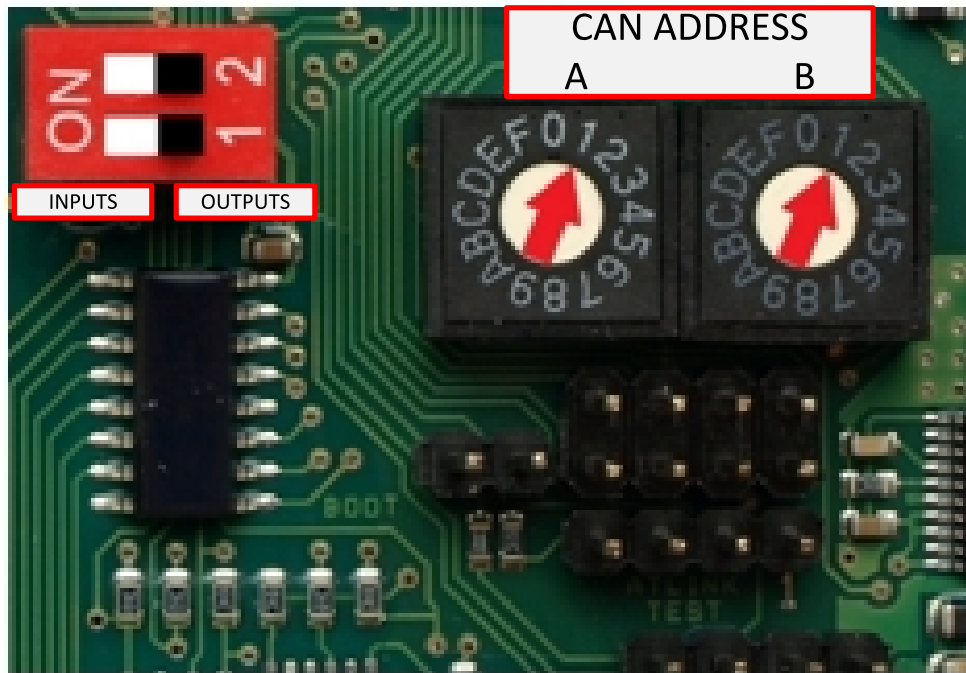
Address and DIP switches setting

Configuration as Intel IO8/8

CAN address for binary inputs is determined by DIP switch A, CAN address for binary output and analog outputs is determined by DIP switch B.

Configuration as Intel IO16/0

CAN address for binary inputs is determined by DIP switch A, first group of 8 input has address A, second group of 8 inputs has address A+1. CAN address of analog outputs is set by DIP switch B.



In case of setting the CAN address to zero, the appropriate group of signals is deactivated.

Programming Firmware

Firmware upgrade is via AT-link (TTL). For programming is necessary to close jumper TEST.

For programming FlashProg PC tool version 4.2 or higher must be used.

LED indication

Binary input

Each binary input has LED which indicates input signal. LED is shining when input signal is set, and LED is dark while input signal has other state.

Binary output

Each binary output has LED which indicates output signal. Binary output LED is shining when binary output is set.

Binary output status LED

When this LED is shining, then module is configured as 8 binary inputs and 8 binary outputs.

When this LED is dark, then the module is configured as 16 binary inputs.

LED at power connector – status LED

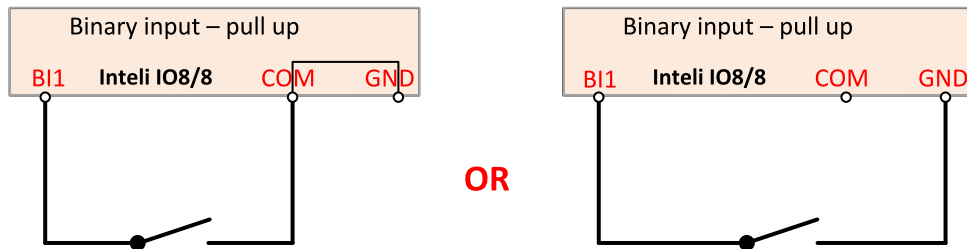
Led status	Description
Dark	Fw in module does not work correctly.
Flashing	At least one “group of signals” (binary inputs, binary outputs, analog outputs) with a non-zero address does not communicated.
Fast flashing	Detection of CAN communication speed
Lights	Power supply is in the range and communication between Inteli IO8/8 and controller properly works.

Wiring

Binary inputs

► Pull up

Two options of wiring

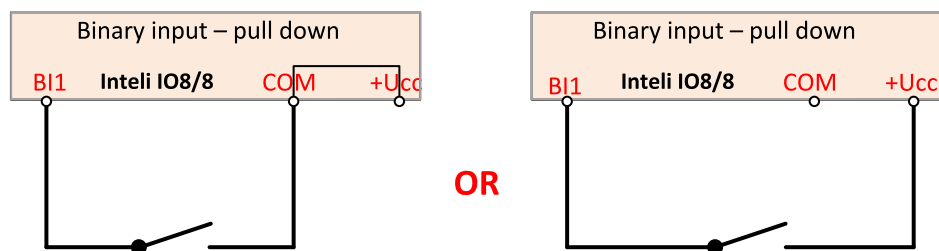


There are two options of wiring. On left side you can see case when binary input is connected between pins BI1 and COM (COM is connected internally to the GND).

On right side is case of wiring between pins BI1 and GND. Both ways are correct.

► Pull down

Two options of wiring



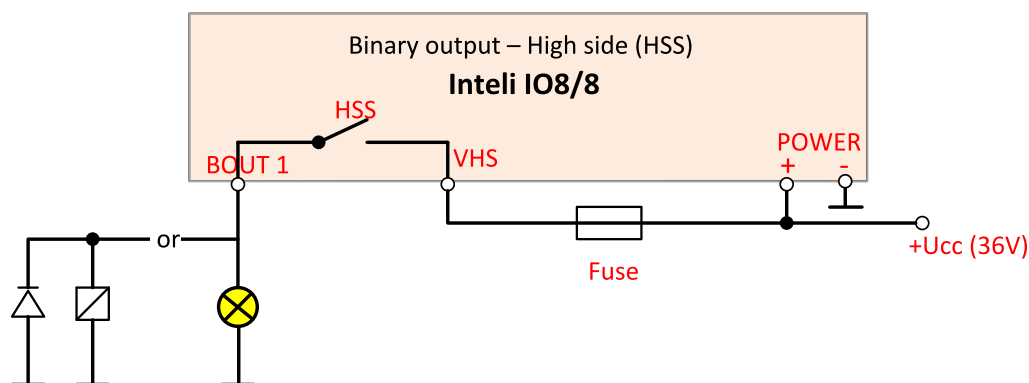
There are two options of wiring. On left side you can see case when binary input is connected between pins BI1 and COM (COM is connected internally to the +Ucc).

On right side is case of wiring between pins BI1 and +Ucc. Both ways are correct.

IMPORTANT: Do not connect COM pin to power (GND or Ucc). Otherwise the module will be damaged.

Binary outputs

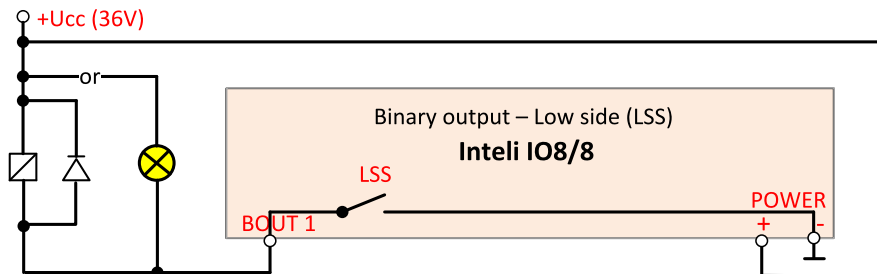
► High side



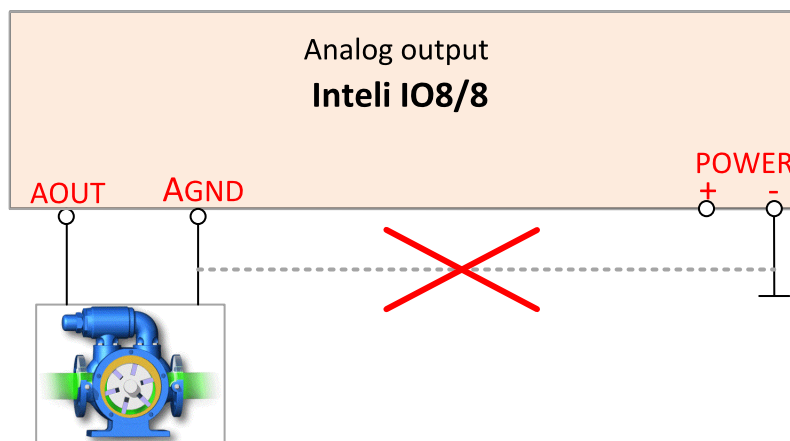
When High side setting of outputs is chosen - binary output must be connected to the plus potential (+ U_{cc}) of power supply connect directly to terminal VHS (voltage High side). Maximal current of each binary output is 500mA.

Size of fuse depends on load.

► Low side



Analog outputs



Terminator for analog output has special analog ground (AGND), which must not be connected to the GND. Limit of analog ground (AGND) is 100mA.

Technical data

Dimension (W × H × D)	110 × 110 × 46 mm (4.3" × 4.3" × 1.8")
Weight	240 grams
Interface to controller	CAN1

Binary inputs	
Input resistance	4400 Ω
Input range	0 to 36V DC
Switching voltage level for open contact indication	0 to 2 V
Max voltage level for close contact indication	6 to 36 V

Binary output (Open collector output)	
Max current	500 mA
Max switching voltage	36V DC

Analog output (not electric separated)		
Current	Range	0 - 20 mA
	Accuracy	$\pm 100 \mu\text{A} + \pm 0.5 \%$ of actual value (Rmax 500 Ω)
Voltage	Range	0 – 10 V
	Accuracy	$\pm 20 \text{ mV} + \pm 0.5 \%$ of actual value (Imax 5mA)
PWM	Level 5V, adjustable freq 200÷2400Hz (Imax 20 mA) (minimal step of pulse is 2 μs)	
Max current of AGND		100 mA

Galvanic separation	CAN bus is galvanic separated from the measurement and power supply. All Inputs/outputs are not galvanic separated from power supply
----------------------------	--

Power supply	8 to 36 V DC
Protection	IP20
Current consumption	35 mA at 24V ÷ 100 mA at 8 V
Storage temperature	- 40 °C to + 80 °C
Operating temperature	- 30 °C to + 70 °C
Heat radiation	4 W

The product is fully supported in fw IGS-NT 3.0 or higher and in IGS-NT-branches based on this fw.

[🔍 back to Extensional modules](#)

8.2.4 IS-BIN16/8



Description

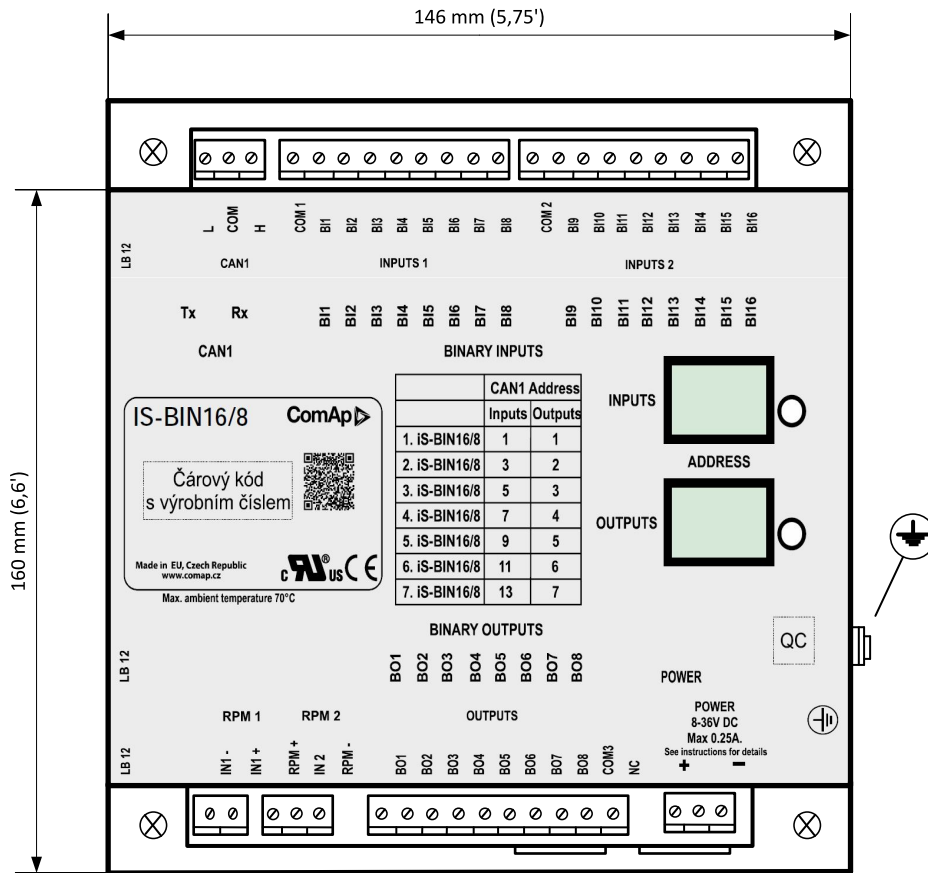
IS-BIN16/8 is an extension module with 16 binary inputs (galvanic separated) and 8 binary output (galvanic separated), 2 pulse inputs (frequency measurement or pulse counting). All I/O can be configured to any logical function or protection. It is possible to connect up to 6 IS-BIN16/8 external units to one controller. External modules IS-BIN16/8 is connected to controller CAN1 bus. To operate external modules:

- ▶ Connect all external modules to CAN1 bus line
- ▶ On each module adjust I/O CAN1 address in the range of 1 to 7 for IS-BIN16/8 output, 1,3,5,7,9,11,13 for IS-BIN18/8 inputs
- ▶ In case of use generic module in configuration you can set CAN address from 1 – 12
- ▶ In case of set 0 CAN address - inputs/ outputs are deactivated
- ▶ Input output address is displayed on the front panel LCD's
- ▶ Use PC configuration tool to configure controller according external modules setting

IS-BIN16/8 module has two separate CAN1 addresses for binary inputs Group 1, Group 2 and binary output Group (total three addresses). The CAN1 address for BI Group 1 and for BO Group 2 can be adjusted on the IS-BIN16/8. The address for BI Group 2 is set automatically to the address following BI Group 1.

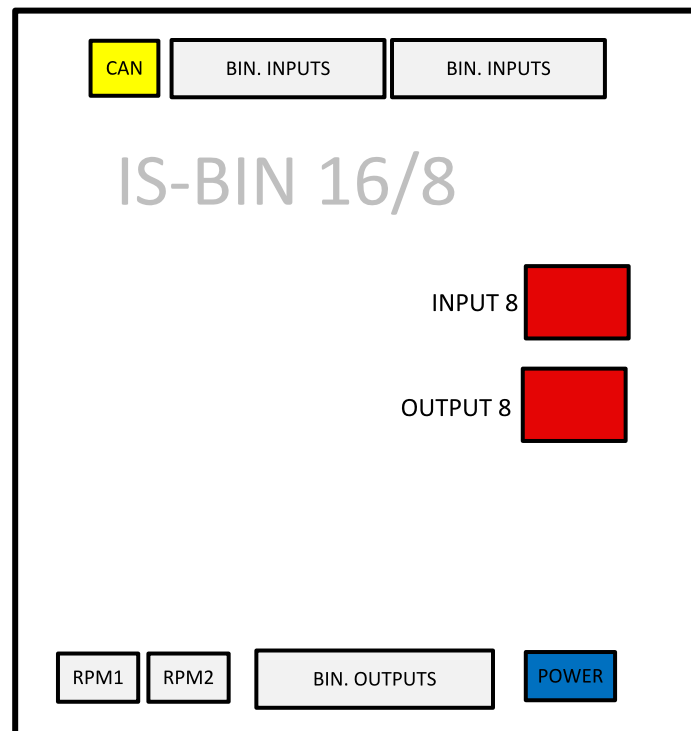
Note: CAN address 0 disables corresponding CAN message (Group data are not send).

Dimensions



Note: Unit is 35 mm DIN rail mounted.

Connectors



CAN	CAN1 line
BINARY INPUTS	16 binary inputs
BINARY OUTPUT	8 binary output
RPM1, RPM2	2 frequency inputs
POWER	Power supply
INPUTS	LDD CAN address
OUTPUT	LDD CAN address

Address and jumpers settings

CAN 1 address is setting by following procedure:

- ▶ Press Address buttons (for INPUTS address and OUTPUT address) during IS-BIN8 power supply on to switch to addressing mode.
- ▶ Then repeatedly press or keep pressed address button to adjust required address according to CONTROLLER configuration.
- ▶ After setting requested address, release the buttons and wait until the digits blink – it indicates write the changed address to EEPROM memory.

	CAN 1 Address	
	Inputs	Output
1. IS-BIN16/8	1	1
2. IS-BIN16/8	3	2
3. IS-BIN16/8	5	3
4. IS-BIN16/8	7	4

5. IS-BIN16/8	9	5
6. IS-BIN16/8	11	6
7. IS-BIN16/8	16	7

Table 8.3 Table of recommended CAN1 address setting

SW version check

Let suppose IS-AIN8 of SW version 1.4. Shortly press address button. Following sequence appears on the display: number “1”, one second pause, number “4”, two second pause, number “1”, one second pause, number “4”, two second pause and finally IS-AIN8 actual address.

Error message (e.g. SD BOUT2) appears on Controller screen when Binary input or output Address x is configured but corresponding unit is not recognized (no message is received from CAN bus). Check IS configuration and corresponding external IS-AIN, IS-BIN unit address setting.

LED indication

Tx			Rx		
Dark	Blink	Light	Dark	Blink	Light
Any data are transmitted on the CAN1 line	Data are transmitted on the CAN1 line		Any data are received on the CAN1 line	Data are received on the CAN1 line	

Table 8.4 Tx / Rx LED status

Wiring

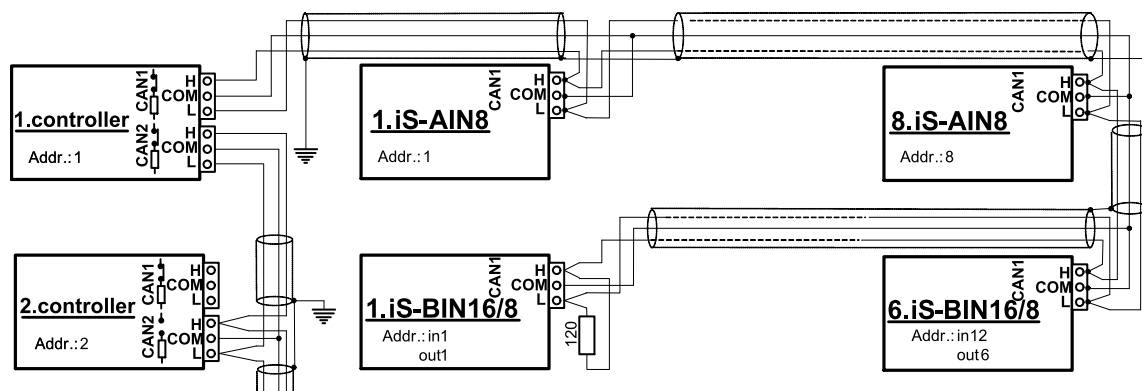


Image 8.5 CAN bus line has to be terminated by 120 ohm resistors on the both ends.

Note: CAN bus line has to be terminated by 120 ohm resistors on the both ends.

For longer distances is recommended to connect CAN COM terminals between all controllers and cable shielding to the **ground in one point!**

Recommended CAN bus data cables see in Chapter Technical data.

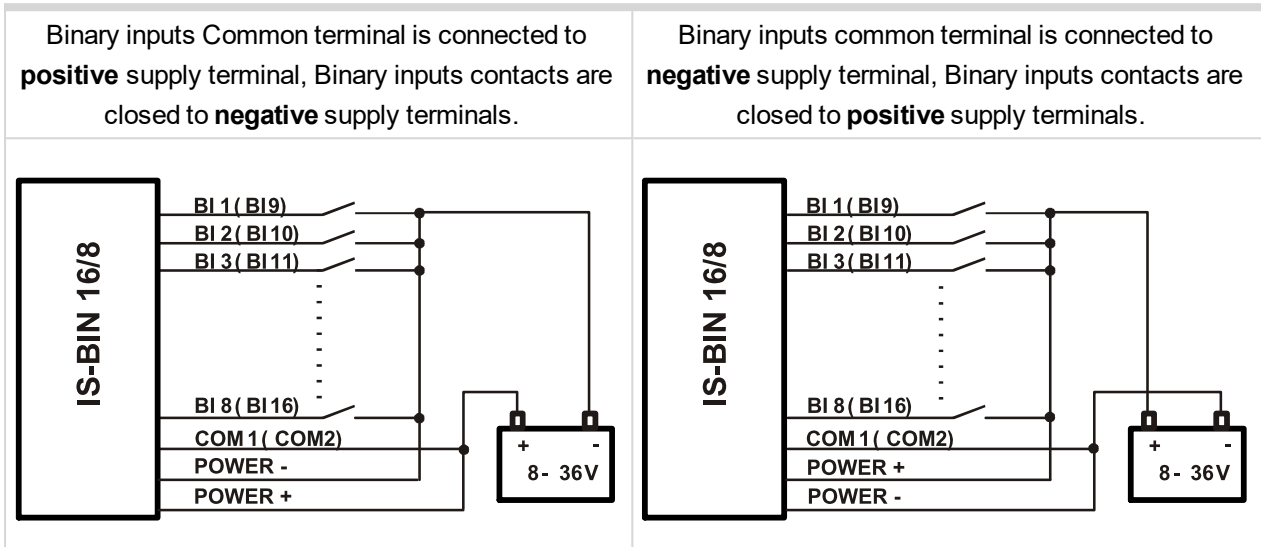
External units can be connected on the CAN bus line in any order, but line arrangement (no tails no star) is necessary-

Recommended CAN bus data cables see in Chapter Technical data.

Binary inputs

There are two groups of eight Binary inputs BI1 to BI8 and BI9 to BI16. Each group has a separate Common terminal COM1 and COM2. The Common terminal can be connected to positive or negative pole – see following drawing. Binary inputs are galvanically separated from IS-BIN16/8 power supply.

Note: Theory of binary inputs and outputs (page 349) (Pull Up, Pull Down, High side switch, Low side switch)



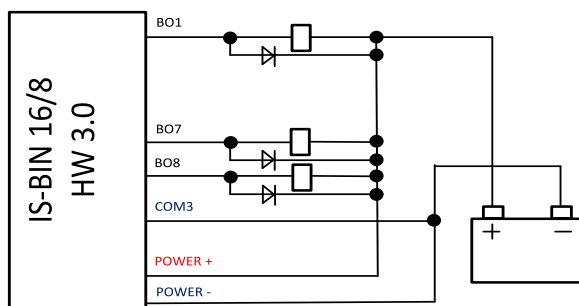
Input voltage range for opened contact is from 8 VDC to Power supply VDC. Input voltage range for closed contact is from 0 to 2 VDC. Voltage level is defined between Binary input and Binary input COM terminal and does not depend on “positive” or “negative” connection.

Impulse inputs do not work with IGS-NT controller.

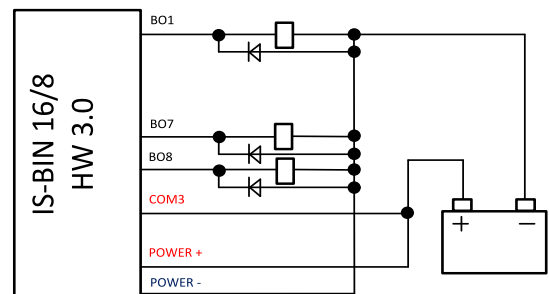
Binary output

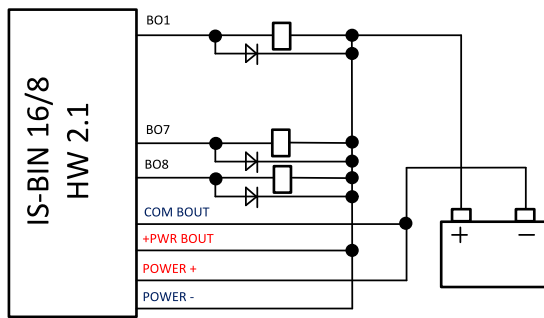
The Common terminal can be connected to positive or negative pole (HW3.0 only) – see following drawing. Binary outputs are galvanic separated from IS-BIN16/8 power supply (have a look at technical data). The maximum load values are 0.5 A / 36V for one output.

Binary output common terminal is connected to **negative** supply terminal, Binary output contacts are closed to **positive** supply terminals.



Binary output common terminal is connected to **positive** supply terminal, Binary output contacts are closed to **negative** supply terminals.





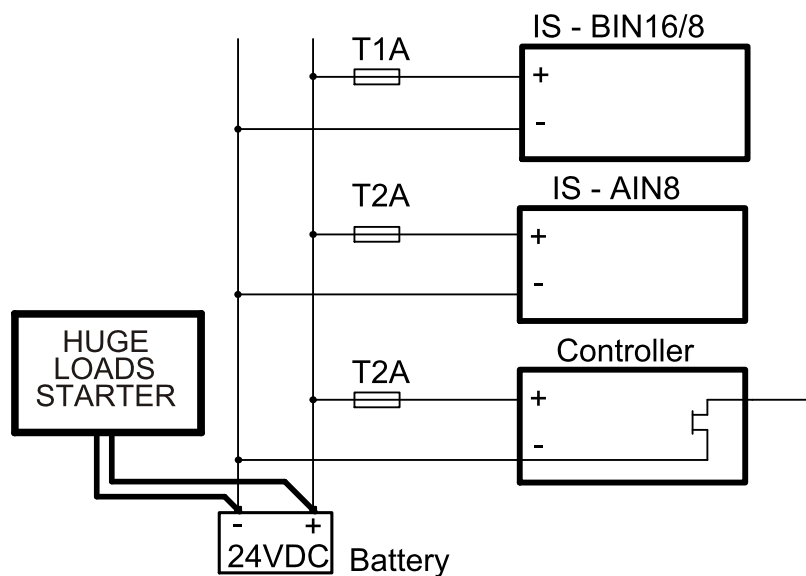
Power supply fusing

A (2) respectively (1) amp fuse should be connected in-line with the power to the controller and modules, these items should never be connected directly to the starting battery.

Take care for proper controller, extension units and relays power supply fusing. Fuse value and type depends on number of connected devices and wire length.

Controller or unit	Fuse
Controller	T1A or T2A
IS-AIN8	T2A
IS-BIN16/8	T1A

Table 8.5 Recommended fuse (not fast) types



For more extension units use separate fusing according to the table above.

Controller power supply should never be connected to starter terminals.

Technical data

Dimension (W × H × D)	146 × 160 × 46 mm (5.79' × 6.6' × 1.83')
Interface to controller	CAN1

Relays inputs (galvanic separated)
Voltage level is defined between binary input and binary input COM terminal

Number of inputs	8 + 8
Input resistance	3000 Ω
Input voltage range	0-36 VDC
Input voltage level for open contact	8 to Power supply VDC
Input voltage level for close contact	0 to 2 VDC

Frequency inputs* (for IS-CU only)
RPM1

Type of sensor	Magnetic pick-up
Minimum input voltage	2 Vpk-pk (from 4 Hz to 4 kHz)
Maximum input voltage	50 Veff
Maximum measured frequency	8 kHz (min. input voltage 6Vpk-pk), frequency mode

RPM2

Type of sensor	Contact or Active sensor
Minimal pulse width	10 ms, integration mode
Maximum measured frequency	60 Hz, integration mode

Relays outputs (galvanic separated) only HW 3.0 (non galvanic separated) HW 2.1

Number of output	8
Maximum current	0.5A DC
Maximum switching voltage	36 VDC

Power supply	8 to 36 V DC
Protection front panel	IP20
Current consumption	250 mA** at 24 V
Humidity	95% without condensation
Storage temperature	- 40 °C to + 80 °C
Operating temperature	- 30 °C to + 70 °C
Heat radiation	2 W

Standard conformity

Number of output	8
Low Voltage Directive	EN 61010-1:95 +A1:97
Electromagnetic Compatibility	EN 50081-1:94, EN 50081-2:96 EN 50082-1:99, EN 50082-2:97

*RPM1, RPM2 are available in IS-CU only

**During powering up current can be up to 1.5A

 [back to Extensional modules](#)

8.2.5 IntelI AIO9/1 (I-AIO9/1)



Description

IntelI AIO9/1 module is extension module equipped with analog inputs and outputs – designed for DC measurement.

The module can be used for ID-DCU, IntelIMains-NT, IntelIGen-NT and IntelISys-NT controllers.

This module is compatible with MTU ECU-7 at communication speed 125 kbps when uploaded with firmware 1.2.0 and higher.

The detection of communication speed is indicated by fast flashing of status LED. Once the speed is detected the module remains set for the speed even when the communication is lost. Renewal of communication speed detection is done by reset of the module.

Available inputs/outputs

Analog inputs

- ▶ 4 channels AIN1 – AIN4 can be configured as:
 - Sensor $\pm 65V$ (it is determined for measurement of battery voltage)
- ▶ 4 channels AIN5 – AIN8 can be configured as:
 - Thermocouples – type J, K or L (in $^{\circ}C$ or $^{\circ}F$)
 - Sensor $\pm 75mV$ DC – (for connecting current shunts)
- ▶ 1 channel AIN9 can be configured as:
 - RTD (Pt1000, Ni1000)
 - Common resistance 0-2400 Ω

Analog outputs

▶ 1 channel AOUT1. Type of output:

- 0-10V DC
- 0-20mA
- PWM (5V, freq 2,4Hz \pm 2,4kHz)

▶ Analog output has 4-pins connector – GND and one pin for each type of output.

All analog inputs can be configured to any logical function or protection.

It is possible to connect up to 5 modules to the IntelliGen-NT, IntelliSys-NT or IntelliMains-NT controllers.

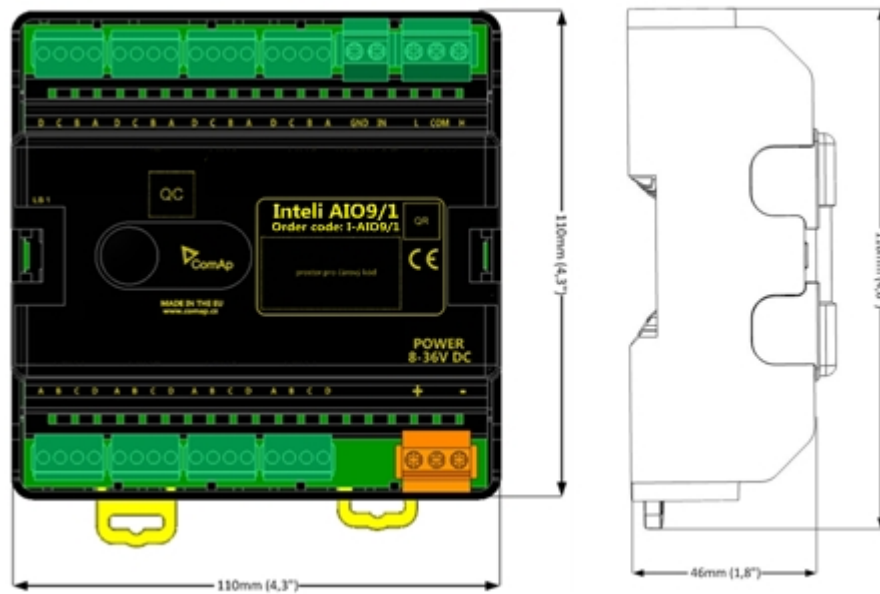
In case of connection Intelli AIO9/1 module to ID-DCU controller – number of module depends on using fw.

Intelli AIO9/1 module is designed for connecting to controller CAN1 bus.

Supported sensors

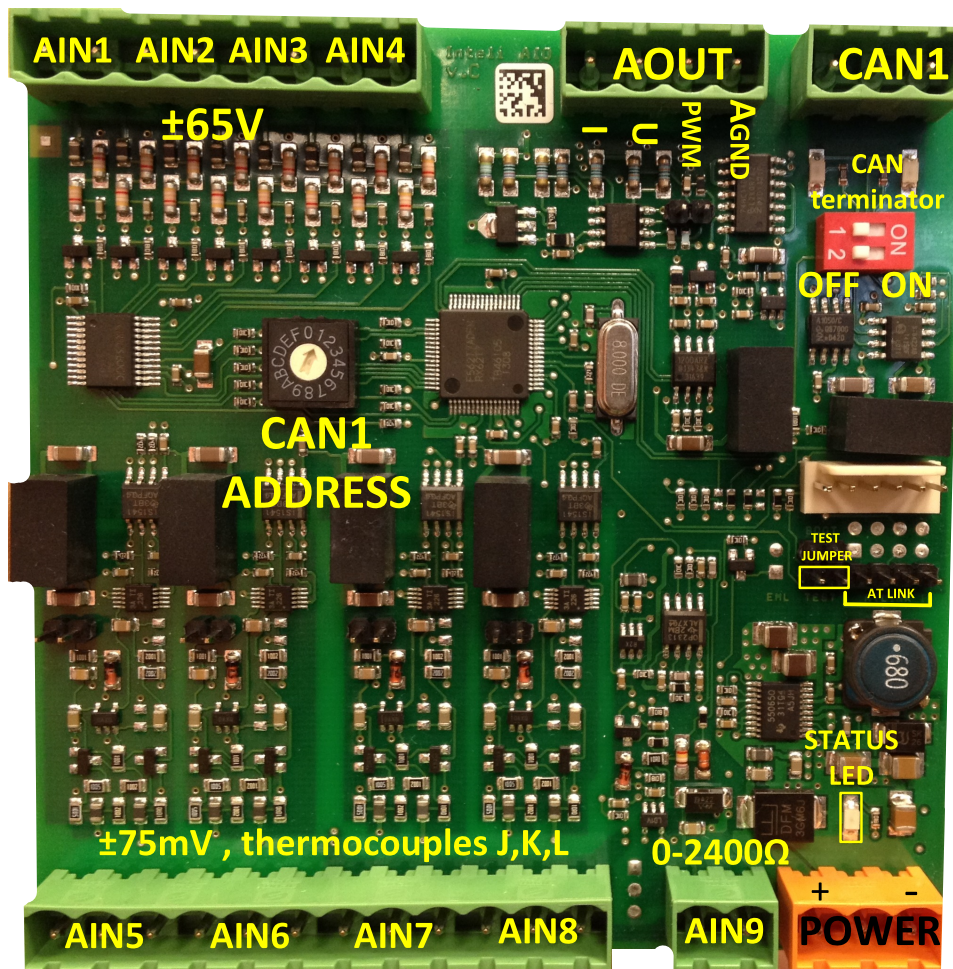
Sensors
User curves
PT1000 [°C] (fix)
NI1000 [°C] (fix)
0-2400Ω (fix linear)
± 65 V DC (fix linear)
+/-75mV (fix linear)
Thermocpl J [°C] (fix)
Thermocpl K [°C] (fix)
Thermocpl L [°C] (fix)
Thermocpl (nc) J [°C] (fix)
Thermocpl (nc) K [°C] (fix)
Thermocpl (nc) L [°C] (fix)
Thermocpl (nc) J [°F] (fix)
Thermocpl (nc) K [°F] (fix)
Thermocpl (nc) L [°F] (fix)

Dimensions



Unit is 35 mm DIN rail mounted.

Terminals



ANALOG INPUT	9 channels
ANALOG OUTPUTS	1 channel
CAN	CAN1 line
POWER	Power supply
CAN LED Tx, Rx	Indication transmitted or received data
Status LED	LED indication of correct function
CAN terminator	Terminating CAN resistor (active in position "ON")
TEST jumper	Upgrade of sw
AT-LINK	Connector for AT-LINK (Upgrade of sw)

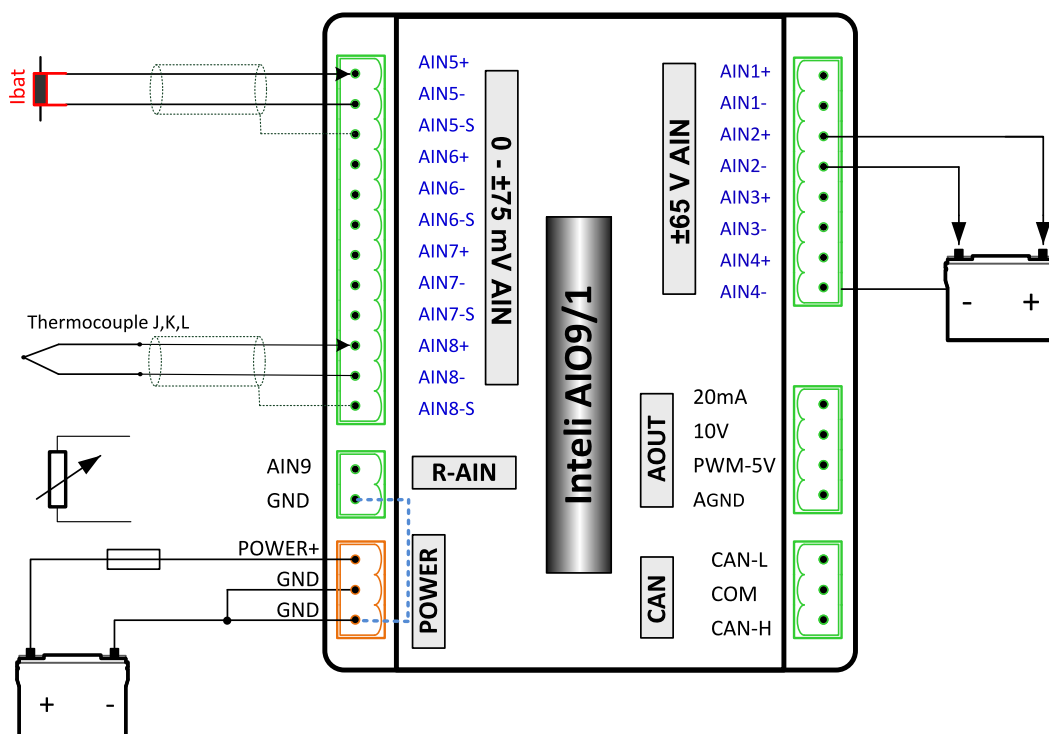
LED indication

LED at power connector – status LED

LED status	Description
Dark	Fw in module does not work correctly.
Flashing	Module does not communicate with controller (in case non-zero CAN address)
Fast flashing	Detection of CAN communication speed
Lights	Power supply is in the range and the communication between Inteli AIN8TC and controller works properly. Or power supply is in range and zero CAN address is set. (in case zero CAN address module doesn't communicate with the controller)

Wiring

The following diagrams show the correct connection of sensors.



Measuring resistance – AIN9

- ▶ 2 – wire measurement



Ranges: Pt1000, Ni1000, 0 – 2400 Ω .

Analog input 9 is determined for measuring resistance only.

Technical data

Dimension (W × H × D)	110 × 110 × 46 mm (4.3" × 4.3" × 1.8")
Weight	248 grams
Interface to controller	CAN1 – galvanic separated from power supply and measurement,

Analog inputs (not electric separated)		9 channels
AIN1-AIN4 – Voltage inputs	Range	0-65 V \pm 0.25 % of actual value + \pm 120 mV Measurement is not galvanic separated from power supply, but IN- is not interconnected with GND – there is floating measurement.
	Accuracy of measurement	\pm 0,1 % of actual value + \pm 100 μ V (\pm 3 $^{\circ}$ C)
AIN5-AIN8 – Voltage inputs	Range	\pm 75 mV (nominal) (measurement up to \pm 80 mV)
	Accuracy of measurement	\pm 0.1 % of actual value + \pm 75 μ V Galvanic separated from power supply
AIN9 resistance input	Range	0- 2400 Ω
	Accuracy of measurement	\pm 0.5 % of actual value + \pm 4 Ω Pt1000, Ni1000 \pm 2,5 $^{\circ}$ C It is not galvanic separated from power supply.

Analog output	
I	0-20mA /500Rmax. \pm 1 % of actual value + \pm 200 μ A
U	0-10V \pm 0.5 % of actual value + \pm 50 mV
PWM	– 5 V, 200 Hz-2.4kHz 15 mA max.
Galvanic separated from power supply	

Galvanic separation	CAN bus is galvanic separated from the measurement and power supply
----------------------------	---

Power supply	8 to 36 V DC
Protection	IP20
Current consumption	150 mA at 24 V ÷ 400 mA at 8 V
Storage temperature	- 40 °C to + 80 °C
Operating temperature	- 30 °C to + 80 °C

The product is fully supported in fw IGS-NT 3.1.1 or higher.

Information about support this module in IGS-NT fw branches and ID-DCU – please read New Feature Lists.

🔍 back to Extensional modules

8.2.6 IS-AIN8



Description

IS-AIN8 is input extension module equipped with 8 analog inputs. The module can be used for ID, IGS-NT controller. IS-AIN8 can be configured to:

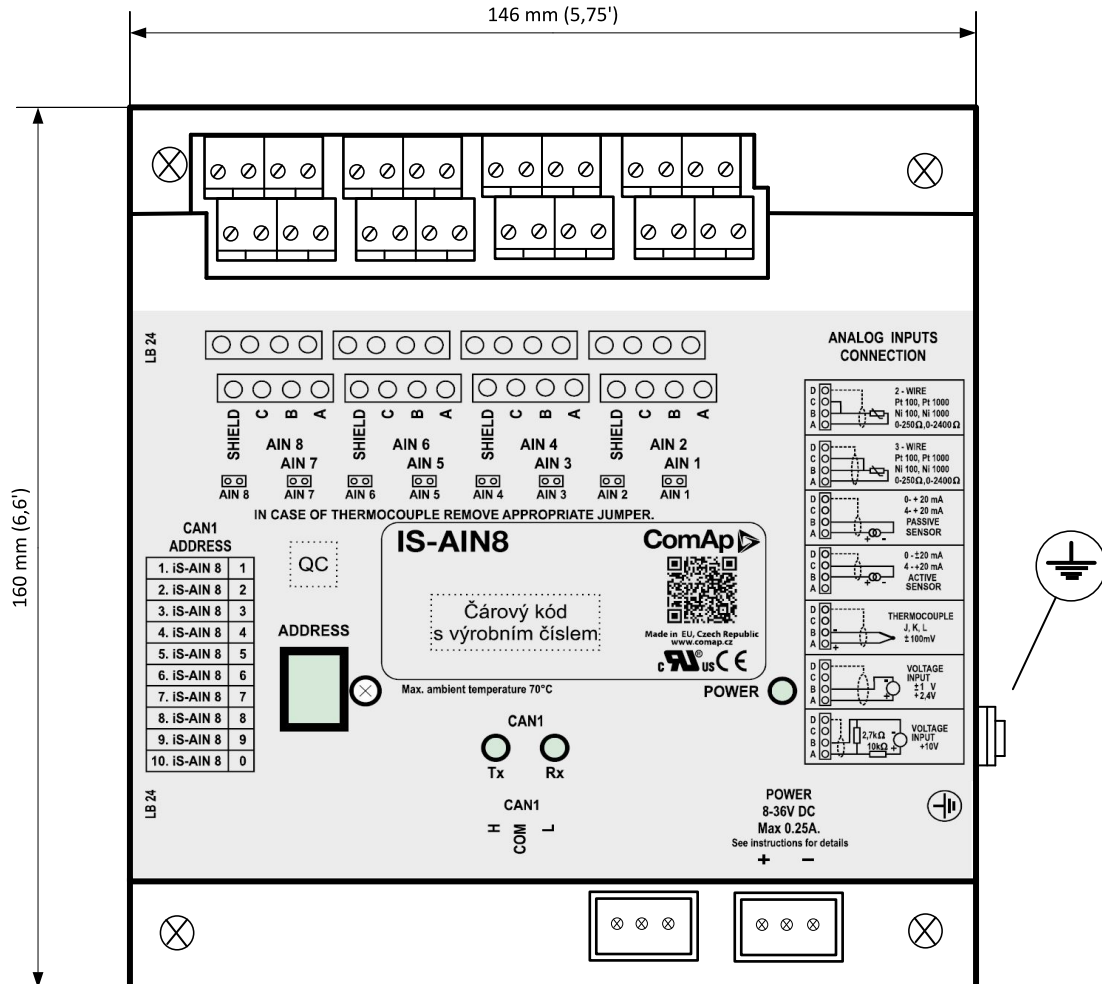
- ▶ Resistor two wire input
- ▶ Resistor three wire input
- ▶ Current input
- ▶ Thermocouple input
- ▶ Voltage input

All inputs can be configured to any logical function or protection. It is possible to connect up to 10 IS-AIN8 (with IGS-NT) or up to 4 (with ID) external units to one controller. IS-AIN8 is connected to controller CAN1 bus.

This module is compatible with MTU ECU-7 at communication speed 125 kbps when uploaded with firmware 1.2.0 and higher.

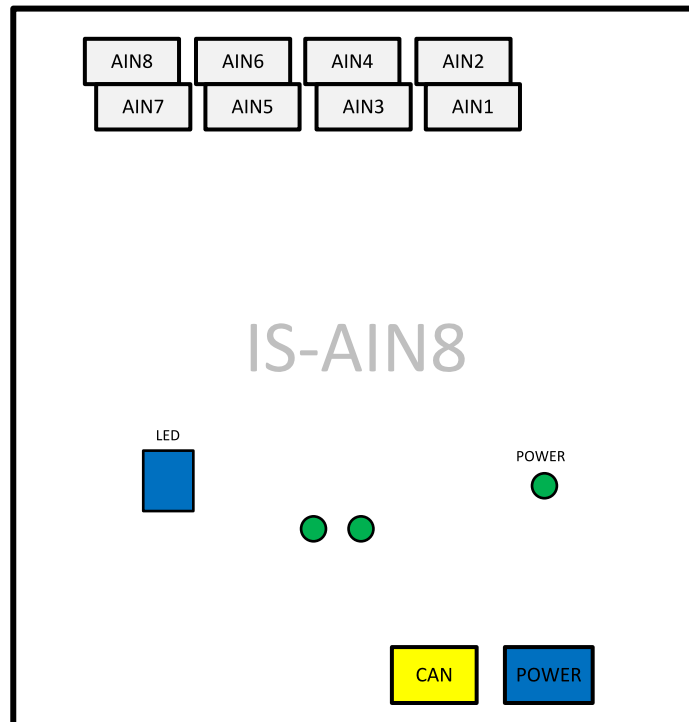
The detection of communication speed is indicated by fast flashing of status LED. Once the speed is detected the module remains set for the speed even when the communication is lost. Renewal of communication speed detection is done by reset of the module.

Dimensions



Note: Unit is 35 mm DIN rail mounted.

Connectors



AIN1 – AIN8	8 analog inputs
CAN	CAN1 line
POWER	Power supply
POWER	State indication
Rx, Tx	Data transmitted and received on CAN1 line
LDD	CAN1 adress

Address and jumper settings

CAN 1 address is set by following procedure:

1. Press Address button during IS-AIN8 power supply on to switch to addressing mode.
2. Then repeatedly press or keep pressed address button to adjust required address according to controller configuration.
3. After setting requested address, release the buttons and wait until the digits blink – it indicates writing of the change address to EEPROM memory.

	CAN 1 Address
1. IS-AIN8	1
2. IS-AIN8	2
3. IS-AIN8	3
4. IS-AIN8	4
5. IS-AIN8	5
6. IS-AIN8	6

7. IS-AIN8	7
8. IS-AIN8	8
9. IS-AIN8	9
10. IS-AIN8	0

Table 8.6 Table of recommended CAN1 address setting

SW version check

Let suppose IS-AIN8 of SW version 1.4. Shortly press address button. Following sequence appears on the display: number “1”, one second pause, number “4”, two second pause, number “1”, one second pause, number “4”, two second pause and finally IS-AIN8 actual address. Error message (e.g. SD BOUT2) appears on Controller screen when Binary input or output Address x is configured but corresponding unit is not recognized (no message is received from CAN bus). Check IS configuration and corresponding external IS-AIN8, IS-BIN8/16 unit address setting.

LED indication

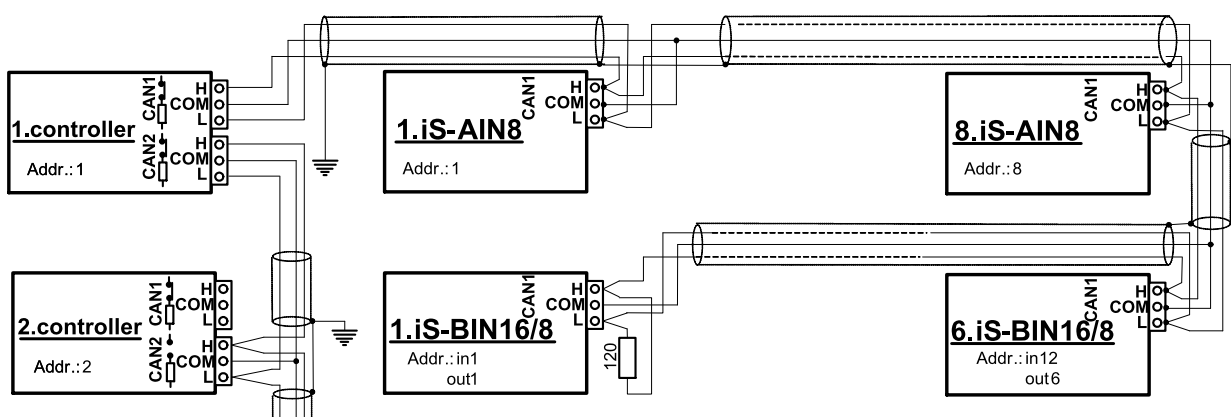
Power LED		Address LDD	
Lighting	Blink	Lighting	Blink
Power supply and CAN address are with no problems	CAN1 address is adjusted different in IS-AIN8 and in controller	Displaying current CAN1 address	Displaying current SW version

Table 8.7 LED / LDD status

Tx		Rx	
Lighting	Blink	Lighting	Blink
Any data are transmitted on the CAN1 line	Data are transmitted on the CAN1 line	Any data are received on the CAN1 line	Data are received on the CAN1 line

Table 8.8 Tx/Rx LED status

Wiring



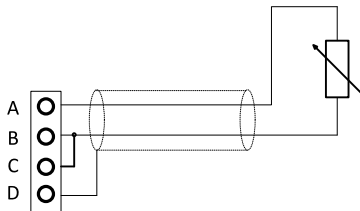
Note: CAN bus line has to be terminated by 120 Ω resistors on the both ends.

For longer distances is recommended to connect CAN COM terminals between all controllers and cable shielding to the **ground in one point!** External units can be connected on the CAN bus line in any order, but line arrangement (no tails no star) is necessary.

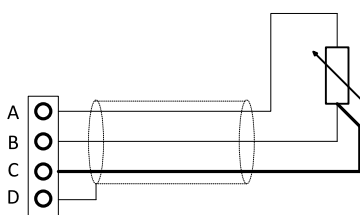
Recommended CAN bus data cables see in Chapter Technical data.

IG-MU and IG-IB units are connected to CONTROLLER CAN2 bus.

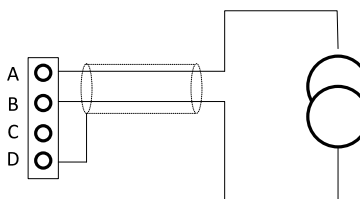
Select sensor characteristic from the list or define user sensor characteristic in PC configuration tool.



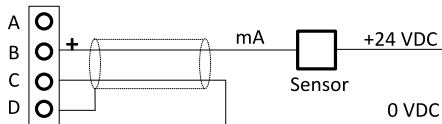
- ▶ Resistor sensor input – two wire connection.
- ▶ Range 0 to 2400 Ω.
- ▶ Pt100, Pt1000, Ni100, Ni1000
- ▶ D terminal is shielding



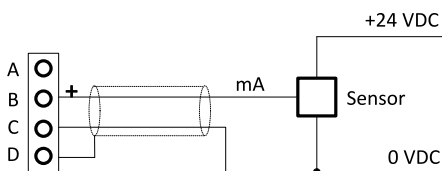
- ▶ Resistor sensor input – three wire connection.
- ▶ Range 0 to 2400 Ω.
- ▶ Pt100, Pt1000, Ni100, Ni1000 – recommended.
- ▶ D terminal is shielding



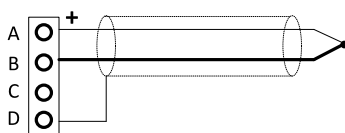
- ▶ Passive current sensor (current source is in IS-AIN8)
- ▶ Range 0 to +20 mA or 4 to + 0 mA
- ▶ D terminal is shielding



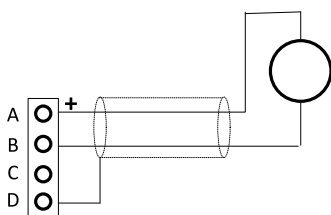
- ▶ Active current sensor (current source is in sensor)
- ▶ Range -20mA to +20 mA or 4 to +20 mA



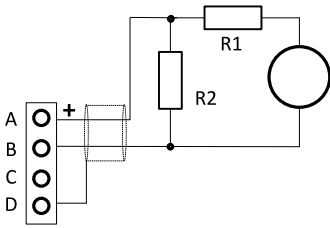
- ▶ D terminal is shielding



- ▶ Thermocouple J, K, L D terminal is shielding
- ▶ From IS-AIN8 hardware version 5.1 can be B terminal grounded to frame

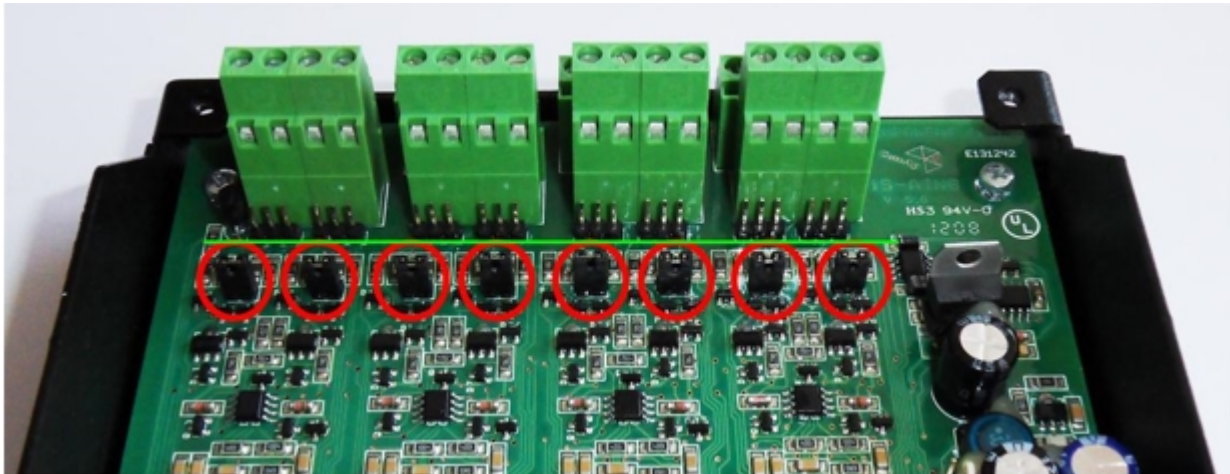



- ▶ Voltage input
- ▶ Range 0 to + 2500 mV.
- ▶ Voltage range is 0 to ±1000 mV.
- ▶ D terminal is shielding



- ▶ For 10 V input voltage range connects external resistors R1, R2 and select sensor characteristic 10 V
- ▶ R1=10 k Ω , R2=2.7 k Ω .
- ▶ D terminal is shielding

Note: If the thermocouples are connected to IS-AIN8, appropriate jumpers must be removed (see rear sticker). (jumpers are placed under the cover)



Sensor IS-AIN8	None	
	I-CB analog	Value is received from I-CB
	Pt100/°C	 Use button to create new sensor characteristic.
	Pt1000/°C	
	Ni100/°C	
	Ni1000/°C	
	Thermocouple J/°C	
	Thermocouple K/°C	
	Thermocouple L/°C	Adjust Range = maximal measured value
	4 to 20 mA passive	Adjust Range
	4 to 20 mA active	Adjust Range
	0 to 20 mA passive	Adjust Range
	0 ± 20 mA active	Adjust Range
	0-250 ohm	Adjust Range
	0-2400 ohm	Adjust Range
	0 – 2.4 V	
	±1 V	
	0 - 10 V	
	0 - 100mV	
	Pt100/°F	
	Pt1000/°F	
	Ni100/°F	
	Ni1000/°F	
	Thermocouple J/°F	
	Thermocouple K/°F	
	Thermocouple L/°F	

Cold Junction Compensation (CJC)

Cold junction compensation is also called reference junction compensation. When measuring temperature using thermocouples, the reference terminal may not be held at 0°C, but at the surrounding temperature of T1°C instead. Without any compensation, the thermocouple output will be changed (reduced) by T1°C. This is compensated by adding potential difference to the IS-AIN8 corresponding to T1°C.

1		✓
2		✓
3		✗
4		✗

- ▶ **Example 1** shows the correct temperature measurement. The 3rd metal (the cable between IS-AIN8 and thermocouple) is connected in cold bath which temperature is 0°C. This is very difficult to provide in real application.
- ▶ **Example 2** shows the correct temperature measurement. The 3rd metal (the cable between IS-AIN8 and thermocouple) is connected in ambient environment which temperature is not 0°C, but T1°C. Resultant temperature is correct, because is compensated by internal IS-AIN8 temperature sensor. The temperature of IS-AIN8 and junction is the same $T-T_1+T_1$ (reduced and compensated by T1).
- ▶ **Example 3** shows the incorrect temperature measurement. The 3rd metal (the cable between IS-AIN8 and thermocouple) is connected in ambient environment which temperature is not 0°C, but T1°C. Resultant temperature is $T-T_1$ (reduced by T1). Internal IS-AIN8 compensation should not be used because measures T2 temperature, not T1!
- ▶ **Example 4** shows the correct temperature measurement. The 3rd metal (the cable between IS-AIN8 and thermocouple) is connected in ambient environment which temperature is not 0°C, but T1°C. Resultant temperature is correct, because is compensated by external temperature sensor, $T+T_1$ (reduced and compensated by T1).

Cold Junction Compensation (CJC) settings

- ▶ **Example 1** is not a practical in regard of ice bath. In this case should any of not compensated (nc) sensors for analog input be selected base on used thermocouple.

Property	Value
Function	<input type="checkbox"/>
Protection	<input type="checkbox"/>
Name	AIN-1 1
Dim	-
Sensor	None
Resolution	Thermocpl L/°F
Sensor range	Thermo(nc) J/°C
Bargraph 0%	Thermo(nc) K/°C
Bargraph 100%	Thermo(nc) L/°C
Offset	Thermo(nc) J/°F
	Thermo(nc) K/°F
	Thermo(nc) L/°F
	4-20mA passive

- ▶ **Example 2** is a standard wiring between thermocouple sensor and IS-AIN8. IS-AIN8 is placed in the same ambient temperature as thermocouple terminal; it means IS-AIN8's internal temperature sensor measures the same temperature as is on thermocouple terminal. In this case, could junction compensation is done by IS-AIN8 itself. Any of standard (compensated) sensors should be selected.

Function	<input type="checkbox"/>
Protection	<input type="checkbox"/>
Name	AIN-1 1
Dim	-
Sensor	None
Resolution	NH1000/°F
Sensor range	Thermocpl J/°C
Bargraph 0%	Thermocpl K/°C
Bargraph 100%	Thermocpl L/°C
Offset	Thermocpl J/°F
	Thermocpl K/°F
	Thermocpl L/°F
	Thermo(nc) J/°C

- ▶ **Example 3** is a standard wiring between thermocouple sensor and IS-AIN8. Regardless selected type of sensor the resultant temperature will be incorrect
 - Not compensated sensor – temperature T1 is not calculated
 - Compensated sensor – IS-AIN8 measures different T2 temperature, not T1
- ▶ **Example 4** External temperature T1 sensor is included. Resultant temperature is correct if
 - Any of **not compensated sensors** (nc) is selected
 - External sensor **has a function Cold Temp 1**

Property	Value	Logical function	Used
Function	<input checked="" type="checkbox"/>	Cold Temp 1	<input checked="" type="checkbox"/>
Protection	<input type="checkbox"/>	Cold Temp 2	<input type="checkbox"/>
Name	CJC of IS-AIN8	Cold Temp 3	<input type="checkbox"/>
Dim	°C	Cold Temp 4	<input type="checkbox"/>
Sensor	PT100,°C		
Resolution	0,1		
Sensor range	0,0		
Bargraph 0%	0,0		
Bargraph 100%	100,0		
Function	Cold Temp 1		
Offset	0,0		

Note: LAI (logical analog input) Cold Temp 1 compensates every of 8 thermocouples inputs of IS-AIN8 on address 1 IS-AIN8 on address 2 – 10 is not compensated by this LAI Cold Temp1.

- ▶ Any of non thermocouple configured input is not compensated anyway
- ▶ Any of non thermocouple input with sensor adjusted as compensated is not compensated by external compensation (IS-AIN8 compensates it itself)
- ▶ IS-AIN8 on address 2 – 10 is not compensated by this LAI Cold Temp1.

LAI Cold Temp 2 compensates every of 8 thermocouples inputs of IS-AIN8 on address 2, etc.

Up to 32 (Cold Temp 1-4 times 8 analog input of IS-AIN8) may be compensated by external sensor.

Even only one external sensor may be configured for more than one LAI Cold Temp.

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Technical data

Dimension (W × H × D)	146 × 160 × 46 mm (5.79' × 6.6' × 1.83')
Interface to Controller	CAN1
Analog inputs	8, galvanic separated from power supply, 16 bit *
Power supply	8 to 36 V DC
Current consumption	250 mA at 24 V
Protection front panel	IP20
Humidity	95% without condensation
Storage temperature	- 40 °C to + 80 °C
Operating temperature	- 30 °C to + 70 °C
Heat radiation	2 W

* each analog input can be software configured to:

		Measuring range		Accuracy
		From	To	
Resistance		0 Ω	2400 Ω	± 0.5 %
		0 Ω	250 Ω	± 1.0 %
Current	Passive	0/4 mA	20 mA	± 0.5 %
	Active	4 mA	20 mA	± 0.5 %
	Active	0 mA	± 20 mA	± 0.5 %
Voltage	Thermocouples J, K, L type			± 0.2 %
		0 mV	100 mV	± 0.2 %
		- 1000 mV	+ 1000 mV	± 0.5 %
		0 mA	2500 mV	± 0.5 %

Standard conformity

Low Voltage Directive

EN 61010-1:95 +A1:97

Electromagnetic Compatibility

EN 50081-1:94, EN 50081-2:96
EN 50082-1:99, EN 50082-2:97

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8.2.7 IS-AIN8TC



IM-NT



IG-NT/IS-NT



ID



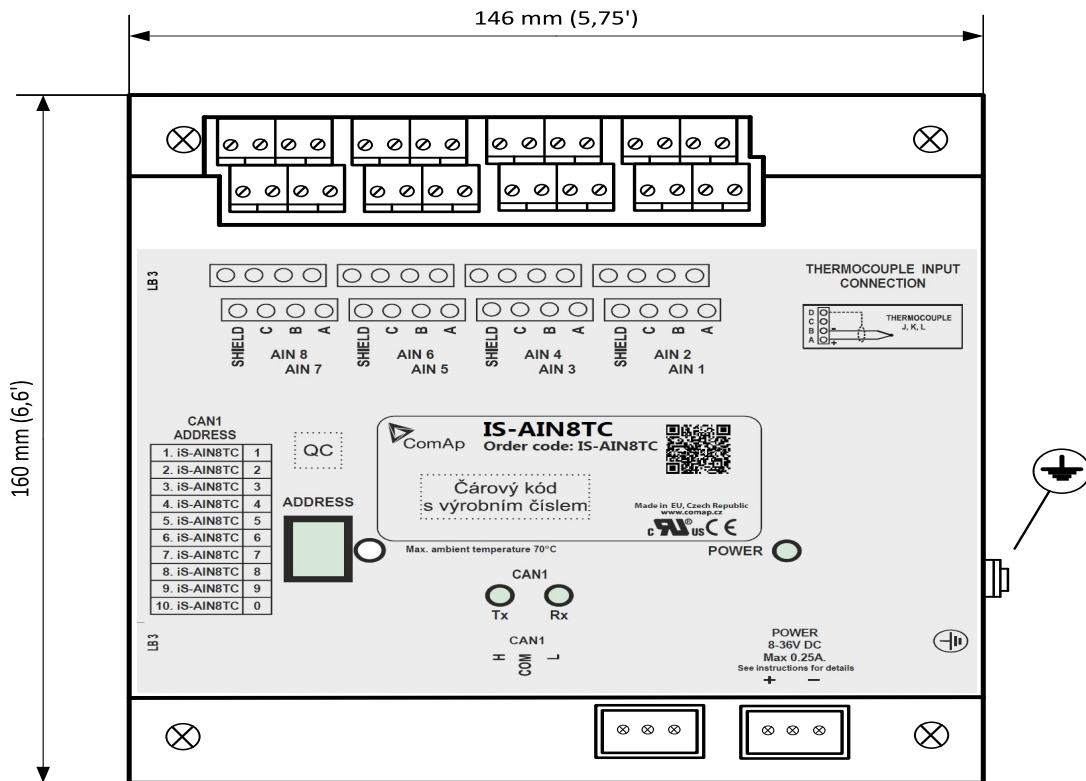
Description

IS-AIN8 is input extension module equipped with 8 analog inputs dedicated for thermocouple sensors only. The module can be used for ID, IGS-NT controller. IS-AIN8TC can be configured to:

► Thermocouple input

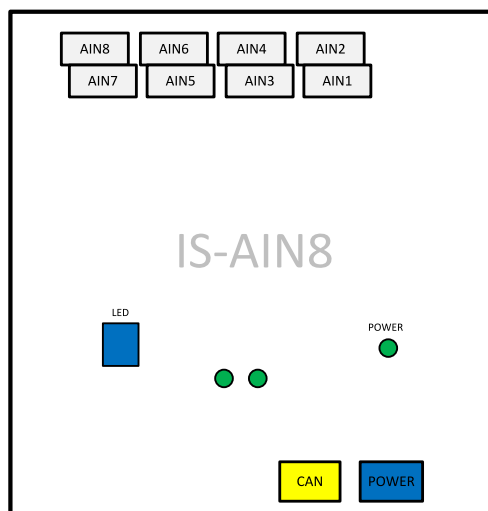
All inputs can be configured to any logical function or protection. It is possible to connect up to 10 IS-AIN8TC (with IGS-NT) or up to 4 (with ID) external units to one controller. IS-AIN8TC is connected to controller CAN1 bus.

Dimensions



Unit is 35 mm DIN rail mounted.

Connectors



AIN1 – AIN8	8 analog inputs
CAN	CAN1 line
POWER	Power supply
POWER	State indication
Rx, Tx	Data transmitted and received on CAN1 line
LDD	CAN1 address

Address and jumper settings

CAN1 address is set by following procedure:

1. Press Address button during IS-AIN8TC power supply on to switch to addressing mode.
2. Then repeatedly press or keep pressed address button to adjust required address according to controller configuration.
3. After setting requested address, release the buttons and wait until the digits blink – it indicates writing of the change address to EEPROM memory.

	CAN11 Address
1. IS-AIN8TC	1
2. IS-AIN8TC	2
3. IS-AIN8TC	3
4. IS-AIN8TC	4
5. IS-AIN8TC	5
6. IS-AIN8TC	6
7. IS-AIN8TC	7
8. IS-AIN8TC	8
9. IS-AIN8TC	9
10. IS-AIN8TC	0

Table 8.9 Table of recommended CAN1 address setting

SW version check

Shortly press address button. Following sequence appears on the display: number “1”, one second pause, number “4”, two second pause, number “1”, one second pause, number “4”, two second pause and finally IS-AIN8TC actual address.

Error message (e.g. SD BOUT2) appears on Controller screen when Binary input or output Address x is configured but corresponding unit is not recognized (no message is received from CAN bus). Check IS configuration and corresponding external IS-AIN8TC, IS-BIN8/16 unit address setting.

LED indication

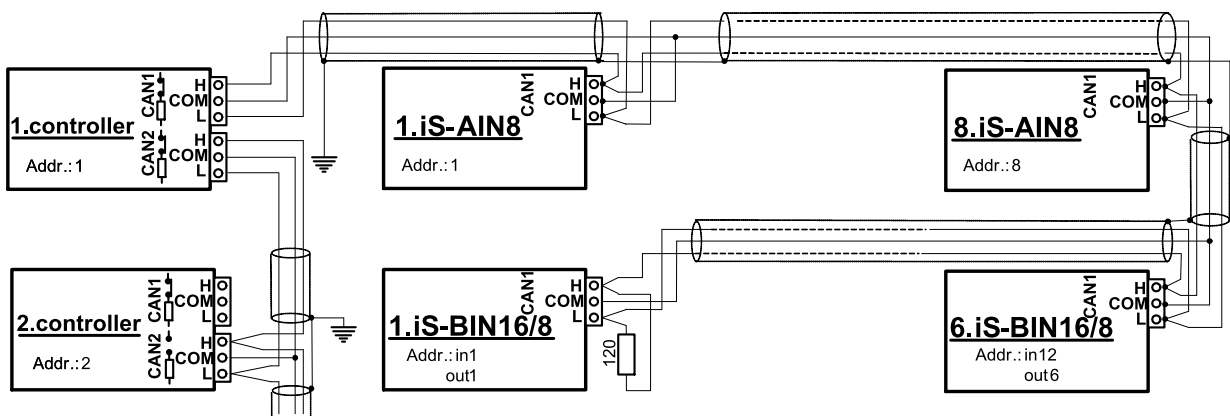
Power LED		Address LDD	
Lighting	Blink	Lighting	Blink
Power supply and CAN address are with no problems	CAN1 address is adjusted different in IS-AIN8TC and in controller	Displaying current CAN1 address	Displaying current SW version

Table 8.10 LED/LDD status

Tx		Rx	
Dark	Blink	Dark	Blink
Any data are transmitted on the CAN1 line	Data are transmitted on the CAN1 line	Any data are received on the CAN1 line	Data are received on the CAN1 line

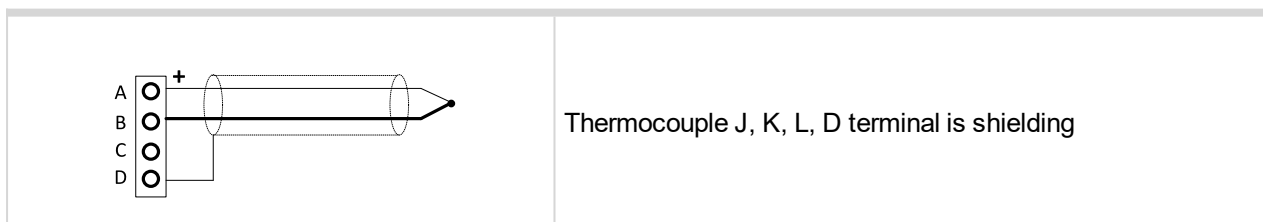
Table 8.11 Tx/Rx LED status

Wiring



Note: CAN bus line has to be terminated by 120 ohm resistors on the both ends.
 For longer distances is recommended to connect CAN COM terminals between all controllers and cable shielding to the **ground in one point!**
 External units can be connected on the CAN bus line in any order, but line arrangement (no tails no star) is necessary.
 Recommended CAN bus data cables see in Chapter Technical data.
 IG-MU and IG-IB units are connected to CONTROLLER CAN2 bus.

Select sensor characteristic from the list or define user sensor characteristic in PC configuration tool.



Cold Junction Compensation (CJC) settings

Please have a look at **Cold Junction Compensation (CJC) (page 325)** IS-AIN8 chapter.

Technical data

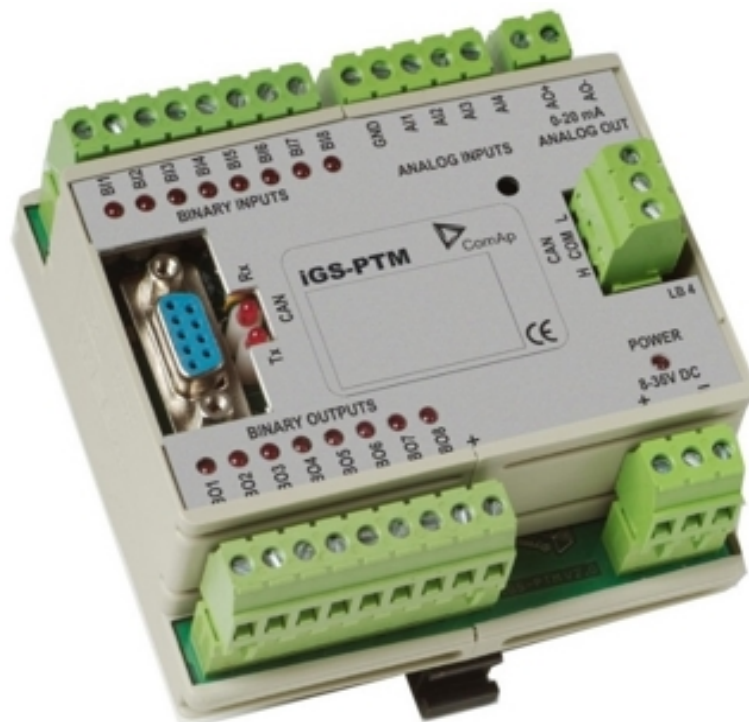
Dimension (W × H × D)	110 × 110 × 46 mm (4.3" × 4.3" × 1.8")
Weight	237.5 grams
Interface to controller	CAN1

Analog inputs (not electric separated)	8, no galvanic separated
Measuring	± 100 mV
Accuracy	± 0.1 % of actual value + ± 100 μ V (± 3 °C)
Internal sensor for measuring cold junction - Accuracy	± 1 °C in temperature range -20 °C \div $+70$ °C
Galvanic separation	CANbus is galvanic separated from the measurement and power supply. All analog inputs are galvanic separated from power supply. Analog inputs are not galvanic separated between channels

Power supply	8 to 36 V DC
Protection	IP20
Current consumption	35 mA at 24 V \div 100 mA at 8 V
Storage temperature	-40 °C to $+80$ °C
Operating temperature	-30 °C to $+70$ °C
Heat radiation	2 W

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8.2.8 IGS-PTM



Description

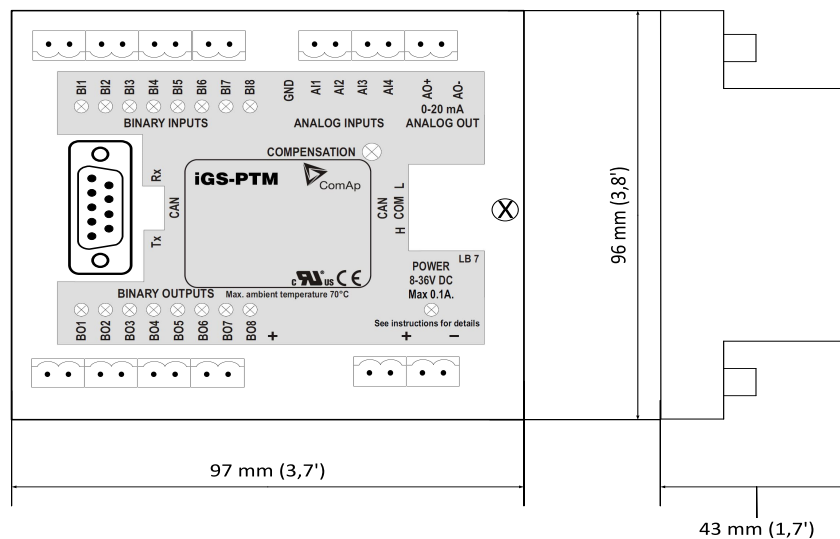
IGS-PTM is modification of standard IG-IOM module with four analog inputs, which can be configured for range:

- ▶ 0 – 250 Ω (suitable for Pt100, Ni100)
- ▶ 0 – 100 mV
- ▶ 0/4 – 20 mA

This module is compatible with MTU ECU-7 at communication speed 125 kbps when uploaded with firmware 11.0.0 and higher.

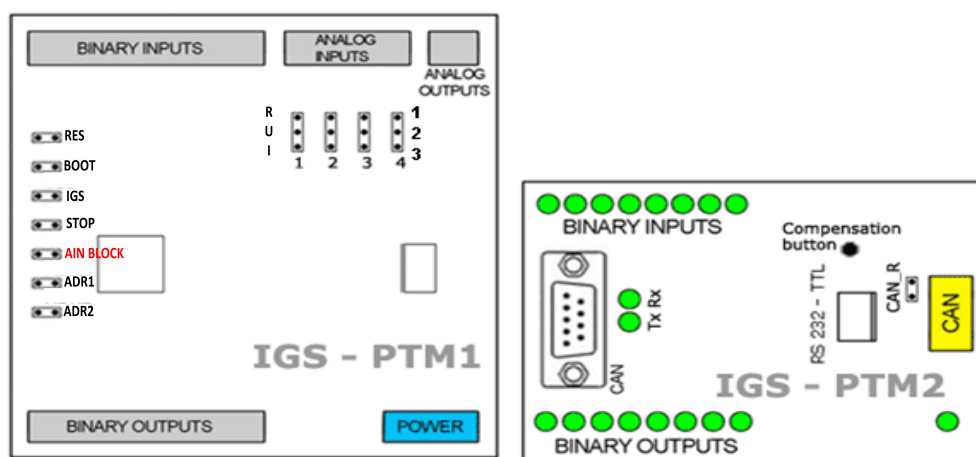
The detection of communication speed is indicated by fast flashing of status LED. Once the speed is detected the module remains set for the speed even when the communication is lost. Renewal of communication speed detection is done by reset of the module.

Dimensions



Note: Unit is 35 mm DIN rail mounted.

Terminals



BINARY INPUTS	8 binary input
ANALOG INPUTS	4 analog input
ANALOG OUTPUT	1 analog output

BINARY OUTPUT	8 binary output
CAN	CAN1 line
RS232-TTL	Interface for programming
POWER	Power supply
BINARY INPUTS	8 LEDs for binary input indication
BINARY OUTPUT	8 LEDs for binary output indication
Tx, Rx	Indication transmitted or received data
POWER	Power supply LED indication
CAN_R	Terminating CAN resistor
RUI	Analog inputs configuration
RESET	Programming / reset
BOOT	Programming
IGS	Controller type selection
AIN BLOCK	Block of all Analog inputs
STOP	Service jumper
ADR1	Module's address settings
ADR2	
Compensation button	Long wires resistance compensation

Note: Configuration jumpers IGS, ADR1, ADR2 are OPEN by default.
 CAN_R jumper is CLOSE by default (IG-IOM mode).
 Analog inputs are configured for resistance measurement by default.

Address and jumpers setting

Controller type selection

The type of controller to be used with IGS-PTM must be selected via jumper labeled IGS accessible at the lower PCB.

IGS jumper	Controller type
OPEN	IL-NT, IC-NT, ID (FLX)
CLOSE	IG-NT, IS-NT, IM-NT, ID-DCU, ID-Mobile, IL

Table 8.12 IGS jumper description

Address configuration

If IGS-NT controller type is selected (by IGS jumper), address of IGS-PTM could be modified via jumpers labeled ADR1 and ADR2.

ADR1	ADR2	BIN module	BOUT module	AOUT module	AIN module
Open	Open	1	1	1	1
Close	Open	2	2	2	2
Open	Close	3	3	3	3
Close	Close	4	4	4	4

Table 8.13 CAN address settings

Analog inputs hardware configuration

Analog inputs can be configured for:

- ▶ Resistance measurement
- ▶ Current measurement
- ▶ Voltage measurement

The type of analog inputs is configured via jumpers RUI located on lower PCB.

RUI	Analog input configuration
1 - 2	Resistance measuring
2 - 3	Current measuring
NO jumper	Voltage measuring

Table 8.14 Analog input settings

Programming firmware

Firmware upgrade is via AT-link (TTL). For programming is necessary to close jumper BOOT. RESET jumper is used to reset the device. Close jumper to reset the device. For programming is used FlashProg PC tool.

LED indication

Binary inputs

Each binary input has LED which indicates input signal. LED is shining when input signal is set, and LED is dark while input signal has other state.

Binary output

Binary output LED shining when binary output is set.

Power

LED status	Description
Dark	No required power connected
One flash and pause	Compensation fail
Three flashes and pause	Compensation successful
Flashing	there is no communication between IGS-PTM and the controller.
Fast flashing	Detection of CAN communication speed
Lights	Power supply is in the range and communication between IGS-PTM and controller properly works.

Wiring

Analog inputs connection

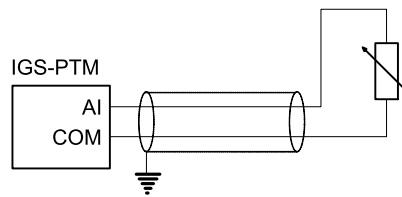


Image 8.6 Two wire resistor sensor

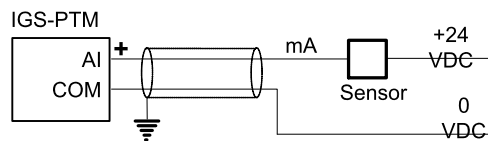


Image 8.7 Two wire current sensor.

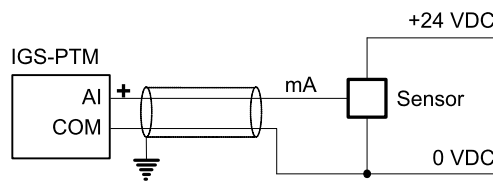


Image 8.8 Three wire current sensor.

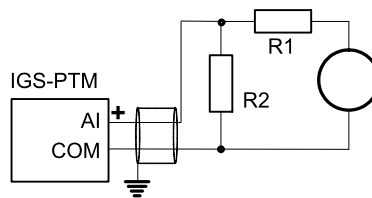


Image 8.9 Extension of voltage measuring range.

Note: It is not necessary to connect analog inputs COM terminal to negative power supply.

Long wires resistance compensation

Process of compensation:

1. Short all wires to analog sensors at the end (replace sensors with shorting links).
2. Hold the compensation button on IGS-PTM through the hole in upper cover when switching IGS-PTM on.
3. Result of compensation will be shown in 2 seconds by flashing of POWER LED.
 - ▶ One flash and pause – compensation fail.
 - ▶ Three flashes and pause – compensation success.
4. Measured lead's resistance is stored in EEPROM memory (separate value for each input) and is subtracted from measured value when resistance measuring.

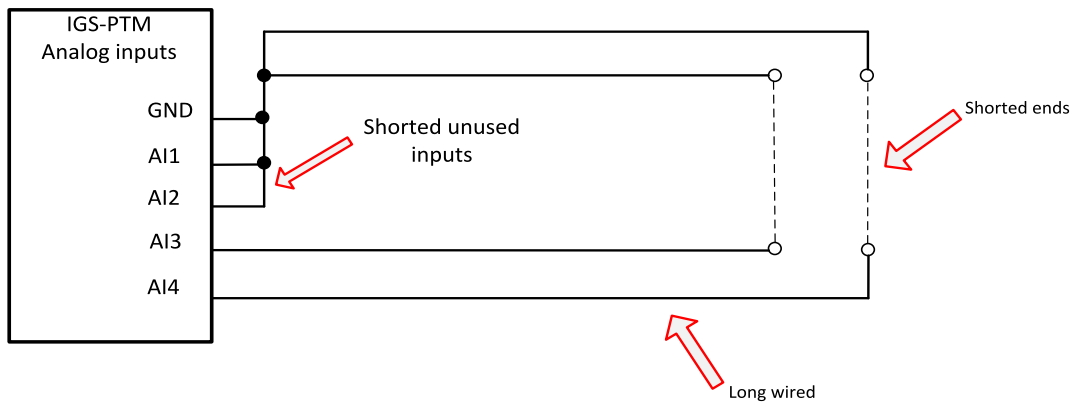


Image 8.10 Long wires resistance compensation

Note: Maximum resistance of two leads (from IGS-PTM to sensor and back) can be 20Ω. Otherwise the compensation fails. Unused analog inputs must be shorted at the IGS-PTM.

Analog inputs connection

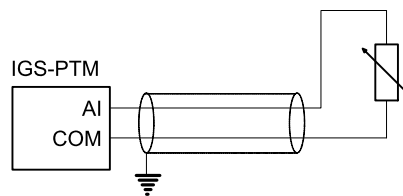


Image 8.11 Two wire resistor sensor

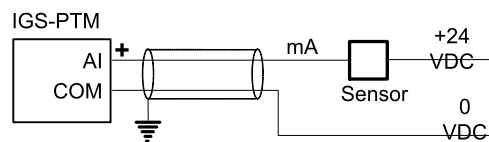


Image 8.12 Two wire current sensor.

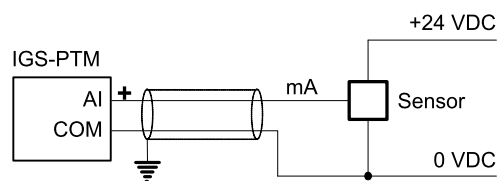


Image 8.13 Three wire current sensor.

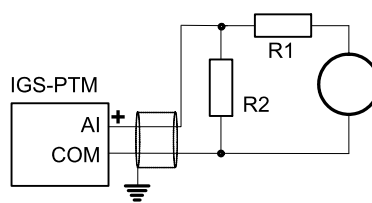


Image 8.14 Extension of voltage measuring range.

Note: It is not necessary to connect analog inputs COM terminal to negative power supply.

Technical data

Dimension (W × H × D)	95 × 96 × 43 mm (3.7' × 3.8' × 1.7')
Interface to controller	CAN1

Binary inputs	
Input resistance	4700 Ω
Input range	0 to 36V DC
Type	Pull Up
Switching voltage level for open contact indication	0 to 2 V
Max voltage level for open contact indication	8 to 36 V

Binary output (Open collector output)	
Type	Low side switch (LSS)
Max current	500 mA
Max switching voltage	36V DC

Analog inputs (Not electric separated)	
Resolution	10 bits
Sensor resistance range	0 to 250 Ω
Maximal voltage range	0 to 100 mV
Maximal current range	0 to 20 mA
Resistance measurement tolerance	1 % ± 2 Ω out of measured value
Voltage measurement tolerance	1.5 % ± 1 mV out of measured value
Current measurement tolerance	2.5 % ± 0.5 Ω out of measured value
Input impedance for measuring current	3.9 Ω
Input impedance for measuring voltage	100 kΩ

Analog output (not electric separated)	
Output current	0 to 20 mA ± 0.33 mA
Resolution	10 bit

Power supply	8 to 36 V DC
Protection	IP20
Current consumption	100 mA at 24V ÷ 500 mA
Storage temperature	- 40 °C to + 80 °C
Operating temperature	- 30 °C to + 80 °C
Heat radiation	8 W

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8.2.9 InternetBridge-NT

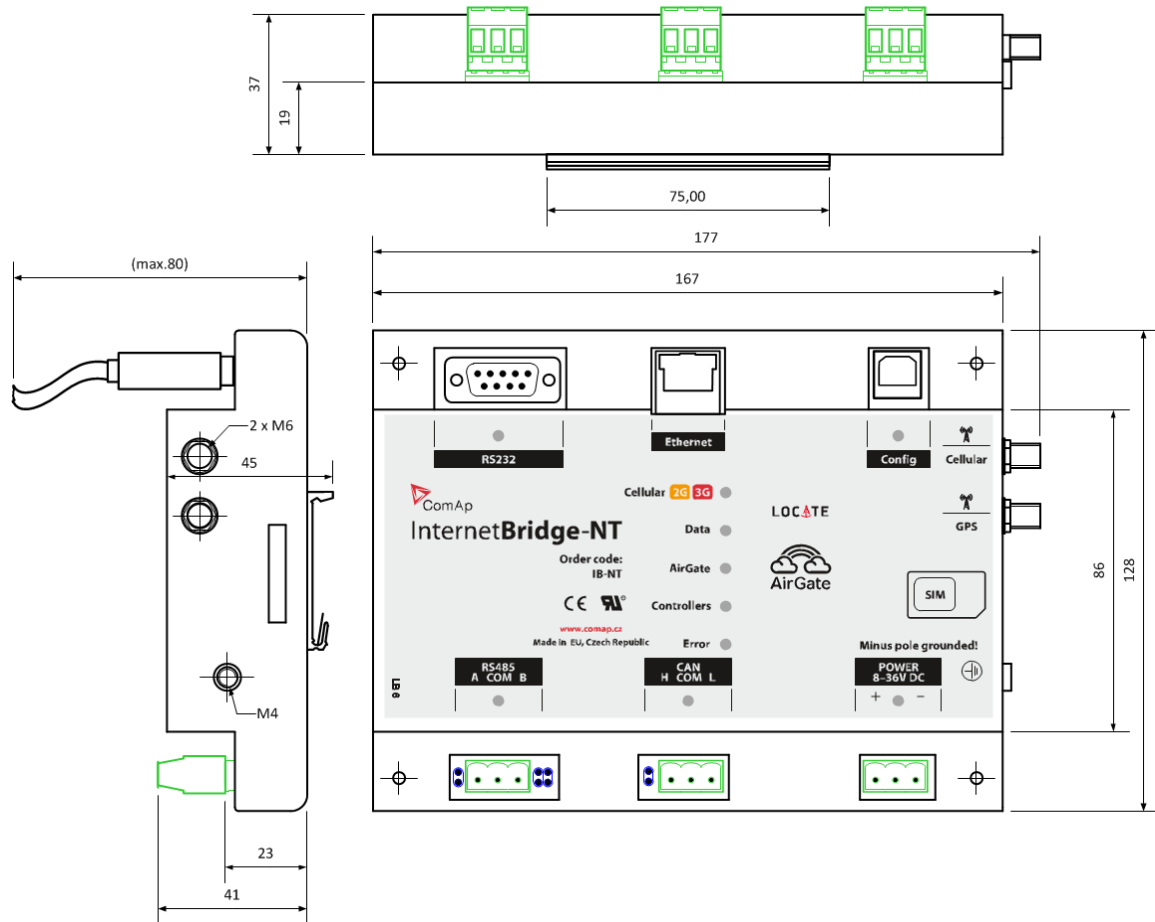


Image 8.15 Dimensions of IB-NT

For more information about IB-NT, please see [InternetBridge-NT Global Guide](#)

Note: Connect ID DCU HW 2.0 and newer + ID-COM with RS485 connected to IB-NT over RS485 works fine. But: only one couple of balancing resistors has to be added on the whole RS485 line, and setpoint in ID-DCU CommSet called RS485 TermCSpd (page 112) has to be set to 57600 bps.

8.2.10 I-CB Communication bridge

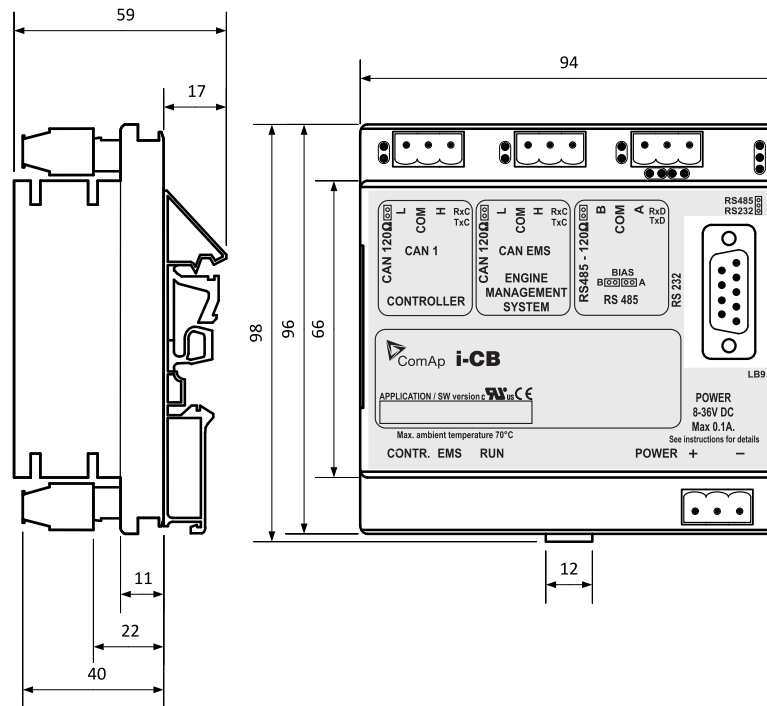


Image 8.16 Dimensions of I-CB

All dimensions are in mm.

I-CB unit can be mounted on DIN rail (35 mm).

I-CB (Communication bridge) is CAN bus interface between Controller and Engine Control Unit (ECU) that has not standard J1939 communication (MTU, CAT etc.). Engine values (RPM, Oil pressure and other) are received from ECU via CAN and corresponding sensors are not needed on controller. Use ICBEedit software for I-CB configuration (included in installation package).

I-CB wiring and configuration

1. Configure I-CB using I-CBEedit software. Configured I-CB behaves like fictive IS-AIN and IS-BIN units. I-CB configuration associates selected values (from ECU database) received from Engine Control Unit to selected CAN addressees (fictive IS-AIN, IS-BIN inputs and outputs).
2. Configure corresponding controller CAN addresses and tick in PC configuration tool.
3. Configure separate inputs and outputs in corresponding Analog, Binary inputs, outputs in PC configuration tool.

8.2.11 I-AOUT8



Description

I-AOUT8 is an extension unit with 8 analog outputs. Each analog output can be switched to

- ▶ 0 to 20 mA DC
- ▶ 0 to 10 V DC
- ▶ PWM (Pulse With Modulation on 1.2 kHz)

I-AOUT8 module is connected on IGS-NT or ID CAN1 (peripheral) bus. The corresponding module Address 1 to 4 (default 1) must be set on module (by ADR.1 and ADR.2 jumpers) and in controller configuration. Communication fail is indicated in controller Alarm list and by binary output. Use DriveConfig PC tool for controller configuration.

It is possible to connect up to four I-AOUT8 units to one controller. CAN1 terminating 120Ω resistor jumper is connected as default. AGND terminals are on the same potential.

General Description

I-AOUT8 is an extension unit with 8 Analog outputs. Each analog output can be switched by jumper for.

- ▶ 0 to 20 mA
- ▶ 0 to 10 VDC
- ▶ PWM (Pulse With Modulation on 1,2 kHz)

I-AOUT8 modules is connected on CAN 1 (peripheral) bus. The corresponding module Address 1 to 4 (default 1) must be set on module (by ADR.1 and ADR.2 jumpers) and in controller configuration. Communication fail is indicated in controller Alarm list and by binary output. Use DriveConfig PC tool for controller configuration.

It is possible to connect up to four I-AOUT8 units to one controller.

I-AOUT8 unit can be mounted on DIN rail (35 mm).

CAN 1 terminating 120 Ω resistor jumper is connected in default. AGND terminals are on the same potential.

Number of analog outputs	8, no galvanic separation	
Type of analog outputs (jumper selectable)	U	0 to 10VDC \pm 1% , max 5 mA
	I	0 to 20 mA \pm 1% , max 500 Ω
	p	pwm 1200 Hz, 5V level, max 10 mA
Power supply	8 to 36 VDC	
Current consumption	100 \div 300 mA at 24 VDC	
Communication interface	CAN1, with jumper selectable address 1 to 4 Jumper selectable terminating resistor 120 Ω	
RS232 interface	TTL, firmware upgrade via AT-link.	
Operating temperature range	-40°C to +70°C	
Analog outputs refreshment	Max. 300 ms	

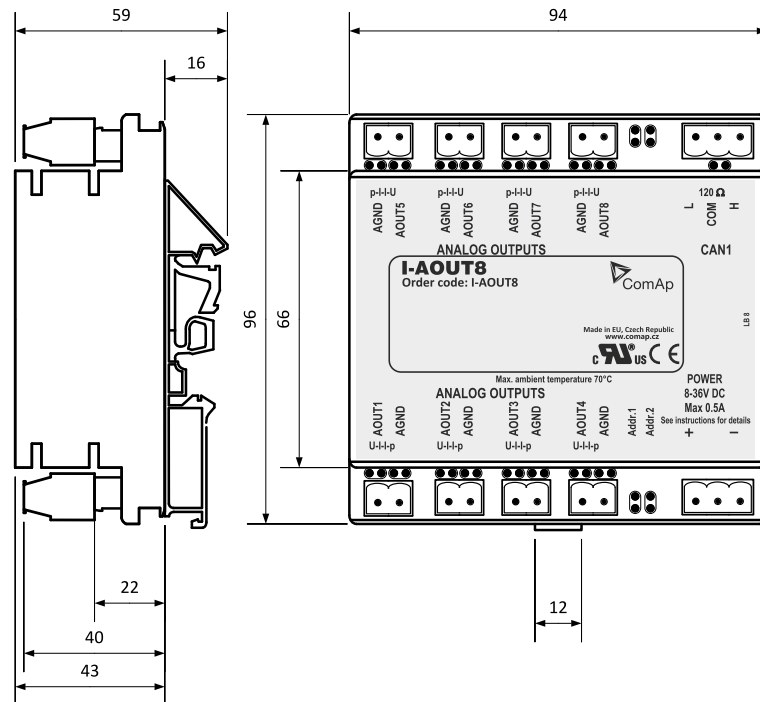
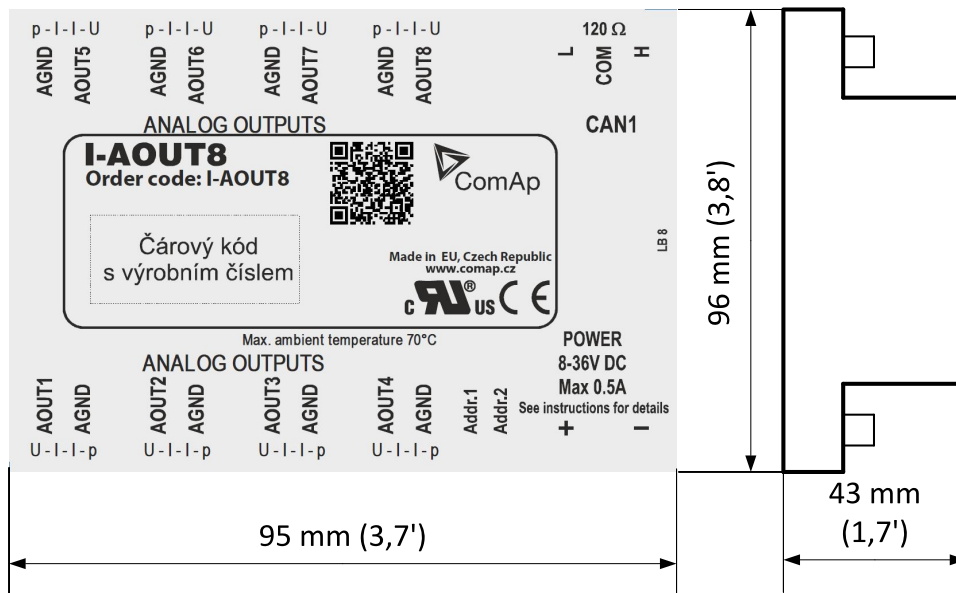


Image 8.17 Dimensions of I-AOUT8

All dimensions are in mm.

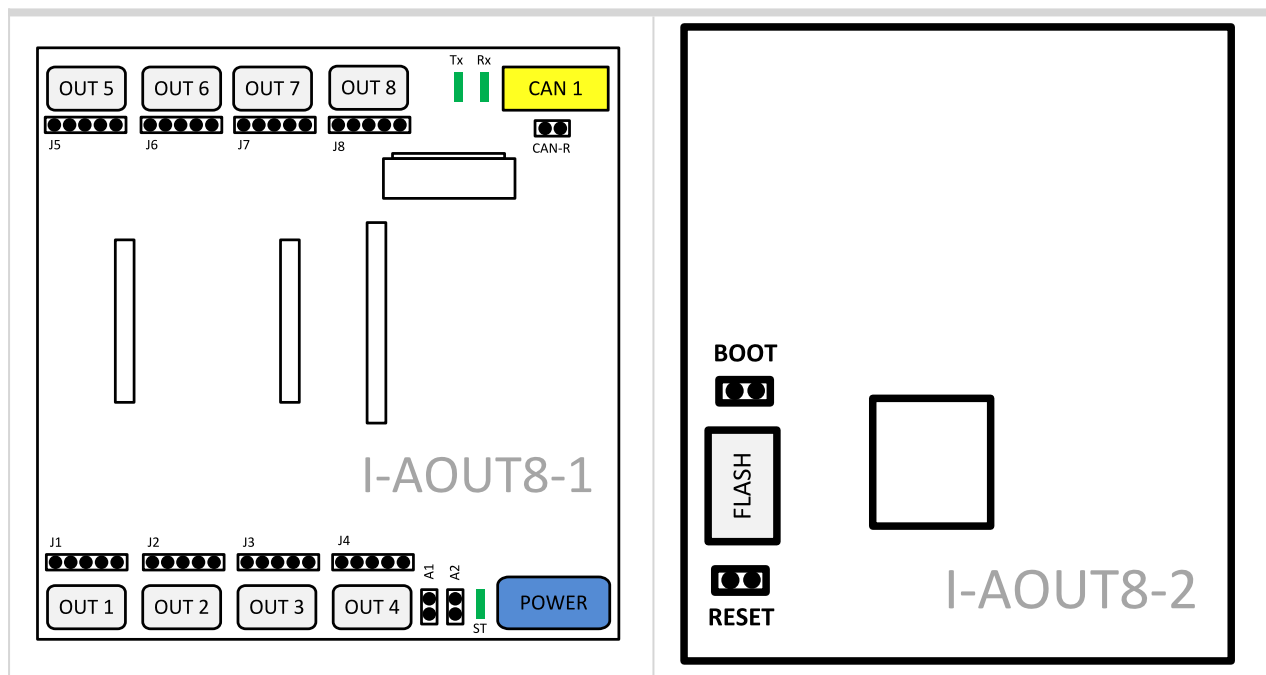
I-AOUT8 unit can be mounted on DIN rail (35 mm).

Dimensions



Note: Unit is 35 mm DIN rail mounted.

Connectors



POWER	Power supply
CAN 1	CAN1 line
OUT1 - OUT8	Analog output
FLASH	AT-link
J1 – J8	Output mode
A1, A2	CAN 1 address
CAN-R	Terminating resistor

BOOT	Programming
RESET	Programming / reset
Tx, Rx	CAN 1data
ST	Power/module state

Address and jumpers setting

CAN Address

The module CAN address is set by jumpers A1 and A2. Set module CAN address correspondingly to configuration according table below.

CAN Address	A1	A2
1	Open	Open
2	Close	Open
3	Open	Close
4	Close	Close

Table 8.15 Setting CAN address

Output mode

Follow the p – I – U symbols on the module sticker. There are two equivalent positions for current output.




AOUT	Symbol	Function
	p	PWM Pulse-Width-Modulation
	I	0 to 20 mA DC
	U	0 to 10 V DC

Table 8.16 Setting output mode

Programming firmware

Firmware upgrade is via AT-link (TTL). For programming it is necessary to close jumper BOOT. RESET jumper is used to reset the device. Close jumper to reset the device. For programming is used FlashProg PC tool.

CAN1 termination

I-AOUT8 has own CAN terminating resistor (120 ohm). Close jumper CAN-R to connect terminating resistor to CAN bus, open jumper CAN-R disconnecting terminating resistor.

Wiring

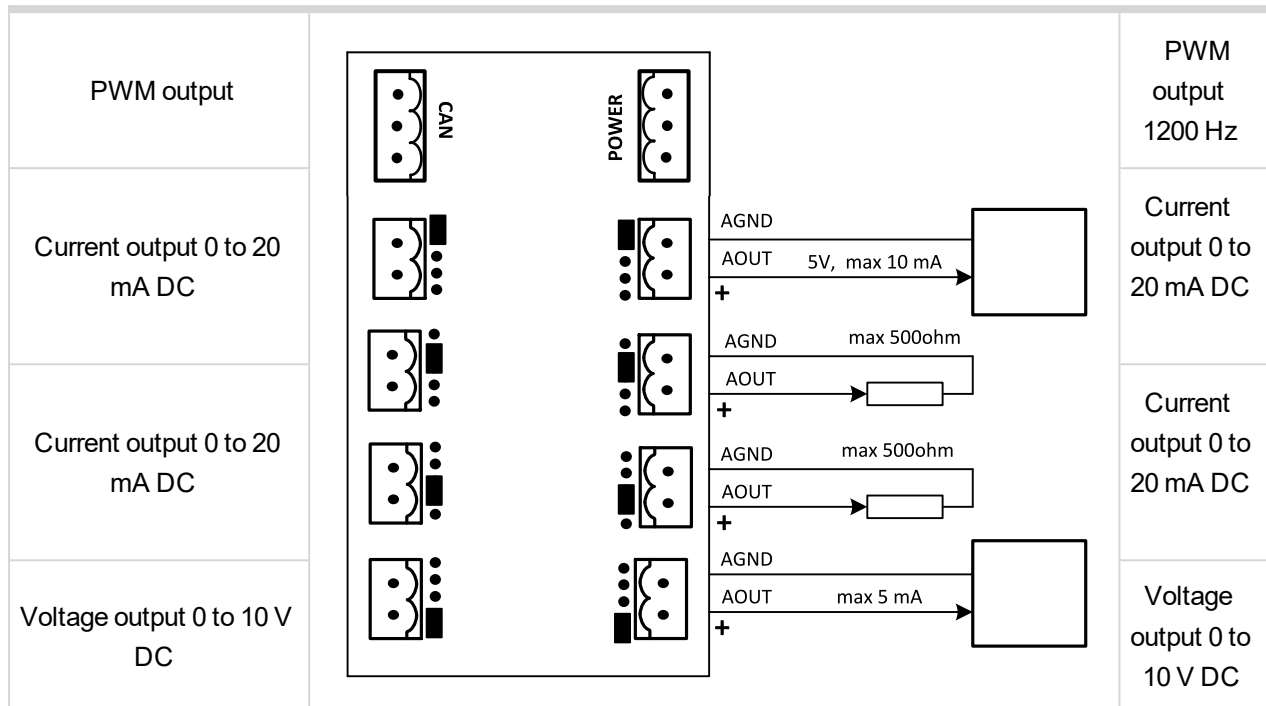


Image 8.18 Possible output modes

Technical data

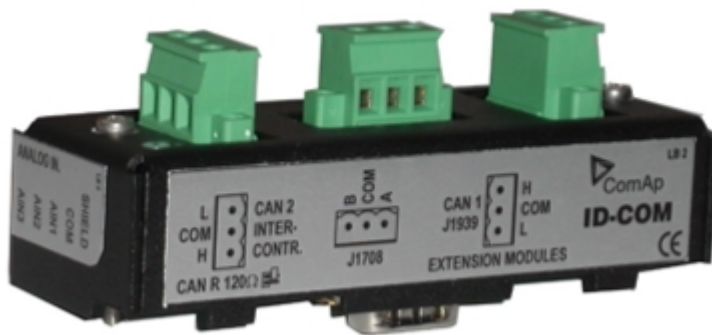
Dimension (W × H × D)	95 × 96 × 43 mm (3.7' × 3.8' × 1.7')
Interface to controller	CAN
Output	8 analog, no galvanic separation

Type of analog output
0 to 10V DC ± 1 % , max 5 mA DC
0 to 20 mA DC ± 1 % , max 500 Ω
PWM 1200 Hz, 5V DC level, max 10 mA DC

Power supply	8 to 36 V DC
Analog output refreshment	320 ms
Current consumption	max 300 mA (100 mA at 24 V)
RS232 interface	TTL, firmware upgrade via AT-link.
Storage temperature	- 40 °C to + 80 °C
Operating temperature	- 30 °C to + 70 °C
Heat radiation	2.5 W

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8.2.12 ID-COM



ID



Description

InteliDrive Communication interface for proprietary and/or remote communication. The CAN1 line is used for J1939 (ECU) bus connection or extension modules. The CAN2 line is used for inter-controller communication and remote displays. There are 2 variants of the ID-COM module that differ in the interface in the middle of the module. The standard version includes the RS485 interface for Modbus connection or remote display connection. The special variant then offers the J1708/J1587 for a redundant communication link, especially in conjunction with Volvo Penta engines. ID-COM is mounted directly to ID-DCU box. Heat radiation of this module is 2 W.

Dimensions

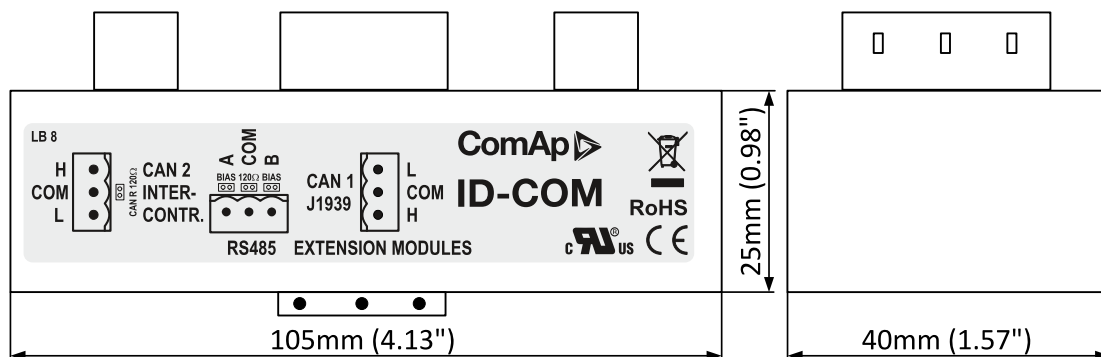


Image 8.19 Dimensions of ID-COM

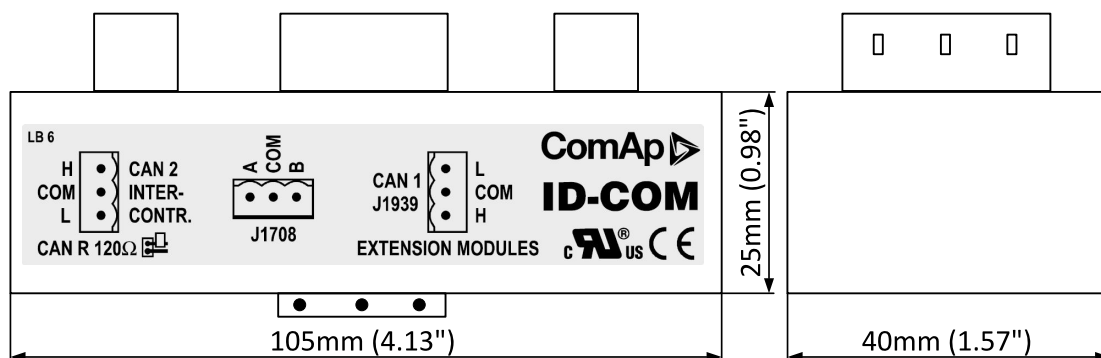
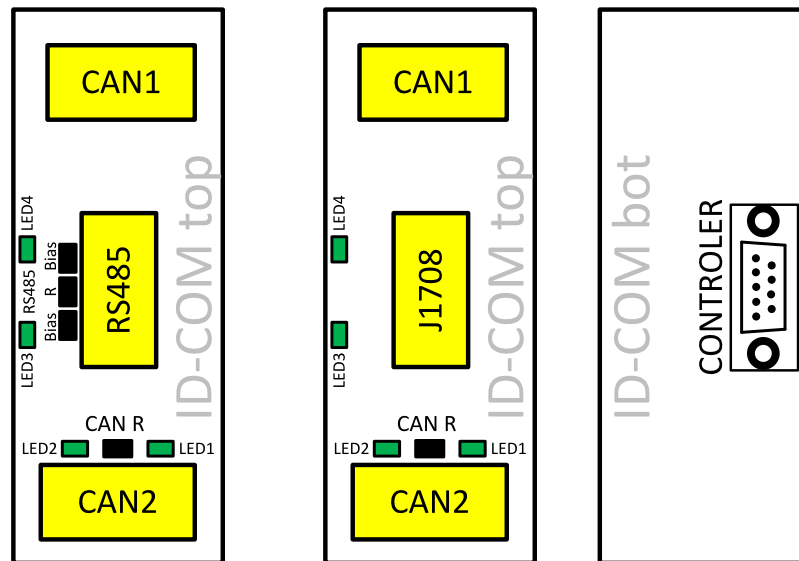


Image 8.20 Dimensions of ID-COM J1708

Connectors



CAN1	CAN1 line
CAN2	CAN2 line
RS485	Serial line RS485
J1708	SAE J1708 line
Controller	Connection to controller
LED1, LED2	Communication on CAN2 (Tx, Rx)
LED3, LED4	Communication on RS485 or J1708 (Rx, Tx)

Note: Maximal torque to tight main screw is 0.25 Nm.

Address and jumper settings

CAN1 termination

CAN1 has its own terminating resistor (120 ohm) directly on controllers board (PCB). Close jumper CAN R connecting terminating resistor to CAN bus, open jumper CAN R disconnecting terminating resistor.

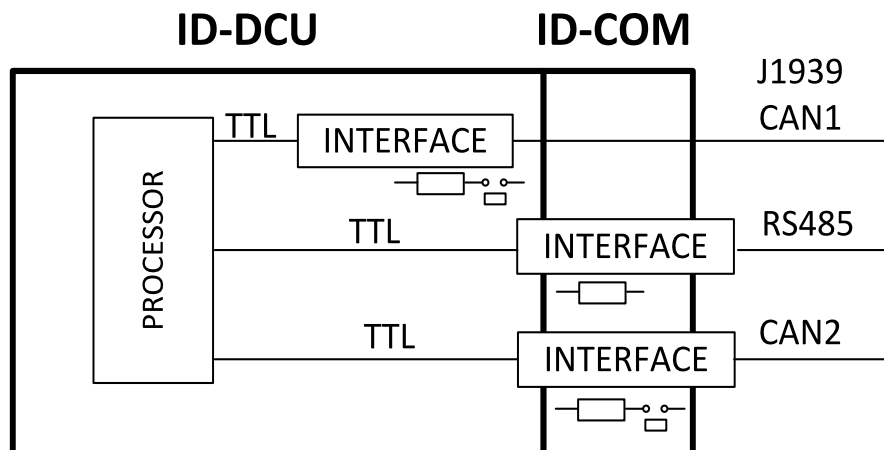
RS485 termination

When point-to-point is connected (eg with display), keep both Bias and termination resistors closed - default jumper settings.

LED indication

LED	Description
LED1, LED2	Blink when data are transmitted / received on the CAN2 line
LED3, LED4	Blink when data are transmitted / received on the RS485 or J1708 line

Wiring



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Technical data

Dimension (W × H × D)	105 × 40 × 25 mm (4.13' × 1.57' × 0.98')
Interface to controller	Sudect mounted (ID-COM family port)

Binary inputs and outputs	-
Analog input and outputs	-
Nominal power supply	Directly from ID-DCU consumption
Power supply range	
Current consumption	0.1A
Operating temperature	-30 °C to +70 °C

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8.2.13 Theory of binary inputs and outputs

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Binary inputs

Pull Up

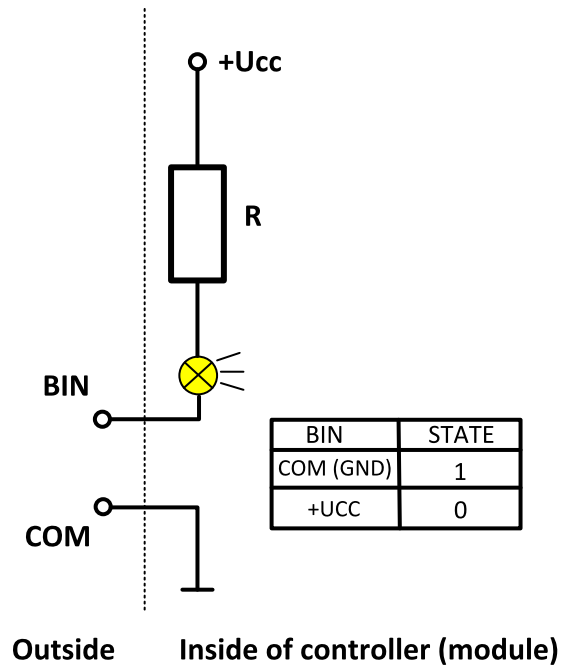
Principle of internal connection is showed on picture below.

The bulb presents internal state of binary input.

In case of connection terminal "BIN" with terminal "COM" (GND) then the internal state is logical 1.

In case of connection +Ucc polarity to the "BIN" terminal is internal state logical 0.

Binary input : Pull Up



Pull Down

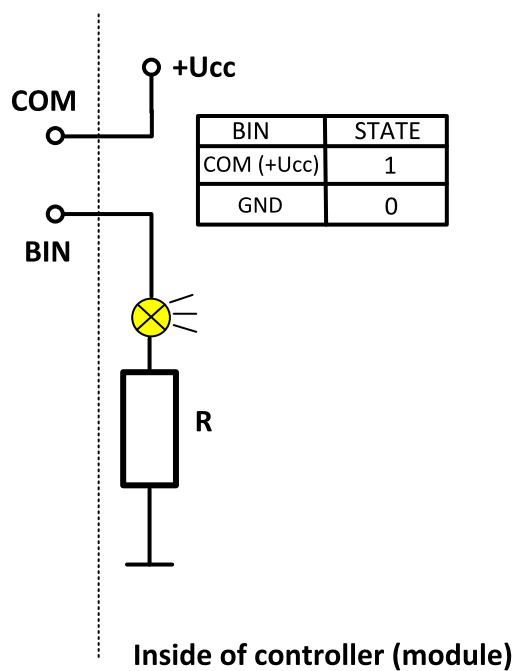
Principle of internal connection is showed on picture below.

The bulb presents internal state of binary input.

In case of connection terminal "BIN" with terminal "COM" (+Ucc) then the internal state is logical 1.

In case of connection GND to the "BIN" terminal is internal state logical 0.

Binary input : Pull Down



[back to Theory of binary inputs and outputs](#)

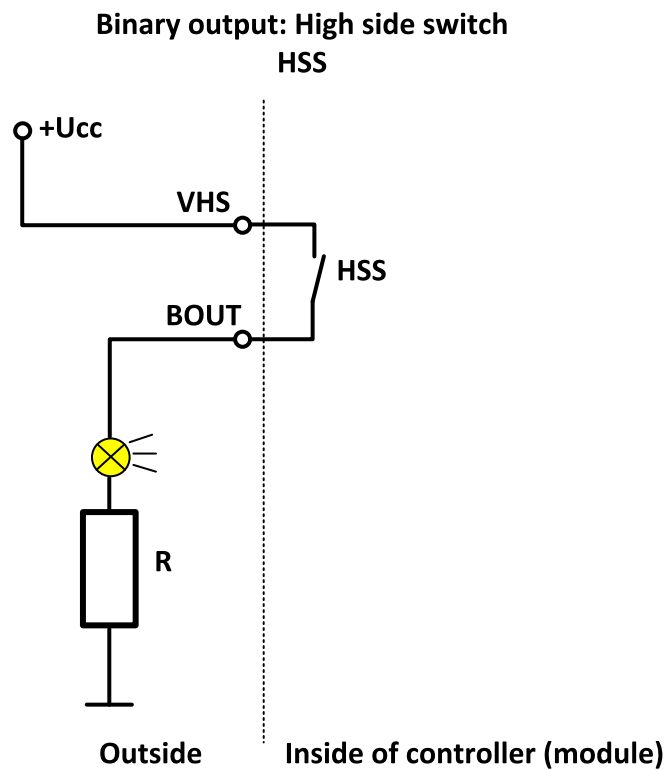
Binary outputs

High side switch - HSS

Principle of internal connection is showed on picture below.

High side switch connection is for case, where load is permanently connected to the ground (GND).

By activating of Binary output (Bout=1) is closed switch which causes connection of load to the VHS (Voltage High side) and +Ucc.



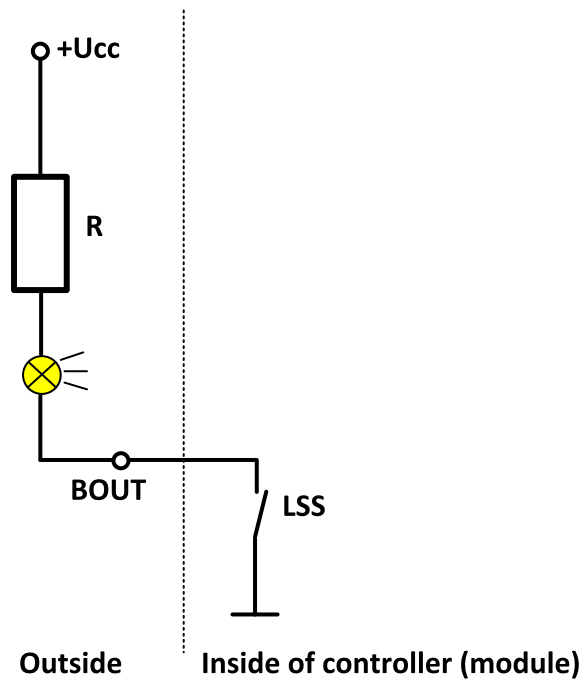
Low side switch - LSS

Principle of internal connection is showed on picture below.

Low side switch connection is for case, where load is permanently connected to the voltage (+Ucc).

By activating of Binary output (Bout=1) is closed switch which causes connection of load to the ground (GND).

Binary output: Low side switch
LSS



[back to Theory of binary inputs and outputs](#)