ComAp
The heart of smart control

InteliDrive-Mobile

Expendable automotive engine controller

SW version 2.6.0

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Global Guide

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1 Document information

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.

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Pay attention to the following recommendations and measures to increase the level of security of ComAp products and services.

Please note that possible cyber-attacks cannot be fully avoided by the below mentioned recommendations and set of measures already performed by ComAp, but by following them the cyber-attacks can be considerably reduced and thereby to reduce the risk of damage. ComAp does not take any responsibility for the actions of persons responsible for cyber-attacks, nor for any damage caused by the cyber-attack. However, ComAp is prepared to provide technical support to resolve problems arising from such actions, including but not limited to restoring settings prior to the cyber-attacks, backing up data, recommending other preventive measures against any further attacks.

Warning: Some forms of technical support may be provided against payment. There is no legal or factual entitlement for technical services provided in connection to resolving problems arising from cyber-attack or other unauthorized accesses to ComAp's Products or Services.

General security recommendations and set of measures

1. AccessCode

• Change the AccessCode BEFORE the device is connected to a network.

• Use a secure AccessCode – ideally a random string of 8 characters containing lowercase, uppercase letters and digits.

• For each device use a different AccessCode.

2. Password

• Change the password BEFORE the device enters a regular operation.

• Do not leave displays or PC tools unattended if an user, especially administrator, is logged in.

3. Controller Web interface

• The controller web interface at port TCP/80 is based on http, not https, and thus it is intended to be used only in closed private network infrastructures.

• Avoid exposing the port TCP/80 to the public Internet.

4. MODBUS/TCP

• The MODBUS/TCP protocol (port TCP/502) is an instrumentation protocol designed to exchange data between locally connected devices like sensors, I/O modules, controllers etc. From it's nature it does not contain any kind of security – neither encryption nor authentication. Thus it is intended to be used only in closed private network infrastructures.

• Avoid exposing the port TCP/502 to the public Internet.

5. SNMP

• The SNMP protocol (port UDP/161) version 1,2 is not encrypted. Thus it is intended to be used only in closed private network infrastructures.

• Avoid exposing the port UDP/161 to the public Internet.

1.3 Conformity declaration

Following described machine complies with the appropriate basic safety and health requirement of the EC Low Voltage Directive No: 73/23 / EEC and EC Electromagnetic Compatibility Directive 89/336 / EEC based on its design and type, as brought into circulation by us.

Note: *ComAp believes that all information provided herein is correct and reliable and reserves the right to update at any time. ComAp does not assume any responsibility for its use unless otherwise expressly undertaken.*

1.4 Symbols in this manual

- 3 x Phases
- Active current sensor
- AirGate
- Alternating current
- Analog modem
- Battery
- Binary output
- Breaker contact
- Breaker contact
- Breaker
- Breaker
- Breaker
- Capacitor
- Coil
- Connector - female
- Connector - male
- Contact
- Contactor
- Controller simplified
- Current measuring
- Current measuring
- Diode
- Ethernet male
- Ethernet female
- Fuel solenoid
- Fuse
- Fuse switch
- Generator
- Generator schematic
- Grounding
- GSM
- GSM modem
- IG-AVRi
- IG-AVRi TRANS
- Jumper
- Load
- Mains
- Mains
- Mobile provider
- Passive current sensor
- Pick - up
- Relay coil
- Relay coil of slow-operating
- Resistor
- Resistor adjustable
- Resistive sensor RPTC
- RS 232 male
- RS 232 female
- Starter
- Switch - manually operated
- Transformer
- USB type B male
- USB type B female
- Voltage measuring
- Wifi / WAN / LAN

1.5 Related documentation

> **IMPORTANT: Below mentioned versions are valid with the issuing of this document. For available updates follow ComAp web pages.**

Software

Import package	Files	Note
ID-Mobile-2.6.idc	ID-Mobile-2.6.mhx	ID-Mobile-Logger firmware
	ID-Mobile-2.0.aim4	Default configuration archives

PC Tools

Related Software
InteliMonitor 3.12
DriveConfig 3.9.3
WinScope 2.10.1

Documentation

PDF files	Description
ID-Mobile New Features.pdf	New Features List of ID-Mobile
ID-Mobile Reference Guide	Reference guide of ID-Mobile
DriveConfig New Features.pdf	New Features list of PC tool DriveConfig
DriveConfig.pdf	Reference guide of PC tool DriveConfig
InteliMonitor New Features.pdf	New Features list of PC tool InteliMonitor
InteliMonitor-Reference Guide.pdf	Reference guide of PC tool InteliMonitor
Inteli Communication Guide.pdf	Communication guide for the Inteli controllers

Note: *For more information see InteliDrive Mobile webpage.*

1.6 Document history

Revision number	Related sw. version	Date	Author
1	2.6.0	3. 4. 2019	Weinfurt Petr

1.7 What is ID-Mobile?

InteliDrive ID-Mobile is a specialized engine controller for automotive 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 communication protocol.

1.7.1 Benefits

Integrated solution, less wiring and components

- Engine specific, plug and play support of engines with ECU – access to all available engine values
- Designed specifically for harsh environment – trouble free operation in all conditions
- Built-in Event & Performance Log – easy troubleshooting and warranty claim handling
- Remote monitoring support – reduced call-out costs of service engineers
- Fleet management program with GPS localization of supervised machines available

1.7.2 Features

- Running-hours meter, number of starts counter, fuel consumption indication
- RS485 communication line with Modbus
- J1939 and Modbus ECU support with Input / Output configuration
- Engine measurement and control by sensors and actuators or via J1939
- CAN1-bus line for extension (Slave) modules and J1939
- CAN2-bus line for connection of external display
- Optional internal GSM/GPRS modem and/or GPS receiver
- 12 Binary inputs for contacts switching to Battery– or Battery+, 4 Binary inputs with broken wire detection
- 8 Analog inputs configurable for industry standard sensors
- 8 Binary switches configurable as:
  - Hi-side switches 3A with detection of broken wire
  - Low-side switches 3A
  - PWM switches 3A
- 8 configurable analog inputs / outputs:
  - voltage (10VDC, 20mA, 24VBat) outputs compatible with hydraulic proportional valves
  - 20mA, 5VDC, 24VDC, 2.5 kΩ, PT1000 inputs
- 8 Binary Hi-side switches with max. current 3A and detection of broken wire
- 4 Frequency inputs for RPM measurement
- 2 Impulse inputs for rotary flow meters or other cumulative measuring
- Internal – configurable PLC functions: Logical functions, Comparators with delay or hysteresis, Analog switches, Mathematical functions, Linear interpolation, Filters, PID loops with analog or binary outputs, Counters, Timers, Delay functions
- Operating temperature: –40 to +70°C
- Supply voltage: 8-36 VDC continuously, 6 VDC for 1s
- EMC compatibility: EN61000-6-1/2/3/4, SS4631503(PL4), IEC 255-3
- Vibration resistivity: IEC 60068-2-6, 5-28Hz / ± 1,5mm, 28-150Hz/5g,
- Shock test: IEC 68-2-27
- Dust and water protection IP6x, IPx9

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2 System overview

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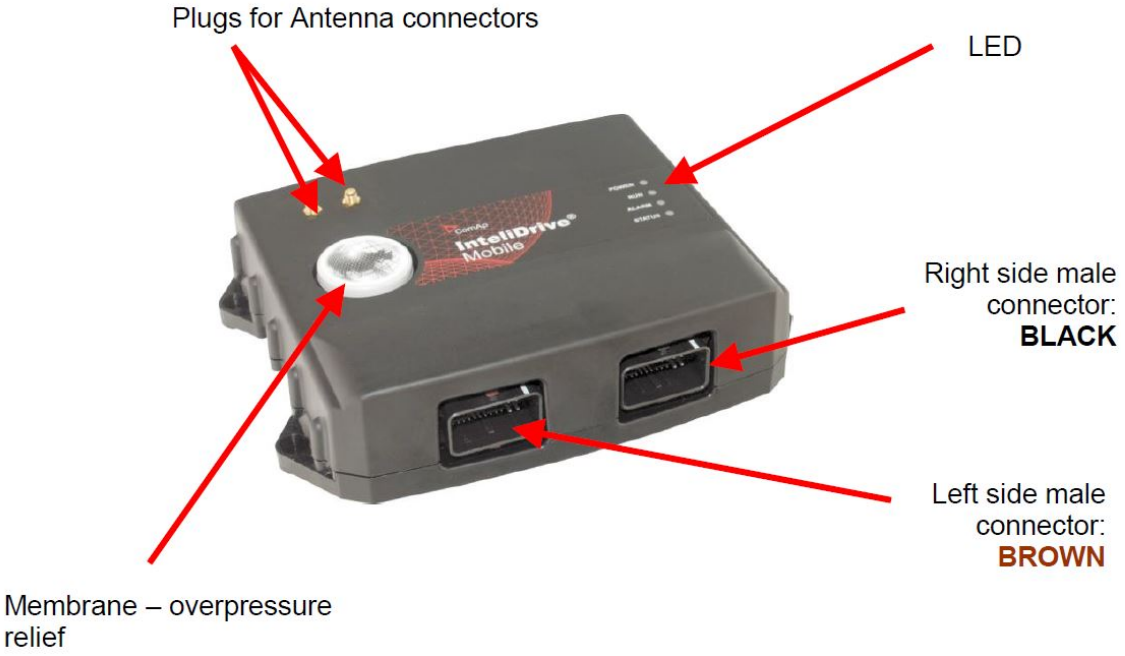


Image 2.1 Hardware

2.1 LED indication

2.1.1 Power

Power supply indication – is always lighted if the power supply is on.

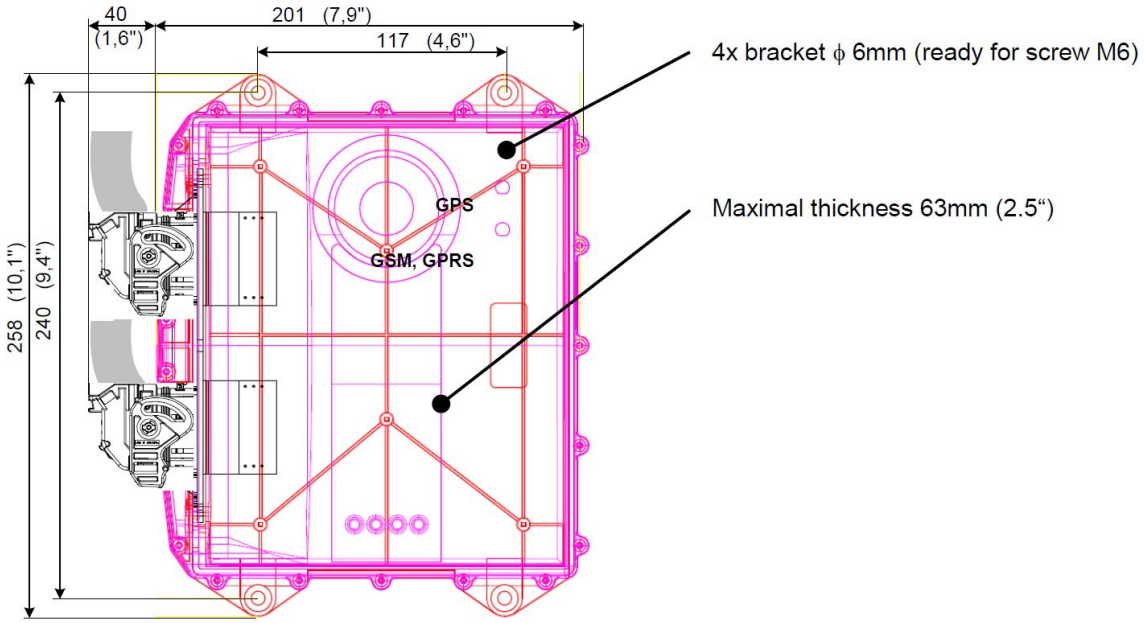
2.1.2 Run

Running engine indication – is lighted if the engine is running

2.1.3 Alarm

Incoming Alarm indication. Because no Fault reset is expected for controller the new incoming Alarm activates steady state light for 60min. Any new alarm during this 60 minutes causes 2 sec fast blinking and prolong the Alarm LED for next 60min. Auto quitted function disable the Alarm LED after 60 minutes after the last alarm even if is still active.

2.2 Dimensions and assembly



The ID-Mobile chassis is assembled with two parts (controller case and controller cover). Both parts are connected together with 19 bolts (2.9 × 16m).

Note: *The unit is completed with two screws for the delivery. The rest of screws are attached so the unit can be completed before applying. The main reason is to be plug-in modules (GPS, GSM, GPRS) easily applicable.*

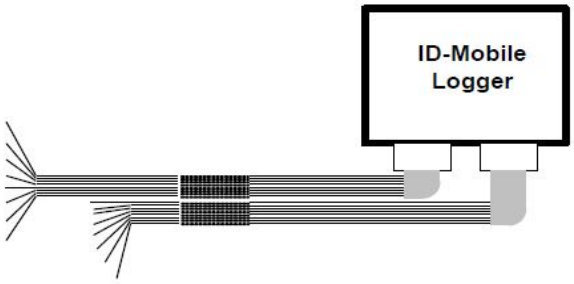
2.2.1 Disassembling

- Screw out 19 bolts from the bottom side of the controller case.
- Gently divide controller cover and case.
- Watch the GPS/GPRS antenna interconnections (if applicable).
- The silicone sealing is lubricated some lube could be present in the joint.

2.2.2 Assembling

- Settle the silicone sealing and be sure the sealing is undamaged
- Fit the controller case and cover so that both parts are matching properly in joint shells
- Firstly screw up all bolts but do not finalize
- Finalize all bolts with the sequence as shown below. **The maximum torque is 1 Nm**

2.3 Harnesses



All signals are connected via two MOLEX CMC (4×12) 48 pins connectors. Bold (power) items are connected via MOLEX CMC stronger pins with wires crosscut about 1.5 mm^2.

Available standard harnesses supplied by ComAp

Harness Lenght	ComAp Order Code
1.5. meters	ID-Mobile Harness-1.5
6 meters	ID-Mobile Harness-6
Sets of harnesses	▶ left and right connector ▶ cables, interconnection ▶ cable sleeve

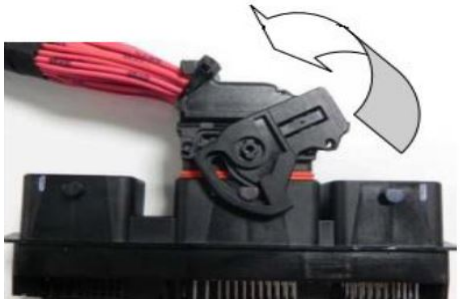
Note: *Harnesses for ID-Mobile Logger are not compatible with ID-Mobile control unit.*

Connectors

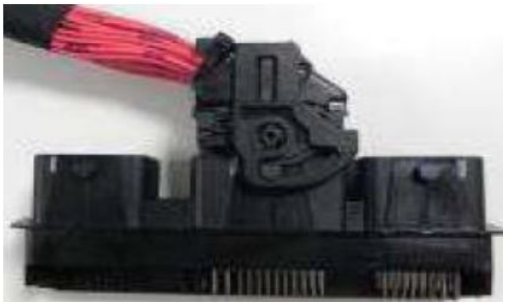
Item	ComAp Order Code
Set of Connectors	Term set ID-Mobile
Includes	▶ right and left connector (brown, black) ▶ accessories (pins, plugs)

2.3.1 Mating/Unmating of the connector from the header

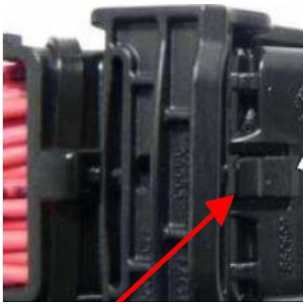
Insert the connector until it stops in the header



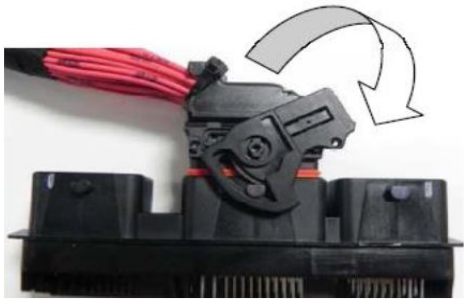
Rotate the lever



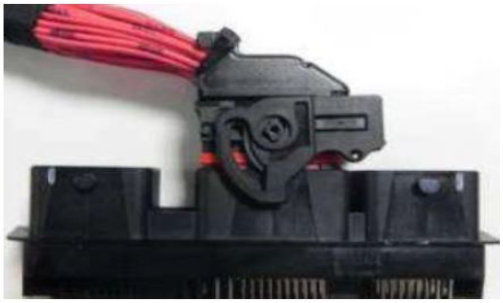
Lock it on the cover cap until it clicks



Press on the latch



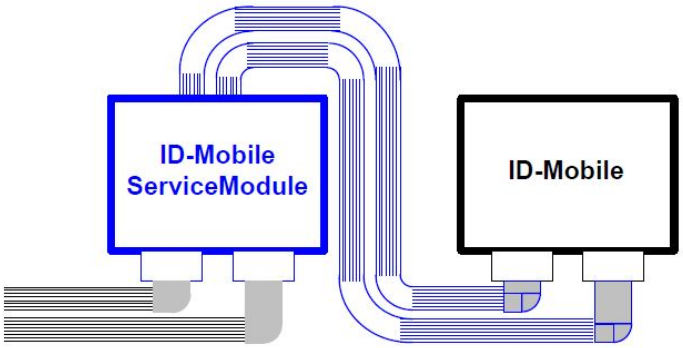
Rotate the lever

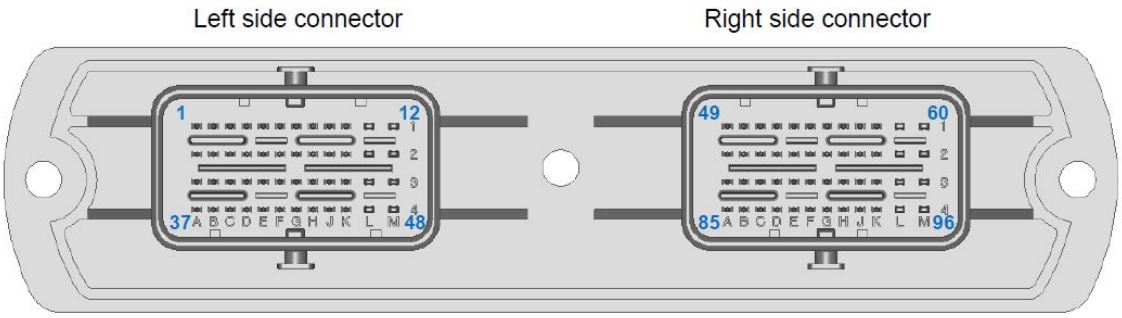


Rotate the lever

2.4 ID-Mobile Service Module

Service module enables access to any of 96 ID-Mobile signals for measuring and simulation. It is designed in ID-Mobile box with one meter harness tail – see in blue (containing all signals) to be connected to ID-Mobile box. Vehicle harness (see in black) is in this case connected to Service Module.





Note: *This accessory is available just on request with extended delivery time (for more info contact sales support).*

2.5 Terminals

Pins (numbering) location (four rows per 12 pins each, power pins are **in bold**)

Left side male connector													Right side male connector											
1	2	3	4	5	6	7	8	9	10	**11**	**12**	1	49	50	51	52	53	54	55	56	57	58	**89**	**60**
13	14	15	16	17	18	19	20	21	22	**23**	**24**	2	61	62	63	64	65	66	67	68	69	70	**71**	**72**
25	26	27	28	29	30	31	32	33	34	**35**	**36**	3	73	74	75	76	77	78	79	80	81	82	**83**	**84**
37	38	39	40	41	42	43	44	45	46	**47**	**48**	4	85	86	87	88	89	90	91	92	93	94	**95**	**96**
Bottom side of box																								
A	B	C	D	E	F	G	H	J	K	**L**	**M**		A	B	C	D	E	F	G	H	J	K	**L**	**M**

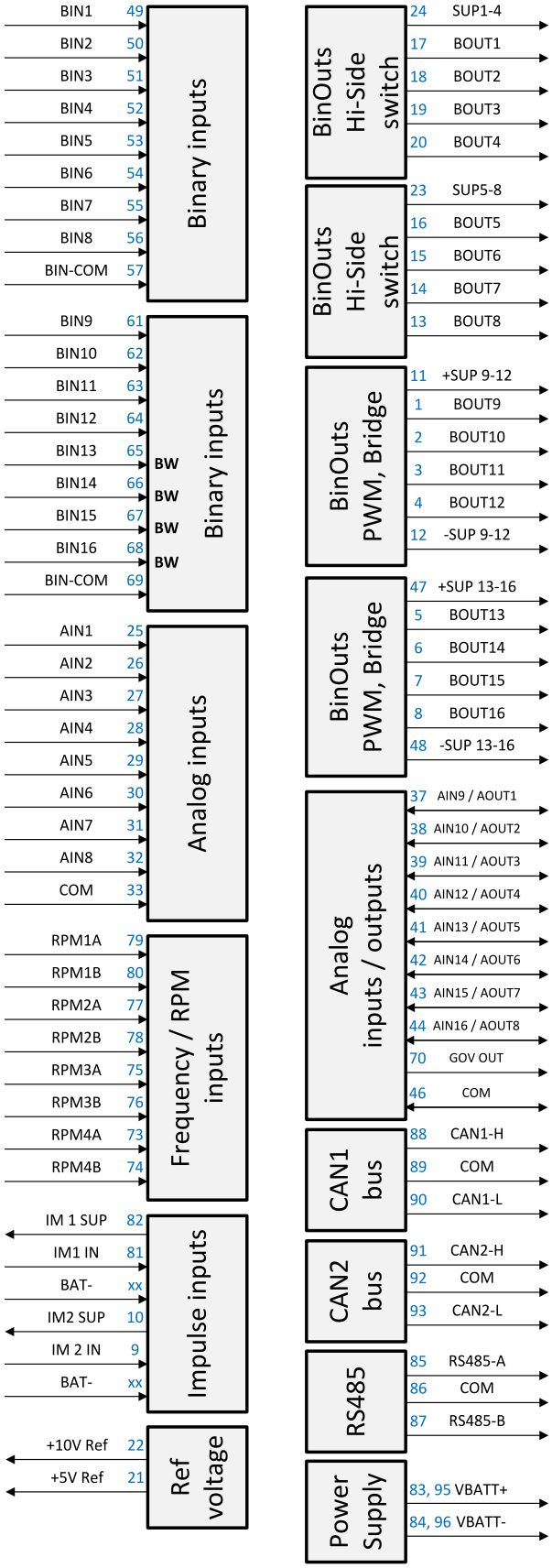
Left side connector - Pins function

	4		3			2		1
37	AIN9 / AOUT1	25	AIN 1	**A**	13	BOUT 8	1	BOUT 9
38	AIN 10/AOUT 2	26	AIN 2	**B**	14	BOUT 7	2	BOUT 10
39	AIN 11/AOUT 3	27	AIN 3	**C**	15	BOUT 6	3	BOUT 11
40	AIN 12/AOUT 4	28	AIN 4	**D**	16	BOUT 5	4	BOUT 12
41	AIN 13/AOUT 5	29	AIN 5	**E**	17	BOUT 1	5	BOUT 13
42	AIN 14/AOUT 6	30	AIN 6	**F**	18	BOUT 2	6	BOUT 14
43	AIN 15/AOUT 7	31	AIN 7	**G**	19	BOUT 3	7	BOUT 15
44	AIN 16/AOUT 8	32	AIN 8	**H**	20	BOUT 4	8	BOUT 16
45	n.c.	33	AIN COM	**J**	21	+5V	9	IM 2 IN
46	IN/OUT-COM	34	BINserv	**K**	22	+10V	10	IM 2 SUP
47	**VBOUT 13-16+ BAT PLUS**	**35**	BOUTserv	**L**	**23**	**VBOUT5-8+ BAT PLUS**	**11**	**VBOUT 9-12+ BAT PLUS**
48	**VBOUT 13-16- BAT MINUS**	**36**	**BAT MINUS**	**M**	**24**	**VBOUT1-4+ BAT PLUS**	**12**	**VBOUT 9-12- BAT MINUS**

Right side connector - Pins function

	4		3			2		1
85	RS485A	73	RPM 4-	**A**	61	BIN 9	49	BIN 1
86	RS-COM	74	RPM 4+	**B**	62	BIN 10	50	BIN 2
87	RS485B	75	RPM 3-	**C**	63	BIN 11	51	BIN 3
88	CAN1H	76	RPM 3+	**D**	64	BIN 12	52	BIN 4
89	CAN1-COM	77	RPM 2-	**E**	65	BIN 13	53	BIN 5
90	CAN1L	78	RPM 2+	**F**	66	BIN 14	54	BIN 6
91	CAN2H	79	RPM 1-	**G**	67	BIN 15	55	BIN 7
92	CAN2-COM	80	RPM 1+	**H**	68	BIN 16	56	BIN 8
93	CAN2L	81	IM 1 IN	**J**	69	BIN 9-16 COM	57	BIN 1-8 COM
94	D+	82	IM 1 SUP	**K**	70	GOV	58	n.c.
95	**BAT PLUS**	**83**	**BAT PLUS**	**L**	**71**	**BAT PLUS**	**59**	**BAT PLUS**
96	**BAT MINUS**	**84**	**BAT MINUS**	**M**	**72**	**BAT MINUS**	**60**	**BAT MINUS**

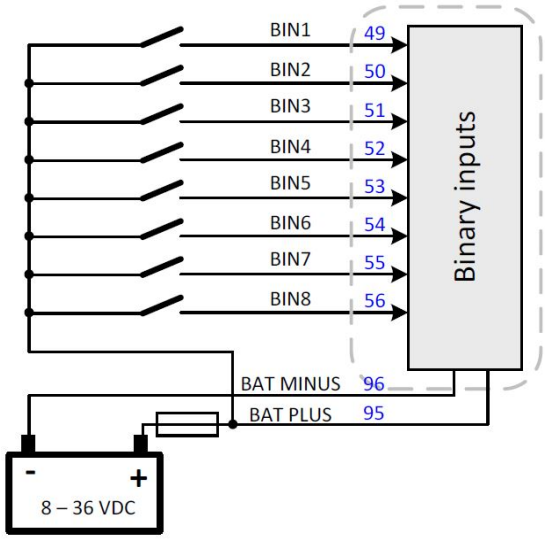
2.6 Physical input/output structure



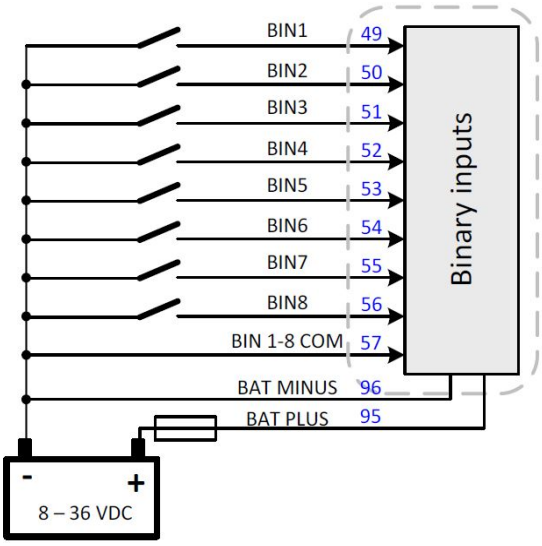
2.6.1 Binary inputs BIN1 to BIN16

Binary inputs BIN1 to BIN8 can be active to minus or plus of power supply. It can be selected by jumper “BI1 – BI8 polarity” and corresponding setpoint JumperBIN1to8.

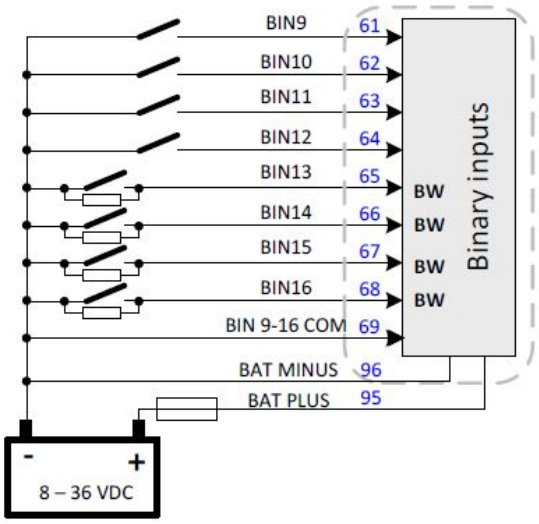
Activate to BATT+ :



Activate to BATT- :

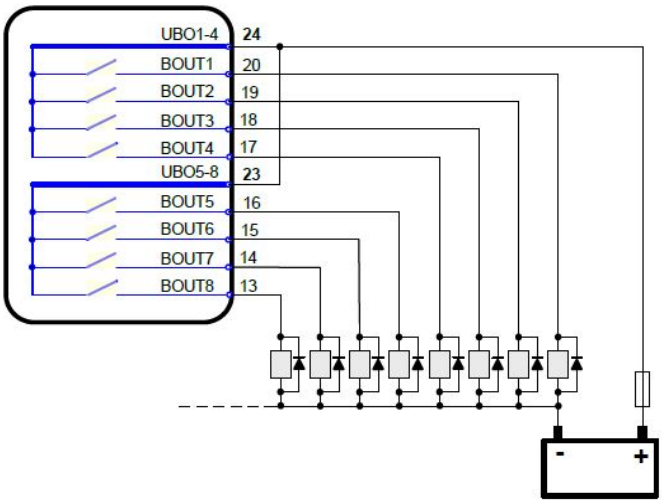


Binary inputs BIN9 to BIN16 can be active to minus of power supply only. BIN13 – BIN16 has implemented functionality Broken wire detection (BW). For correct behavior between BIN and COM has to be connected 10 kΩ resistor.



2.6.2 Binary outputs BO1 to BO8

BO1 to BO8 are single high-side switches where the load is connected against minus power supply terminal.



Maximal output current continuous 2A. Maximal short term current 3A.

When not all channels are used it is recommended to use gaps between channels (e.g. BO1, BO3, BO5, BO7)

It is possible to invert channels logic in DriveConfig.

PWM is not available on BOUT1 to BOUT8.

Close corresponding jumper to avoid BW detection of unused outputs BO1 to BO8.

BO 1/2 Fail is indicated in the case of BW on BO1 or BO2 (collected indication for 1-2, 3-4, 5-6, 7-8 output couples).

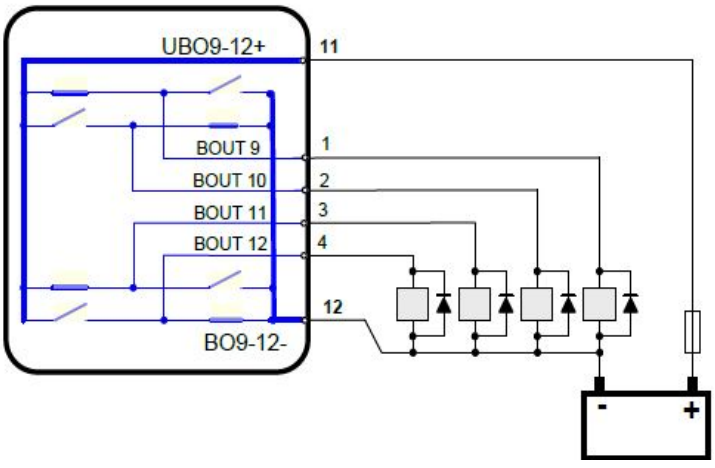
Reason of BOUT1 – BOUT8 disconnection (block) and error indication:

- Short circuit (over 8 Amps) between BOUT 1-2; BOUT 3-4; BOUT 5-6; BOUT 7-8;
- Short circuit (over 8 Amps) of any BOUT1-8 to BAT MINUS
- Short circuit (over 8 Amps) of any BOUT1-8 to BAT PLUS
- Overheat (over 150 °C on chip) and Undervoltage below 5.3V of chip supply.
- Broken wire (just indication)

2.6.3 Binary outputs BO9 to BO16

There is one control signal for each binary channel. The load is closed or not depends if load is wired to plus or minus of power supply (i.e. as Hi-side or Low-side switch). One of two switches on each Binary output is closed and one opened in any operational case. Both switches are opened only when on-chip (e.g. overcurrent or overheat) protection is activated.

Binary outputs BO9 to BO16 can be configured many different ways:



High-Side switches

> **Example:** BOUT9 and BOUT11 are closed
> BOUT10 and BOUT12 are opened

Configuration:

- Property–Output type = BO
- Property–Inverted = YES or NO

High-Side PWM

Configuration:

- Property–Output type = PWM
- Property–Output curve = … create in Expert mode-User curves-Output curves Or use linear curve

> **IMPORTANT: It is not recommended to use High-Side switches for activation of Emergency or admission type of actuators (e.g. gas valves, fuel valves etc.).**

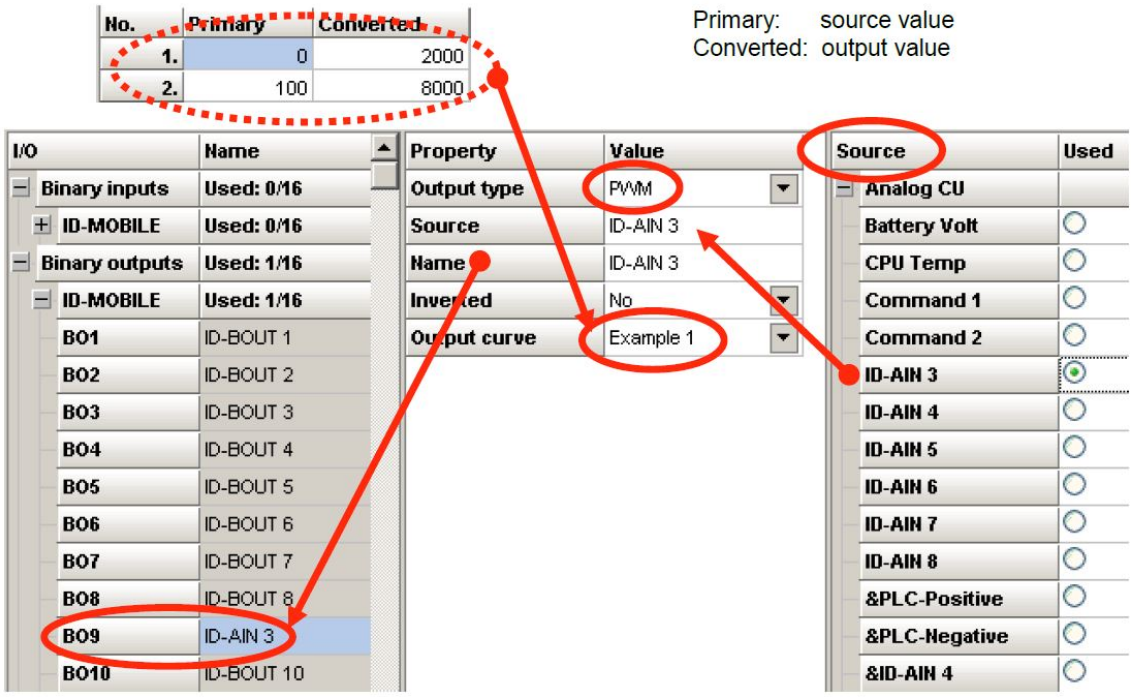
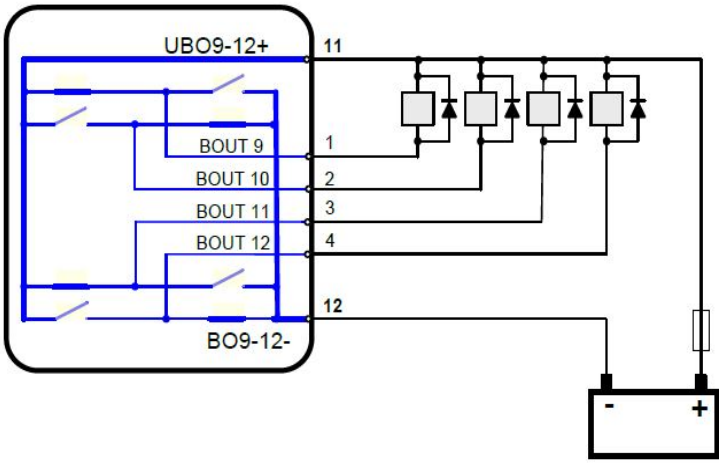


Image 2.2 Example 1 of Output curve for PWM on Binary output

Reason of BOUT9 – BOUT16 disconnection (block) and error indication

- Short circuit (over 8 Amps) between BOUT 9-10; BOUT 11-12; BOUT 13-14; BOUT 15-16;
- Short circuit (over 8 Amps) of any BOUT9-16 to BAT MINUS
- Short circuit (over 8 Amps) of any BOUT9-16 to BAT PLUS
- Overheat (over 150 °C on chip) and Undervoltage below 5,3V of chip supply.



Low-Side switches

> **Example:** BOUT9 and BOUT11 are opened
> BOUT10 and BOUT12 are closed

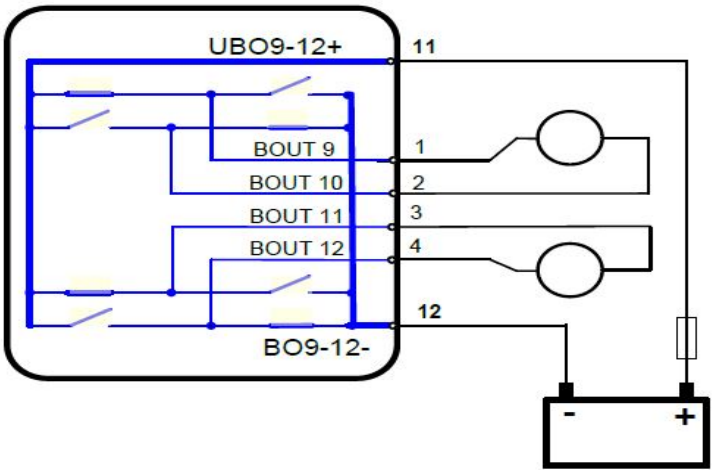
Configuration:

- Property–Output type = BO
- Property–Inverted = YES or NO

Low-Side PWM

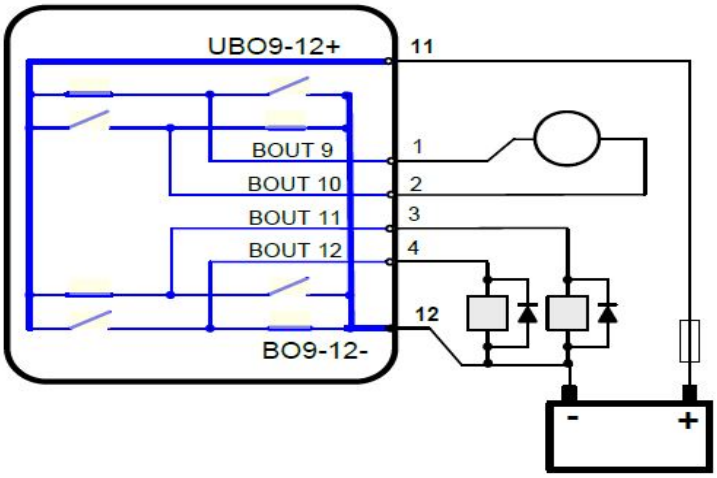
Configuration:

- Property–Output type = PWM
- Property–Inverted = YES or NO



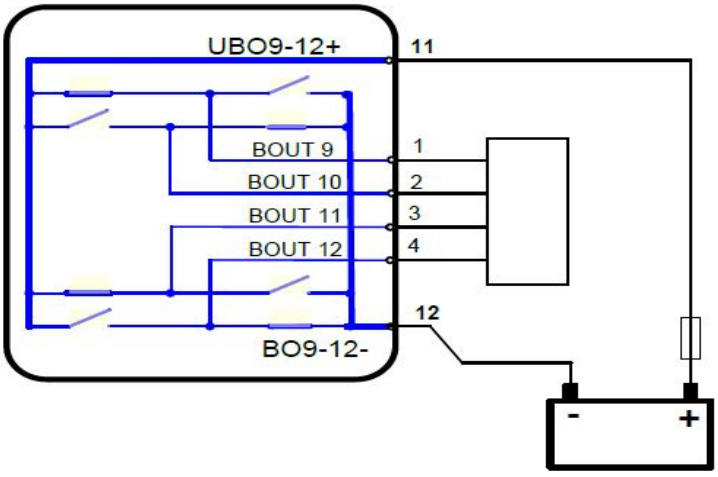
Bridge outputs

Example: Two reversible actuators



Bridge outputs

Combined: One reversible actuator and two relays.

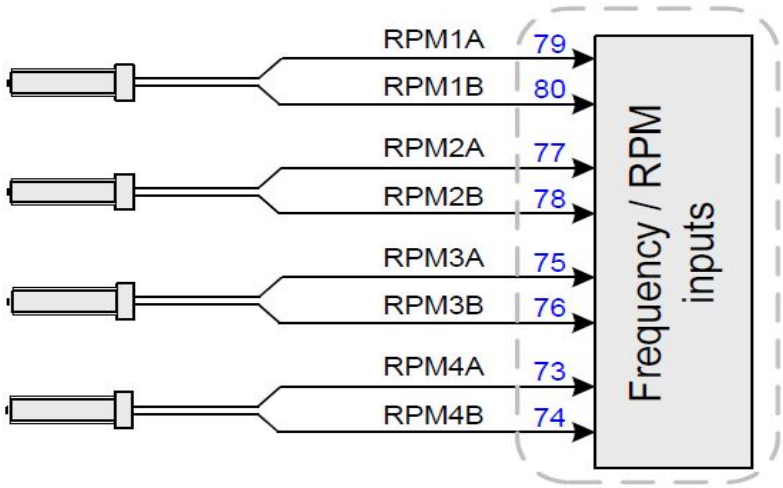


DC motor control

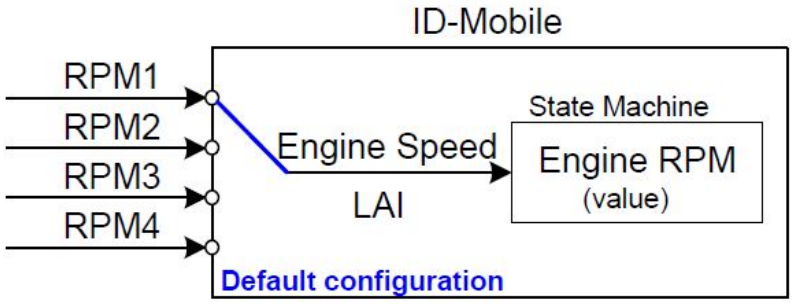
The same structure can be used for BOUT 13 – BOUT16

Name	Pin	Configuration as			
UBO9-12+	**11**	Positive power supply for BO9-12			
BOUT9	1	BO	PWM	BRIDGE	DC Motor
BOUT10	2	BO	PWM		
BOUT11	3	BO	PWM	BRIDGE	
BOUT12	4	BO	PWM		
BO9-12-	**12**	Negative power supply for BO9-12			
UBO13-16+	**47**	Positive power supply for BO13-16			
BOUT13	5	BO	PWM	BRIDGE	DC Motor
BOUT14	6	BO	PWM		
BOUT15	7	BO	PWM	BRIDGE	
BOUT16	8	BO	PWM		
BO13-16-	**48**	Negative power supply for BO13-16			

2.6.4 RPM Inputs

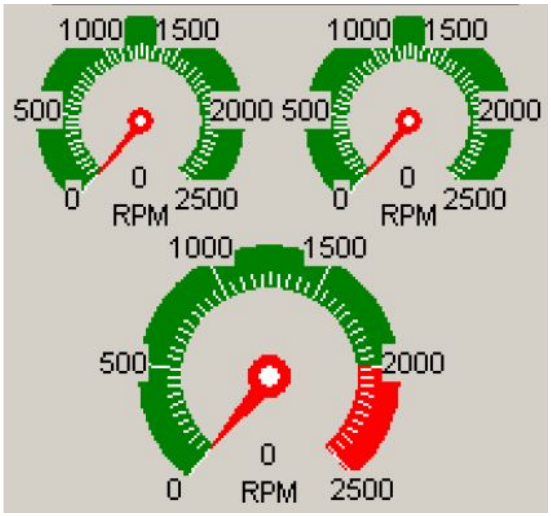


Use magnetic pickups.



LAI = Logical Analog Input

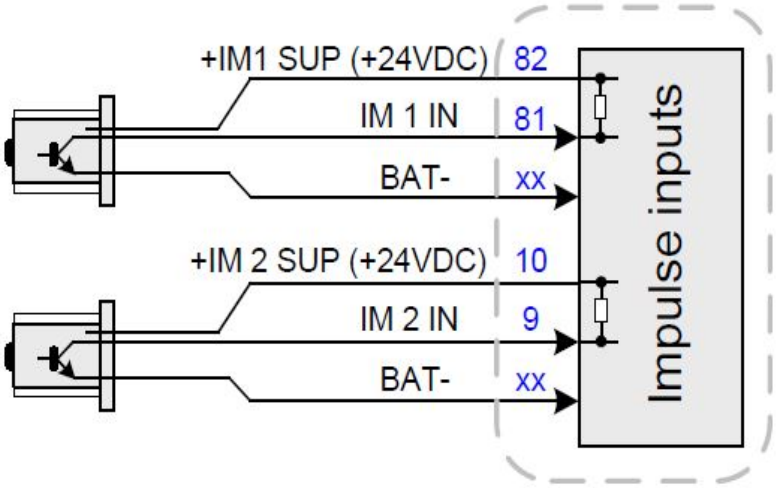
Engine RPM = value default configured to RPM1.



Indication of RPM2 and RPM3 in DriveMonitor-2.5

Indication of Engine RPM (RPM1 in default).

2.6.5 Impulse inputs



Use active NPN open collector sensors.

2.7 Jumpers – hardware configuration

Prior to configuration procedure the hardware jumpers has to be connected. See below available jumpers groups.

Note: *Take care of correct jumper setting to avoid repeated ID Mobile box opening.*

A GROUP	AOUT1-AOUT8 range switch
B GROUP	AOUT1-AOUT8 function and On/Off switch
C GROUP	AIN1 – AIN16 range switch
BOUT1-8	Corresponding jumper has to be closed when BOUT is not used (wired) to avoid BW (broken wire) message.
CAN1, CAN2, RS485	Terminating 120 ohms resistors
SGO	Speed governor (analog) output selection

BOOT	System booting
BI1 - BI8 polarity	Setting of polarity for activation of BIN1 to BIN8
BOUT	BOUT broken wire detection blocking for not used outputs

Note: *Analog outputs AOUT1–8 and analog inputs AIN 9-16 share connector pins 37 to 44 – see table below. Each pin from this group can be used or for AIN or for AOUT (not both).*
To use any analog input AIN9-16 the corresponding B Group jumper has to be disconnected and corresponding AOUT can not be used.
Analog inputs AIN1-AIN8 can be used in any case - do not depend on AOUT1-AOUT8 configuration.

PIN	Function	
37	AOUT1	AIN9
38	AOUT2	AIN10
39	AOUT3	AIN11
40	AOUT4	AIN12
41	AOUT5	AIN13
42	AOUT6	AIN14
43	AOUT7	AIN15
44	AOUT8	AIN16

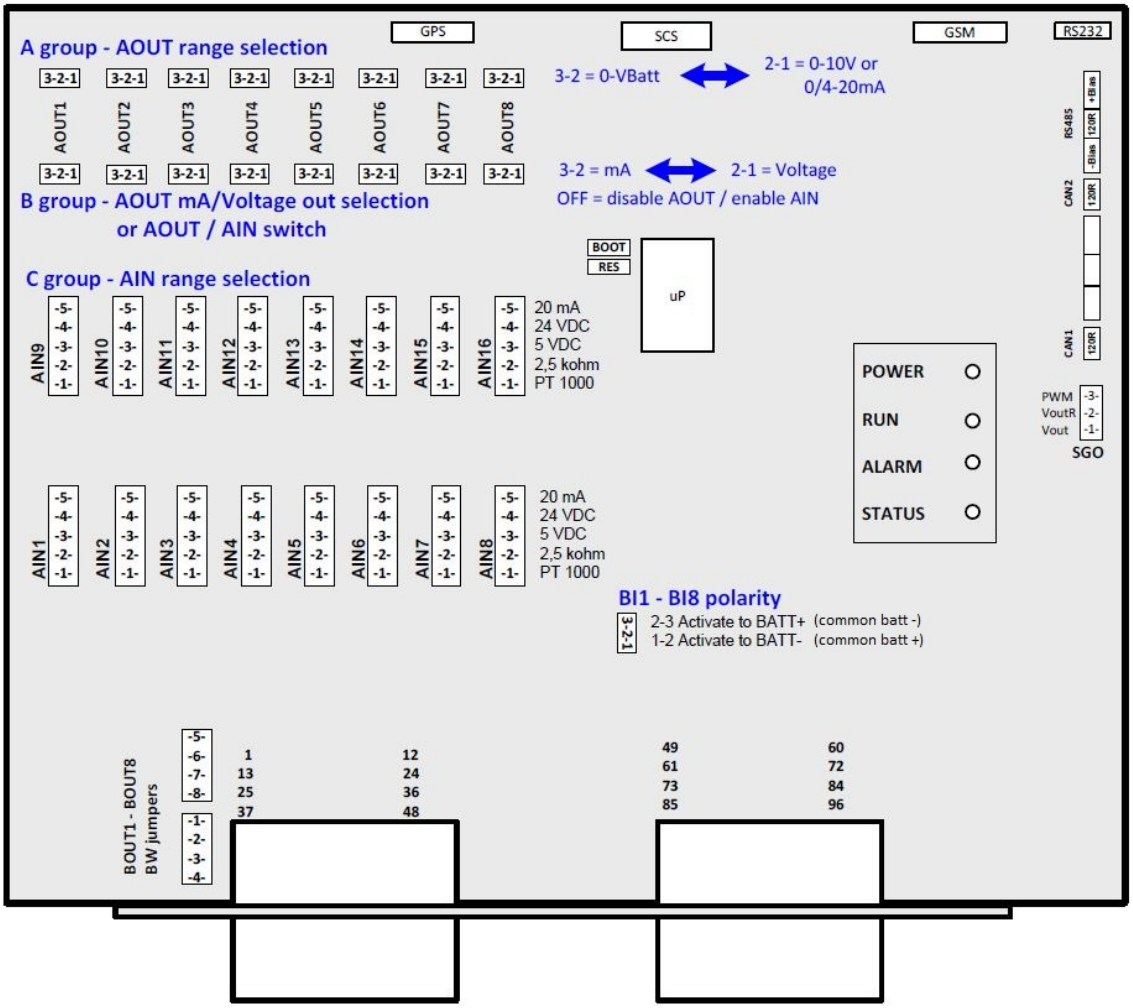
2.8 Configuration examples

Function	A GROUP	B GROUP	C GROUP
AOUT: 0 - 24VBatt	3-2	2-1	OFF
AOUT: 0 - 10VDC	2-1	2-1	OFF
AOUT: 0 – 20 mA	2-1	3-2	OFF
AIN: 20 mA	X	OFF	5
AIN: 5 VDC	X	OFF	4
AIN: 24 VDC	X	OFF	3
AIN: 2.5 kOhm	X	OFF	2
AIN: PT1000	X	OFF	1+2

Note:
X … opened or closed

> **IMPORTANT: To use any analog output AOUT1-8 the corresponding C Group jumper has to be disconnected. E.g. for AOUT1 has to be disconnected all C Group jumper AIN9. Connected jumper has influence on AOUT.**

2.8.1 Jumpers



2.8.2 Analog inputs

		Jumper		
	AI1 to AI8 Jumpers	**A**	**B**	**C**
Range Position	**PT 1000**	X	X	1+2
	2.5 kΩ	X	X	2
	5 VDC	X	X	3
	24 VDC	X	X	4
	0/4 - 20 mA	X	X	5

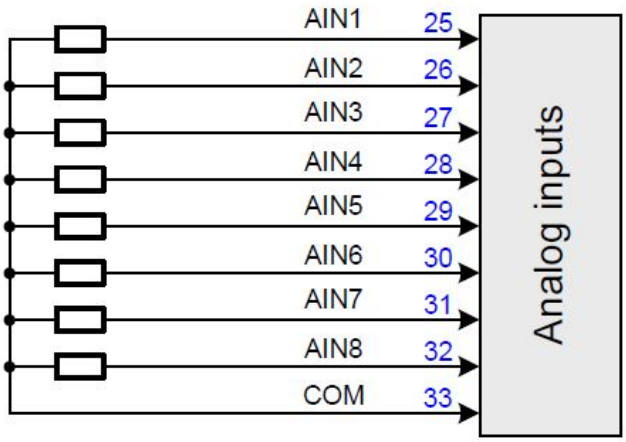
X … opened or closed

OFF … no jumper (both 1-2 and 2-3 open)

1+2 … two jumpers on position 1 and 2

2 … one jumper on position 2

		Jumper		
	AI9 to AI16 Jumpers	**A**	**B**	**C**
Range Position	**PT 1000**	X	OFF	1+2
	2.5 kΩ	X	OFF	2
	5 VDC	X	OFF	3
	24 VDC	X	OFF	4
	0/4 - 20 mA	X	OFF	5



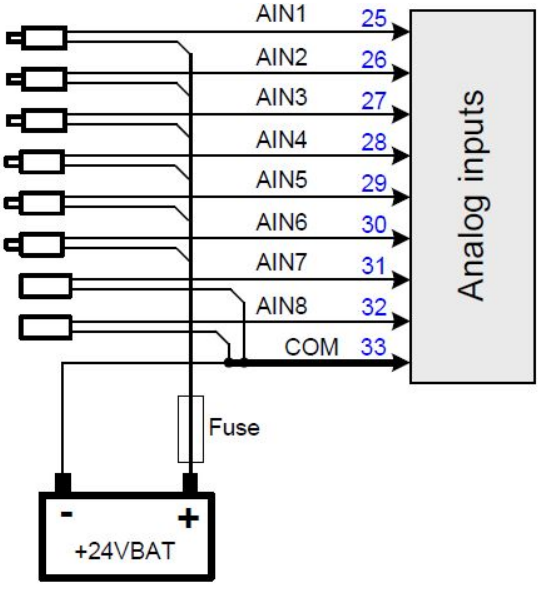
Example of resistive measuring.

Max sensor resistance = 2500 ohms.

Jumpers in position: 1+2 for PT1000

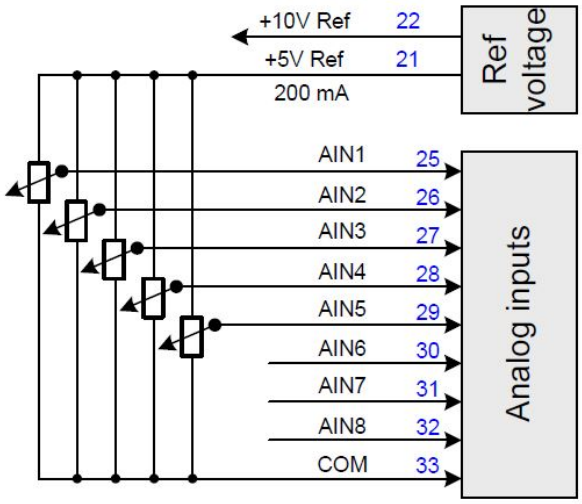
2 for 0 to 2500 ohms range

Sensors from this group have to be connected directly to COM terminal 33.



Example of 0/4-20mA current measuring.

Sensors from this group have to be connected directly to COM terminal 33.



Example of 5V inputs measuring.

Sensors from this group have to be connected directly to COM terminal 33.

Note: *To use analog input AIN9-AIN16 the corresponding B group jumper. – MUST be disconnected!!!*

2.8.3 Analog outputs

	AOUT1 to AOUT8 Jumpers	A	B	C
Range Position	0 to 10V	1-2	1-2	OFF
	0 to +VBat(*)	2-3		OFF
	0/4 to 20 mA	1-2	2-3	OFF

X … opened or closed

1-2 … jumper on position 1- 2

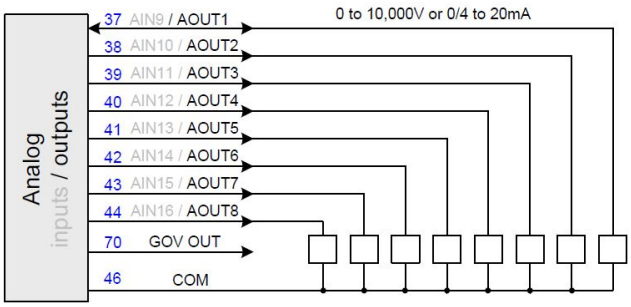
OFF … no jumper (both 1-2 and 2-3 open)

IMPORTANT: To use any analog output AOUT1-8 the corresponding C Group jumper has to be disconnected. E.g. for AOUT1 has to be disconnected all C Group jumper AIN9. Connected jumper has influence on AOUT.

Note: *Restriction for HW version 1.2 and lower:*
Power supply must be more than 18VDC to achieve full range of AOUT.

IMPORTANT: Power supply should be not less than 10V if output 10 V must be achieved.

Note: *AOUT range value is in mV i.e. 10000 = 10,000Volts*
Analog output is disconnected when corresponding B GROUP jumper is removed.



General example of Analog outputs wiring.

Jumpers (A, B group) selectable range

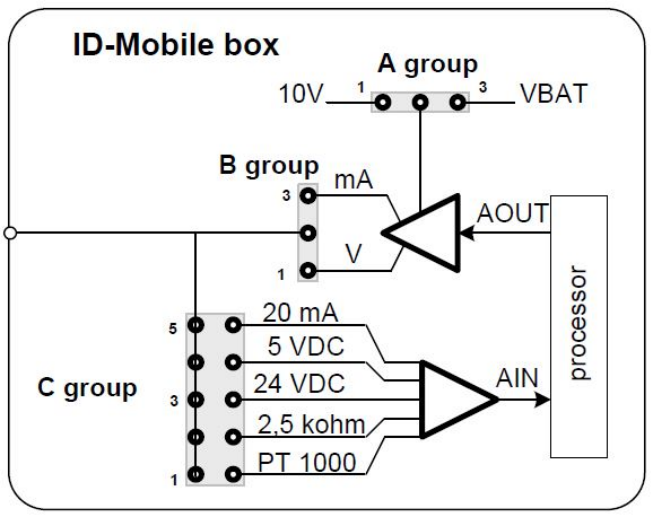
0 to 10,000V (A=2-1 B=2-1) or

0 to – Vbatt (A=3-2 B=2-1) or

0/4 to 20 mA. (A=2-1 B=3-2)

AIN/AOUT terminals group is variable. Different combination of AIN and AOUTS can be configured.

Note: *To use analog input AIN9-AIN16 the corresponding B group jumper. – MUST be disconnected!!!*



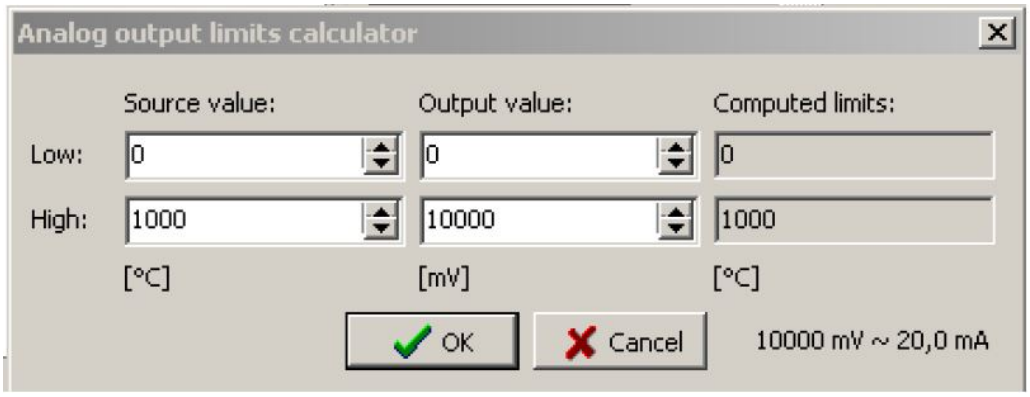
Speed governor output GOV OUT (terminal 70) is engine governor analog interface selectable by SGO jumper between:

- 0 to 10,000V – position 1
- 0 to 10,000V via 10kiloohms resistor – position 2
- PWM – position 3

IMPORTANT: GOV OUT is not configurable by DriveConfig.

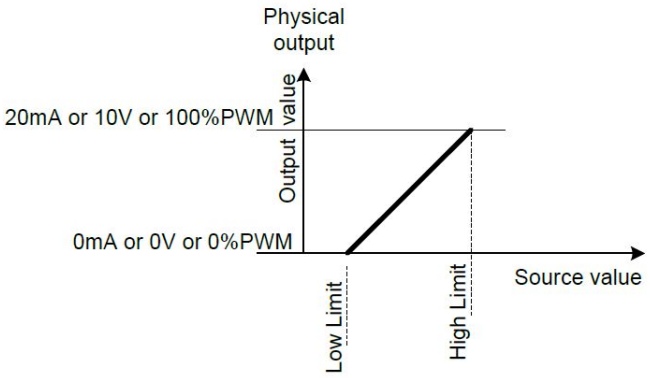
2.8.4 Analog outputs limits calculator

Available for Analog outputs configuration.



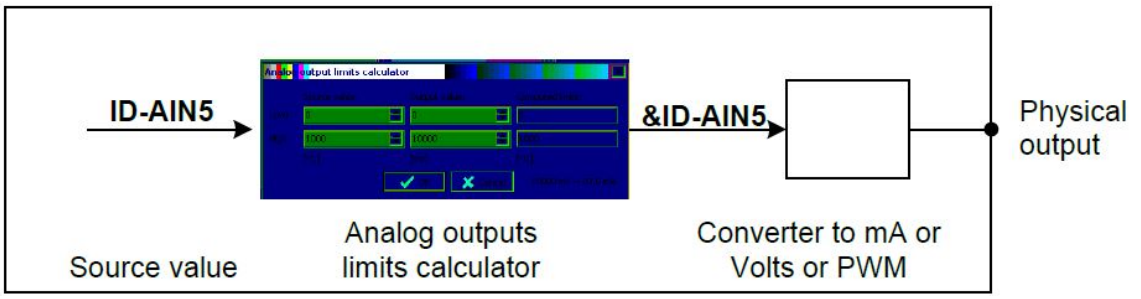
Output value	Meaning	Configuration	Valid for
0	0 mA	0/4 to 20 mA	AOUT1 to AOUT8
	0 mV	0 to 10 V	AOUT1 to AOUT8
	0% PWM	PWM	BOUT9 to BOUT16
10000	20 mA	0/4 to 20 mA	AOUT1 to AOUT8
	10,000 V	0 to 10 V	AOUT1 to AOUT8
	100% PWM	PWM	BOUT9 to BOUT16

2.8.5 Low and High limit explanation



2.8.6 Transformed output value indication

The „&" prefix is used with Source value name for output value indication in corresponding analog inputs.



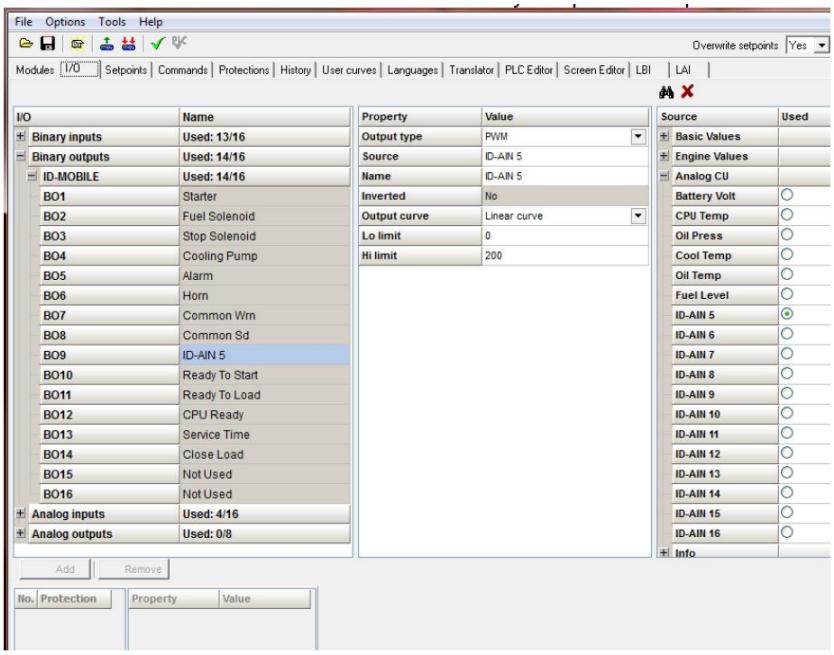
2.8.7 PWM output on BO9 up to BO16

Dither function is intended to avoid an unpredictable behavior of hydraulic proportional valves caused by hysteresis and stiction. Dither is a rapid, small movement of the spool around desire position which eliminates the stiction and enables more accurate moving of the valve.

Typical use – Proportional hydraulic valves.

Setting of BO

PWM and Dither function is available on Binary Output BO9 up to BO16



Property	Value	Details
Output type	BO	Standard Binary Output
	PWM	Pulse With Modulation (PWM) output
Name	Text	Title of the BOUT – maximum 14 charts
Source	According to Input	Source for output. See list of sources
Inverted	Yes	Inversion (negation) of BO signal is active
	No	Inversion (negation) of BO signal is active
Output curve	According to user curves	If no user curve is created the output is linear
Lo limit	0%	0% of PWM conforms to physical value (e.g.0%PWM = 0V)
Hi limit	100%	100% of PWM conforms to physical value (e.g.100%PWM = 10V)

Note: *Dither function is active only if PWM output type is configured.*

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3 Applications overview

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3.1 Event Log

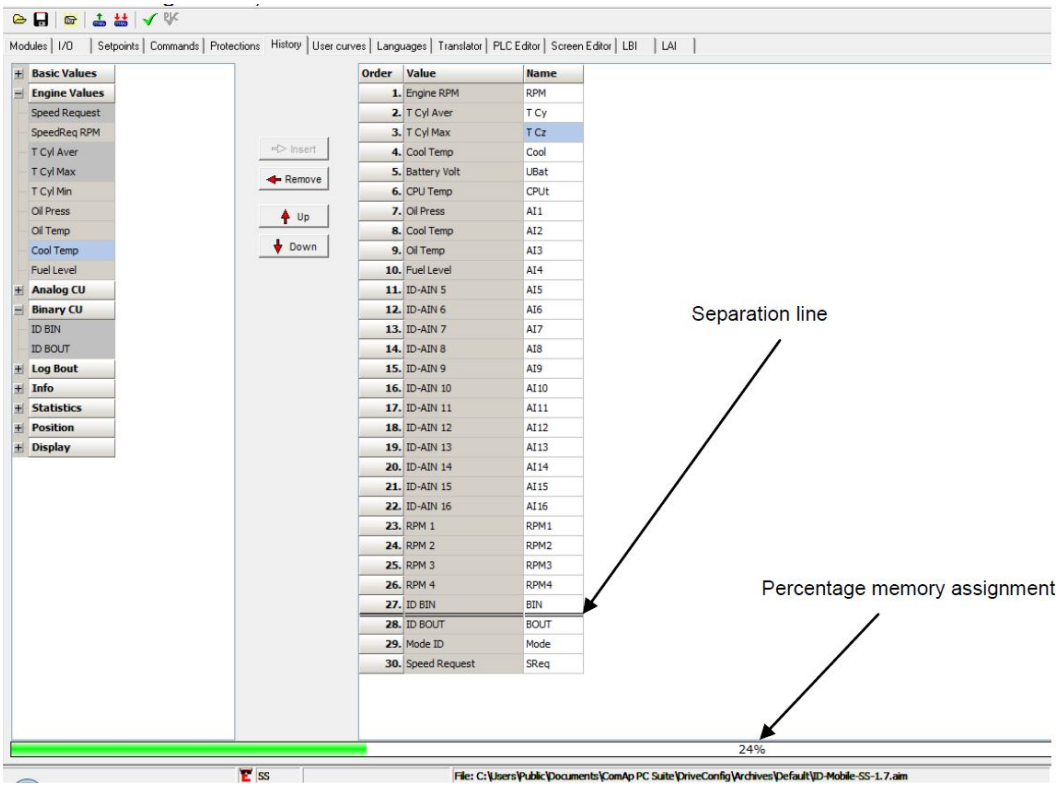
3.1.1 Statistic values

		It is calculated:
1	Number of starts	Each successful start (starter is switched off due to RPM> Starting RPM) is calculated. External (manual) engine start (running indications).
2	Running hours	Each finished 60 minutes when engine is running.
3	Number of unsuccessful starts	Each finished cranking due to MaxCrank time is over

Level of Statistic values password protection against changing can be configured in DriveConfig.

3.1.2 History records

Each ID-Mobile History record is justified to 32 or 64 or 96 or 128 bytes of length (depends on record structure configuration).



Memory assignment up to	Max.number of records
1% above separation line (aprox. 23%)	382
below separation line – 50%	190
50% - 79%	126
80% - 100%	95

Following table contains typical messages. Do not contain messages from ECU.

Events specification	Protection type	Information available on binary output
Alarms		
GeoFencing	WRN *)	YES
Wrn Analog input 1 to 8 (16)	WRN	YES
Sd Analog input 1 to 8 (16)	SD	YES
ID-MOBILE Binary inputs 1 to 16	Configurable	YES
ID-MOBILE Battery voltage <, >	WRN	YES
Battery flat	WRN	
Start fail	WRN	YES
ParamFail	NONE	
Overspeed	SD	YES
Underspeed	WRN	YES
EmergencyStop	SD	
Pickup fail	WRN	
Stop fail	WRN	YES
WrnServiceTime	WRN	
ChrgAlternFail	WRN	YES
Fault reset		
Local mode ON		YES
Local mode OFF		
Harbour mode ON		YES
Harbour mode OFF		
SecBattery		YES
Emergency stop		
Alarms from IS-AIN8, IS-BIN16/8, ECU	WRN or SD	YES

Note:
**) and Start blocking*

Engine events	Note
Starts	
CAN control + Button start	Start from external terminal
RS485 control + Button start	Start from DriveMonitor

Engine events	Note
Remote start	Start from BI
Stops	
CAN control + Engine stop	Stop from external terminal
RS485 control + Engine stop	Stop from DriveMonitor
Remote start	ID-MOBILE binary input
RS485 control	Start, Stop, Fault reset, On/Off button from DriveMonitor or I-RD
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 I-RD or IG-MU
ActCallCH1-OK	Successful active call on channel 1
ActCallCH2-OK	Successful active call on channel 2
ActCallCH3-OK	Successful 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
Close Load ON	Binary output clutch was closed
Close Load 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

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

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4 Installation and wiring

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4.1 Booting procedure

The ID-Mobile has no protection which is blocking incorrect FW of Mobile platform (ID-Mobile Logger Firmware to ID-Mobile Hardware).

After wrong upgrade does the controller not respond (No LEDs are on), the only one way how to upload the correct firmware is with using the Booting procedure

IMPORTANT: Be sure the correct firmware is uploaded to the hardware

You need

Image 4.1 AT-link converter (order code: AT-LINK CONV)

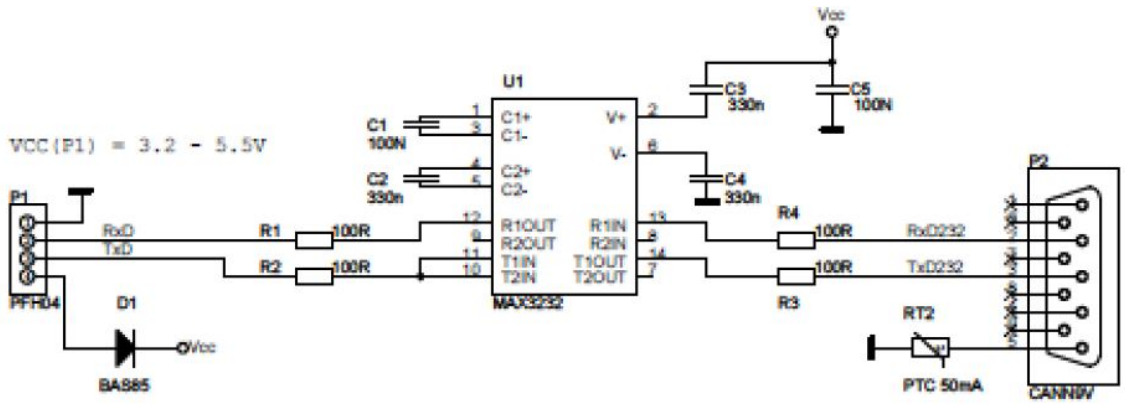


Image 4.2 Connection between AT link converter and PC RS232 or RS232/USB converter

4.1.1 RS232 cable

It is recommended to use standard Null-modem cable for local connection between controller and PC, although the three wires (TxD, RxD, GND) RS232 connection is enough for direct controller to PC communication:

Controller connection D-SUB9 female	PC RS232 connector D-SUB9 female
2	3 TxD
3	2 RxD
5	5 GND

4.1.2 Connect the AT link converter

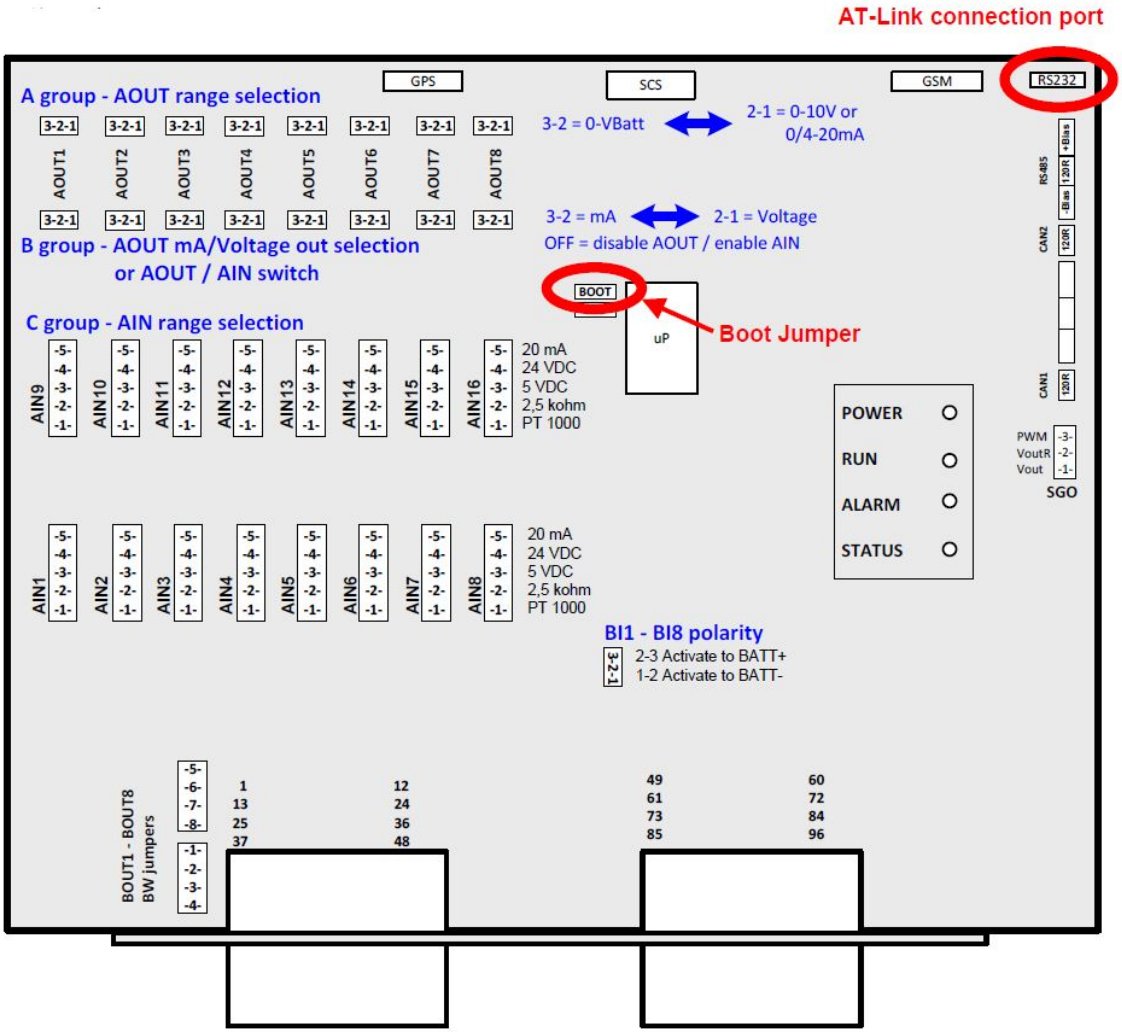
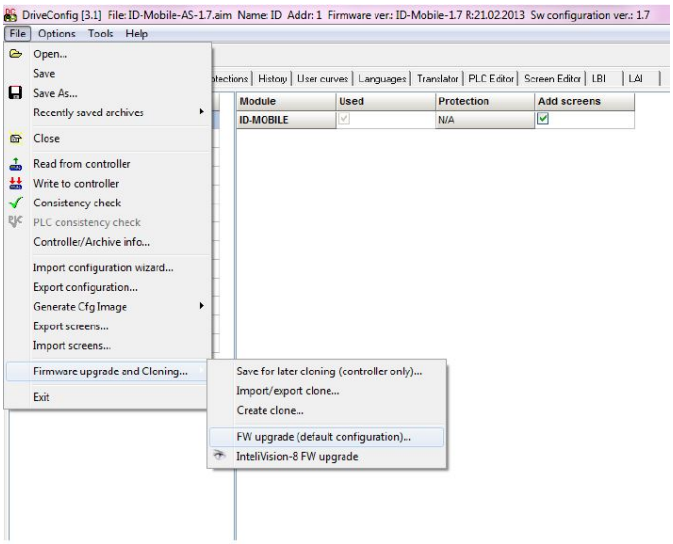
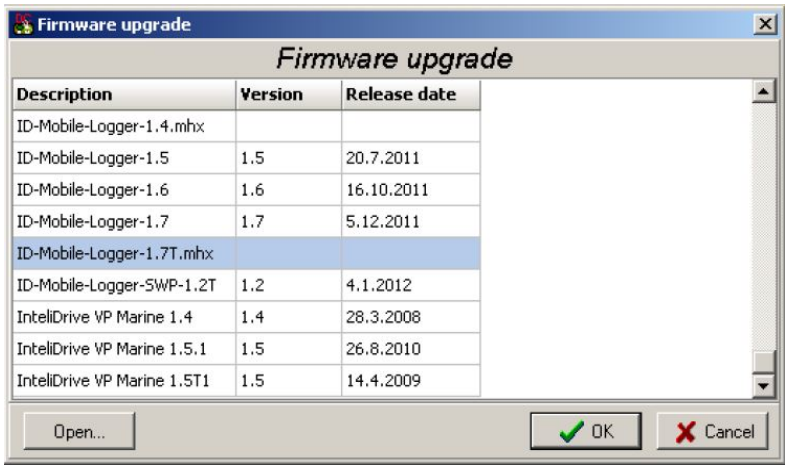


Image 4.3 File/Firmware upgrade and Cloning/FW upgrade (default configuration)…

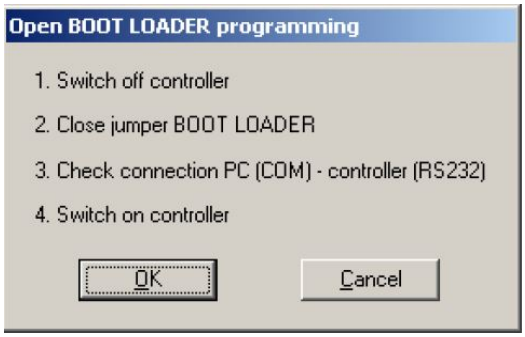


Select the requested firmware



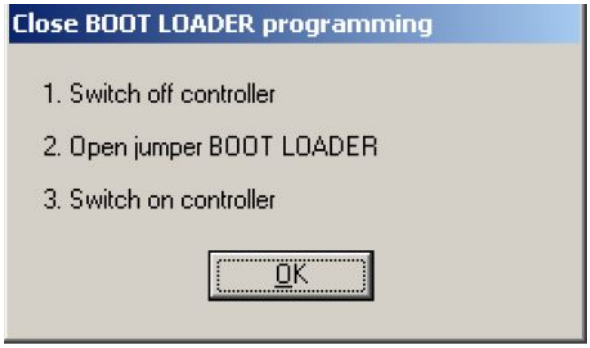
The upgrade will be processing

Follow instructions on the screen



Upgrading will continue

Follow instructions



Firmware is upgraded with default archive.

4.2 Plug-in module installation

4.2.1 GPS Module

GPS module enables function of exact controller location and ground speed as well as protection against unwanted manipulation of the controller (GeoFencing).

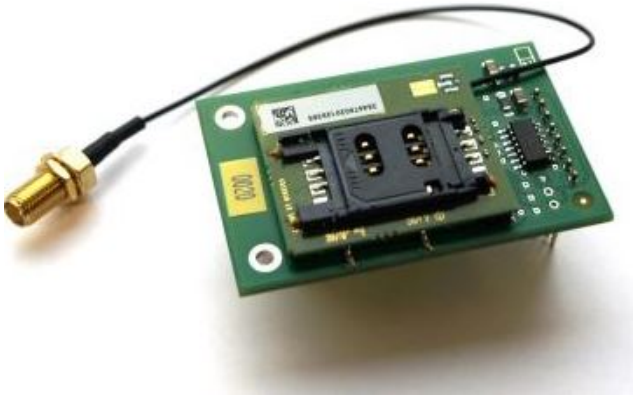
After installation of the module to the controller is for the basic function no other setpoints required.

For setting of GeoFencing **see Group: Position on page 109**.

Note: *Recommended Antenna Order code: GSM/GPRS ANTENNA*

Note: *For further details how to install the module see GPS Assembling document in supplement.*

4.2.2 GPRS Module



The module has two operation modes:

- Standard GSM mode CSD (Circuit Switch Data)
- GPRS mode

Selection of the mode is done by setpoint (**see Group: Act. Calls/SMS on page 101**).

Note: *Recommended Antenna Order code: OT1A4GXXMCX*

Overview of supported modes and functions

Module type	Operation mode	Description	Supports
ID-Mobile GPRS	SIMCOM CSD	Standard GSM mode CSD (Circuit Switch Data)	Alarm SMS Drive Monitor via modem connection
	SIMCIM GPRS	GPRS network – enables connection via AirGate	Alarm SMS AirGate Drive Monitor (via AirGate) WebSupervisor

IMPORTANT: For support of WebSupervisor and AirGate chose the ID-Mobile GPRS plug-in module.

Note: *Proper function of GPRS/GPS connection depends significantly to cell network provider. Be sure your provider supports data transfer.*

IMPORTANT: Disable the PIN code on the SIM card prior applying in ID-Mobile/ID-Mobile Logger.

Note: *For further details how to install the module see GSM Assembling document in supplement.*

4.3 External displays

4.3.1 InteliVision 12Touch

12.1” color display - 1280x800 pixels

Operating temperature: -30 + 70°C

Front panel protection IP65

CAN bus interface

Plug and Play structure following controller configuration

Power supply 8 – 36 VDC

Note: *The display configuration is done via the Screen Editor module in the PC tool DriveConfig.*

Note: *Compatible from FW version ID-Mobile 2.5.0 and above.*

4.3.2 InteliVision 8

8” color TFT display - 800x600 pixels

Operating temperature: -20 + 75°C

Front IP65 / Rear IP 20

CAN bus interface

Plug and Play structure following controller configuration

Power supply 8 – 36 VDC

Note: *Screen can be customized with ScreenEditor (SW application included in DriveConfig).*

4.3.3 InteliVision 5 CAN

5" color TFT display - 320 × 240 pixels

Operating temperature: -20 + 75°C

Protection IP 65

CAN bus interface

Plug and Play structure following controller configuration

Power supply: 8 -36 VDC

Note: *InteliVision 5 can also be used, but in case of PC tool communication RS485 will be display switched off.*

back to Installation and wiring

5 Controller setup

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5.1 Controller configuration and monitoring

InteliDrive installation package contains separate PC software tools: DriveConfig (DC) and DriveMonitor (DM).

DriveConfig and DriveMonitor is based on Windows 95/98/NT/ME/2000/XP/7 or higher platform and requires 15 MByte of hard disc free space.

5.1.1 Direct connection to the PC

ID-Mobile is usually connected with PC via RS485/USB interface or via I-LB (Local Bridge) or via IG-IB (Internet Bridge). No RS232 or USB is available on ID-Mobile.

5.1.2 DriveConfig

There are two controller file types:

Firmware	Application file (archive) Configuration
ID-Mobile-2.6.idc	ID-Mobile-SS-2.6.aim ID-Mobile-AS-2.6.aim

Delivered controller contains firmware and default configuration. This configuration can be modified by customer using DriveConfig PC software (when configuration is not locked). 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: *Any ECU Inputs/Outputs configuration procedure has to start from default AS or SS archive. The problems can occur when the finished ECU configuration is simply changed to another ECU (e.g. from Volvo to Scania) without ECU-1 module unselecting (unclicking).*

Application (configuration) “aim” file - archive

Binary type archive “*.aim” file contains:

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

Configuration file can be opened (Open file or Read from controller) modified and stored to the PC (Save, Save as) or downloaded to Controller (Write to controller).

DriveConfig functions

DriveConfig is tool for ID-Mobile and other InteliDrive controller 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 DriveMonitor)
- Controller firmware (mhx 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)
- Internal PLC editor

5.1.3 Configuration steps

Note: *Before ID-Mobile ECU configuration switch to ECU list: Option – ESL files … select Mobile.esl*

Following configuration steps are available in DriveConfig software:

- 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 (in Expert mode only).
- Configure History record (in Expert mode only)
- Configure password protection
- Add/Translate the language (in Expert mode only)

Translator

Enables to translate all or some texts to up 5 languages that are all available in controller. Controller language can be changed from panel buttons. It is possible to operate different languages on each ID-Mobile and Drive Monitor. External display (e.g. Bodas and CANtrak) language depends on specific display firmware.

Note: *Check all screens after translation if some texts do not overflow.*

5.1.4 DriveMonitor

Functions

On-line direct, Modem or Internet connection

Active Modem or Internet call received from engine to PC (activated by selected Alarm)

Continuous one engine monitoring in on-line connection

On-line or Off-line History record listing

Setpoints listing and adjusting (password protected)

Statistics value (e.g. Running hours) Set/Reset

Password and Access code change

Remote Switches Set/Reset

Connection types

	Direct connection via RS485 – up to 1000m.
	Modem connection via Analog, ISDN or GSM modem.
	Internet connection – Static IP address required. Connection via internet bridge
	AirGate connection (no static IP address is required)
	Active call (via modem). Controller calls to the preselected telephone number and sends the AID file when active call is activated. To receive AID file the DriveMonitor must be in Active call waiting window.
	Off line connection enables open and list Application AID file stored in PC.

Note: *More detail regarding different types of connection see in InteliCommunication guide.*

	Control window: displays all ID-MOBILE and I/O states, enables engine control.
	Setpoints: listing and adjusting
	Values: reading of all I/O include external modules
	History list: complete history list.

5.1.5 Password protection

Password is a four-digit number in 0 – 65535 range. 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 DriveMonitor (direct or Modem) until this level is set in DriveMonitor (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.

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

Any password can be changed once that level or supervisor (highest) password has been entered.

Configuration lock

Selection is available in Modules window and can be selected just in On-line mode, because this info is stored in controller memory. Locked configuration file can be loaded from controller but is not visible and cant be modified without password setting.

5.1.6 Modbus protocol

- Direct connection: RS485
- Modem connection
- 9600, 19200 or 38400 bps, 57600 (8 data bits, 1 stop bit, no parity)
- Transfer mode RTU
- Function 3 (Read Multiply Registers)
- Function 6 (Write Single Register)
- Function 16 (Write Multiply 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 and Open Modbus Specification Release 1.0. Both documents are available from web site at www.modicon.com.

Modbus Multipack message

It is special communication object that contains all values that are used for History record (configurable) and can be read by one command.

Note: *Detail Modbus command description see in ComAp Communication guide.*

5.1.7 AirGate and WebSupervisor support

ID-Mobile-controller with ID-Mobile GPRS modem supports the AirGate and WebSupervisor system. This system enables engines fleet management as well as position monitoring (in conjunction with ID-Mobile GPS. For more details on WebSupervisor kindly visit www.websupervisor.net.

AirGate technology serves for easy plug'n'play communication over Internet. It overcomes problems with fixed and public IP address necessity, with firewalls and difficult communication settings.

GSM/GPRS values in Info group

GSM SignalLvl	ID-Mobile GPRS module show the strength of GSM signal. It is relative value helping to find the best signal and for troubleshooting cases. Standard external GSM modems usually support it as well.
GSM Diag Code	Troubleshooting diagnostic code for ID-Mobile GPRS modem.

Code	Description
0	OK. No error.
1	Not possible to hang up.
2	ID-Mobile-GPRS is switched off
3	ID-Mobile-GPRS is switched on
4	ID-Mobile-GPRS – error in initialization
5	ID-Mobile-GPRS – not possible to set the APN
6	ID-Mobile-GPRS – not possible to connect to GPRS network
7	ID-Mobile-GPRS – not possible to retrieve IP address
8	ID-Mobile-GPRS – not accepted DNS IP address
9	Error in modem detection
10	Error in initialization of analog modem
11	SIM card is locked (Possibly PIN code required, PIN needs to be deactivated) or unknown status of SIM locking
12	No GSM signal
13	Not possible to read the SIM card parameters
14	GSM modem did not accepted particular initialization command, possibly caused by locked SIM card
15	Unknown modem
16	Bad answer to complement initialization string
17	Not possible to read GSM signal strength
18	CDMA modem not detected
19	No CDMA network
20	Unsuccessful registration to CDMA network
255	Only running communication is needed to indicate

AirGate Diag – AirGate Troubleshooting diagnostic Code.

Code	Description
1	Controller registered, waiting for authorization
2	Not possible to register, controller blacklisted
3	Not possible to register, server has no more capacity
4	Not possible to register, other reason
5	Controller registered and authorized

AirGate ID – Identification name generated by AirGate server for purpose of establishing communication via WebSupervisor DriveMonitor or InteliMonitor.

It is communicated on first connection of ID-Mobile controller with ID-Mobile GPRS module. DriveMonitor will need this information when opening connection via AirGate to this controller. WebSupervisor will need this information when user will add this controller.

Modem Status

- "-----" - After controller initialization
- „Trying“ – modem active, trying to establish connection
- „Ready“ – modem ready, communication with modem is ok

Short guide how to start using ID-Mobile-GPRS module

- Assemble ID-Mobile controller, ID-Mobile GPRS, antenna, SIM card with GPRS service.
- Contact SIM card operator for getting GPRS APN name, username and password.
- Make sure SIM card does not require PIN code. If it does, it is possible to disable it in every common mobile telephone.
- Power up the ComAp controller and open the DriveMonitor on-line connection.
- Enter correct APN Name, APN UserName and APN UserPass in controller's Comms Settings. Set COM1 Mode = DIRECT.
- Switch off the ID-Mobile controller.
- Place the SIM card into slot on ID-Mobile GPRS.
- Connect the antenna to designated SMA connector.
- Power up the system.
- Wait for approx 2 - 4 minutes for the first connection to the AirGate. Then navigate to DriveMonitor: Info screen where you will find AirGate ID value.

Once this AirGate ID is displayed, connection via AirGate was successful. This value will be needed for LiteEdit or WebSupervisor connection.

5.2 Functions

5.2.1 Default archives

The ID-Mobile controller can be configured for constant or variable speed engines. The configuration can be changed in the DriveConfig software by selecting appropriate archive file. Default configuration is located in …/Archives/Default/ … directory in DriveConfig folder.

Application		Archive file	Available modes
SS	Single speed	Mobile-2.4-SS.aid	OFF – RUN
AS	All speed	Mobile-2.4-AS.aid	OFF – RUN

5.2.2 Operational modes

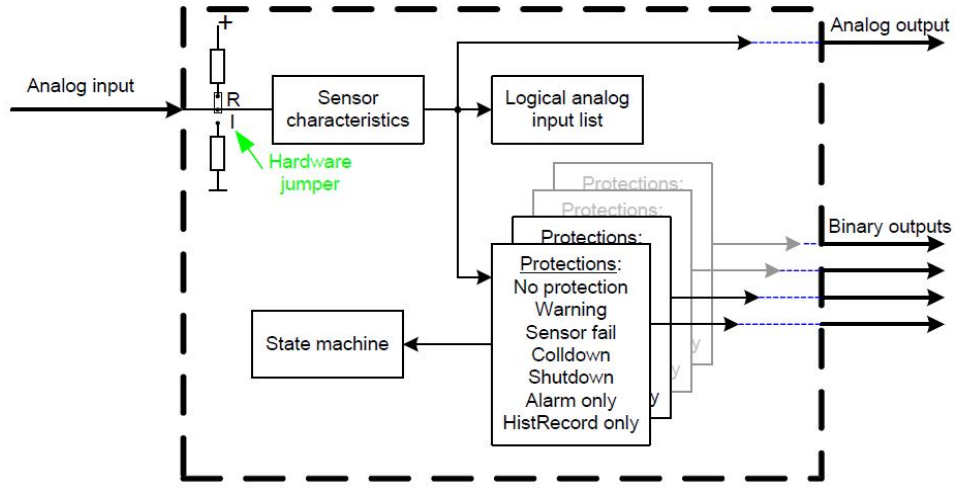
OFF mode

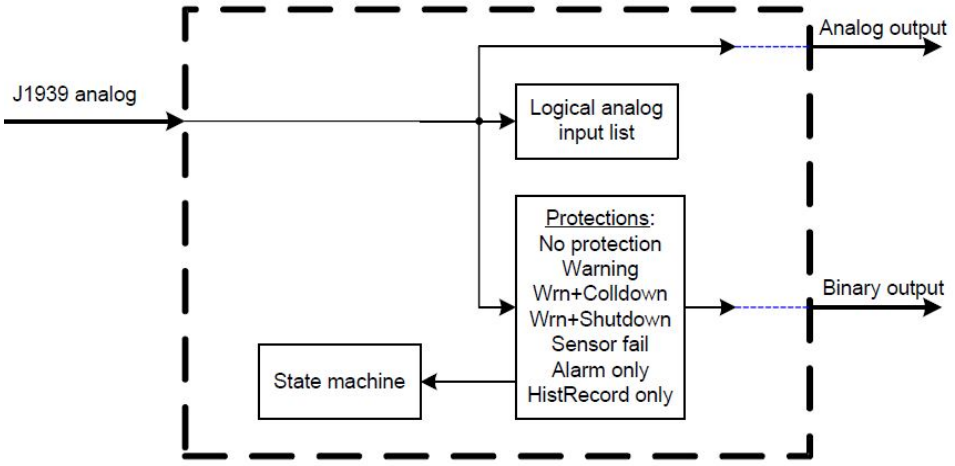
Engine can't be started or running engine is stopped, prelubrication function is not active. Firmware and controller configuration can be changed in OFF mode only. OFF mode is available in both applications – SS and AS.

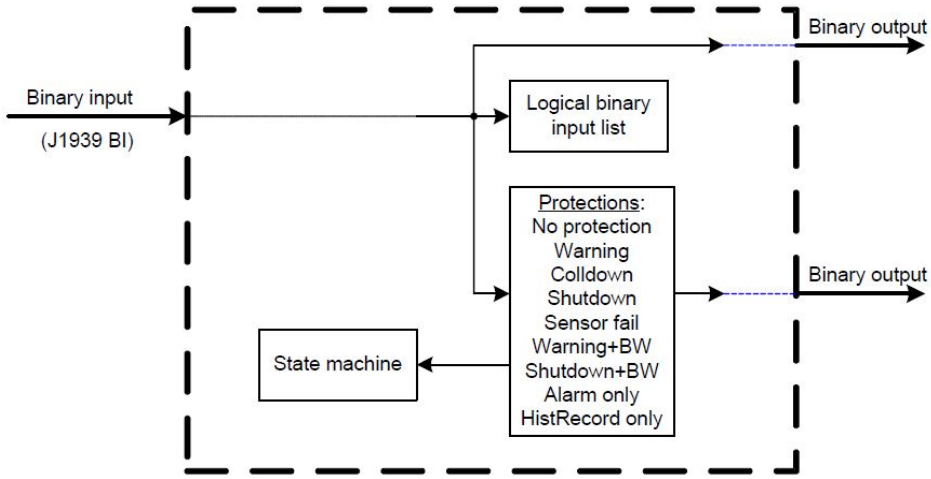
Other functions

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.

5.2.3 Protections

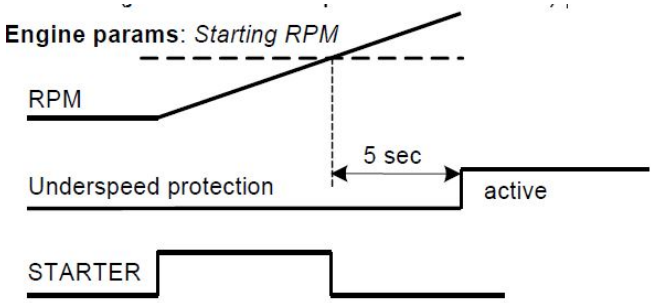






5.2.4 Engine start

It is not possible to start engine without RPM signal (from pickup or from J1939) but the Engine stays running when RPM signal is lost (just Wrn Pickup fail is indicated).



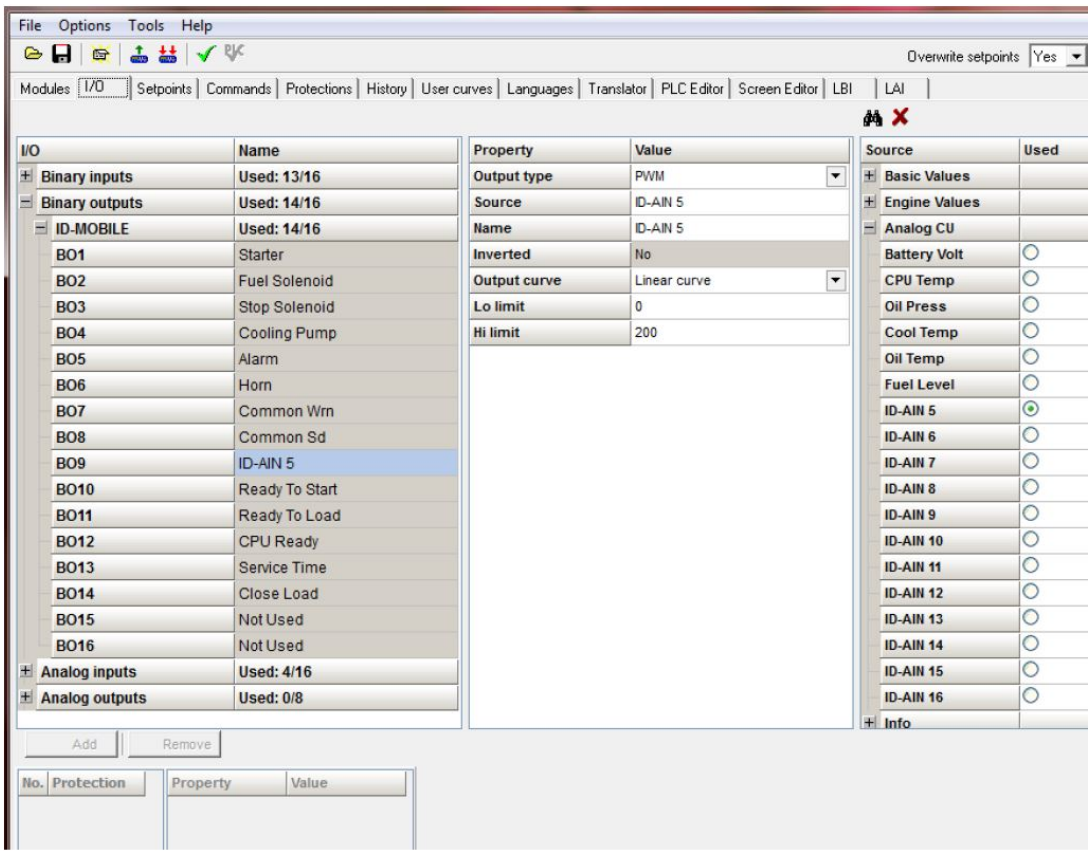
5.2.5 PWM and Dither

Dither function is intended to avoid an unpredictable behavior of hydraulic proportional valves caused by hysteresis and stiction. Dither is a rapid, small movement of the spool around desire position which eliminates the stiction and enables more accurate moving of the valve.

Typical use – Proportional hydraulic valves.

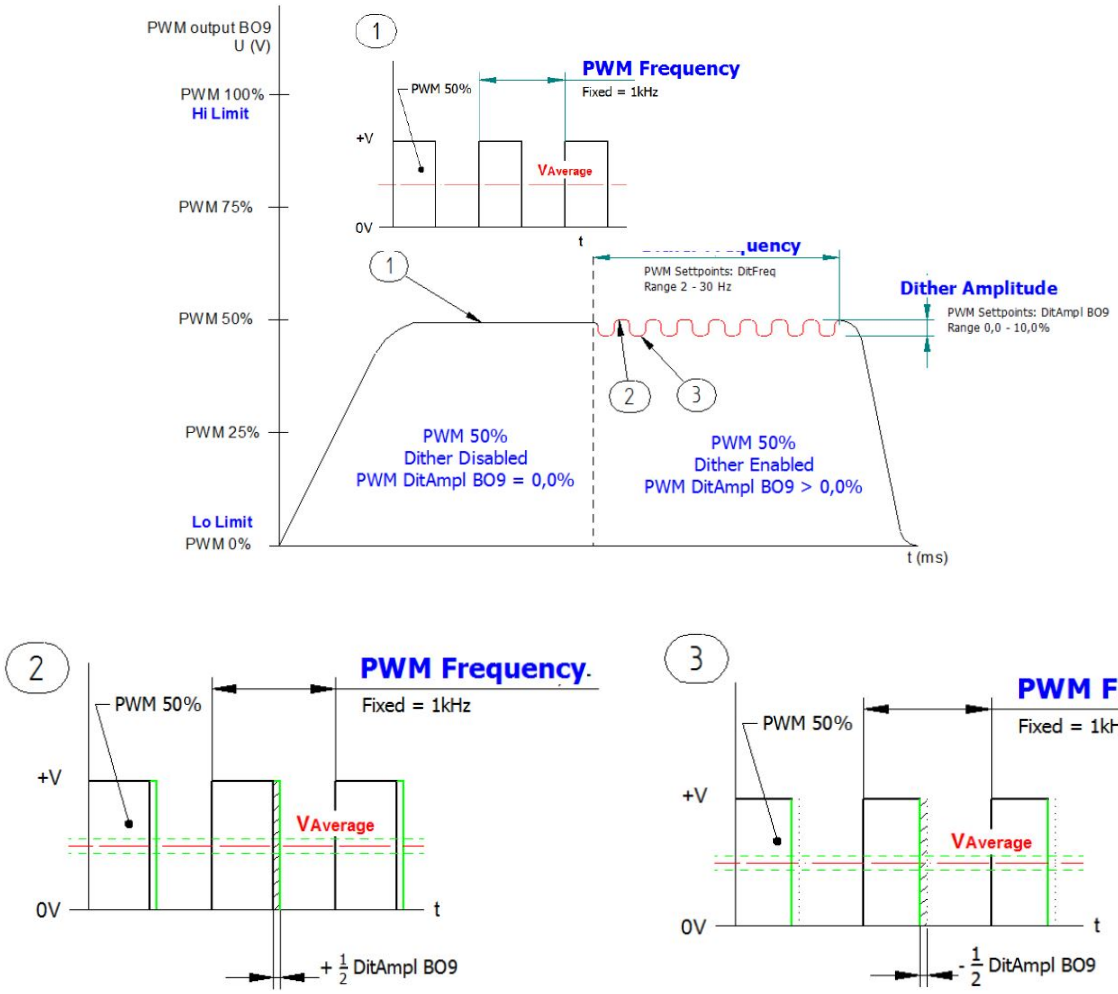
Setting of BO

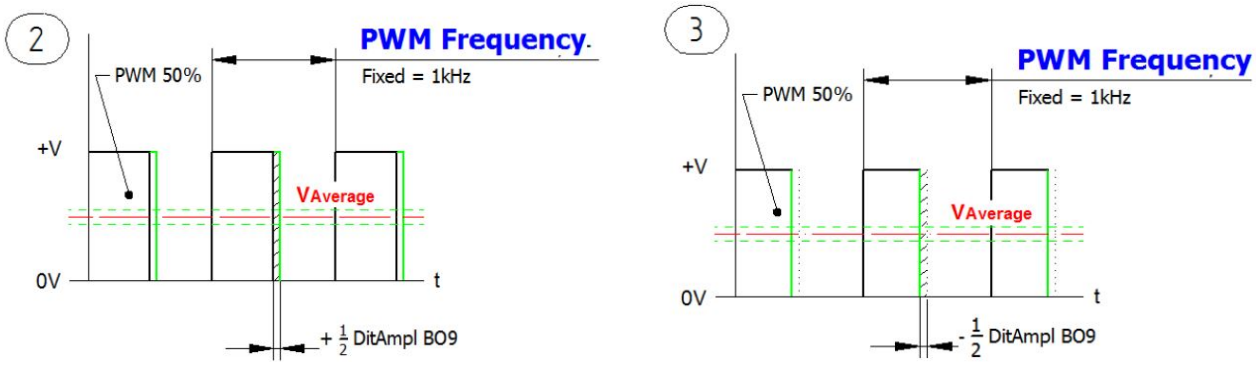
PWM and Dither function is available on Binary Output BO9 up to BO16



Property	Value	Details
Output type	BO	Standard Binary Output
	PWM	Pulse With Modulation (PWM) output
Name	Text	Title of the BOUT – maximum 14 charts
Source	According to Input	Source for output. See list of sources
Inverted	Yes	Inversion (negation) of BO signal is active
	No	Inversion (negation) of BO signal is active
Output curve	According to user curves	If no user curve is created the output is linear
Lo Limit	0%	0% of PWM conforms to physical value (e.g.0%PWM = 0V)
Hi Limit	100%	100% of PWM conforms to physical value (e.g.100%PWM = 10V)

Note: *Dither function is active only if PWM output type is configured.*





Setpoints

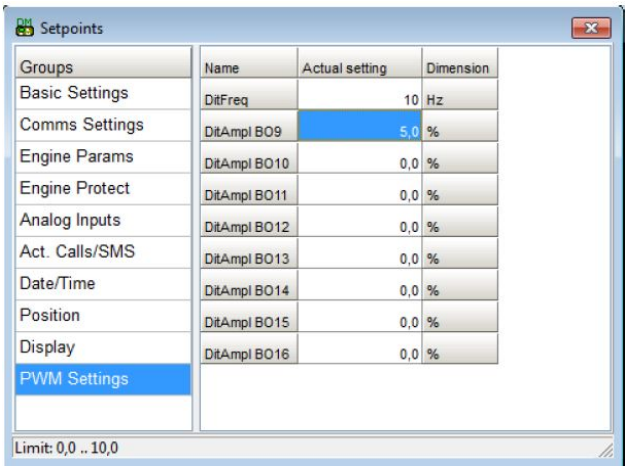


Image 5.1 **Group: PWM Settings (page 115)**

IMPORTANT: If DitAmpl BOx = 0 – Dither function is deactivated.

Note: *The frequency of PWM output is fixed* f_{PWM} ***= 1kHz*** *for all PWM available binary outputs (BO9 – BO16).*

back to Controller setup

6 Communication lines

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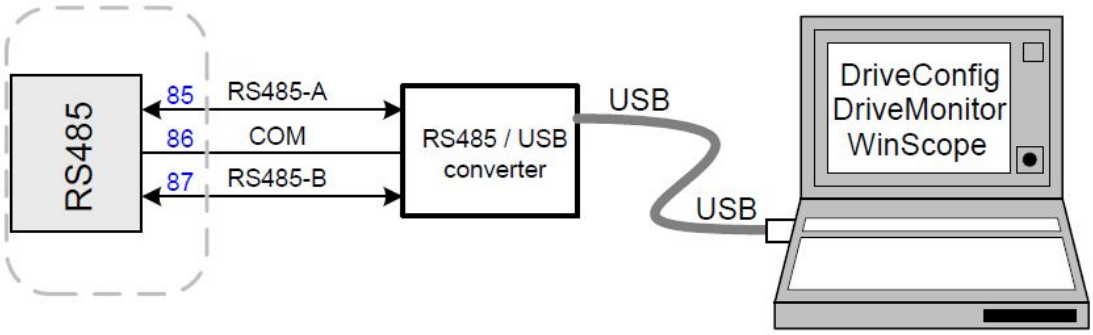
Communications	ID-Mobile-Logger
Direct connection	✓
USB	✗
RS485	✓
RS232	✗
CAN1	✓
CAN2	✓
GSM	✓ 1)
GPRS	✓ 1)
GPS	✓ 1)
1) Plug-in module required	

6.1 RS485



ID-Mobile/ID-Mobile-Logger RS485 interface is dedicated to:

- PC interface for communication with DriveMonitor, DriveConfig and other SW.
- MODBUS communication interface

6.2 CAN1

Interface for:

- ECU (Engine Control Unit) – J1939 or KWP2000 protocols.
- I-CB (Inteli-Communication Bridge)
- IGS-PTM (I/O Extension module - 8BI, 8BO, 4AI, 1AO)
- IS-AIN (Analog input extension module - 8 AI)
- IS-BIN (Binary Inputs extension module - 16BI, 8BO)

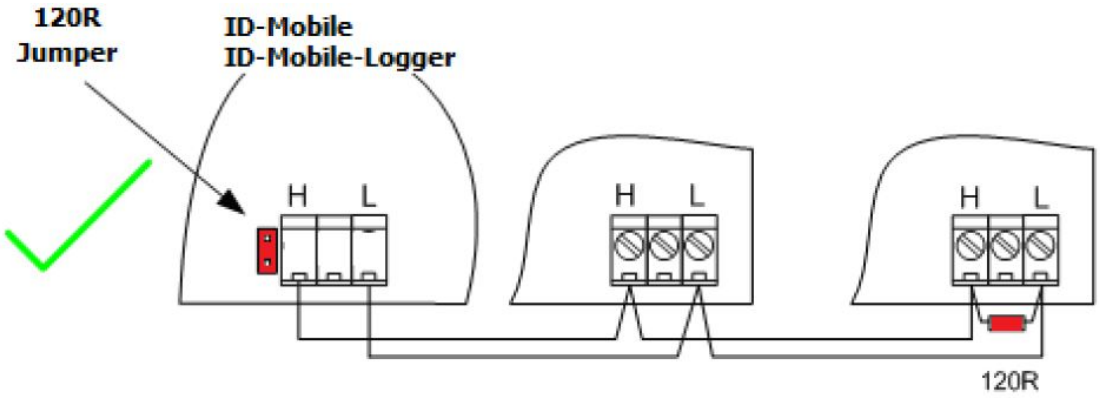
6.3 CAN2

ID-Mobile/ID-Mobile-Logger CAN2interface is dedicated to:

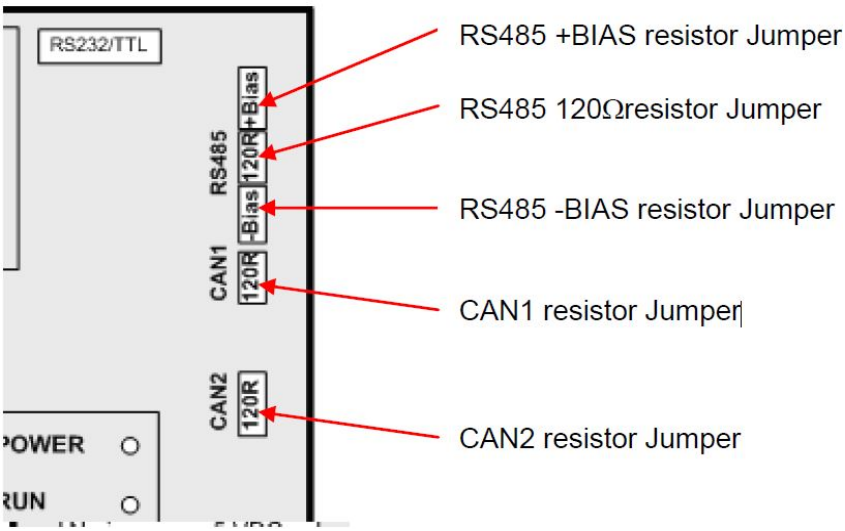
- External displays (see External displays)
- ID-Mobile Slave unit
- I-LB, I-LB+, (Inteli – Local Bridge communication module)

6.4 CAN bus connection rules

Can bus line must be connected in series, from one unit to another (no star, no cable stubs, no braches) and both ends must be terminated with 120Ω resistor.



There are internal 120Ω resistors on ID-Mobile/ID-Mobile-Logger motherboard available:



Note: *All controllers must be adjusted to the same CAN bus mode. Default mode for CAN1 and CAN2 bus in ID-Mobile/ID-Mobile-Logger is 250kBd. The limitation of line for the default speed is* ***200m*** *maximum.*

back to Communication lines

7 Technical data

Power Supply

Nominal power supply	24 VDC
Power supply range	8 – 36 VDC
Current consumption	0.34A @ 8V 0.12A @ 24 V 0.09A @ 36 V
Battery voltage measurement tolerance	2% at 24V
RTC battery life cycle	10 years

Operating conditions

Operating temperature	-40 to +80 °C
Storage temperature	-40 to +80 °C
Humidity	97% (accord. IEC 60068-2-30)
Flash memory data retention time	10 years
Protection (Dust and Water)	IP6x and IPx9

Standard conformity

Low Voltage Directive	EN 61010-1:95+A1:97 EN 61000-6-2, October 2001 EN 61000-6-4, October 2001 IEC 60533, Ed. 2; 1999-11
Shock test	IEC 68-2-27
Vibration resistance	IEC 60068-2-6, 5-28Hz/ ± 1,6mm, 28-150Hz/ 5g
EMC compatibility	EN61000-6-1/2/3/4, SS4631503 (PL4), IEC 255-3

Dimensions

Dimensions	240×200×63mm

Heat radiation

Heat radiation value	9 W
Accessories	2 W
Extension module	+1 W per 1 module

Binary inputs

Number of inputs	16
Broken wire detection	BI13 – BI16
Input impedance	4.7 kΩ
Input Range	0-36VDC
Switch voltage level for close contact indication	0-2 V
Voltage level for open contact indication	4-36 V
Minimal input signal duration	110 ms

Binary outputs

Number of inputs	16
BO1 to BO8	Hi-Side
Max continuous current (single channel)	3A
Peak current (single channel)	4A
Max continuous current BO1 to BO8	8×2A

BO9 to BO16

Max continuous current (single channel)	3A
Peak current (single channel)	4A
Max continuous current BO9 to BO16	4×2A
Maximum switching voltage	36VDC

Analog inputs

Number of inputs	16 (8 common pins with Analog outputs)
Resolution	10 bits
Jumper selectable range (AIN1 – AIN16)	20mA, 5 VDC, 24VDC, 2,5kΩ, PT1000
Maximal resistance range	25 kΩ
Maximal voltage range	38 V
Maximal current range	22 mA
Input impedance	180 Ω for mA measuring
Input impedance	> 100 kΩ for V measuring
Resistance measurement tolerance	± 2 % ± 2 Ω out of measured value
Voltage measurement tolerance	± 2 % ± 1mV out of measured value
Current measurement tolerance	± 2 % ± 0,5mA out of measured value

Analog outputs

Number of outputs	8 common pins with Analogue inputs (AI9-AI16)
Resolution	10 bits
Jumper selectable range (AIN9 – AIN16)	20mA, 10 VDC, 24VDC
	Note: *Restriction for HW version 1.2 and lower: power supply must be more than 18VDC to achieve full range of AOUT*
Maximal current loading	10 mA
Voltage output tolerance	± 2 % ± 0.1V out of measured value
Current output tolerance	± 2 % ± 0,5mA out of measured value

Governor output

Number of outputs	1
Jumper selectable range	±10 VDC ±10VDC via 10 kΩ PWM (430 – 3.000 Hz, step 1Hz)

Speed pick-up input

Number of inputs	4
Type of sensor	magnetic pick-up (connection by shielded cable is recommended)
Input impedance	10 kΩ
Minimum input voltage	2 Vpk-pk (from 4Hz to 4kHz)
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+ funcion

Max. D+ output current	300 mA
Guaranteed level for signal Charging OK	90% of supply voltage

Impulse input

Number of inputs	2
Type of sensor	NPN
Frequency rate	0 to 60Hz
Minimum pulse duration	1 ms1
Input impedance	4 kΩ
ON input voltage	< 0.8 V
OFF input voltage	> 4.2V
R_{ON} max	1 kΩ
Maximum input voltage	40V

CAN bus interface

Galvanically separated	
Maximum CAN bus length	CAN bus mode = 32C 200 m CAN bus mode = 8C 900 m
Speed	32C 250 kBd 8C 64 kBd
Nominal impedance	120 Ω
Cable type	twisted pair (shielded)
Wire crosscut	min.0.25 mm^2
Maximal attenuation (at 1 MHz)	2 dB / 100m

Recommended Industrial Automation & Process Control Cables:

- BELDEN (see 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 lappgroup.com)
  - Unitronic BUS DeviceNet Trunk Cable
  - Unitronic BUS DeviceNet Drop Cable
  - Unitronic BUS CAN
  - Unitronic-FD BUS P CAN UL/CSA

RS 485

Maximal distance	1000m
Speed	up to 57.6 kBd

ID-Mobile GPRS

Type	Simcom SIM900
Frequency Bands	GSM 850; EGSM 900, DCS 1800; PCS 1900; GSM/GPRS
GSM class	Small MS
Transmitting power	Class 4 (2W) at GSM 850 and EGSM 900 Class 1 (1W) at DCS 1800 and PCS 1900
GPRS	multi-slot class 10
CSD	up to 14.4 kbps
TCP/IP communication over GPRS	
Voltage supply	8-36 VDC

ID-Mobile GPS

Type	U-BLOX, LEA-5H
Receiver type	50 Channels`GPS L1 frequency; C/A Code;GALILEO Open Service capable, GLONASS
Sensitivity	Tracking & Navigation – 162 dBm Reacquisition - 160 dBm Cold Start - 148 dBm
Horizontal position accuracy	2.5 m
Accuracy for Timepulse signal	RMS 30 ns 99% <60ns
Velocity accuracy	0.1 m/s

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8 Appendix

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8.1 Controller objects

8.1.1 List of controller objects types

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8.1.2 Setpoints

List of setpoint groups

For full list of setpoints go to the chapter **List of setpoints (page 61)**.

List of setpoints

Group of setpoints: Basic settings

Group of setpoints: Communication Settings

Group of setpoints: Engine parameters

Group of setpoints: Engine protection

Group of setpoints: Analog inputs

Group of setpoints: Act. Calls/SMS

Group of setpoints: Date/Time

Group of setpoints: Position

Group of setpoints: Display

Group of setpoints: PWM Settings

back to Controller objects

Group: Password

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
2. Master level allows change of setpoints protected by Operator and Master level
3. Supervisor highest level allows all setpoints or configuration changes, firmware upgrade.

Note: *It is possible to protect remote Start, Stop commands from DriveMonitor and InteliVision (or general terminal) as well. This three level command protection can be configured from DriveConfig.*

EnterPassword

Password is any number in the range from 0 to 65535. Only setpoints associated with the entered password level can be modified.

ChangePassword 1

ChangePassword 2

ChangePassword 3

Note: *Any password can be changed once that level password or higher has been entered.*

To change password protection:

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

Access code

- Can be changed from DriveMonitor 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 Password3 has to be entered before the new Access code can be changed.

Engine commands and Statistics protection

Commands (Engine cmd) password protection protects Start, Stop, Horn reset, Fault reset commands from DriveMonitor direct, modem or GSM modem connection.

Selected Command password level 0, 1, 2, 3 is valid for all engine commands.

Separately can be protected statistic commands: ClearStatistics, SetSucc starts, EngRun hours, SetUnsuc starts, RemoteSwitch, Set Imp1, Set Imp2.

To set commands protection from DriveConfig:

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

Note: *All setpoints below can be adjusted by DriveMonitor.*

Group: Basic settings

Note: *Default setting of Controller address is 1.*

Engine Name

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	[-]		
Default value	ID		
Step			
Comm object	8637	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

User defined name, used for controller identification at remote phone or mobile connection.

Engine name is max 15 characters long and have to be entered manually using DriveConfig /DriveMonitor /InteliVision software.

> ***Note:*** *Engine name is not changed when new archive is loaded. Check Engine name after firmware upgrade.*

back to List of setpoints

Mode ID

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	[OFF, RUN]		
Default value	OFF		
Step			
Comm object	8315	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

OFF mode controller programming mode, engine functions are blocked. PLC functions are still working.

RUN mode operational mode, all functions are active.

> ***Note:*** *Mode change can be separately password protected. Mode can be changed by binary input Remote OFF or Remote MAN.*

back to List of setpoints

Gear Teeth 1

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	1 .. 500 [-]		
Default value	120		
Step	1		
Comm object	11576	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Number of teeth on the engines flywheel for the pick-up – related to RPM1 input . Internal value Engine speed is in default connected to RPM1 input if there is no other configuration to ECU or PLC function.			

back to List of setpoints

Gear Teeth 2

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	1 .. 500 [-]		
Default value	120		
Step	1		
Comm object	11577	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Number of teeth on the RPM sensing element – related to RPM2 input.			

back to List of setpoints

Gear Teeth 3

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	1 .. 500 [-]		
Default value	120		
Step	1		
Comm object	11578	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Number of teeth on the RPM sensing element – related to RPM3 input.			

back to List of setpoints

Gear Teeth 4

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	1 .. 500 [-]		
Default value	120		
Step			
Comm object	11579	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Number of teeth on the RPM sensing element – related to RPM4 input.			

back to List of setpoints

Nominal RPM

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	30 .. 4000 [RPM]		
Default value	1500		
Step	1 RPM		
Comm object	8253	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Nominal engine speed, base for Over-speed protection limit and Requested RPM % calculation.			

back to List of setpoints

Pulses/Litre 1

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	0 .. 60000 [ppl]		
Default value	1		
Step	1		
Comm object	11565	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Conversion constant (number of pulses for increment by 1) from IM1 impulse input to Imp1 value. Frequency range is max 300 Hz.			

back to List of setpoints

Pulses/Litre 2

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	0 .. 60000 [ppl]		
Default value	1		
Step	1		
Comm object	11566	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Conversion constant (number of pulses for increment by 1) from IM2 impulse input to Imp1 value. Frequency range is max 300 Hz.

> **Example:** To measure e.g. actual water flow in liters (or cubic meter) per minute set TransferRate = 10 [ ] when sensor gives 10 pulses per liter (or cubic meter).

> **Example:** To measure total water consumption in liters (or cubic meter) set TransferRate = 100 [ ] when sensor gives 100 pulses per 1liter (or cubic meter).

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SpdGovPWM Rate

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	430 .. 3000 [Hz]		
Default value	1200		
Step	1 Hz		
Comm object	10911	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Frequency of PWM signal on Speed Governor Output.

> ***Note:*** *Corresponding hardware jumper SGGO has to be switched to PWM position.*

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Governor Mode

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	[ISOCHRON, DROOP, BIN.INPUT]		
Default value	ISOCHRON		
Step			
Comm object	10230	**Related applications**	
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 Binary input BI DROOP (DROOP when closed).			

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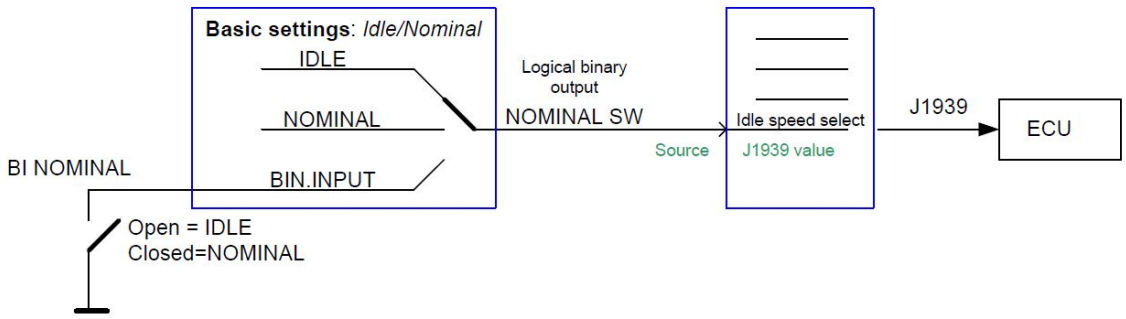
Idle/Nominal

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	[IDLE, NOMINAL, BIN.INPUT]		
Default value	IDLE		
Step			
Comm object	10336	**Related applications**	
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 Binary input BI NOMINAL (NOMINAL when closed).  			

back to List of setpoints

Speed Select (SS only)

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	[PRIMARY, SECONDARY, BIN.INPUT]		
Default value	PRIMARY		
Step			
Comm object	10231	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Activates/deactivates the logical binary output “Second RPM Sw” see Logical BO in table below. This output can be configured to J1939 output to switch ECU Nominal RPM.

BIN.INPUT: PRIMARY / SECONDARY Nominal RPM is selected via Binary input “BI Secondary Sw”.

Setpoint name	Setpoint setting	Logical BO	Logical BI
Governor mode	ISOCH / DROOP / BIN.INPUT	Droop Sw	BI Droop
Speed select	PRIMARY / SECONDARY / BIN.INPUT	Second RPM Sw	BI Secondary
Idle/Nominal	IDLE / NOMINAL / BIN.INPUT	Nominal Sw	BI Nominal

Note: *Basic setting: Nominal RPM must correspond to ECU Nominal RPM for 100% Throttle position in AS and 50% in SS.*

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Timer ON

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	[hh:mm:ss]		
Default value	00:00:00		
Step			
Comm object	10042	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

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Timer OFF

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	[hh:mm:ss]		
Default value	00:00:00		
Step			
Comm object	10199	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

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Timer Repeat

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	[Never, Mon-Fri, Mon-Sat, Mon-Sun, Sat-Sun]		
Default value	NEVER		
Step			
Comm object	10045	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Logical binary output Timer Active is closed when actual time is over the Time ON and opened when actual time is over Time OFF. The function depends on Timer repeat settings. The output is closed when controller is switched On and Timer settings corresponds to closed state.

> ***Note:*** *To use this function (for automatic starting/stopping) wire the Binary output Timer active to Binary input Rem start-stop.*

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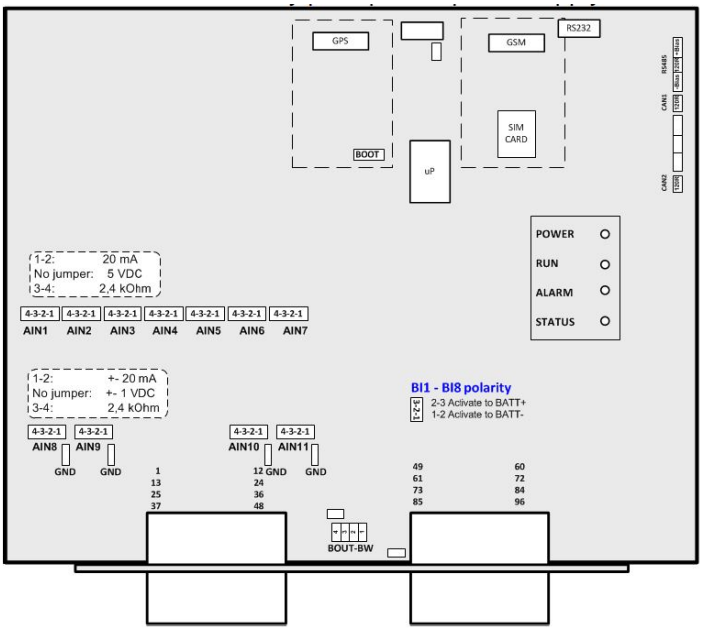
JumperBIN1to8

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	[ACTIV TO BATT - / ACTIV TO BATT +]		
Default value	ACTIV TO BATT-		
Step			
Comm object	12045	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Setpoint JumperBIN1to8 (group Basic Settings) determinates jumper position for selection what signal polarity is used for activation of BI1 to BI8:

ACTIV TO BATT - Jumper BI1 – BI8 Polarity is set Activate to BATT- – binary inputs are activated by minus pole of power supply

ACTIV TO BATT + Jumper BI1 – BI8 Polarity is set Activate to BATT+ – binary inputs are activated by plus pole of power supply.



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PLCMonEnterLev

Setpoint group	Basic settings	**Related FW**	2.6.0
Range [units]	0 .. 3 [-]		
Default value	3		
Step	1		
Comm object	8271	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Password protection level settings for accessing to the PLC monitor.			

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Group: Communication Settings

Contr. addr

Setpoint group	Communication Settings	**Related FW**	2.6.0
Range [units]	1 .. 32 [-]		
Default value	1		
Step	1		
Comm object	24537	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Controller CAN bus and RS-485 identification number. Each controller on CAN bus has to have its own unique number. ***Note:*** *When opening Direct or Modem connection to the controller (using PC monitoring/control SW), the Contr. address has to correspond to the Gen-set setting in PC SW.*			

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RS485 mode

Setpoint group	Communication Settings	**Related FW**	2.6.0
Range [units]	[STANDARD / MODBUS / ECU LINK]		
Default value	STANDARD		
Step			
Comm object	24522	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Communication protocol selection.

STANDARD	InteliDrive (DriveConfig, DriveMonitor, Remote panel) communication protocol.
MODBUS	Modbus RTU protocol.
ECU LINK	Specific ECU communication via RS485.

Note: *Detail Modbus protocol description include some examples see in Inteli-Communication guide.*

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MODBUS

Setpoint group	Communication Settings	**Related FW**	2.6.0
Range [units]	[9600, 19200, 38400, 57600]		
Default value	9600 bps		
Step			
Comm object	24477	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Modbus interface baud rate setting.

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ECU Diag

Setpoint group	Communication Settings	**Related FW**	2.6.0
Range [units]	[ENABLED, DISABLED]		
Default value	ENABLED		
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.			

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SHxOcol Detect

Setpoint group	Communication Settings	**Related FW**	2.6.0
Range [units]	[ENABLED, DISABLED]		
Default value	ENABLED		
Step			
Comm object	11024	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is dedicated for virtual peripheries; it can enable / disable error messages when more then one master (source) is configured.			

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ComApPort

Setpoint group	Communication Settings	**Related FW**	2.6.0
Range [units]	[-]		
Default value	23		
Step	1		
Comm object	24374	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Port for ComAp communication over ID-Mobile-GPRS (AirGate).			

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APN Name

Setpoint group	Communication Settings	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	24363	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Name of APN access point for GPRS network. ***Note:*** *This information shall provide GSM/GPRS operator* *e.g. Vodafone UK: "pp.Vodafone.co.uk"*			

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APN UserName

Setpoint group	Communication Settings	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	24361	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
User name for APN access point for GPRS network. ***Note:*** *This information shall provide GSM/GPRS operator* *e.g. Vodafone UK: "web"*			

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APN UserPass

Setpoint group	Communication Settings	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	24360	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
User password for APN access point for GPRS network. ***Note:*** *This information shall provide GSM/GPRS operator e.g. Vodafone UK: "web"*			

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AirGate IP

Setpoint group	Communication Settings	**Related FW**	2.6.0
Range [units]	[-]		
Default value	airgate.comap.cz		
Step			
Comm object	24364	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
IP Address of AirGate server.			

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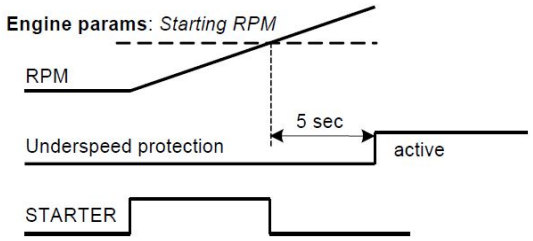
Group: Engine parameters

Starting RPM

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	30 ... Nominal RPM [RPM]		
Default value	350		
Step	1 RPM		
Comm object	9095	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

"Firing" speed when controller stops cranking = one of the engine running indications and limit for Under speed protection activation.



Note: *Under speed limit is fix 30 RPM.*

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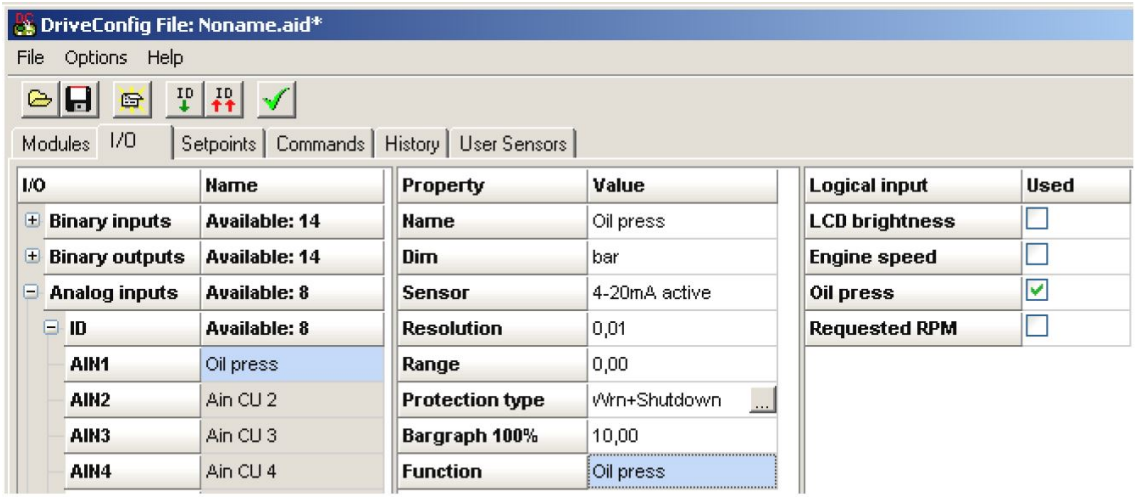
Starting POil

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0 .. 10 [Bar]		
Default value	10		
Step			
Comm object	9681	**Related applications**	
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 (PAGE 211)**.

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



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StartPCoolant (AS only)

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0 .. 10.00 [bar]		
Default value	10		
Step	0.01 bar		
Comm object	10138	**Related applications**	
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 (AS ONLY) (PAGE 203)**.

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

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Prestart Time

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	1 .. 6000 [s]		
Default value	2		
Step	1 s		
Comm object	8394	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Time the binary output PRE-START 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 PRE-START 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 parameters	**Related FW**	2.6.0
Range [units]	1 .. 200 [s]		
Default value	20		
Step	1 s		
Comm object	8256	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Amount of time the controller will crank the engine in an attempt to start. ***Note:*** *The InteliDrive stops cranking after three seconds when RPM = 0.*			

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CrnkFail Pause

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	1 .. 200 [s]		
Default value	8		
Step	1 s		
Comm object	8257	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Pause between crank attempts.			

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Crank Attempts

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	1 .. 200 [-]		
Default value	3		
Step	1		
Comm object	8255	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Max number of crank attempts.			

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Idle RPM (AS only)

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	350 .. 1500 [RPM]		
Default value	500		
Step	1 RPM		
Comm object	9946	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Default Idle speed (should be same as adjusted in ECU). ***Note:*** *100% of Requested speed is the range between Engine params: Idle RPM and Basic setting: Nominal RPM.*			

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Idle Offset (AS only)

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0 .. 100 [%]		
Default value	0		
Step	1 %		
Comm object	10010	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Offset of Idle speed in % of Nominal RPM.			

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Idle Time

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0 .. 600 [s]		
Default value	10		
Step	1 s		
Comm object	9097	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Idle time delay starts when RPM exceeds Start RPM. During the Idle time is Binary output IDLE/NOMINAL opened and after then is closed. Binary output IDLE/NOMINAL opens after Cooling period is over.			

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Prelubr Time

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0 .. 600 [s]		
Default value	0		
Step	1 s		
Comm object	8780	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
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 Prelubr pause, then activate again. This will continue the entire time the engine is not running. Function is not active in controller OFF mode.			

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Prelubr Pause

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	1 .. 4000 [min]		
Default value	1		
Step	1 min		
Comm object	8781	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Time interval between prelubrication cycles.

Note: *To use Prelubrication, configure Binary output PRELUBRICATION at first.*
Prelubrication is disabled in controller OFF mode or when is Prelubr time set to zero.
When engine is running PRELUBRICATION binary output is opened.
Prelubrication starts Prelubr Pause after engine goes to stop. Prelubrication starts immediately when:
- Controller power supply turns on
- mode changes from OFF to another
- Emergency stop is released.
Controller indicates Not ready state during this the first prelubrication period.

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Stop Time

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0 .. 600 [s]		
Default value	60		
Step	1 s		
Comm object	9815	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Under normal conditions the engine must certainly stop within this period.

Stop Time = STOP press → **Cooling Time** → **Stop valve**

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Cooling Time

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0 .. 600 [s]		
Default value	30		
Step	1 s		
Comm object	8258	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Runtime of the unloaded engine to cool the engine before stop.			

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AfterCoolTime

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0 .. 3600 [s]		
Default value	120		
Step	1 s		
Comm object	8662	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Runtime of engine after cooling pump. The binary output Cooling pump closes when engine starts and opens AfterCoolTime delayed after the engine comes to quiet state - RPM = 0. ***Note:*** *If the engine After cooling function is needed the binary output COOLING PUMP should be configured.*			

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D+ function

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	[ENABLED / CHRGFAIL / DISABLED]		
Default value	DISABLED		
Step			
Comm object	9683	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

ENABLED	The D+ terminal is used for both functions – “running engine” detection and charge fail detection.
CHRGFAIL	The D+ terminal is used for charge fail detection only
DISABLED	The D+ terminal is not used.

Note: *The magnetization current is provided independently on this setpoint value.*

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Fuel Solenoid

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	[DIESEL / GAS]		
Default value	DIESEL		
Step			
Comm object	9100	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Selecting of FUEL SOLENOID output function.

DIESEL	Output closes together with Binary output STARTER. The output opens if Emergency stop comes or Cooled engine is stopped and in pause between repeated starts.
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.

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BI Speed Ramp

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0.0 .. 100.0 [%/s]		
Default value	5		
Step	0.1 %/s		
Comm object	9984	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Speed ramp for BI Speed Up/Down not for Analog input request.			

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FireAlarmSpeed (AS only)

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0 .. 100 [%]		
Default value	50		
Step	1 % of Requested RPM range.		
Comm object	10008	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
When Binary input Fire speed is closed the binary output Clutch connect opens and engine Requested RPM is set to Engine params: FireAlarmSpeed value.			

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EnLocalSpeed

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	[ENABLED / DISABLED]		
Default value	DISABLED		
Step			
Comm object	10098	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
ENABLED	Engine speed request is defined by Engine params: Local speed setpoint. The speed request can be changed regardless on controller mode.		
DISABLED	Requested speed is changed via Binary inputs Speed up, Speed down or via analog input Requested RPM.		

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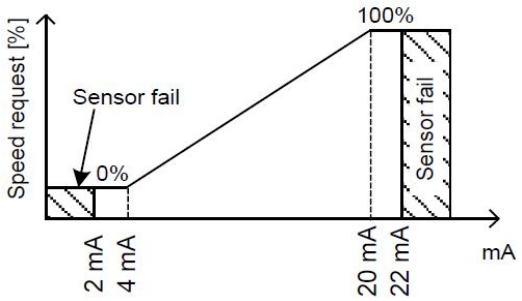
Back Up Speed1

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0.0 .. 100.0 [%]		
Default value	50		
Step	0.1 %		
Comm object	10099	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Requested RPM if corresponding Binary input Back up speed is active and the Requested RPM via analog input is out of range (sensor fail is detected). Requested RPM = 0 when analog request is out of range and Binary input Back up speed is not active.



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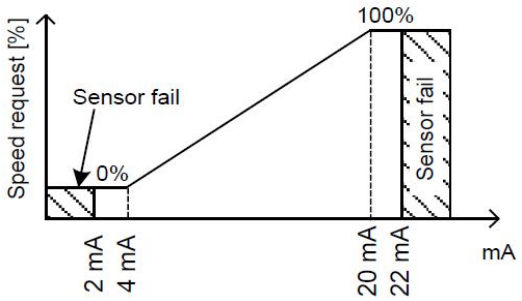
Back Up Speed2

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0.0 .. 100.0 [%]		
Default value	50		
Step	0.1 %		
Comm object	10523	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Requested RPM if corresponding Binary input Back up speed is active and the Requested RPM via analog input is out of range (sensor fail is detected). Requested RPM = 0 when analog request is out of range and Binary input Back up speed is not active.



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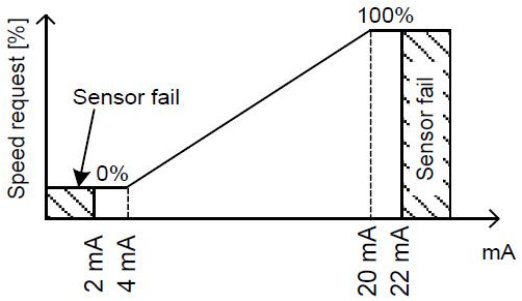
Back Up Speed3

Setpoint group	Engine parameters	**Related FW**	2.6.0
Range [units]	0.0 .. 100.0 [%]		
Default value	50		
Step	0.1 %		
Comm object	10524	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Requested RPM if corresponding Binary input Back up speed is active and the Requested RPM via analog input is out of range (sensor fail is detected). Requested RPM = 0 when analog request is out of range and Binary input Back up speed is not active.



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Group: Engine protection

Horn Timeout

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 600 [s]		
Default value	10		
Step	1 s		
Comm object	8264	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

The maximum amount of time the Binary output Horn is closed (horn, buzzer will sound). If it desired to have the horn sound until the alarm is cleared then set to zero.

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RunOnlyBlkDel1

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 60 [s]		
Default value	10		
Step	1 s		
Comm object	10023	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Engine running Alarms activation – group 1.			

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RunOnlyBlkDel2

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 60 [s]		
Default value	20		
Step	1 s		
Comm object	10024	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Engine running Alarms activation – group 2.			

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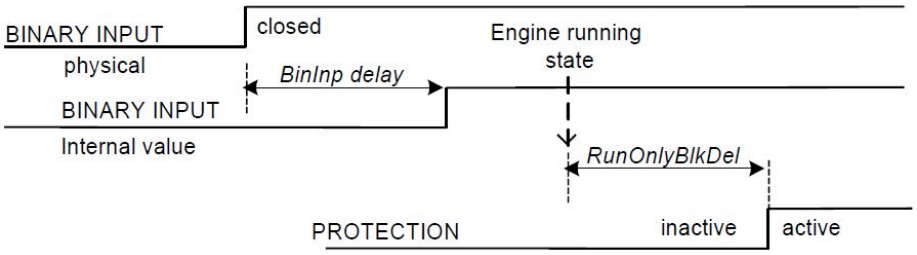
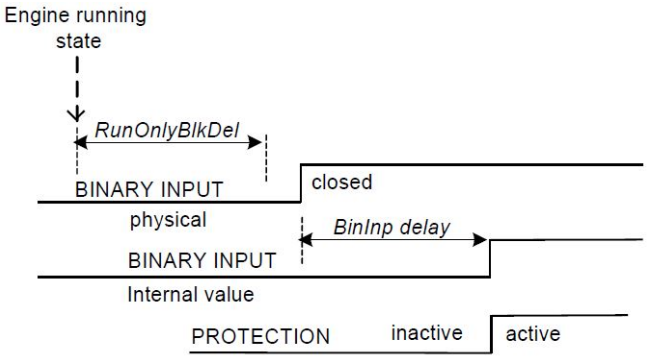
RunOnlyBlkDel3

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 60 [s]		
Default value	30		
Step	1 s		
Comm object	10025	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Delay for Engine running Alarms activation – group 3.





Engine running state =	RPM > Engine params: Starting RPM or Analog input Oil pressure > Engine params: Starting Poil or Active Binary input Run indication1 or Active Binary input Run indication2 or Active Binary input Run indication3. D+ function

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BinInp Delay 1

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 60 [s]		
Default value	1		
Step	1 s		
Comm object	10131	**Related applications**	
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 must be configured in DriveConfig for Property – Delay = BinInp delay 1.			

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BinInp Delay 2

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 60 [s]		
Default value	5		
Step	1 s		
Comm object	10132	**Related applications**	
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 must be configured in DriveConfig for Property – Delay = BinInp delay 2.			

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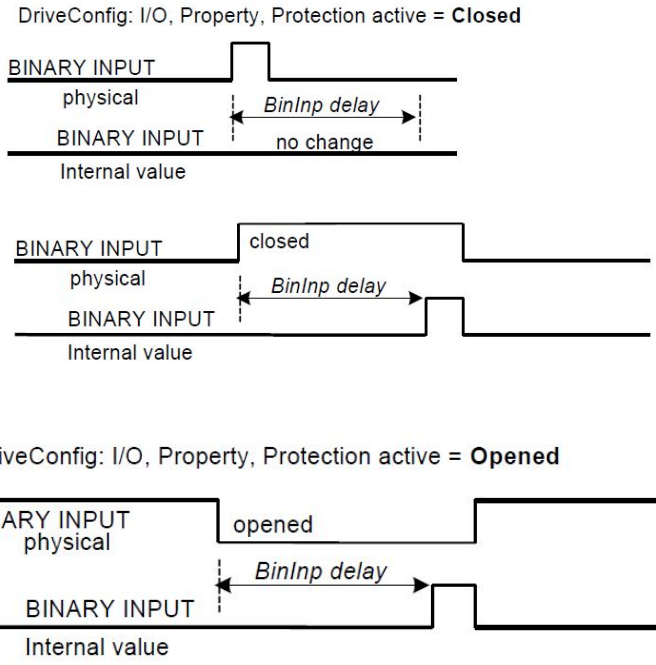
BinInp Delay 3

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 60 [s]		
Default value	10		
Step	1 s		
Comm object	10133	**Related applications**	
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 must be configured in DriveConfig for Property – Delay = BinInp delay 3.

Note: *BinInp delay is active only for Binary inputs configured as protection.*



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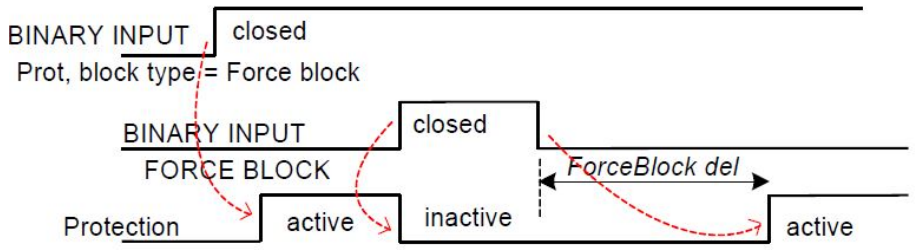
ForceBlock Del

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 60 [s]		
Default value	40		
Step	1 s		
Comm object	10129	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Delay for Force block protection activation after Binary input Force block 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 protection	**Related FW**	2.6.0
Range [units]	0 .. 200 [%]		
Default value	110		
Step	1 % of Nominal RPM		
Comm object	8263	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Threshold for engine over speed protection.

Note: *Underspeed alarm is activated when engine is running and actual RPM is below 30 RPM.*

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MinLoadSpeed

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. Nominal RPM [RPM]		
Default value	500		
Step	1 RPM		
Comm object	10139	**Related applications**	
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. MinLoad speed is an condition to close BO Close load when panel On/Off button is closed.			

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Batt <V

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	8 .. Batt >V [V]		
Default value	8		
Step	0.1 V		
Comm object	8387	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning (last acceptable) level for low battery voltage.			

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Batt >V

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	Batt <V .. 40 V [V]		
Default value	30		
Step	0.1 V		
Comm object	9587	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning level for battery overvoltage.			

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Batt Volt Del

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 600 [s]		
Default value	10		
Step	1 s		
Comm object	8383	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for battery voltage alarms.			

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OverloadSpLim (AS only)

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 100 [%]		
Default value	20		
Step	1 %		
Comm object	9950	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Engine overload protection limit.			

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Overload Del (AS only)

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 600 [s]		
Default value	10		
Step	1 s		
Comm object	9947	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Overload RPM protection limit.			

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Service Time

Setpoint group	Engine protection	**Related FW**	2.6.0
Range [units]	0 .. 65535 [h]		
Default value	65535		
Step	1 h		
Comm object	9648	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Running hours down counter is decremented when engine is running. Service alarm is indicated in Alarm list and History record activated when counter reach zero. Service time setpoint is actual counter value. ***Note:*** *Once the service time has elapsed the Service time will have to be adjusted to non-zero value (at least for 30sec) to clear the alarm and begin a new countdown.*			

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Group: Analog inputs

AIN1 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	8431	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN1.			

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AIN2 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	8407	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN2.			

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AIN3 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	8467	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN3.			

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AIN4 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	8793	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog inputs AIN4.			

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AIN5 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	8794	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN5.			

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AIN6 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	8795	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN6.			

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AIN7 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	8796	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN7.			

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AIN8 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	11599	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN8.			

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AIN9 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	11914	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN9.			

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AIN10 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	11915	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN10.			

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AIN11 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	11916	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN11.			

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AIN12 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	11917	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN12.			

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AIN13 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	11918	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN13.			

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AIN14 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	11919	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN14.			

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AIN15 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	11920	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN15.			

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AIN16 Offset

Setpoint group	Analog inputs	**Related FW**	2.6.0
Range [units]	-32767 .. 32767 [-]		
Default value	0		
Step	1		
Comm object	11921	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjustable offset for corresponding analog input AIN16.			

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Group: Act. Calls/SMS

Warning Call

Setpoint group	Act. Calls/SMS	**Related FW**	2.6.0
Range [units]	[DISABLED, ENABLED]		
Default value	DISABLED		
Step			
Comm object	8482	**Related applications**	
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**	2.6.0
Range [units]	[DISABLED, ENABLED]		
Default value	DISABLED		
Step			
Comm object	8484	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Enables or disables active calls/SMS to selected phone or mobile numbers when a Shut down alarm occurs.			

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Cool Down Call

Setpoint group	Act. Calls/SMS	**Related FW**	2.6.0
Range [units]	[DISABLED, ENABLED]		
Default value	DISABLED		
Step			
Comm object	8485	**Related applications**	
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**	2.6.0
Range [units]	[DISABLED, DATA, SMS, E-MAIL, EML-SMS]		
Default value	DISABLED		
Step			
Comm object	9594	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

3 channels are available for following types active messages:

DISABLED	Channel is disabled
DATA	Standard analog, GSM or ISDN modem connection to DriveMonitor.
SMS	Channel sends SMS message. Only when is GSM modem connected.

> ***Note:*** *Email contains:*
> *- Header with serial number and application info.*
> *- Alarm list*
> *- 20 History records (reason, date, time)*

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AcallCH1-Addr

Setpoint group	Act. Calls/SMS	**Related FW**	2.6.0
Range [units]	[Phone number]		
Default value	0		
Step			
Comm object	9597	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

3 channels are available for following types active messages:

Address for channel 1 active call. Each above message type has either a number or an e-mail address associated to it.

For more details see DriveMonitor guide chapter IG-IB Internet communication.

> ***Note:*** *For GSM numbers use either national format (i.e. like number you will dial if you want to make a local call) or full international format with "+" character followed by international prefix in the beginning.*

> **IMPORTANT: This setpoint can be modified from PC only!**

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AcallCH2-Type

Setpoint group	Act. Calls/SMS	**Related FW**	2.6.0
Range [units]	[DISABLED, DATA, SMS, E-MAIL, EML-SMS]		
Default value	DISABLED		
Step			
Comm object	9595	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

3 channels are available for following types active messages:

DISABLED	Channel is disabled
DATA	Standard analog, GSM or ISDN modem connection to DriveMonitor.
SMS	Channel sends SMS message. Only when is GSM modem connected.

> ***Note:*** *Email contains:*
> *- Header with serial number and application info.*
> *- Alarm list*
> *- 20 History records (reason, date, time)*

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AcallCH2-Addr

Setpoint group	Act. Calls/SMS	**Related FW**	2.6.0
Range [units]	[Phone number]		
Default value	0		
Step			
Comm object	9598	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

3 channels are available for following types active messages:

Address for channel 2 active call. Each above message type has either a number or an e-mail address associated to it.

For more details see DriveMonitor guide chapter IG-IB Internet communication.

> ***Note:*** *For GSM numbers use either national format (i.e. like number you will dial if you want to make a local call) or full international format with "+" character followed by international prefix in the beginning.*

> **IMPORTANT: This setpoint can be modified from PC only!**

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AcallCH3-Type

Setpoint group	Act. Calls/SMS	**Related FW**	2.6.0
Range [units]	[DISABLED, DATA, SMS, E-MAIL, EML-SMS]		
Default value	DISABLED		
Step			
Comm object	9596	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

3 channels are available for following types active messages:

DISABLED	Channel is disabled
DATA	Standard analog, GSM or ISDN modem connection to DriveMonitor.
SMS	Channel sends SMS message. Only when is GSM modem connected.

> ***Note:*** *Email contains:*
> *- Header with serial number and application info.*
> *- Alarm list*
> *- 20 History records (reason, date, time)*

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AcallCH3-Addr

Setpoint group	Act. Calls/SMS	**Related FW**	2.6.0
Range [units]	[Phone number]		
Default value	0		
Step			
Comm object	9599	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

3 channels are available for following types active messages:

Address for channel 3 active call. Each above message type has either a number or an e-mail address associated to it.

For more details see DriveMonitor guide chapter IG-IB Internet communication.

> ***Note:*** *For GSM numbers use either national format (i.e. like number you will dial if you want to make a local call) or full international format with "+" character followed by international prefix in the beginning.*

> **IMPORTANT: This setpoint can be modified from PC only!**

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Num Rings AA

Setpoint group	Act. Calls/SMS	**Related FW**	2.6.0
Range [units]	1 .. 30 [-]		
Default value	3		
Step	1		
Comm object	24512	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Number of rings prior to open modem connection from PC to controller. ***Note:*** *NumberRings AA change is accepted after controller is switched on or when modem is connected to controller.*			

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A.C.Multiplie

Setpoint group	Act. Calls/SMS	**Related FW**	2.6.0
Range [units]	1 .. 250 [-]		
Default value	3		
Step	1		
Comm object	24505	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Setpoint specify the number of attempt to open the Active call connection when the phone line is engaged. ***Note:*** *Timeout for connection is 90 sec and after 120 sec controller starts the next attempt. Incoming calls are blocked during the time the controller is trying to send an active call type.*			

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Modem

Setpoint group	Act. Calls/SMS	**Related FW**	2.6.0
Range [units]	[TELIT CSD, TELIT GPRS, SIMCOM CSD, SIMCOM GPRS]		
Default value	TELIT CSD		
Step			
Comm object	24451	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Selection of internal modem mode

Module type	Operation mode	Description	Supports
ID-Mobile GSM	TELIT CSD	GSM mode CSD (Circuit Switch Data)	Alarm SMS Drive Monitor (via modem connection)
	TELIT GPRS	Customized interface	For special custom application only
ID-Mobile GPRS	SIMCOM CSD	Standard GSM mode CSD (Circuit Switch Data)	Alarm SMS Drive Monitor via modem connection
	SIMCIM GPRS	GPRS network – enables connection via AirGate	Alarm SMS AirGate Drive Monitor (via AirGate) WebSupervisor

Note: *GSM Module is not available since 2015.*

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Group: Date/Time

Time

Setpoint group	Date/Time	**Related FW**	2.6.0
Range [units]	[HH:MM:SS]		
Default value	12:00:00		
Step			
Comm object	24554	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Controller internal Real Time Clock adjustment.s			

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Date

Setpoint group	Date/Time	**Related FW**	2.6.0
Range [units]	[DD:MM:YY]		
Default value	##.##.##		
Step			
Comm object	24553	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Actual date adjustment.			

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Time stamp per

Setpoint group	Date/Time	**Related FW**	2.6.0
Range [units]	0 .. 240 [min]		
Default value	1		
Step	1 min		
Comm object	8979	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Time interval for history record. Time base is based on number of minutes since midnight.

Note: *No history Time stamp is recorded when TimeStamp Per = 0.*
RTC and Date is in each History record.

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HistoryEntries

Setpoint group	Date/Time	**Related FW**	2.6.0
Range [units]	[ALL TIME, RUNNING ONLY, BI HISTORY]		
Default value	RUNNING ONLY		
Step			
Comm object	12162	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

The history can be forced to list as follow:

ALL TIME	History records are active all time.
RUNNING ONLY	History is recorded when engine is running only.
BI HISTORY	History record is forced when LBI BI History is configured and liked with binary input.

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SummerTimeMod

Setpoint group	Date/Time	**Related FW**	2.6.0
Range [units]	[DISABLED, WINTER, SUMER, WINTER-S, SUMMER-S]		
Default value	DISABLED		
Step			
Comm object	8727	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Summer/Winter time applied

DISABLED	Automatic switching between summer and wintertime is disabled.
WINTER (SUMMER)	Automatic switching between summer and wintertime is enabled – set to winter (summer) season.
WINTER-S (SUMMER-S)	Same as above modified for southern hemisphere.

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Group: Position

Home Lat

Setpoint group	Position	**Related FW**	2.6.0
Range [units]	[°/'/"]		
Default value	0°0'0.000"N	**Force value Alternative config**	YES
Step			
Comm object	11675	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Home Latitude position.

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Home Long

Setpoint group	Position	**Related FW**	2.6.0
Range [units]	[°/'/"]		
Default value	0°0'0.000"E		
Step			
Comm object	11676	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Home Longitude position.			

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Fence Radius

Setpoint group	Position	**Related FW**	2.6.0
Range [units]	10 .. 10000 [m]		
Default value	1000		
Step	1 m		
Comm object	11677	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Circle with center in Home position.			

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Fence Delay

Setpoint group	Position	**Related FW**	2.6.0
Range [units]	30 .. 60000 [s]		
Default value	30		
Step	1 s		
Comm object	11682	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Once the controller is out of Fence Radius and Fence Delay time elapsed the engine is shut down. ***Note:*** *Wrn GeoFencing alarm is announced immediately the controller crosses the Fence Radius*			

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Geo Fencing

Setpoint group	Position	**Related FW**	2.6.0
Range [units]	[ENABLED / DISABLED / BIN.INPUT]		
Default value	DISABLED		
Step			
Comm object	11681	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

ENABLED	Wrn GeoFencing is enabled.
DISABLED	Wrn GeoFencing is disabled.
BIN.INPUT	Wrn GeoFencing is enabled when by Binary input GeoFencingEna is closed.

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Group: Display

DisplMessage1

Setpoint group	Display	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	11690	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Up to 31 characters message can be activated on external (e.g.Bodas) display message screen by corresponding Binary Input DisplayMessage1.

Note: *Messages displaying is not available in standard Bodas-1.3 firmware.*

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DislpMessage2

Setpoint group	Display	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	11691	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Up to 31 characters message can be activated on external (e.g.Bodas) display message screen by corresponding Binary Input DisplayMessage2.

Note: *Messages displaying is not available in standard Bodas-1.3 firmware.*

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DisplMessage3

Setpoint group	Display	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	11692	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Up to 31 characters message can be activated on external (e.g.Bodas) display message screen by corresponding Binary Input DisplayMessage3.

Note: *Messages displaying is not available in standard Bodas-1.3 firmware.*

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DisplMessage4

Setpoint group	Display	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	11693	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Up to 31 characters message can be activated on external (e.g.Bodas) display message screen by corresponding Binary Input DisplayMessage4.

Note: *Messages displaying is not available in standard Bodas-1.3 firmware.*

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DisplMessage5

Setpoint group	Display	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	11694	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Up to 31 characters message can be activated on external (e.g.Bodas) display message screen by corresponding Binary Input DisplayMessage5.

Note: *Messages displaying is not available in standard Bodas-1.3 firmware.*

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DisplMessage6

Setpoint group	Display	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	11695	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Up to 31 characters message can be activated on external (e.g.Bodas) display message screen by corresponding Binary Input DisplayMessage6.

Note: *Messages displaying is not available in standard Bodas-1.3 firmware.*

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DisplMessage7

Setpoint group	Display	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	11696	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Up to 31 characters message can be activated on external (e.g.Bodas) display message screen by corresponding Binary Input DisplayMessage7.

Note: *Messages displaying is not available in standard Bodas-1.3 firmware.*

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DisplMessage8

Setpoint group	Display	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	11697	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Up to 31 characters message can be activated on external (e.g.Bodas) display message screen by corresponding Binary Input DisplayMessage8.

Note: *Messages displaying is not available in standard Bodas-1.3 firmware.*

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DisplMessage9

Setpoint group	Display	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	11698	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Up to 31 characters message can be activated on external (e.g.Bodas) display message screen by corresponding Binary Input DisplayMessage9.

Note: *Messages displaying is not available in standard Bodas-1.3 firmware.*

back to List of setpoints

DisplMessage10

Setpoint group	Display	**Related FW**	2.6.0
Range [units]	[-]		
Default value			
Step			
Comm object	11699	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Up to 31 characters message can be activated on external (e.g.Bodas) display message screen by corresponding Binary Input DisplayMessage10.

Note: *Messages displaying is not available in standard Bodas-1.3 firmware.*

back to List of setpoints

Group: PWM Settings

DitFreq

Setpoint group	PWM Settings	**Related FW**	2.6.0
Range [units]	2 .. 167 [Hz]		
Default value	15		
Step	1		
Comm object	13108	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			
Frequency of dither.			

back to List of setpoints

DitAmpl BO9

Setpoint group	PWM Settings	**Related FW**	2.6.0
Range [units]	0.0 .. 10.0 [%]		
Default value	0		
Step			
Comm object	13109	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Amplitude of Dither.

> **IMPORTANT: If DitAmpl BOx = 0 – Dither function is deactivated.**

Note: *The frequency of PWM output is fixed fPWM = 1kHz for all PWM available binary outputs (BO9 – BO16).*

Note: *For more details see Functions/PWM and Dither.*

back to List of setpoints

DitAmpl BO10

Setpoint group	PWM Settings	**Related FW**	2.6.0
Range [units]	0.0 .. 10.0 [%]		
Default value	0		
Step			
Comm object	13110	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Amplitude of Dither.

> **IMPORTANT: If DitAmpl BOx = 0 – Dither function is deactivated.**

Note: *The frequency of PWM output is fixed fPWM = 1kHz for all PWM available binary outputs (BO9 – BO16).*

Note: *For more details see Functions/PWM and Dither.*

back to List of setpoints

DitAmpl BO11

Setpoint group	PWM Settings	**Related FW**	2.6.0
Range [units]	0.0 .. 10.0 [%]		
Default value	0		
Step			
Comm object	13111	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Amplitude of Dither.

> **IMPORTANT: If DitAmpl BOx = 0 – Dither function is deactivated.**

Note: *The frequency of PWM output is fixed fPWM = 1kHz for all PWM available binary outputs (BO9 – BO16).*

Note: *For more details see Functions/PWM and Dither.*

back to List of setpoints

DitAmpl BO12

Setpoint group	PWM Settings	**Related FW**	2.6.0
Range [units]	0.0 .. 10.0 [%]		
Default value	0		
Step			
Comm object	13112	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Amplitude of Dither.

> **IMPORTANT: If DitAmpl BOx = 0 – Dither function is deactivated.**

Note: *The frequency of PWM output is fixed fPWM = 1kHz for all PWM available binary outputs (BO9 – BO16).*

Note: *For more details see Functions/PWM and Dither.*

back to List of setpoints

DitAmpl BO13

Setpoint group	PWM Settings	**Related FW**	2.6.0
Range [units]	0.0 .. 10.0 [%]		
Default value	0		
Step			
Comm object	13113	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Amplitude of Dither.

> **IMPORTANT: If DitAmpl BOx = 0 – Dither function is deactivated.**

Note: *The frequency of PWM output is fixed fPWM = 1kHz for all PWM available binary outputs (BO9 – BO16).*

Note: *For more details see Functions/PWM and Dither.*

back to List of setpoints

DitAmpl BO14

Setpoint group	PWM Settings	**Related FW**	2.6.0
Range [units]	0.0 .. 10.0 [%]		
Default value	0		
Step			
Comm object	13114	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Amplitude of Dither.

> **IMPORTANT: If DitAmpl BOx = 0 – Dither function is deactivated.**

Note: *The frequency of PWM output is fixed fPWM = 1kHz for all PWM available binary outputs (BO9 – BO16).*

Note: *For more details see Functions/PWM and Dither.*

back to List of setpoints

DitAmpl BO15

Setpoint group	PWM Settings	**Related FW**	2.6.0
Range [units]	0.0 .. 10.0 [%]		
Default value	0		
Step			
Comm object	13115	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Amplitude of Dither.

> **IMPORTANT: If DitAmpl BOx = 0 – Dither function is deactivated.**

Note: *The frequency of PWM output is fixed fPWM = 1kHz for all PWM available binary outputs (BO9 – BO16).*

Note: *For more details see Functions/PWM and Dither.*

back to List of setpoints

DitAmpl BO16

Setpoint group	PWM Settings	**Related FW**	2.6.0
Range [units]	0.0 .. 10.0 [%]		
Default value	0		
Step			
Comm object	13116	**Related applications**	
Config level	Standard		
Setpoint visibility	Always		
Description			

Amplitude of Dither.

> **IMPORTANT: If DitAmpl BOx = 0 – Dither function is deactivated.**

Note: *The frequency of PWM output is fixed fPWM = 1kHz for all PWM available binary outputs (BO9 – BO16).*

Note: *For more details see Functions/PWM and Dither.*

back to List of setpoints

Group: Protections

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

Group: PLC

PLC group contains all used PLC setpoints. List is dynamically created during configuration process.

8.1.3 Values

What values are:

Any of values from the Source list (see below) can be configured to any ID Mobile AOUT1 to AOUT8 or to ECU/J1939 (virtual) Analog output. Speed Governor Output (GOV OUT) is not configurable.

There are following logical analog groups: Basic Values, Engine values, Analog CU, Info and Statistics (and others when IS-AIN8 extension modules are used).

List of value groups

For full list of values go to the chapter **List of values (page 121)**.

List of values

back to Controller objects

Group of values: Basic

Group of values: Engine

Group of values: Analog CU

Group of values: Binary CU

Group of values: Log Bout

Group of values: Info

Group of values: Statistics

Group of values: Position

Group: Basic

Engine RPM

Value group	Basic	Related FW	2.6.0
Resolution [units]	[RPM]		
Comm object	10123	Related applications	AMF, MRS
Description			
Actual value can be sourced (depends on configuration) from different sources (RPM1-4, ECU-RPM or physical Analog input).			

back to List of values

RPM1

Value group	Basic	Related FW	2.6.0
Resolution [units]	[RPM]		
Comm object	11571	Related applications	AMF, MRS
Description			
Four separate independent values for any frequency measuring. See – setpoints in Basic setting: Gear Teeth1 to Gear Teeth4.			

back to List of values

RPM2

Value group	Basic	Related FW	2.6.0
Resolution [units]	[RPM]		
Comm object	11572	Related applications	AMF, MRS
Description			
Four separate independent values for any frequency measuring. See – setpoints in Basic setting: Gear Teeth1 to Gear Teeth4.			

back to List of values

RPM3

Value group	Basic	Related FW	2.6.0
Resolution [units]	[RPM]		
Comm object	11573	Related applications	AMF, MRS
Description			
Four separate independent values for any frequency measuring. See – setpoints in Basic setting: Gear Teeth1 to Gear Teeth4.			

back to List of values

RPM4

Value group	Basic	Related FW	2.6.0
Resolution [units]	[RPM]		
Comm object	11574	Related applications	AMF, MRS
Description			
Four separate independent values for any frequency measuring. See – setpoints in Basic setting: Gear Teeth1 to Gear Teeth4.			

back to List of values

Group: Engine

SpeedRequest

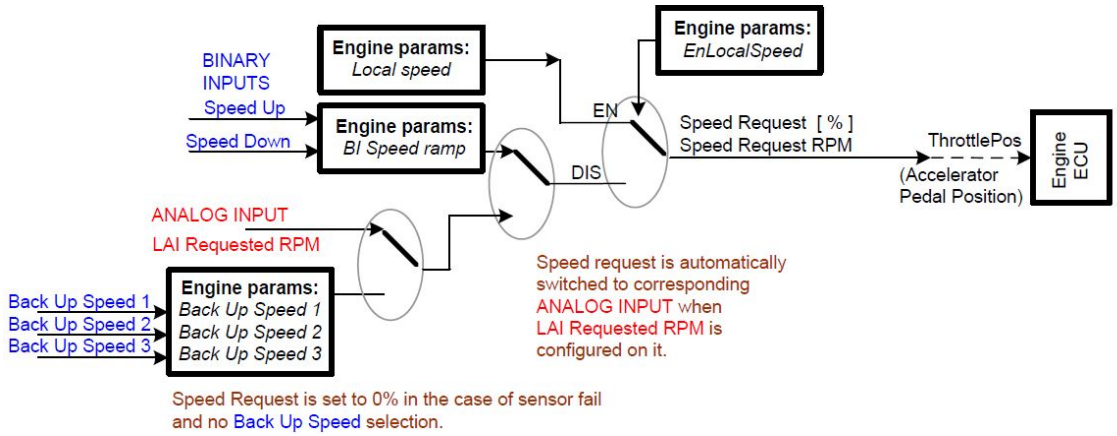
Value group	Engine	Related FW	2.6.0
Resolution [units]	[%]		
Comm object	10137	Related applications	AMF, MRS
Description			
Internal value of Engine speed request in 0,0 to 100,0 % range that can be sourced from different sources – see drawing below.			

back to List of values

Speed Request RPM

Value group	Engine	Related FW	2.6.0
Resolution [units]	[RPM]		
Comm object	10006	Related applications	AMF, MRS
Description			
Internal value of Engine speed request in RPM range that can be sourced from different sources – see drawing below.			

Note: *Different ECU types requires Speed request in % or in RPM range (J1939 - TSC1 frame).*



back to List of values

T Cyl Aver

Value group	Engine	Related FW	2.6.0
Resolution [units]	[°C]		
Comm object	9620	Related applications	AMF, MRS
Description			
Engine Cylinder temperature Average, Maximal and Minimal values are calculated from configured Cyl Temp 1 to Cyl Temp 16 Analog values.			

back to List of values

T Cyl Max

Value group	Engine	Related FW	2.6.0
Resolution [units]	[°C]		
Comm object	10526	Related applications	AMF, MRS
Description			
Engine Cylinder temperature Average, Maximal and Minimal values are calculated from configured Cyl Temp 1 to Cyl Temp 16 Analog values.			

back to List of values

T Cyl Min

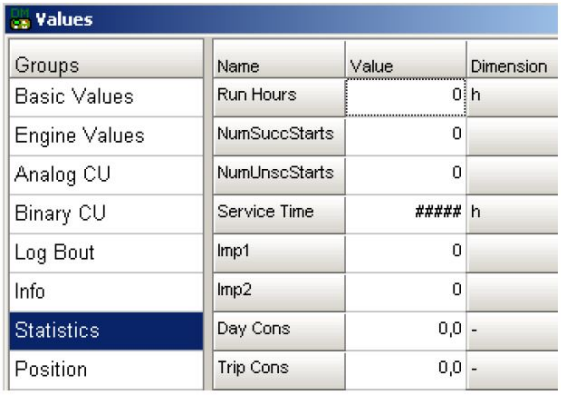
Value group	Engine	Related FW	2.6.0
Resolution [units]	[°C]		
Comm object	10527	Related applications	AMF, MRS
Description			
Engine Cylinder temperature Average, Maximal and Minimal values are calculated from configured Cyl Temp 1 to Cyl Temp 16 Analog values.			

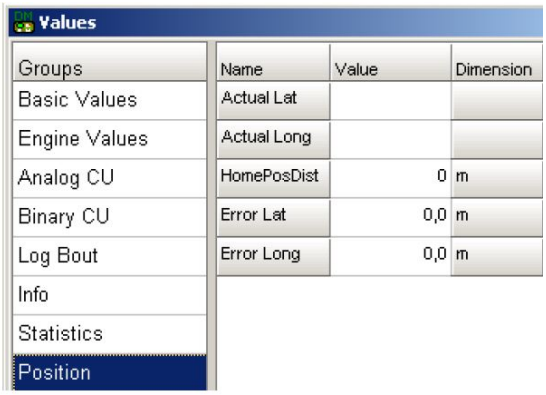
back to List of values

Oil Press

Value group	Engine	Related FW	2.6.0
Resolution [units]	[Bar]		
Comm object	10268	Related applications	AMF, MRS
Description			

Logical values to be displayed on external display (e.g. Bodas or CANtrak).





Statistics values availability

Statistics	AOUTs	PLC *)	History	DriveMonitor
Run Hours	N	Y	Y	Y
NumSuccStarts	Y	Y	Y	Y
NumUnscStarts	Y	Y	Y	Y
Service Time	Y	Y	Y	Y
Imp1	N	Y	Y	Y
Imp2	N	Y	Y	Y
DayCons	N	Y	Y	Y
Total Cons	N	Y	Y	Y

Note:
**) PLC just via conversion CONVERT function*

Position values availability

Position	AOUTs	PLC *)	History	DriveMonitor
Actual Lat	N	N	Y	Y
Actual Long	N	N	Y	Y
HomePosDist	N	Y	Y	Y
Error Lat	Y	Y	Y	Y
Error Long	Y	Y	Y	Y

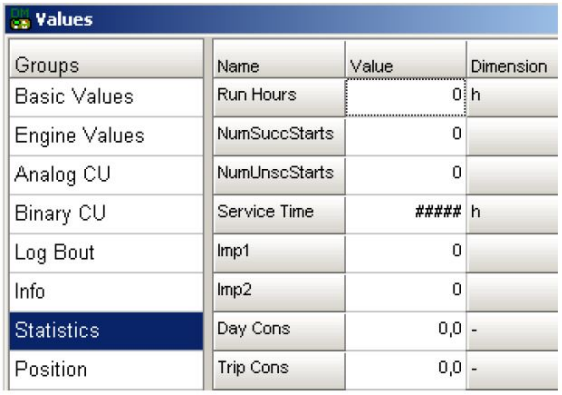
Note:
**) PLC just via conversion CONVERT function*

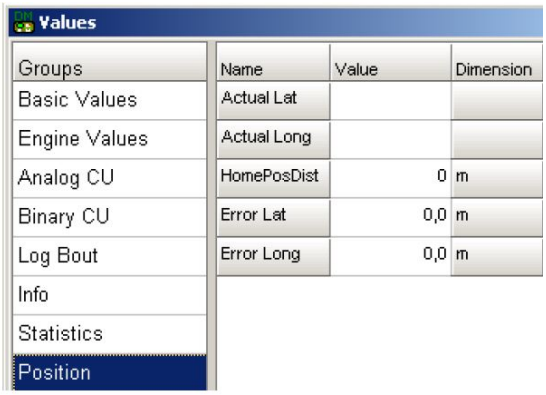
back to List of values

Oil Temp

Value group	Engine	Related FW	2.6.0
Resolution [units]	[°C]		
Comm object	11569	Related applications	AMF, MRS
Description			

Logical values to be displayed on external display (e.g. Bodas or CANtrak).





Statistics values availability

Statistics	AOUTs	PLC *)	History	DriveMonitor
Run Hours	N	Y	Y	Y
NumSuccStarts	Y	Y	Y	Y
NumUnscStarts	Y	Y	Y	Y
Service Time	Y	Y	Y	Y
Imp1	N	Y	Y	Y
Imp2	N	Y	Y	Y
DayCons	N	Y	Y	Y
Total Cons	N	Y	Y	Y

Note:
**) PLC just via conversion CONVERT function*

Position values availability

Position	AOUTs	PLC *)	History	DriveMonitor
Actual Lat	N	N	Y	Y
Actual Long	N	N	Y	Y
HomePosDist	N	Y	Y	Y
Error Lat	Y	Y	Y	Y
Error Long	Y	Y	Y	Y

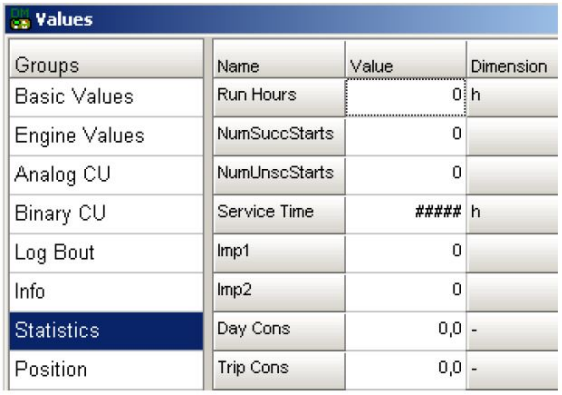
Note:
**) PLC just via conversion CONVERT function*

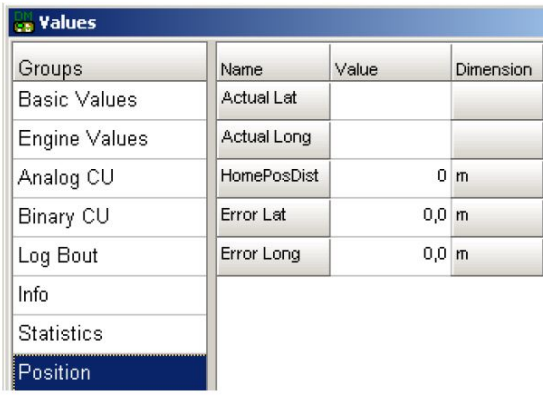
back to List of values

Cool Temp

Value group	Engine	**Related FW**	2.6.0
Resolution [units]	[°C]		
Comm object	10267	**Related applications**	AMF, MRS
Description			

Logical values to be displayed on external display (e.g. Bodas or CANtrak).





Statistics values availability

Statistics	AOUTs	PLC *)	History	DriveMonitor
Run Hours	N	Y	Y	Y
NumSuccStarts	Y	Y	Y	Y
NumUnscStarts	Y	Y	Y	Y
Service Time	Y	Y	Y	Y
Imp1	N	Y	Y	Y
Imp2	N	Y	Y	Y
DayCons	N	Y	Y	Y
Total Cons	N	Y	Y	Y

Note:
**) PLC just via conversion CONVERT function*

Position values availability

Position	AOUTs	PLC *)	History	DriveMonitor
Actual Lat	N	N	Y	Y
Actual Long	N	N	Y	Y
HomePosDist	N	Y	Y	Y
Error Lat	Y	Y	Y	Y
Error Long	Y	Y	Y	Y

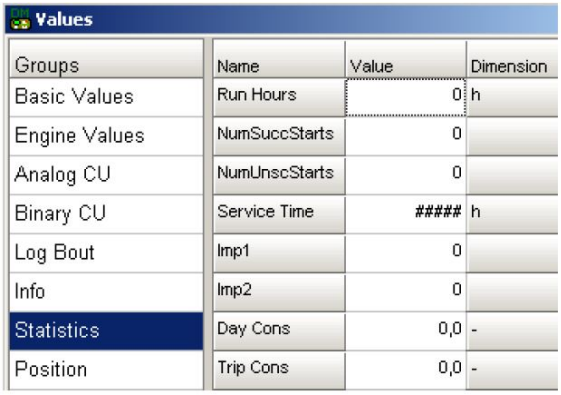
Note:
**) PLC just via conversion CONVERT function*

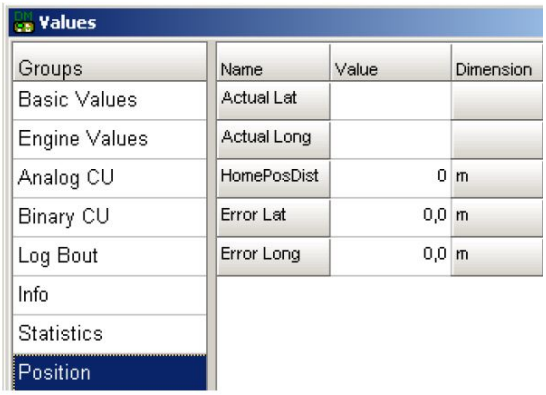
back to List of values

Fuel Level

Value group	Engine	**Related FW**	2.6.0
Resolution [units]	[%]		
Comm object	11570	**Related applications**	AMF, MRS
Description			

Logical values to be displayed on external display (e.g. Bodas or CANtrak).





Statistics values availability

Statistics	AOUTs	PLC *)	History	DriveMonitor
Run Hours	N	Y	Y	Y
NumSuccStarts	Y	Y	Y	Y
NumUnscStarts	Y	Y	Y	Y
Service Time	Y	Y	Y	Y
Imp1	N	Y	Y	Y
Imp2	N	Y	Y	Y
DayCons	N	Y	Y	Y
Total Cons	N	Y	Y	Y

Note:
**) PLC just via conversion CONVERT function*

Position values availability

Position	AOUTs	PLC *)	History	DriveMonitor
Actual Lat	N	N	Y	Y
Actual Long	N	N	Y	Y
HomePosDist	N	Y	Y	Y
Error Lat	Y	Y	Y	Y
Error Long	Y	Y	Y	Y

Note:
**) PLC just via conversion CONVERT function*

back to List of values

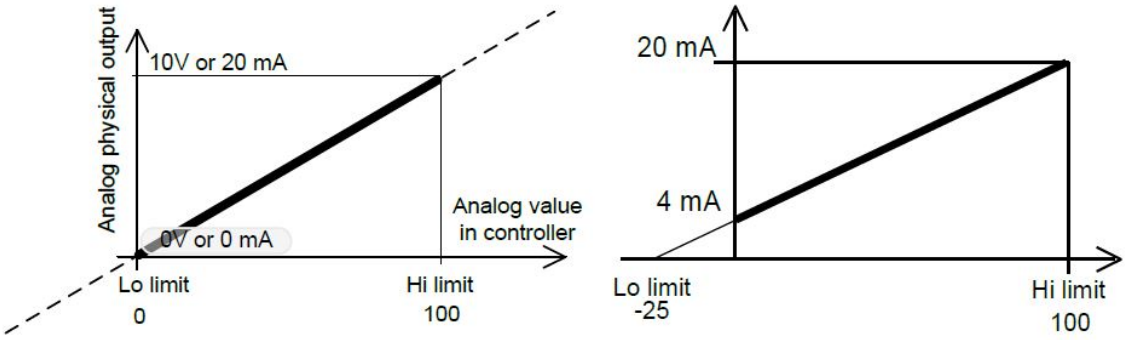
Analog outputs availability

Module	Number of outputs	Note
ID-Mobile	AOUT1 to AOUT8	
ECU (J1939)	4 (virtual outs)	Format depends on ECU
I-AOUT8	4× 8 Analog outputs	

Analog outputs configuration

The two limits “Lo limit” and “Hi limit” can be modified in DriveConfig. “Lo limit” corresponds to low Analog output limit i.e. 0V or 0mA output and Hi limit corresponds to full range 10V or 20mA output. Lo limit and Hi limit transfer the full internal analog value range to Analog output range.

Following is example of transfer characteristics 0 - 100% to 0 – 20mA and 4 -20mA.



Group: Analog CU

Values are shown and titled according to configuration AIN1 – AIN11 and:

Battery Volt

Value group	Analog CU	**Related FW**	2.6.0
Resolution [units]	[V]		
Comm object	8213	**Related applications**	AMF, MRS
Description			
Voltage of the battery (Power source for the controller).			

back to List of values

CPU Temp

Value group	Analog CU	**Related FW**	2.6.0
Resolution [units]	[°C]		
Comm object	10124	**Related applications**	AMF, MRS
Description			
Processor temperature of the controller.			

back to List of values

Group: Binary CU

ID BIN

Value group	Binary CU	**Related FW**	2.6.0
Resolution [units]	[-]		
Comm object	8235	**Related applications**	AMF, MRS
Description			
Binary inputs according to configuration.			

back to List of values

ID BOUT

Value group	Binary CU	**Related FW**	2.6.0
Resolution [units]	[-]		
Comm object	8239	**Related applications**	AMF, MRS
Description			
Binary outputs according to configuration.			

back to List of values

Group: Log Bout

LogBout 1

Value group	Log Bout	**Related FW**	2.6.0
Resolution [units]	[-]		
Comm object	9143	**Related applications**	AMF, MRS
Description			
Logical binary functions.			

back to List of values

LogBout 2

Value group	Log Bout	**Related FW**	2.6.0
Resolution [units]	[-]		
Comm object	9144	**Related applications**	AMF, MRS
Description			
Logical binary functions.			

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LogBout 3

Value group	Log Bout	**Related FW**	2.6.0
Resolution [units]	[-]		
Comm object	9145	**Related applications**	AMF, MRS
Description			
Logical binary functions.			

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LogBout 4

Value group	Log Bout	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	9146	Related applications	AMF, MRS
Description			
Logical binary functions.			

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LogBout 5

Value group	Log Bout	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	9147	Related applications	AMF, MRS
Description			
Logical binary functions.			

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RemoteControl

Value group	Log Bout	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	10627	Related applications	AMF, MRS
Description			
Remote control switches status.			

back to List of values

Group: Info

Engine State

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	9244	Related applications	AMF, MRS
Description			
Engine state: Not Running, Ready to Start, Cranking, Cooling etc.			

back to List of values

PasswordDecode

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	9090	Related applications	AMF, MRS
Description			
This code together with controller S/N is needed if controller password is forgotten.			

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SW Version

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	0	Related applications	AMF, MRS
Description			
SW version in the controller.			

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SW Branch

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	0	Related applications	AMF, MRS
Description			
SW branch identification.			

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Mode ID

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	9887	Related applications	AMF, MRS
Description			
Current controller mode (OFF, RUN).			

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Timer Text

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	10040	Related applications	AMF, MRS
Description			
Information of timer status.			

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Timer Val

Value group	Info	Related FW	2.6.0
Resolution [units]	[s]		
Comm object	8955	Related applications	AMF, MRS
Description			
Time to next timer.			

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ECU DiagSource

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	10226	Related applications	AMF, MRS
Description			
Indication of ECU diagnostic codes source. Typically: None, J1939-DM1, J1939-KWP, J1587-DTC, MODBUS.			

back to List of values

Master/Slave

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	11031	Related applications	AMF, MRS
Description			
Definition of controller type see: ID-Mobile Master – Slave concept.			

back to List of values

GSMSignalLevel

Value group	Info	Related FW	2.6.0
Resolution [units]	[%]		
Comm object	11895	Related applications	AMF, MRS
Description			
Indicating quality of GSM signal.			

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GSM Diag Code

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	11270	Related applications	AMF, MRS
Description			

Troubleshooting diagnostic code for ID-Mobile GPRS module

Code	Description	Code	Description
0	OK. No error.	11	SIM card is locked (Possibly PIN code required, PIN needs to be deactivated) or unknown status of SIM locking
1	Not possible to hang up.	12	No GSM signal
2	ID-Mobile-GPRS is switched off	13	Not possible to read the SIM card parameters
3	ID-Mobile-GPRS is switched on	14	GSM modem did not accepted particular initialization command, possibly caused by locked SIM card
4	ID-Mobile-GPRS – error in initialization	15	Unknown modem
5	ID-Mobile-GPRS – not possible to set the APN	16	Bad answer to complement initialization string
6	ID-Mobile-GPRS – not possible to connect to GPRS network	17	Not possible to read GSM signal strength
7	ID-Mobile-GPRS – not possible to retrieve IP address	18	CDMA modem not detected
8	ID-Mobile-GPRS – not accepted DNS IP address	19	No CDMA network
9	Error in modem detection	20	Unsuccessful registration to CDMA network
10	Error in initialization of analog modem	225	Only running communication is needed to indicate

back to List of values

AirGate Diag

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	11271	Related applications	AMF, MRS
Description			

AirGate Troubleshooting diagnostic code

Code	Description
1	Controller registered, waiting for authorization
2	Not possible to register, controller blacklisted
3	Not possible to register, server has no more capacity
4	Not possible to register, other reason
5	Controller registered and authorized

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AirGate ID

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	12385	Related applications	AMF, MRS
Description			

Identification name generated by AirGateserver to establish connection with:

- DriveMonitor
- InteliMonitor
- WebSupervisor

> **IMPORTANT: Connection via AirGate is supported with ID-Mobile GPRS module only (ID-Mobile GSM module does NOT support AirGate)**

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Modem Status

Value group	Info	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	12485	Related applications	AMF, MRS
Description			

"-----"	After controller initialization	
„Trying“	modem active, trying to establish connection	
„Ready“	modem ready, communication with mode"-----"	After controller initialization
„Trying“	modem active, trying to establish connection	
„Ready“	modem ready, communication with modem is ok	
m is ok		

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LitersPerHour [l/h]

Value group	Info	Related FW	2.6.0
Resolution [units]	[l/h]		
Comm object	12741	Related applications	AMF, MRS
Description			
Actual Fuel consumption in liters per hour calculated from IMP1 input and using the **Pulses/Litre 1 (page 66)**.			

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Group: Statistics

Run Hours

Value group	Statistics	Related FW	2.6.0
Resolution [units]	[h]		
Comm object	8206	Related applications	AMF, MRS
Description			

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RunHoursLoaded

Value group	Statistics	Related FW	2.6.0
Resolution [units]	[h]		
Comm object	12383	Related applications	AMF, MRS
Description			

back to List of values

NumSuccStarts

Value group	Statistics	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	8207	Related applications	AMF, MRS
Description			
Number of total successful starts.			

back to List of values

NumUnscStarts

Value group	Statistics	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	10149	Related applications	AMF, MRS
Description			
Number of total un-successful starts.			

back to List of values

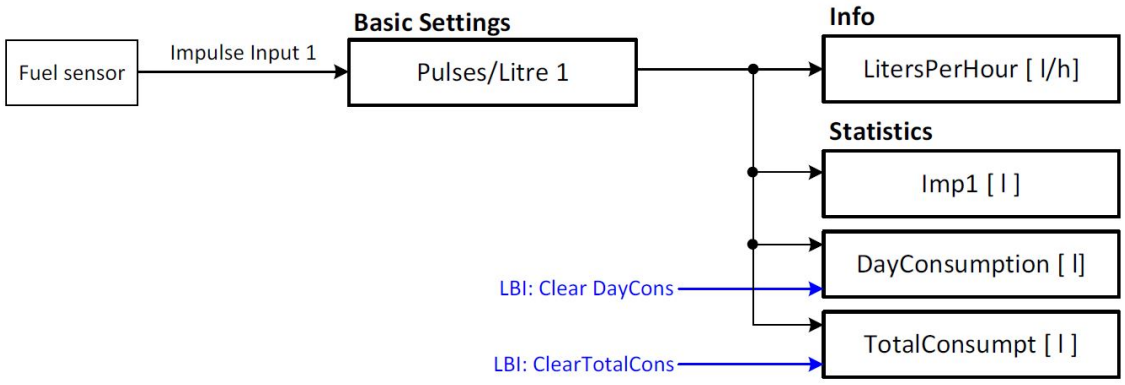
Service Time

Value group	Statistics	Related FW	2.6.0
Resolution [units]	[h]		
Comm object	9648	Related applications	AMF, MRS
Description			
Running hours to next service/maintenance period.			

back to List of values

Imp1

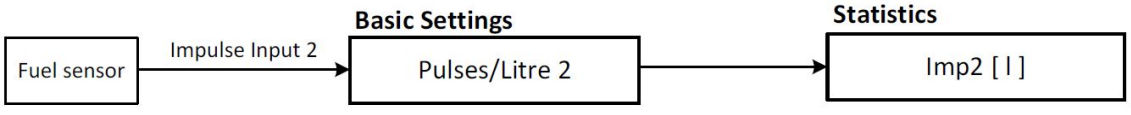
Value group	Statistics	Related FW	2.6.0
Resolution [units]	[l]		
Comm object	11563	Related applications	AMF, MRS
Description			
Recalculated numbers of impulses from Impulse Input 1 by parameters Pulses/Litre 2.			



back to List of values

Imp2

Value group	Statistics	Related FW	2.6.0
Resolution [units]	[l]		
Comm object	11564	Related applications	AMF, MRS
Description			
Recalculated numbers of impulses from Impulse Input 2 by parameters Pulses/Litre 2.			



back to List of values

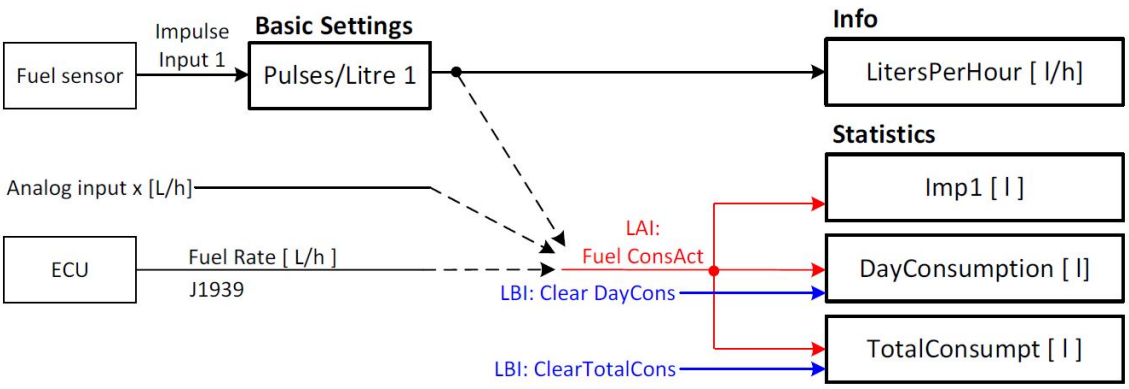
DayConsumption

Value group	Statistics	**Related FW**	2.6.0
Resolution [units]	[l]		
Comm object	11685	**Related applications**	AMF, MRS
Description			

back to List of values

TotalConsumpt

Value group	Statistics	**Related FW**	2.6.0
Resolution [units]	[l]		
Comm object	11686	**Related applications**	AMF, MRS
Description			



back to List of values

Group: Position

Actual Lat

Value group	Position	**Related FW**	2.6.0
Resolution [units]	[-]		
Comm object	11678	**Related applications**	AMF, MRS
Description			
Actual latitude coordinate.			

back to List of values

Actual Long

Value group	Position	**Related FW**	2.6.0
Resolution [units]	[-]		
Comm object	11679	**Related applications**	AMF, MRS
Description			
Actual longitude coordinate.			

back to List of values

HomePosDist

Value group	Position	Related FW	2.6.0
Resolution [units]	[m]		
Comm object	11680	Related applications	AMF, MRS
Description			
Distance from position set as home in meters.			

back to List of values

Error Lat

Value group	Position	Related FW	2.6.0
Resolution [units]	[m]		
Comm object	11680	Related applications	AMF, MRS
Description			
Latitude error in meters.			

back to List of values

Error Long

Value group	Position	Related FW	2.6.0
Resolution [units]	[m]		
Comm object	11684	Related applications	AMF, MRS
Description			
Longitude error in meters.			

back to List of values

SatellitesUsed

Value group	Position	Related FW	2.6.0
Resolution [units]	[-]		
Comm object	12163	Related applications	AMF, MRS
Description			
Actual number of satellites participating in position determination.			

back to List of values

MSL Altitude

Value group	Position	Related FW	2.6.0
Resolution [units]	[m]		
Comm object	12164	Related applications	AMF, MRS
Description			
Mean sea level in meters determined by GPS receiver.			

back to List of values

Ground Speed

Value group	Position	**Related FW**	2.6.0
Resolution [units]	[km/h]		
Comm object	12165	**Related applications**	AMF, MRS
Description			
Actual ground speed in km/h determined by GPS receiver.			

back to List of values

8.1.4 Logical binary inputs

What Logical binary inputs are:

Any InteliDrive controller binary input can be configured as “function” and/or “protection”. Following chapter contains Logical binary inputs list (functions list) that can be configured to any physical input.

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.*

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

Alphabetical groups of Logical binary inputs

For full list of Logical binary inputs go to the chapter **List of LBI (page 142)**.

List of LBI

back to Controller objects

LBI: B

Back Up Speed1 (AS only)

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	159		
Description			
This is back-up for Engine Speed request via failed Analog input. When Engine is Running (or Loaded) and Logical Analog input Requested RPM is not valid (out of range, sensor fail) then Speed Request is set to corresponding Back up Speed value in % (depends on Back Up Speed input). Speed Request = 0% when analog request is out of range and Binary input Back up speed is not active.			

back to List of LBI

Back Up Speed2 (AS only)

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	170		
Description			
This is back-up for Engine Speed request via failed Analog input. When Engine is Running (or Loaded) and Logical Analog input Requested RPM is not valid (out of range, sensor fail) then Speed Request is set to corresponding Back up Speed value in % (depends on Back Up Speed input). Speed Request = 0% when analog request is out of range and Binary input Back up speed is not active.			

back to List of LBI

Back Up Speed3 (AS only)

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	171		
Description			
This is back-up for Engine Speed request via failed Analog input. When Engine is Running (or Loaded) and Logical Analog input Requested RPM is not valid (out of range, sensor fail) then Speed Request is set to corresponding Back up Speed value in % (depends on Back Up Speed input). Speed Request = 0% when analog request is out of range and Binary input Back up speed is not active.			

back to List of LBI

BI Droop

Related FW	2.6.0	**Related applications**	AMF, MRS
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 **Governor Mode (page 68)** = BIN.INPUT (DROOP when closed)			

back to List of LBI

BI History

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	344		
Description			
Closed binary input activates one History record.			

back to List of LBI

BI Nominal

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	169		
Description			
This input changes state of logical binary output NOMINAL SW that can be configured as J1939 output to change ECU mode. Input is active only when **Idle/Nominal (page 68)** = BIN.INPUT.			

back to List of LBI

BI Secondr RPM (SS only)

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	168		
Description			
This input changes state of logical binary output “Second RPM Sw” that can be configured as J1939 output to change ECU mode. Input is active only when **Speed Select (SS only) (page 69)** = BIN.INPUT.			

back to List of LBI

LBI: C

Clear DayCons

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	220		
Description			
Active input clears the Day Consumption counter.			

back to List of LBI

ClearTotalCons

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	221		
Description			
Active input clears the Total Consumption counter.			

back to List of LBI

LBI: D

DisplayMessage1

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	222		
Description			
Up to 10 message texts are specified in **Group: Display (page 111)**. Each message setpoint contains the string up to 31 ASCII characters. The message can be displayed in display “Message Display Area” with Date and Time information, when corresponding Logical Binary Input (LBI) DisplMessageXX is activated. Message disappears when LBI is deactivated.			

back to List of LBI

DisplayMessage2

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	223		
Description			
Up to 10 message texts are specified in **Group: Display (page 111)**. Each message setpoint contains the string up to 31 ASCII characters. The message can be displayed in display “Message Display Area” with Date and Time information, when corresponding Logical Binary Input (LBI) DisplMessageXX is activated. Message disappears when LBI is deactivated.			

back to List of LBI

DisplayMessage3

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	224		
Description			
Up to 10 message texts are specified in **Group: Display (page 111)**. Each message setpoint contains the string up to 31 ASCII characters. The message can be displayed in display “Message Display Area” with Date and Time information, when corresponding Logical Binary Input (LBI) DisplMessageXX is activated. Message disappears when LBI is deactivated.			

back to List of LBI

DisplayMessage4

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	225		
Description			
Up to 10 message texts are specified in **Group: Display (page 111)**. Each message setpoint contains the string up to 31 ASCII characters. The message can be displayed in display “Message Display Area” with Date and Time information, when corresponding Logical Binary Input (LBI) DisplMessageXX is activated. Message disappears when LBI is deactivated.			

back to List of LBI

DisplayMessage5

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	226		
Description			
Up to 10 message texts are specified in **Group: Display (page 111)**. Each message setpoint contains the string up to 31 ASCII characters. The message can be displayed in display “Message Display Area” with Date and Time information, when corresponding Logical Binary Input (LBI) DisplMessageXX is activated. Message disappears when LBI is deactivated.			

back to List of LBI

DisplayMessage6

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	227		
Description			
Up to 10 message texts are specified in **Group: Display (page 111)**. Each message setpoint contains the string up to 31 ASCII characters. The message can be displayed in display “Message Display Area” with Date and Time information, when corresponding Logical Binary Input (LBI) DisplMessageXX is activated. Message disappears when LBI is deactivated.			

back to List of LBI

DisplayMessage7

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	228		
Description			
Up to 10 message texts are specified in **Group: Display (page 111)**. Each message setpoint contains the string up to 31 ASCII characters. The message can be displayed in display “Message Display Area” with Date and Time information, when corresponding Logical Binary Input (LBI) DisplMessageXX is activated. Message disappears when LBI is deactivated.			

back to List of LBI

DisplayMessage8

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	229		
Description			
Up to 10 message texts are specified in **Group: Display (page 111)**. Each message setpoint contains the string up to 31 ASCII characters. The message can be displayed in display “Message Display Area” with Date and Time information, when corresponding Logical Binary Input (LBI) DisplMessageXX is activated. Message disappears when LBI is deactivated.			

back to List of LBI

DisplayMessage9

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	230		
Description			
Up to 10 message texts are specified in **Group: Display (page 111)**. Each message setpoint contains the string up to 31 ASCII characters. The message can be displayed in display “Message Display Area” with Date and Time information, when corresponding Logical Binary Input (LBI) DisplMessageXX is activated. Message disappears when LBI is deactivated.			

back to List of LBI

DisplayMessage10

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	231		
Description			
Up to 10 message texts are specified in **Group: Display (page 111)**. Each message setpoint contains the string up to 31 ASCII characters. The message can be displayed in display “Message Display Area” with Date and Time information, when corresponding Logical Binary Input (LBI) DisplMessageXX is activated. Message disappears when LBI is deactivated.			

back to List of LBI

DisplayPuls1

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	262		
Description			

Logical Binary input DisplayPuls1 can be used e.g. for Bodas Control-Camera screens switching based on ID Mobile Binary input or PLC function.

LBI	Log 0	Log 1
DisplayPuls1	Control screen	Camera screen

Note: *Messages and status displaying are available only in specific customer branches with Bodas displays.*

back to List of LBI

DisplayPuls2

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	263		
Description			

Logical Binary input DisplayPuls2 can be used e.g. for Bodas Control-Camera screens switching based on ID Mobile Binary input or PLC function.

LBI	Log 0	Log 1
DisplayPuls2	Control screen	Camera screen

Note: *Messages and status displaying are available only in specific customer branches with Bodas displays.*

back to List of LBI

DisplayPuls3

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	264		
Description			

Logical Binary input DisplayPuls3 can be used e.g. for Bodas Control-Camera screens switching based on ID Mobile Binary input or PLC function.

LBI	Log 0	Log 1
DisplayPuls3	Control screen	Camera screen

Note: *Messages and status displaying are available only in specific customer branches with Bodas displays.*

back to List of LBI

DisplayPuls4

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	265		
Description			

Logical Binary input DisplayPuls4 can be used e.g. for Bodas Control-Camera screens switching based on ID Mobile Binary input or PLC function.

LBI	Log 0	Log 1
DisplayPuls4	Control screen	Camera screen

Note: *Messages and status displaying are available only in specific customer branches with Bodas displays.*

back to List of LBI

DisplBinary1

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	242		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary1 state.

Example of on display status indication

LBI	Display status
DisplBinary1 = **0**	Engine Oil Pressure: **Normal**
DisplBinary1 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary2

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	243		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary2 state.

Example of on display status indication

LBI	Display status
DisplBinary2 = **0**	Engine Oil Pressure: **Normal**
DisplBinary2 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary3

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	244		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary3 state.

Example of on display status indication

LBI	Display status
DisplBinary3 = **0**	Engine Oil Pressure: **Normal**
DisplBinary3 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary4

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	245		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary4 state.

Example of on display status indication

LBI	Display status
DisplBinary4 = **0**	Engine Oil Pressure: **Normal**
DisplBinary4 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary5

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	246		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary5 state.

Example of on display status indication

LBI	Display status
DisplBinary5 = **0**	Engine Oil Pressure: **Normal**
DisplBinary5 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary6

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	247		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary6 state.

Example of on display status indication

LBI	Display status
DisplBinary6 = **0**	Engine Oil Pressure: **Normal**
DisplBinary6 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary7

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	248		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary7 state.

Example of on display status indication

LBI	Display status
DisplBinary7 = **0**	Engine Oil Pressure: **Normal**
DisplBinary7 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary8

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	249		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary9 state.

Example of on display status indication

LBI	Display status
DisplBinary9 = **0**	Engine Oil Pressure: **Normal**
DisplBinary9 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary9

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	250		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary9 state.

Example of on display status indication

LBI	Display status
DisplBinary9 = **0**	Engine Oil Pressure: **Normal**
DisplBinary9 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary10

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	251		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary10 state.

Example of on display status indication

LBI	Display status
DisplBinary10 = **0**	Engine Oil Pressure: **Normal**
DisplBinary10 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary11

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	252		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary11 state.

Example of on display status indication

LBI	Display status
DisplBinary11 = **0**	Engine Oil Pressure: **Normal**
DisplBinary11 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary12

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	253		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary12 state.

Example of on display status indication

LBI	Display status
DisplBinary12 = **0**	Engine Oil Pressure: **Normal**
DisplBinary12 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary13

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	254		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary13 state.

Example of on display status indication

LBI	Display status
DisplBinary13 = **0**	Engine Oil Pressure: **Normal**
DisplBinary13 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary14

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	255		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary14 state.

Example of on display status indication

LBI	Display status
DisplBinary14 = **0**	Engine Oil Pressure: **Normal**
DisplBinary14 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary15

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	256		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary15 state.

Example of on display status indication

LBI	Display status
DisplBinary15 = **0**	Engine Oil Pressure: **Normal**
DisplBinary15 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary16

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	257		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary16 state.

Example of on display status indication

LBI	Display status
DisplBinary16 = **0**	Engine Oil Pressure: **Normal**
DisplBinary16 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary17

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	258		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary17 state.

Example of on display status indication

LBI	Display status
DisplBinary17 = **0**	Engine Oil Pressure: **Normal**
DisplBinary17 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary18

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	259		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary18 state.

Example of on display status indication

LBI	Display status
DisplBinary18 = **0**	Engine Oil Pressure: **Normal**
DisplBinary18 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary19

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	260		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary19 state.

Example of on display status indication

LBI	Display status
DisplBinary19 = **0**	Engine Oil Pressure: **Normal**
DisplBinary19 = 1	Engine Oil Pressure: **Low**

back to List of LBI

DisplBinary20

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	261		
Description			

The display on screen text status is changed according the corresponding Logical Binary Input (LBI) – DisplBinary20 state.

Example of on display status indication

LBI	Display status
DisplBinary20 = **0**	Engine Oil Pressure: **Normal**
DisplBinary20 = 1	Engine Oil Pressure: **Low**

back to List of LBI

LBI: E

ECU FltReset

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	166		
Description			

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

Note: *Activation of ECU Fault reset will affect InteliDrive only, no reset request is sent to ECU. There is separate acknowledge input for Alarms – see* ***FAULT RESET (PAGE 156)****.*

back to List of LBI

ECUComFailBlck

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	141		
Description			
Active input blocks ECU communication fail. Function can be used e.g. when ECU is switched off after engine stop.			

back to List of LBI

Emerg. Manual

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	45		
Description			
Controller does not activate binary output Fuel solenoid when engine starter is activated externally.			

back to List of LBI

Emergency Stop

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	40		
Description			
Engine Shut down activation. It is recommended to configure Emergency stop as normally closed contact from safety reason (this configuration is in default aid archive).			

back to List of LBI

LBI: F

Fault Reset

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	152		
Description			
Binary input for Alarm acknowledge (edge sensing) has the same function as controller front panel button Fault reset. ***Note:*** *There is separate acknowledge for ECU Alarms – see* ***ECU FLTRESET (PAGE 155)****.*			

back to List of LBI

Fire Speed (AS only)

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	160		
Description			
Running Engine speed is set to **FireAlarmSpeed (AS only) (page 85)** if input is active.			

back to List of LBI

Force Block

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	151		
Description			
Active input blocks protections that are configured as (in DriveConfig) as Property:Prot.block type= Force Block. Corresponding setpoint is ForceBlock del.			

back to List of LBI

LBI: G

GeoFencingEna

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	218		
Description			
Ena/Disables the GeoFencing function (engine block and active alarm) when the **Geo Fencing (page 111)** = BIN.INPUT.			

back to List of LBI

LBI: H

Home Position

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	219		
Description			
Active input (rising edge) moves the actual position into **Home Lat (page 109)** and **Home Long (page 110)**.			

back to List of LBI

Horn Reset

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	153		
Description			
Binary input Horn reset is edge sensing signal.			

back to List of LBI

LBI: L

Load Blocking

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	182		
Description			
“Load blocking” can block the LBO Close load. Active input is indicated in Alarm list as “Load blocking” message.			

back to List of LBI

LBI: N

Nominal Speed

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	41		
Description			
Skips Idle time and switch controller from Idle to running state when closed before Idle time is over.			

back to List of LBI

LBI: P

PrestartOvrd

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	173		
Description			
Prestart override activation skips the Prestart procedure (can be adjusted up to 600 sec). Skip Prestart is possible by binary or by repeated press of START button. Example: Finish engine preheating (prelubrication) based on temperature (pressure) limit..			

back to List of LBI

PWM9 DISABLE

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	174		
Description			
Active input disables (switch off) corresponding PWM signal on selected Binary output BO9.			

back to List of LBI

PWM10 DISABLE

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	175		
Description			
Active input disables (switch off) corresponding PWM signal on selected Binary output BO10.			

back to List of LBI

PWM11 DISABLE

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	176		
Description			
Active input disables (switch off) corresponding PWM signal on selected Binary output BO11.			

back to List of LBI

PWM12 DISABLE

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	177		
Description			
Active input disables (switch off) corresponding PWM signal on selected Binary outputs BO12.			

back to List of LBI

PWM13 DISABLE

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	178		
Description			
Active input disables (switch off) corresponding PWM signal on selected Binary outputs BO13.			

back to List of LBI

PWM14 DISABLE

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	179		
Description			
Active input disables (switch off) corresponding PWM signal on selected Binary output BO14.			

back to List of LBI

PWM15 DISABLE

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	180		
Description			
Active input disables (switch off) corresponding PWM signal on selected Binary output BO15.			

back to List of LBI

PWM16 DISABLE

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	181		
Description			
Active input disables (switch off) corresponding PWM signal on selected Binary output BO16.			

back to List of LBI

LBI: R

Rem On/Off

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	161		
Description			
Binary output Close Load is closed/opened by Rem On/Off input edges (toggled) when running engine RPM is over **MinLoadSpeed (page 94)**. **CLOSE LOAD (PAGE 170)** can be disconnected from external terminal when **REM ON/OFF (PAGE 160)** is closed.			

back to List of LBI

Rem Start/Stop

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	172		
Description			
Activates engine start when active in RUN mode and controller ready state. It is not possible to stop engine by panel STOP button and by Binary input Remote stop when Rem start/stop is active. This input can be configured to Binary output Timer active to enable engine automatic start/stop function.			

back to List of LBI

Remote OFF

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	12		
Description			
Controller is switched to OFF mode if input is closed and back to previous mode after is opened. ***Note:*** *Remote OFF will switch controller to OFF mode even if the Access code or Remote lock is active or Controller mode is password protected.*			

back to List of LBI

Remote Start

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	156		
Description			
External “edge sensitive” request for engine start. Binary input is active in both SS and AS application. Unsuccessful start is recorded to Alarm list and History. Binary input REMOTE START signal is equivalent to external terminal Start button. ***Note:*** *The second edge on Binary input Remote start skips the Idle time when engine is running in Idle state.*			

back to List of LBI

Remote Stop

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	157		
Description			
Engine “edge sensitive” stop request. The first edge changes engine state from running to cooling. REMOTE STOP signal is equivalent to external terminal Stop button. ***Note:*** *Binary inputs Remote start, 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).* *The second Remote Stop edge skip the (rest of) cooling.*			

back to List of LBI

RS485 Mode Mod

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	628		
Description			
Active input switches (by rising edge) **RS485 mode (page 73)** to Modbus (from other like STANDARD, ECU LINK).			

back to List of LBI

RS485 Mode Std

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	212		
Description			
Active input switches (by rising edge) **RS485 mode (page 73)** to STANDARD (from other like Modbus, ECU LINK).			

back to List of LBI

RunIndication1

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	46		
Description			
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). Engine running state = RPM > **Starting RPM (page 77)** or **OIL PRESS (PAGE 211)** > **Starting POil (page 78)** or Active Binary input Run indication1 or Active Binary input Run indication2 or Active Binary input Run indication3 (**RunIndication1 (page 161)**) or **COOLANT PRESS (AS ONLY) (PAGE 203)** > **StartPCoolant (AS only) (page 78)**			

back to List of LBI

RunIndication2

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	47		
Description			

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).

Engine running state =
- RPM > **Starting RPM (page 77)** or
- **OIL PRESS (PAGE 211)** > **Starting POil (page 78)** or
- Active Binary input Run indication1 or
- Active Binary input Run indication2 or
- Active Binary input Run indication3 (**RunIndication2 (page 162)**) or
- **COOLANT PRESS (AS ONLY) (PAGE 203)** > **StartPCoolant (AS only) (page 78)**

back to List of LBI

RunIndication3

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	48		
Description			

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).

Engine running state =
- RPM > **Starting RPM (page 77)** or
- **OIL PRESS (PAGE 211)** > **Starting POil (page 78)** or
- Active Binary input Run indication1 or
- Active Binary input Run indication2 or
- Active Binary input Run indication3 (**RunIndication3 (page 162)**) or
- **COOLANT PRESS (AS ONLY) (PAGE 203)** > **StartPCoolant (AS only) (page 78)**

back to List of LBI

LBI: S

Sd Override

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	44		
Description			

Blocks all protections except Overspeed, Emergency stop and configurable SdO protection.

- All alarms are detected
- Alarms are indicated on the controller display (DriveMonitor) Alarm list screen
- Alarms are recorded into History
- Enabled Active calls remains active
- Controller front panel engine RED LED blinks or lights
- Does not influence Sd Override in electronic engine via J1939

Note: *Shut down override "SdO" protection can be configured to any Analog or Binary input.*

back to List of LBI

Speed Down

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	164		
Description			

The engine Requested RPM is decreased/increased when 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 85)**.

Engine speed can be set by analog input Requested RPM or by BI Speed Up and Down.

Following requested RPM initialization is valid when Analog input Requested RPM is not configured.

Requested RPM (Idle) = 0.

Requested RPM (Running) = 50% for SS (ECU 50%=Nominal RPM).

Requested RPM (Running) = 0% for AS.

Note: *Minimal Speed up and Speed down pulse duration is 110 ms to be accepted by controller.*

back to List of LBI

Speed Up

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	165		
Description			
The engine Requested RPM is decreased/increased when 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 85)**. Engine speed can be set by analog input Requested RPM or by BI Speed Up and Down. Following requested RPM initialization is valid when Analog input Requested RPM is not configured. Requested RPM (Idle) = 0. Requested RPM (Running) = 50% for SS (ECU 50%=Nominal RPM). Requested RPM (Running) = 0% for AS. ***Note:*** *Minimal Speed up and Speed down pulse duration is 110 ms to be accepted by controller.*			

back to List of LBI

StartBlocking

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	68		
Description			
Forces controller NotReady state (=disables engine start).			

back to List of LBI

8.1.5 Logical binary outputs

What Logical binary outputs are:

Configure physical Binary outputs in DriveConfig selecting item from Source (e.g. Log Bout) list. Repeated click un-configures selected item.

Alphabetical groups of Logical binary outputs

For full list of Logical binary outputs go to the chapter **List of LBO (page 166)**.

List of LBO

back to Controller objects

Source: Log Bout

Alarm Blink

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	275		
Description			
Function is based on Binary output COMMON ALARM - 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.			

back to List of LBO

Alarm BlinkAct

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	278		
Description			
Alarm indication: ▶ Output starts switching (blinking 0.5 / 0.5 sec from opened or closed state) when any new alarm comes ▶ Output stays closed after Fault reset when any alarm is still active ▶ Output opens after Fault reset when no alarm is active			

back to List of LBO

Alarm

Related FW	2.6.0	**Related applications**	AMF, MRS
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

BO 1/2 Fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	352		
Description			
Indication of Binary output 1 and/or Binary output 2 fail or Broken wire detection.			

back to List of LBO

BO 3/4 Fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	353		
Description			
Indication of Binary output 3 and/or Binary output 4 fail or Broken wire detection.			

back to List of LBO

BO 5/6 Fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	354		
Description			
Indication of Binary output 5 and/or Binary output 6 fail or Broken wire detection.			

back to List of LBO

BO 7/8 Fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	355		
Description			
Indication of Binary output 7 and/or Binary output 8 fail or Broken wire detection.			

back to List of LBO

BO 9/10 Fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	356		
Description			
Indication of Binary output 9 and/or Binary output 10 fail.			

back to List of LBO

BO 11/12 Fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	357		
Description			
Indication of Binary output 11 and/or Binary output 12 fail.			

back to List of LBO

BO 13/14 Fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	358		
Description			
Indication of Binary output 13 and/or Binary output 14 fail.			

back to List of LBO

BO 15/16 Fail

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	359		
Description			
Indication of Binary output 15 and/or Binary output 16 fail. ***Note:*** *Possible Binary outs fails:* *Short circuit (over 8 Amps) between BOUT 1-2; BOUT 3-4; BOUT 5-6; BOUT 7-8; BOUT 9-10; BOUT 11-12; BOUT 13-14; BOUT 15-16;* *Short circuit (over 8 Amps) of any BOUT9-16 to BAT MINUS* *Short circuit (over 8 Amps) of any BOUT9-16 to BAT PLUS* *Overheat (over 150 °C on chip) and Undervoltage below 5.3 V of chip supply.*			

back to List of LBO

Close Load

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	265		
Description			
Output is closed/opened with rising edge of Binary input Rem On/Off when engine is in Running state and engine RPM is over **MinLoadSpeed (page 94)**. Output opens when RPM is below **MinLoadSpeed (page 94)**. Close load can be opened remotely (e.g. from DriveMonitor) when Binary input Remote On/Off is closed.			

back to List of LBO

ClutchButtEcho

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	285		
Description			
Output is closed for 1 sec when Clutch button (e.g. from DriveMonitor is activated).			

back to List of LBO

Comm AIN fail

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	269		
Description			
Output is closed when any analog extension (IS-AIN, IGS-PTM) unit does not communicate.			

back to List of LBO

Comm AOUT fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	271		
Description			
Output is closed when any analog extension (IS-AOUT, IGS-PTM) unit does not communicate.			

back to List of LBO

Comm BIN fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	270		
Description			
Output is closed when any analog extension (IS-BIN, IGS-PTM) unit does not communicate.			

back to List of LBO

Comm BOUT fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	272		
Description			
Output is closed when any analog extension (IS-BIN, IGS-PTM) unit does not communicate.			

back to List of LBO

Common Alarm

Related FW	2.6.0	**Related applications**	AMF, MRS
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 Cd

Related FW	2.6.0	**Related applications**	AMF, MRS
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	2.6.0	Related applications	AMF, MRS
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

Common Sd

Related FW	2.6.0	Related applications	AMF, MRS
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 SdO

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	251		
Description			
Indication of any active Shut-down Overide protection.			

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Common Wrn

Related FW	2.6.0	Related applications	AMF, MRS
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

Cooling Pump

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	40		
Description			
The output closes when engine starts and opens AfterCoolTime delayed after stop the engine.			

back to List of LBO

Cooling

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	74		
Description			
Closes in cooling state, opens after engine stop.			

back to List of LBO

CPU Ready

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	260		
Description			
CPU indication – output is closed when CPU is ready, opened in Init state.			

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CtrlHeartBeat

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	81		
Description			
Indicates correctly running firmware when cycling on/off with 0.5 sec period.			

back to List of LBO

Display Key 1

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	428		
Description			

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

back to List of LBO

Display Key 2

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	429		

Description

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

back to List of LBO

Display Key 3

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	430		

Description

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

back to List of LBO

Display Key 4

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	431		

Description

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

back to List of LBO

Display Key 5

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	432		

Description

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Display Key 6

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	433		
Description			

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Display Key 7

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	439		
Description			

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Display Key 8

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	440		

Description

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Display Key 9

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	441		

Description

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Display Key 10

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	442		
Description			

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Display Key 11

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	443		
Description			

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Display Key 12

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	444		
Description			

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Display Key 13

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	445		
Description			

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Display Key 14

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	446		
Description			

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Display Key 15

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	447		
Description			

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Display Key 16

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	448		
Description			

ID-Mobile Logical Binary Output (LBO) “Display Key x” is activated when corresponding Bodas button is pressed – see in table below. The first button does not activate the LBO Display Key 1.

LBO	Bodas button
No LBO function	1-st “round”
Display Key 2	2-nd
Display Key 3	3-rd
Display Key 4	4-th
Display Key 5	5-th
Display Key 6	6-th

Note: *Bodas keys procedures are not available in standard Bodas-1.3 firmware, it is dedicated for future customer branches.*

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Droop Sw

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	266		
Description			

The output is closed when setpoint Basic setting: Governor mode = DROOP or Governor mode = BIN.INPUT and corresponding Binary input BI DROOP 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

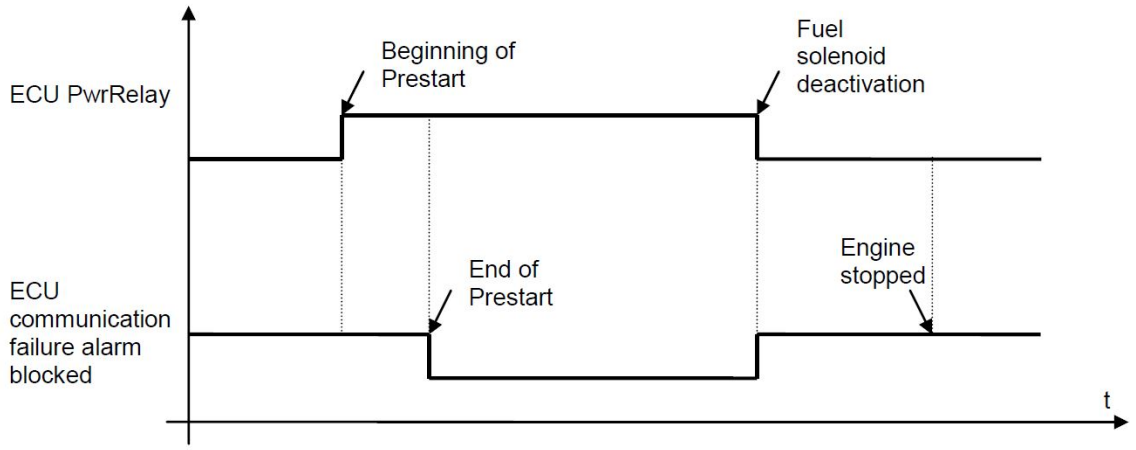
ECU PowerRelay

Related FW	2.6.0	Related applications	AMF, MRS
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 VPIO output), the issuing of communication error is blocked during Prestart and Stopping procedure as shown in the picture.



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

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Engine Running

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	263		
Description			

It activates, when RPM rises above starting RPM and opens when RPM=0.

back to List of LBO

FltResButtEcho

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	283		
Description			

Output is closed for 1 sec when Fault reset button (e.g. from DriveMonitor is activated).

back to List of LBO

Fuel Solenoid

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	22		
Description			
Closed output opens the fuel solenoid. Adjustable to DIESEL or GAS.			

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Horn

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	1		
Description			
Binary output for Horn, Buzzer alarm acoustic indication. Output is automatically switched off after **Horn Timeout (page 88)**. Horn is active unlimited time (until until Horn reset or Fault reset is pressed / activated) when Horn timeout = 0.			

back to List of LBO

HrnResButtEcho

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	284		
Description			
Output is closed for 1 sec when Horn reset button (e.g. from DriveMonitor is activated).			

back to List of LBO

Idle/Nominal

Related FW	2.6.0	**Related applications**	AMF, MRS
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 logic output Nominal/Idle is available as well. ***Note:*** *Connect Binary output IDLE / NOMINAL to electronic speed governor to switch the speed: opened = IDLE, closed=RATED.*			

back to List of LBO

Ignition

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	37		
Description			
Ignition system activation / deactivation during start stop procedure.			

back to List of LBO

Logical 0

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	26		
Description			
Constant value that can be configured to any input or output – mainly in PLC.			

back to List of LBO

Logical 1

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	27		
Description			
Constant value that can be configured to any input or output – mainly in PLC.			

back to List of LBO

No GPS Signal

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	427		
Description			
The output is active when GPS signal from any reason disappear (broken antenna, no GPS signal, GPS module fail) even if the **Geo Fencing (page 111)** = DISABLED.			

back to List of LBO

Nominal Sw

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	276		
Description			
The output is closed when setpoint Basic setting: Idle/Nominal = NOMINAL or Idle/Nominal = BIN.INPUT and corresponding Binary input BI NOMINAL is closed. This logical output (Source) can be configured to corresponding J1939 output (e.g. Idle Speed Select in Volvo-IndustrialD12 Aux).			

back to List of LBO

Nominal/Idle

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	274		
Description			
Inverted function to binary output Idle/Nominal. 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

OFF Mode

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	17		
Description			
The output is closed in controller OFF mode.			

back to List of LBO

Operational

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	61		
Description			
Output closes with binary output Prestart and opens with binary output Cooling pump.			

back to List of LBO

Prelubrication

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	49		
Description			
Periodic prelubrication function – see **Prelubr Time (page 81)** and **Prelubr Pause (page 82)**.			

back to List of LBO

Prestart

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	36		
Description			
The output closes prior to the engine start (Preheat, Prelubrication) for **Prestart Time (page 79)**.			

back to List of LBO

RdyForRemStart

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	280		
Description			
Output is closed when engine is ready for remote start.			

back to List of LBO

Ready To Load

Related FW	2.6.0	Related applications	AMF, MRS
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 94)**.			

back to List of LBO

Ready To Start

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	262		
Description			
Engine state indication, no active start blocking alarms.			

back to List of LBO

RemoteControl1

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	141		
Description			
Remote control outputs can be controlled locally or remotely (via Modem) from DriveMonitor – Remote switch panel.			

back to List of LBO

RemoteControl2

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	142		
Description			
Remote control outputs can be controlled locally or remotely (via Modem) from DriveMonitor – Remote switch panel.			

back to List of LBO

RemoteControl3

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	143		
Description			
Remote control outputs can be controlled locally or remotely (via Modem) from DriveMonitor – Remote switch panel.			

back to List of LBO

RemoteControl4

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	144		
Description			
Remote control outputs can be controlled locally or remotely (via Modem) from DriveMonitor – Remote switch panel.			

back to List of LBO

RemoteControl5

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	145		
Description			
Remote control outputs can be controlled locally or remotely (via Modem) from DriveMonitor – Remote switch panel.			

back to List of LBO

RemoteControl6

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	146		
Description			
Remote control outputs can be controlled locally or remotely (via Modem) from DriveMonitor – Remote switch panel.			

back to List of LBO

RemoteControl7

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	147		
Description			
Remote control outputs can be controlled locally or remotely (via Modem) from DriveMonitor – Remote switch panel.			

back to List of LBO

RemoteControl8

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	148		
Description			
Remote control outputs can be controlled locally or remotely (via Modem) from DriveMonitor – Remote switch panel.			

back to List of LBO

RUN Mode

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	18		
Description			
The output is closed in controller OFF mode.			

back to List of LBO

Second RPM Sw (SS only)

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	267		
Description			
The output is closed when setpoint Basic setting: Speed select = Secondary or Speed select = BIN.INPUT and corresponding Binary input “BI secondr 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.			

back to List of LBO

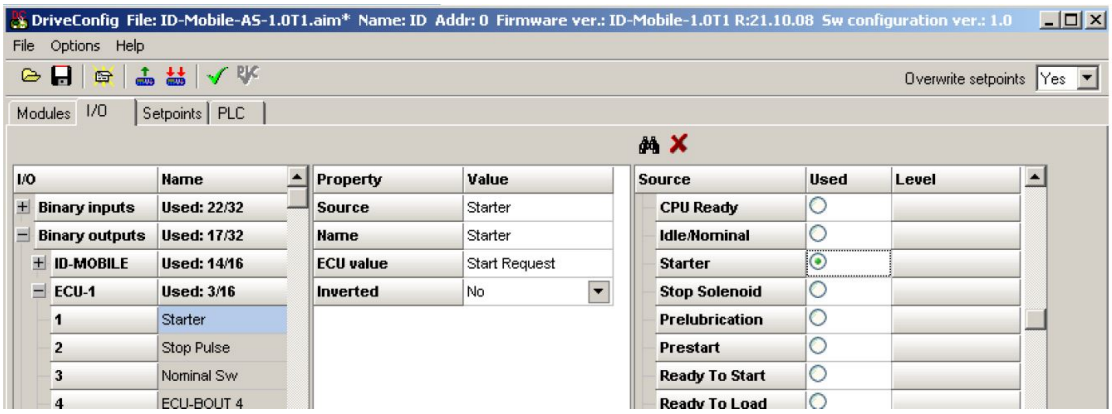
StartButtEcho

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	281		
Description			
Output is closed for 1 sec when Start button (e.g. from DriveMonitor is activated).			

back to List of LBO

Starter

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	24		
Description			
Closed output energizes the engine starter.			



back to List of LBO

Stop Pulse

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	25		
Description			
1 sec pulse is generated in the beginning of Stop procedure.			

back to List of LBO

Stop Solenoid

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	23		
Description			
Output is closed during engine stopping procedure.			

back to List of LBO

StopButtEcho

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	282		
Description			
Output is closed for 1 sec when Stop button (e.g. from DriveMonitor is activated).			

back to List of LBO

Timer Active

Related FW	2.6.0	**Related applications**	AMF, MRS
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 Binary input Rem start/stop. Timer is active in all controller modes include OFF mode.			

back to List of LBO

Unload

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	264		
Description			
1 sec (fix) pulse prior to transfer from Running to Cooling state.			

back to List of LBO

User Button 1

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	726		
Description			
InteliVision function buttons can be assigned to these five LBOs.			

back to List of LBO

User Button 2

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	727		
Description			
InteliVision function buttons can be assigned to these five LBOs.			

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User Button 3

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	728		
Description			
InteliVision function buttons can be assigned to these five LBOs.			

back to List of LBO

User Button 3

Delete this text and replace it with your own content.

User Button 4

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	729		
Description			
InteliVision function buttons can be assigned to these five LBOs.			

back to List of LBO

User Button 5

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	730		
Description			
InteliVision function buttons can be assigned to these five LBOs.			

back to List of LBO

User Button 5

Delete this text and replace it with your own content.

Source: Prg.states

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

Battery Flat

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	52		
Description			
ID-Mobile controller reset during Cranking state.			

back to List of LBO

Battery Volt

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	314		
Description			
Indication when battery voltage (ID-MOBILE power supply) is out of Engine protect: Batt <V and Batt >V limits.			

back to List of LBO

ECU AlarmList

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	303		
Description			
Output is closed when at least one item is in ECU Alarm list.			

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ECU

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	31		
Description			
ECU communication fail indication.			

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EcuDiagBlocked

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	40		
Description			
Output is closed when **ECU Diag (page 74)** = DISABLED.			

back to List of LBO

Emergency Stop

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	44		
Description			
Indication of active Emergency stop input.			

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GeoFencing

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	367		
Description			
The output is active (indicates Warning) when the actual position is out of fence.			

back to List of LBO

ChrgAlternFail

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	47		
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+ (when ENABLED). Starter goes off when any of these conditions becames valid.			

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Load Blocking

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	321		
Description			
Indication of active Load - blocking.			

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MasterCommErr

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	371		
Description			
Communication with Master control unit fails.			

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Not Lubricated

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	54		
Description			
The lubrication cycle (PrelubrTime) is not finished after controller Switch on or return from OFF mode.			

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Overload

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	313		
Description			
Active overload protection activation.			

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Overspeed

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	49		
Description			
Over speed indication.			

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Pickup Fail

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	51		
Description			
Pickup fail indication. Pickup fail: lost of RPM signal in running state (other running indication is active).			

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PLC Message 1

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	181		
Description			
Indication of programmable PLC state.			

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PLC Message 2

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	182		
Description			
Indication of programmable PLC state.			

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PLC Message 3

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	183		
Description			
Indication of programmable PLC state.			

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PLC Message 4

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	184		
Description			
Indication of programmable PLC state.			

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PLC Message 5

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	372		
Description			
Indication of programmable PLC state.			

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PLC Message 6

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	373		
Description			
Indication of programmable PLC state.			

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PLC Message 7

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	374		
Description			
Indication of programmable PLC state.			

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PLC Message 8

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	375		
Description			
Indication of programmable PLC state.			

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SHAIN 1

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	36		
Description			
Status of shared Analog inputs.			

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SHAIN 2

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	233		
Description			
Status of shared Analog inputs.			

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SHAIN 3

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	369		
Description			
Status of shared Analog inputs.			

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SHAIN 4

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	370		
Description			
Status of shared Analog inputs.			

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SHAinCfgErr

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	38		
Description			
Shared Analog module configuration error – i.e. more than one source was configured (is on the CAN2 bus).			

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SHBIN 1

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	32		
Description			
Status of shared Binary inputs.			

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SHBIN 2

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	33		
Description			
Status of shared Binary inputs.			

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SHBIN 3

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	34		
Description			
Status of shared Binary inputs.			

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SHBIN 4

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	35		
Description			
Status of shared Binary inputs.			

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SHBinCfgErr

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	37		
Description			
Shared Binary module configuration error – i.e. more than one source was configured (is on the CAN2 bus).			

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Start Blocking

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	56		
Description			
Indication of active Start - blocking.			

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Start Fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	55		
Description			
The last start attempt was unsuccessful.			

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Stop Fail

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	48		
Description			
Engine stop fail indication. Stop fail: engine does not reach 0 RPM after stop command within **Stop Time (page 82)**.			

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Underspeed

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	50		
Description			
Under speed indication.			

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UnivState 1

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	185		
Description			
Universal state 1 indication. See Universal states description.			

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UnivState 2

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	186		
Description			
Universal states 2 indication. See Universal states description.			

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UnivState 3

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	187		
Description			
Universal states 3 indication. See Universal states description.			

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UnivState 4

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	188		
Description			
Universal state 4 indication. See Universal states description.			

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UnivState 5

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	189		
Description			
Universal states 5 indication. See Universal states description.			

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UnivState 6

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	190		
Description			
Universal states 6 indication. See Universal states description.			

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UnivState 7

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	191		
Description			
Universal state 7 indication. See Universal states description.			

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WrnServiceTime

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	53		
Description			
Output is closed when Service time (count down) = 0. ***Note:*** *History record and Alarm list indication is activated as well.*			

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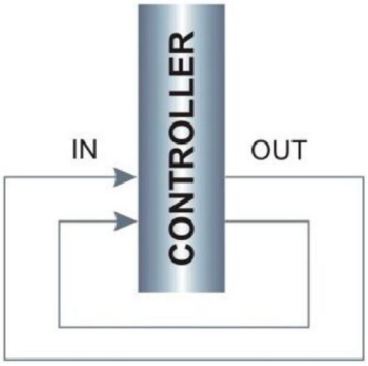
Virtual Binary Outputs

Virtual binary outputs exist only in a form of software modules inside the firmware. They can be interconnected with other modules only by means of logical connections in the configuration. There are available four modules, each includes 8 virtual binary outputs.



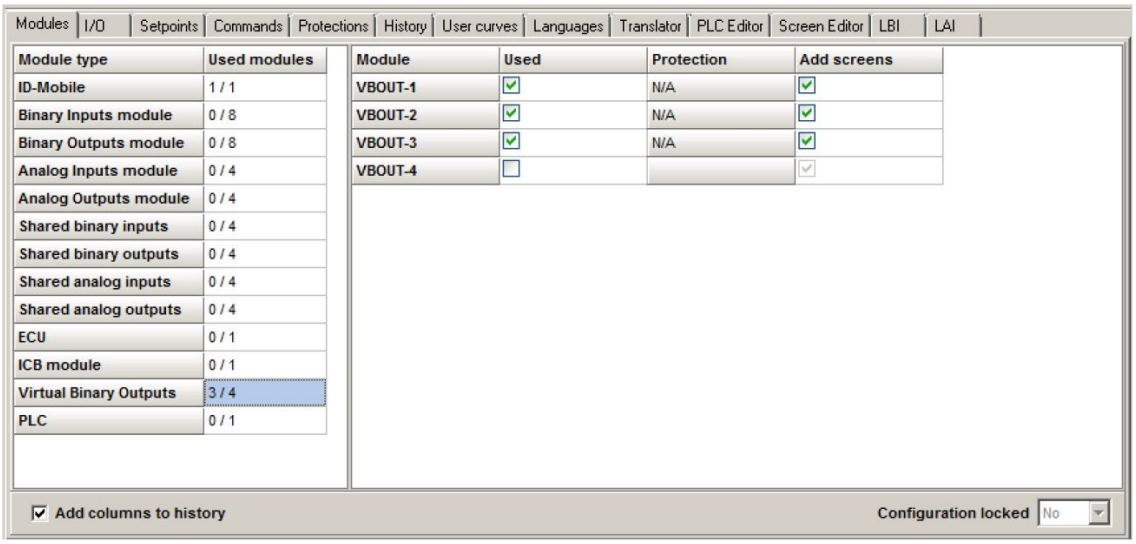


Image 8.1 Adding of Virtual Binary Outputs

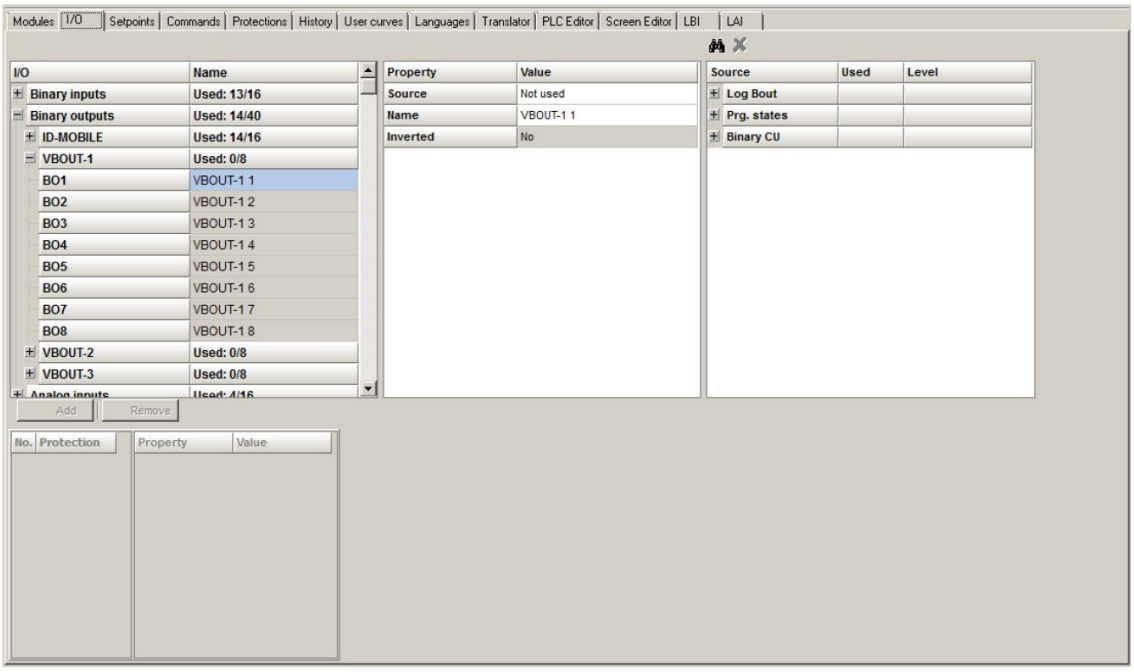


Image 8.2 Configuration of Virtual Binary Outputs

8.1.6 Logical analog inputs

Alphabetical groups of Logical analog inputs

For full list of Logical analog inputs go to the chapter **List of LAI (page 202)**.

List of LAI

back to Controller objects

LAI

Coolant Press (AS only)

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	66		
Description			
Engine Running indication – see **StartPCoolant (AS only) (page 78)**.			

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Coolant Temp

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	67		
Description			
This value is indicated on the first controller screen.			

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Cyl Temp 1

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	16		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 2

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	18		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 3

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	19		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 4

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	20		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 5

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	21		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 6

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	22		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 7

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	23		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 8

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	24		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 9

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	25		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 10

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	26		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 11

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	27		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 12

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	28		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 13

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	29		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

back to List of LAI

Cyl Temp 14

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	30		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 15

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	31		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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Cyl Temp 16

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	32		
Description			
Analog inputs for engine Cylinder temperatures measuring and average value calculation.			

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DisplAnalog1

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	83		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog2

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	84		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog3

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	85		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

back to List of LAI

DisplAnalog4

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	86		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

back to List of LAI

DisplAnalog5

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	92		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog6

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	93		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog7

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	94		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog8

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	95		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog9

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	96		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog10

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	97		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog11

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	98		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog12

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	99		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog13

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	100		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog14

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	101		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog15

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	102		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog16

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	103		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog17

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	104		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog18

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	105		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog19

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	106		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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DisplAnalog20

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	107		
Description			
Logical Analog Inputs for values to be displayed on Bodas display. ***Note:*** *Specific cases has to be solved by separate Bodas firmware customer branch.*			

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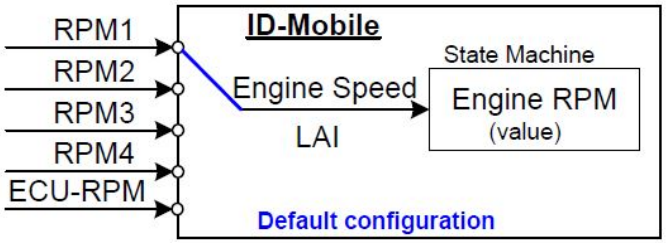
Engine Speed

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	8		
Description			
Logical RPM value for Engine RPM indication, overspeed protection, engine running and overload detection.  			

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Fuel ConsAct

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	82		
Description			
Logical Analog input to connect external Fuel consumption sensor when no ECU value is available. The sensor output has to be in liters per hour.			

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Fuel Level

Related FW	2.6.0	Related applications	AMF, MRS
Comm object	78		
Description			
Logical Analog input for value to be displayed on Bodas display.			

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Oil Press

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	9		
Description			
Value can be used as engine Running indication – see **Starting POil (page 78)**.			

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Oil Temp

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	77		
Description			
Logical Analog input for value to be displayed on Bodas display.			

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Requested RPM

Related FW	2.6.0	**Related applications**	AMF, MRS
Comm object	68		
Description			
Analog Input influences directly Engine Requested RPM register when configured without ramp. In the case of sensor fail (out of range) is Sped request = 0 for AS and 50% (=Nominal RPM) for SS configuration.			

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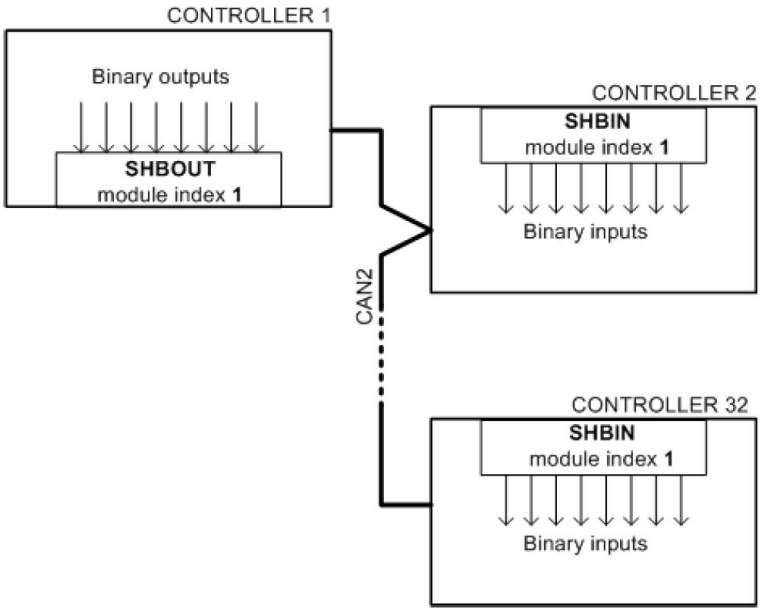
Analog inputs configuration example

for ID-Mobile Starter kit to be displayed on CANtrak-1.1 and Bodas-1.3 with default software.

	Analog input	Dim	Sensor	Resolution	Sensor range	Bargr. 100%	Logical function
1.	Oil Press	Bar	0-2400ohm	0.01	15.00	5.00	Oil Press
2.	Cool Temp	°C	0-2400ohm	1	350	120	Coolant Temp
3.	Oil Temp	°C	0-2400ohm	1	350	140	Oil Temp
4.	Fuel Level	%	0-2400ohm	1	240	100	Fuel Level

Shared Inputs and Outputs

Shared virtual modules are intended for transferring of binary and analog signals from one source controller to other controllers over the CAN2 bus.



Shared Analog Inputs (SHAIN)

The SHAIN module is a block of 4 virtual analog inputs intended for receiving of analog signals that are broadcasted by SHAOUT module.

Note: *The receiving SHAIN module must have identical module index as the broadcasting one.*

Note: *Always use electronic sensor type for analog inputs of the SHAIN modules.*

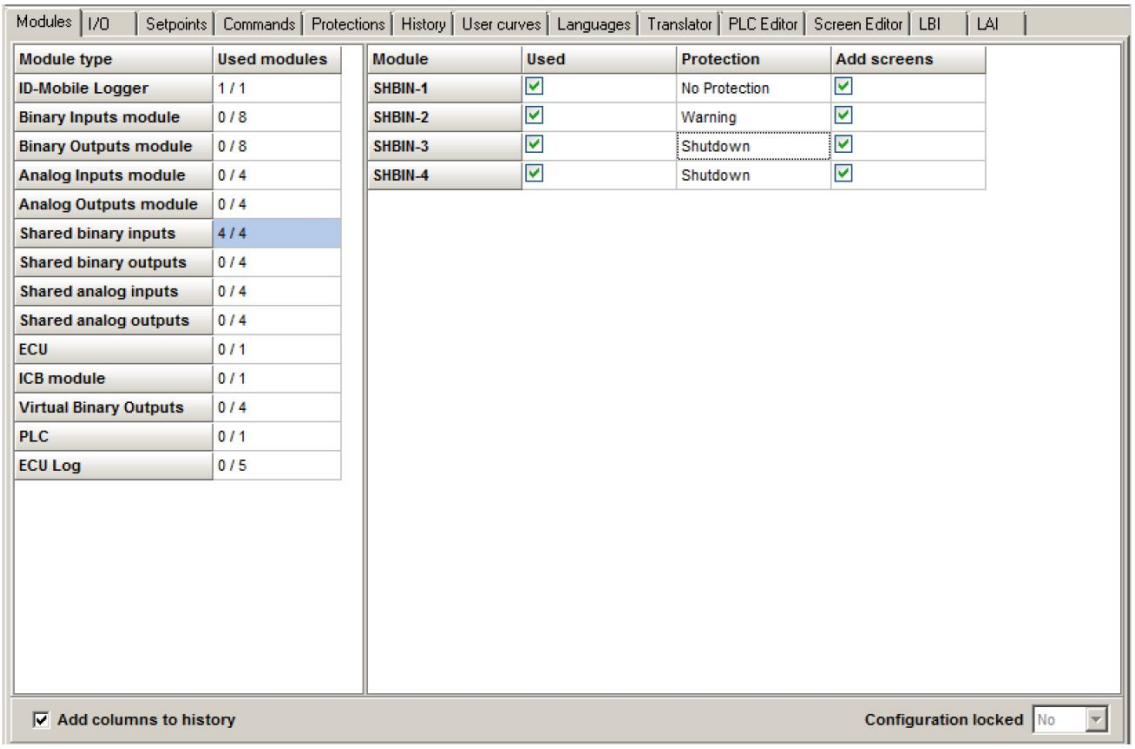


Image 8.3 Adding of Shared Analog/Binary Inputs/Outputs

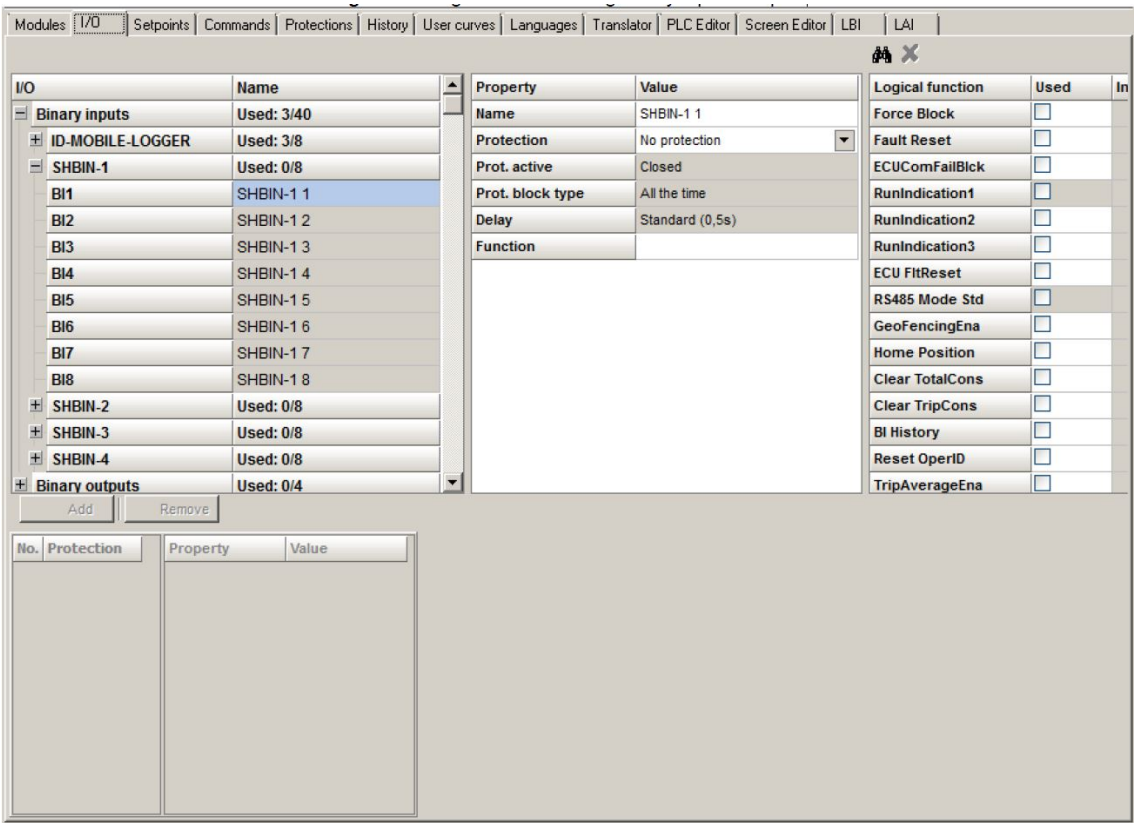


Image 8.4 Configuration of Shared Binary Inputs

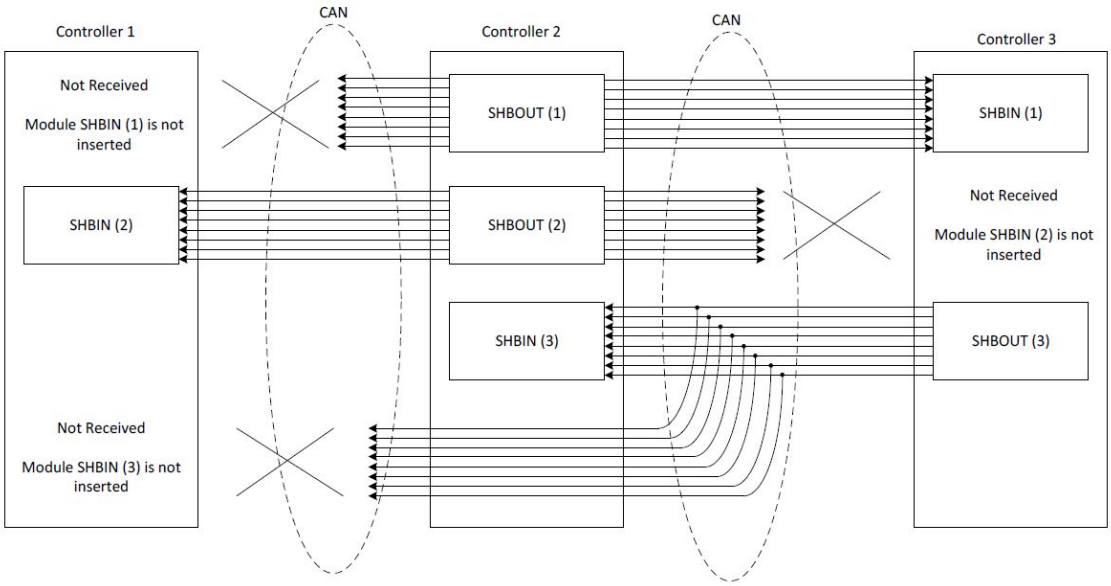


Image 8.5 Principal Scheme (same for shared Binary I/O and shared Analogue I/O

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 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.*

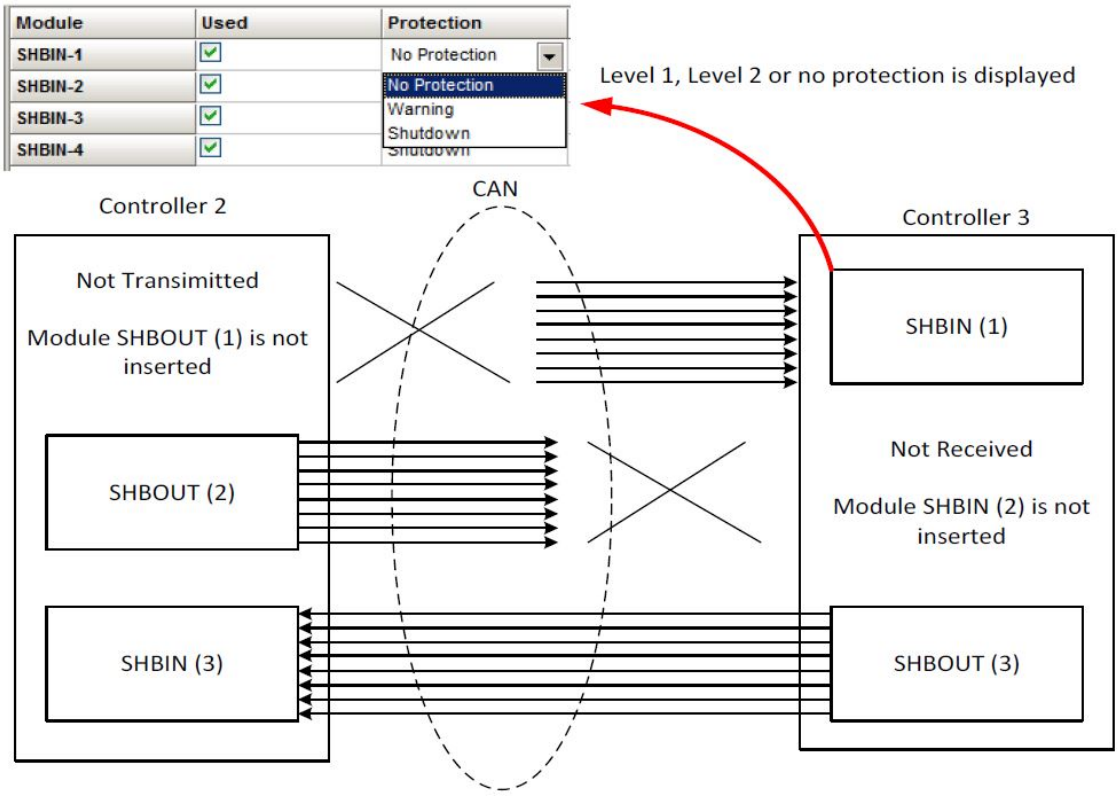


Image 8.6 Setting of protection

Shared Analog Outputs (SHAOUT)

The SHAOUT module is a block of 4 virtual analog outputs. The signals configured on the outputs are broadcasted over the CAN2 bus and can be received in other connected controllers using SHAIN module of the same index as the SHAOUT has.

> **IMPORTANT: Only one controller containing SHAOUT module with one particular index is allowed within a site.**

Shared Binary Inputs (SHBIN)

The SHBIN module is a block of 8 virtual binary inputs intended for receiving of binary signals that are broadcasted by SHBOUT module.

> ***Note:*** *The receiving SHBIN module must have identical module index as the broadcasting one.*

Shared Binary Outputs (SHBOUT)

The SHBOUT module is a block of 8 virtual binary outputs. The signals configured on the outputs are broadcasted over the CAN2 bus and can be received in other connected controllers using SHBIN module of the same index as the SHBOUT has.

> **IMPORTANT: Only one controller containing SHBOUT module with one particular index is allowed within a site.**

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8.2 Extension modules

Following items is possible to configure in DriveConfig – Modules

Module	No	
ID-Mobile	[1/1]	It is obligatory item.
Binary Inputs module	[x/8]	Use for extension modules IGS-PTM, IS-BIN16/8 and ICB.
Binary Outputs module	[x/8]	Use for extension modules IGS-PTM, IS-BIN16/8, IGL-RA15 and ICB.
Analog Inputs module	[x/4]	Use for extension modules IGS-PTM, IS-AIN and ICB.
Analog Outputs module	[x/4]	Use for extension modules IGS-PTM, I-AOUT8 and ICB.
Shared Binary inputs	[x/4]	Binary data transfer between ID-Mobile Master and Slave.
Shared Binary outputs	[x/4]	Binary data transfer between ID-Mobile Master and Slave.
Shared Analog inputs	[x/4]	Binary data transfer between ID-Mobile Master and Slave.
Shared Analog outputs	[x/4]	Binary data transfer between ID-Mobile Master and Slave.
ECU	[x/1]	Item for J1939 electronic engines support.
ICB module	[x/1]	Item for other than J1939 electronic engines support.
Virtual Binary Outputs	[x/4]	For data transfer via Modbus – e.g. separate fault indications.
PLC	[x/1]	Select this item before PLC functions configuration.

8.2.1 ID-Mobile Master – Slave concept

ID-Mobile Master:

Master module i.e. standard ID-Mobile hardware is dedicated as single unit.

ID-Mobile Slave:

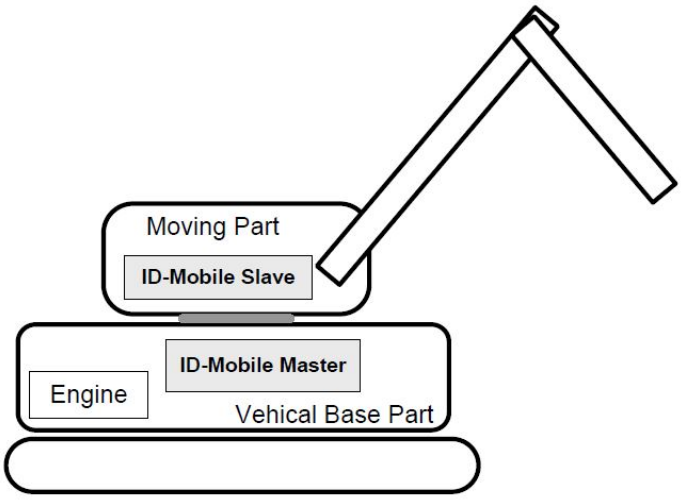
Slave module can be used to increase number of I/O and PLC functions and/or transfer signals from machine moving part just via CAN bus to reduce wiring. ID-Mobile Slave is equal to Master hardware and its function is blocked when used as single unit - without Master.

ID-Mobile slave and master need to be discussed with WNPR if work or not and how to describe properly

When ID-Mobile Slave works as single unit:

- "Sd MasterCommErr" is indicated in Alarm list and in History
- All Analog inputs are indicated as ##### invalid value
- All Binary inputs are indicated as # invalid value

Master and Slave can share values via "Shared Binary and Analog I/Os" via CAN2. There is one common ID-Mobile-1.1 (or higher) firmware for both. Ordering code is ID-Mobile Slave.



back to Extension modules

8.3 PLC toolbar functions

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8.3.1 List of PLC functions

back to PLC toolbar functions

Export drawing to image

Press the button  on the PLC toolbar to export the whole drawing (all sheets) into a windows metafile image (WMF). The WMF is a vector format which can be viewed and edited in most of vector-based graphic editors such as CAD editors, Microsoft Visio etc..

Recovery the drawing

The program creates backups of your drawing automatically. If you close the drawing accidentally, you can recovery it back from the backup copies. Press the button  on the PLC toolbar to select which backup copy you want to open. The filenames of the backup copies are generated automatically from current date and time according to following scheme: "yyyy_mm_dd_hh_mm_ss_xxxx.xml"

> **IMPORTANT: If you open a backup copy which was saved from an archive of different firmware version and/or branch than the current archive is, the configuration of sheet inputs and outputs may be incorrect!!**

Print the drawing

Click to the icon  to print the whole drawing. After clicking the print preview window is opened, where you can see how the drawing will appear on the paper. Then click to **PRINT** button to open the standard windows print dialog.

Note: *Each sheet is printed on two separate sheets of paper. The first paper contains the sheet graphic and the second paper (or more) contains summary of the sheet contents in the form of a table. The graphic is always zoomed to fit one paper.*

Cut selection

Use the button  or CTRL+X to cut the current selection from the sheet into the clipboard.

Copy selection

Use the button  or CTRL+C to copy the current selection from the sheet into the clipboard.

Paste from clipboard

Use the button  or CTRL+V to paste the contents of the clipboard into the active sheet.

Note: *The clipboard is cleared after the it is pasted into the sheet.*

Select whole sheet contents

Press the button  to select all contents of the active sheet.

Cancel selection

Press the button  to cancel the current selection.

Delete selection

Press the button  to delete current selection.

Delete whole sheet contents

Press the button to delete the whole contents of the active sheet.

Reroute selected wire(s)

Undo last change

Press the button or CTRL+Z to undo the last change that was made in the drawing.

Redo last undo change

Press the button to cancel the last undo step and return one step back.

Show drawing history

Press the button to show/hide a panel at the right of the PLC editor window, which contains an overview of last changes that were made in the drawing.

Repaint drawing

If the drawing is not correctly displayed, press the button to repaint it.

Show hints

Press the button to activate/deactivate hints for the blocks placed in the drawing. If the hints are enabled and the mouse pointer is located over a block, a hint with block configuration summary is displayed.

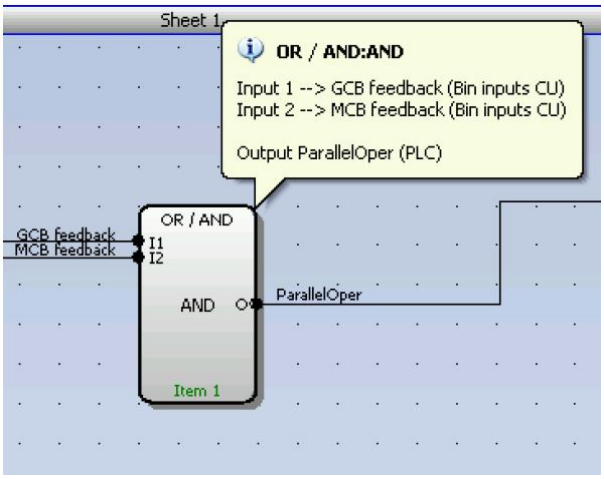

Image 8.7 PLC hint

Note: *Up to 64 PLC outputs is supported (from version 2.3.0).*

Add new sheet

Press the button on the PLC toolbar to add new sheet under the selected sheet. Drag the sheet edges to re-size the sheet according your needs.

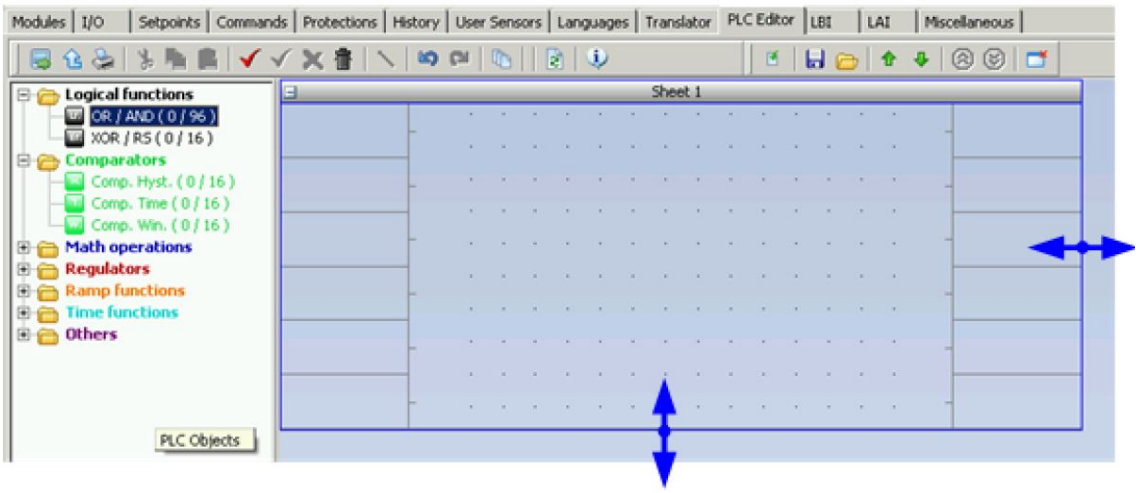

Image 8.8 Re-size sheet

Note: *The print function prints each sheet of the drawing at one sheet of paper, i.e. large sheets are zoomed out to fit the paper size. This can cause that large sheets will be difficult to read.*

Export-import of sheets

Press the button on the PLC toolbar to save currently selected sheet into a file. Press the button to import contents of currently selected sheet from a file. Configuration of sheet outputs is not imported and must be done manually afterwards.

Note: *The import will overwrite all previous sheet contents!*

IMPORTANT: Please always check configuration of sheet inputs, especially if you import a sheet which was originally created in different firmware branch and/or version.

Example: This function can be used e.g. if you have a sheet containing one particular function and you want to use this functionality repeatedly.

Move a sheet

Press the button ↑ or ↓ on the PLC toolbar to move the currently selected sheet within the drawing up or down.

IMPORTANT: Moving sheets causes the order of evaluation of the blocks will be different and might cause the PLC program to work incorrectly.

IMPORTANT: Moving sheets may cause the targets of "jump" blocks will be invalid. Please check "jump" blocks after moving a sheet.

Go to next-previous sheet

Press the button or on the PLC toolbar to display and activate next or previous sheet.

Note: *The active sheet is indicated by the blue sheet border.*

Delete a sheet

Press the button  on the PLC toolbar to delete currently selected sheet from the drawing.

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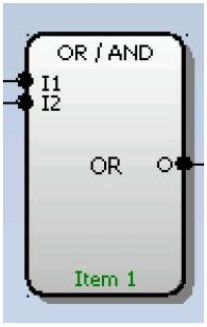
8.3.2 List of PLC Blocks

back to PLC toolbar functions

OR/AND

Symbol



Inputs

Input	Type	Range[DIM]	Function
Input 1..8	B	N/A	Inputs 1..8

Outputs

Output	Type	Range[DIM]	Function
Output	B	N/A	Result of the logical operation

Description

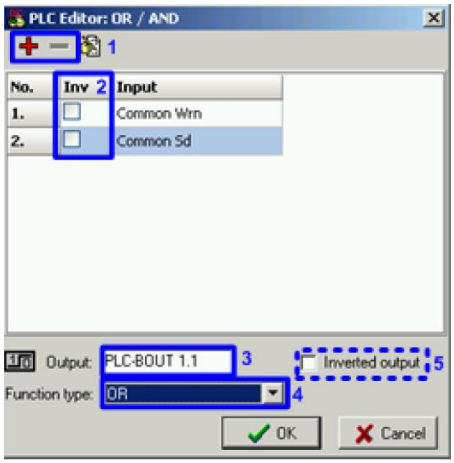
The block performs logical operation AND / OR of 2 - 8 binary operands. The inputs as well as the output can be inverted.

Function AND

I_1	I_2	O
0	0	0
0	1	0
1	0	0
1	1	1

Function OR

I_1	I_2	O
0	0	0
0	1	0
1	0	0
1	1	1

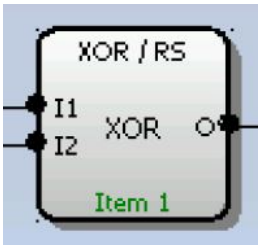


1. Use these buttons to add/remove inputs (up to 8).
2. The inputs can be inverted.
3. Rename the block output.
4. Select function of the block.
5. The output to be inverted.

Note: *The inputs are assigned to their sources in the sheet by dragging a wire from the input to the source.*

XOR/RS

Symbol



Inputs

Input	Type	Range[DIM]	Function
Input 1	B	N/A	Input 1
Input 2	B	N/A	Input 2

Outputs

Output	Type	Range[DIM]	Function
Output	B	N/A	Result of the logical operation

Description

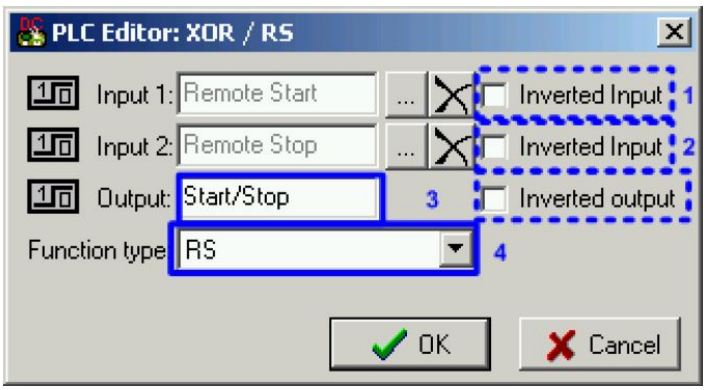
The block provides logical function of two values - XOR or RS flip-flop. Both inputs and output can be inverted.

Function XOR

I_1	I_2	O
0	0	0
0	1	1
1	0	1
1	1	0

Function RS

R	S	Q_{n+1}
0	0	Q_n
0	1	1
1	0	0
1	1	0

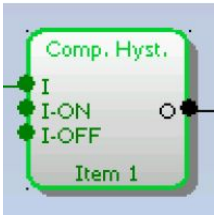


1. The input 1 can be inverted prior to entering the function.
2. The input 2 can be inverted prior to entering the function.
3. Rename the output. The output can be inverted.
4. Finally select the type of the function.

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Comparator with hysteresis

Symbol



Inputs

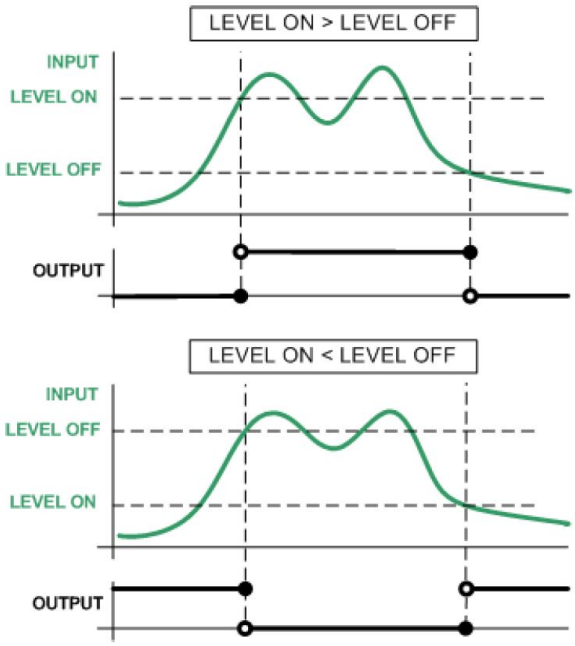
Input	Type	Range[DIM]	Function
Input	A	Any	Compared value
Input ON	A	Same as 'Input'	Comparation level for switching on
Input OFF	A	Same as 'Input'	Comparation level for switching off

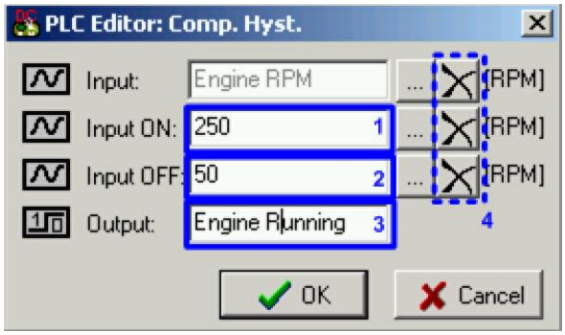
Outputs

Output	Type	Range[DIM]	Function
Output	B	N/A	Comparator output

Description

The block compares the input value with the comparation levels. The behavior depends on whether the ON level is higher than OFF level or vice versa.





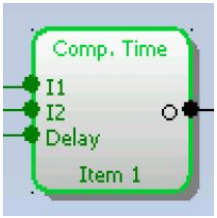
1. If you want the ON level to be a constant, write the constant into this box. Otherwise go back to the sheet, create an input on it and connect the sheet input to the block input by dragging a wire.
2. If you want the OFF level to be a constant, write the constant into this box. Otherwise go back to the sheet, create an input on it and connect the sheet input to the block input by dragging a wire.
3. Rename the output.

Note: *Press the button (4) if you need to delete the currently configured source from the box.*

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Comparator with delay

Symbol



Inputs

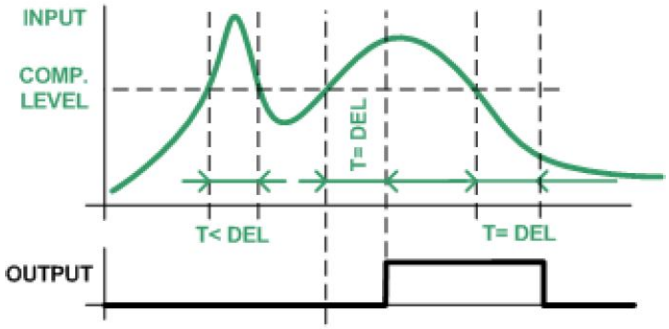
Input	Type	Range[DIM]	Function
Input 1	A	Any	Compared value
Input 2	A	Same as 'Input 1'	Comparation level
Delay	A	0.0..3000.0 [s]	Comparation delay

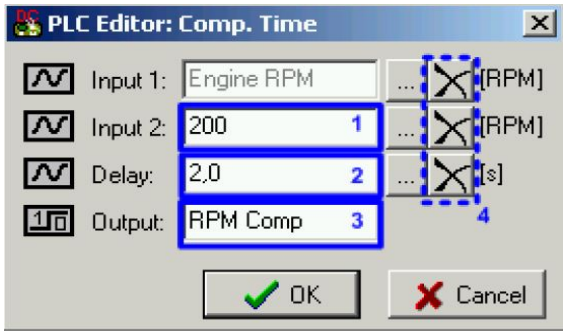
Outputs

Output	Type	Range[DIM]	Function
Output	B	N/A	Comparator output

Description

The block works as an analog switch. It compares the input value with the comparation level. The output will switch on if the input is equal or higher than the comparation level for time longer than the delay.





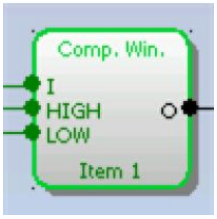
1. If you want the comparation level to be a constant, write the constant into this box. Otherwise go back to the sheet, create an input on it and connect the sheet input to the block input by dragging a wire.
2. If you want the delay value to be a constant, write the constant into this box. Otherwise go back to the sheet, create an input on it and connect the sheet input to the block input by dragging a wire.
3. Rename the output.

Note: *Press the button (4) if you need to delete the currently configured source from the box.*

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Window comparator

Symbol



Inputs

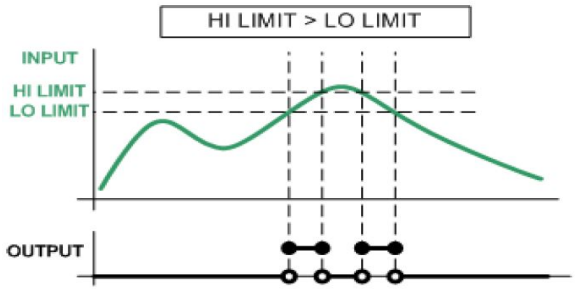
Input	Type	Range[DIM]	Function
Input	A	Any	Compared value
Input HIGH	A	Same as 'Input'	Upper window limit
Input LOW	A	Same as 'Input'	Lower window limit

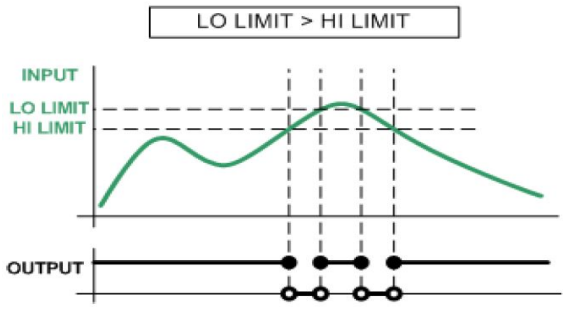
Outputs

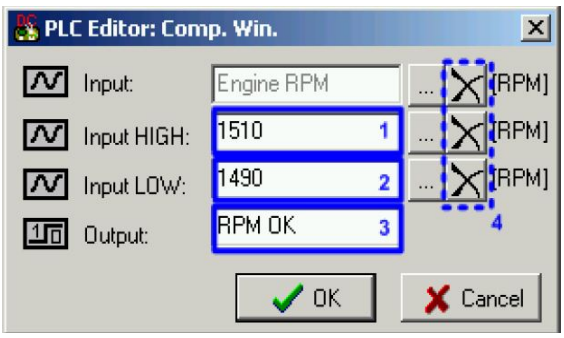
Output	Type	Range[DIM]	Function
Output	B	N/A	Comparator output

Description

The block output is switched on whenever the input value is in the range defined by Lo and Hi levels.



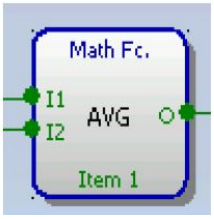




	1. If you want the Hi level to be a constant, write the constant into this box. Otherwise go back to the sheet, create an input on it and connect the sheet input to the block input by dragging a wire. 2. If you want the Lo level to be a constant, write the constant into this box. Otherwise go back to the sheet, create an input on it and connect the sheet input to the block input by dragging a wire. 3. Rename the output. ***Note:*** *Press the button (4) if you need to delete the currently configured source from the box.* ***Note:*** *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Mathematical function I

Symbol



Inputs

Input	Type	Range[DIM]	Function
Input 1	A	Any	Input 1
Input 2	A	Same as 'Input'	Input 2

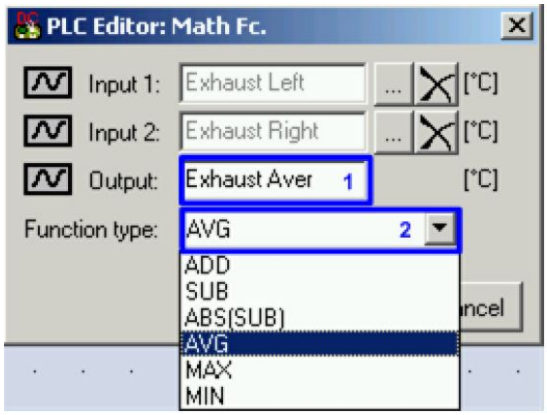
Outputs

Output	Type	Range[DIM]	Function
Output	A	Same as 'Input 1'	Result of the mathematical operation

Description

The block performs basic mathematical operations of 2 operands.

- ADD: Addition
- SUB: Subtraction
- ABS(SUB): Absolute value of subtraction
- AVG: Average
- MIN: Minimum of two
- MAX: Maximum of two

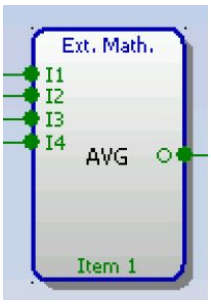


1. Rename the output
2. Select the mathematical operation

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Mathematical function II

Symbol



Inputs

Input	Type	Range[DIM]	Function
Input 1	A	Any	Input 1
Input 2..8	A	Same as 'Input'	Input 2..8

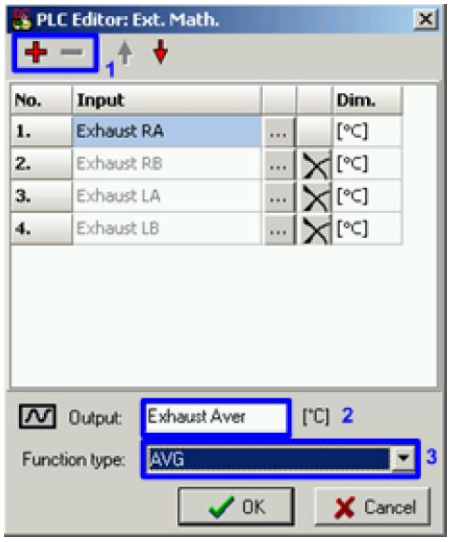
Outputs

Output	Type	Range[DIM]	Function
Output	A	Same as 'Input 1'	Result of the mathematical operation

Description

The block performs basic mathematical operations of 2 - 8 operands.

- ADD: Addition
- AVG: Average
- MIN: Minimal value
- MAX: Maximum value

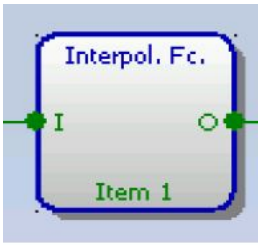


1. Use these buttons to add and remove inputs (up to 8)
2. Rename the output
3. Select the mathematical operation

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Interpolation

Symbol



Inputs

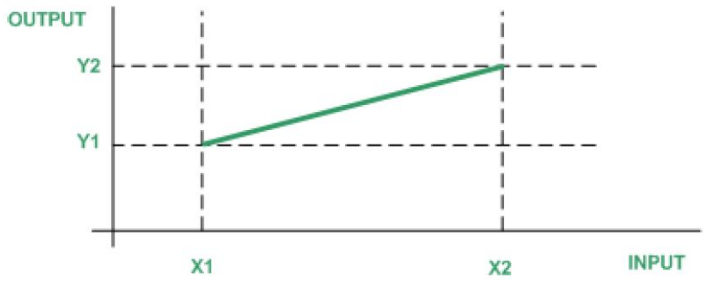
Input	Type	Range[DIM]	Function
Input	A	X1..X2 []	Input value

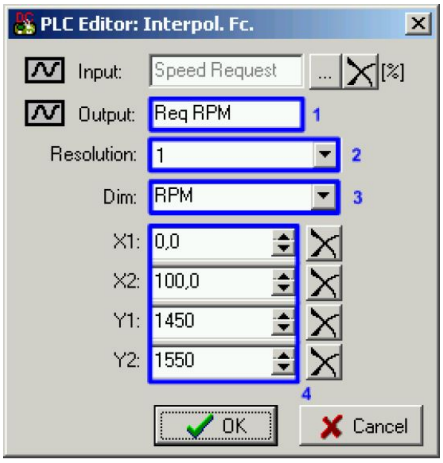
Outputs

Output	Type	Range[DIM]	Function
Output	A	Y1..Y2 []	Transformed value

Description

This block performs a linear transformation of the input. The transformation function is defined by two pairs of points [X1, Y1] and [X2, Y2]. The function works only within the region defined by X1,X2. Outside the region the output is an invalid value (-32768). The block can be used e.g. for changing of decimal resolution of a value.



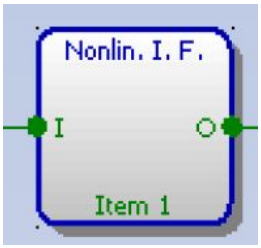


1. Rename the output.
2. Adjust resolution (number of decimal positions) of the output.
3. Adjust dimension of the output.
4. Enter the points of the transformation function. The value of X1 must be lower than the value of X2, however Y1 needn't to be lower than Y2, i.e. the characteristic can be also negative.

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

NonLinear Interpolation

Symbol



Inputs

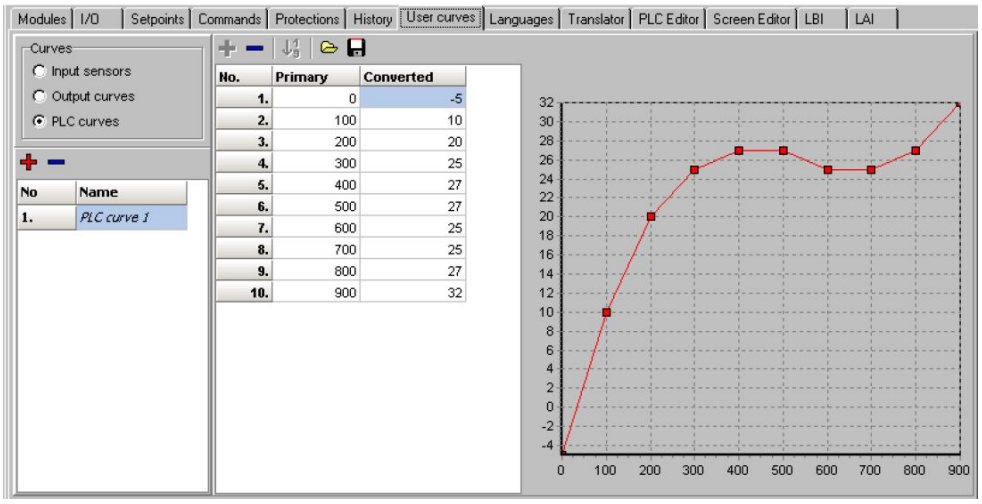
Input	Type	Range[DIM]	Function
Input	A	Any	Input value

Outputs

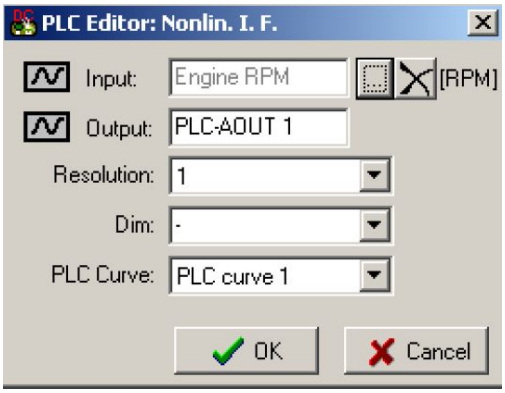
Output	Type	Range[DIM]	Function
Output	A	Adjustable	Transformed value

Description

This block performs a non linear up to 10 points transformation of the input. The transformation function is defined in User curves - PLC curves table by up to 10 pairs of points. The block can be used for non linear transformation and for changing output value decimal resolution.



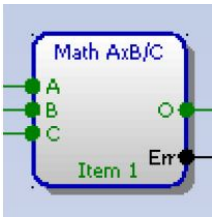
Note: *Up to 8 blocks can be used in application.*



	1. Rename the output. 2. Adjust resolution (number of decimal positions) of the output. 3. Adjust dimension of the output. 4. Select conversion function from the list. ***Note:*** *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input.*

Mathematical function multiplication/dividing (A×B/C)

Symbol



Inputs

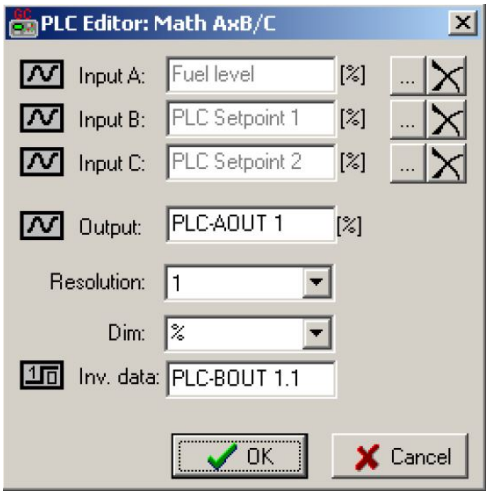
Input	Type	Range[DIM]	Function
Input A	A	Any	First multiplicant
Input B	A	Same as 'Input 1'	Second multiplicant
Input C	A	Same as 'Input 1'	Divider

Outputs

Output	Type	Range[DIM]	Function
Output	A	Same as 'Input 1'	Result of the mathematical operation.
Data Invalid	B	N/A	Atribute of invalid data on output

Description

The block multiplication/dividing (A×B/C) realizes the mathematic operation of three operands (multiplication and dividing). The function can be used e.g. for scaling of values. In case of any invalid data on any of the inputs the output of the function is set to the invalid value -32768 and binary output DataInvalid gets active. The result of multiplication A×B is calculated as first and is stored into 32 bits long value. Whereas the output register is only 16 bits long value, the divider of the operation (input C) has to be selected properly to match the output value of the operation into interval <-32767;32767>. If the result of the operation is out of this range the output of the function is set to invalid value -32768 and the binary output DataInvalid gets active.

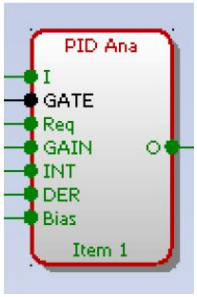


Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Note: *This block is available in version 3.0 and later.*

PID regulator with analog output

Symbol



Inputs

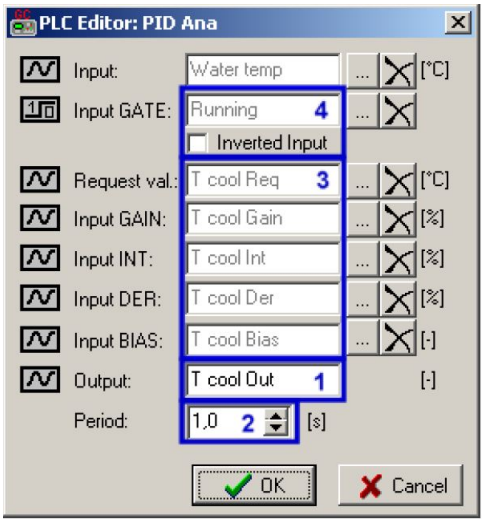
Input	Type	Range[DIM]	Function
Input	A	Any	Regulated value
Requested val.	A	Same as 'Input'	Required value
Gain	A	-100.00..100.00 [%]	Gain of the regulator
Int	A	-100.00..100.00 [%]	Integrative part of the regulator
Der	A	-100.00..100.00 [%]	Derivative part of the regulator
Bias	A	-10000..10000 [-]	Value of the output while the regulator is off
Gate	B	N/A	Regulator on/off input

Outputs

Output	Type	Range[DIM]	Function
Output	A	-10000..10000 [-]	Actuator control output

Description

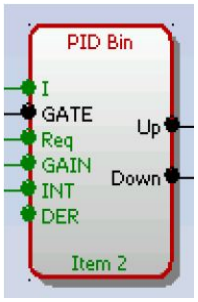
The block is a PID regulator with analog output and adjustable regulation period. The function of the regulator can be disabled by the gate input. While the regulator is disabled, the output is set to bias value.



	1. Rename the output. 2. Adjust regulation period. The period should be adjusted according to the speed of the response of the system, e.g. longer period for slower systems, shorter period for faster systems. 3. You may want to have some regulation parameters, as e.g. derivative part or bias, constant. In such a case write the constant directly into the appropriate box. If there is a source configured, it must be deleted prior to writing of the constant. 4. If you need the regulator to run only if certain condition is fulfiled, use the gate input. Create a binary value representing the condition (e.g. using other plc blocks) and connect it to the gate input. The regulator will then work only if the gate input is active. If the gate input is not connected, the regulator works all the time the controller is switched on. ***Note:*** *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

PID regulator with up/down binary outputs

Symbol



Inputs

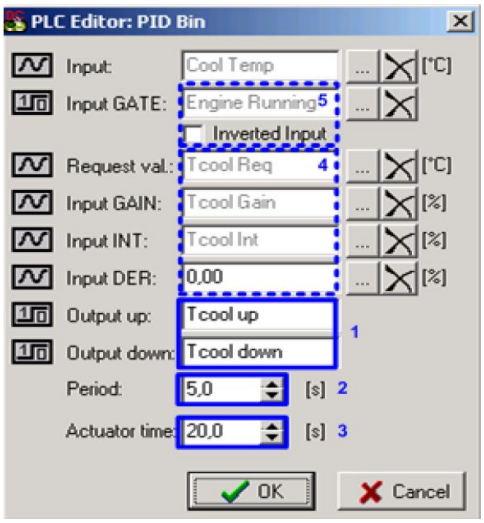
Input	Type	Range[DIM]	Function
Input	A	Any	Regulated value
Requested val.	A	Same as 'Input'	Required value
Gain	A	-100.00..100.00 [%]	Gain of the regulator
Int	A	-100.00..100.00 [%]	Integrative part of the regulator
Der	A	-100.00..100.00 [%]	Derivative part of the regulator
Gate	B	N/A	Regulator on/off input

Outputs

Output	Type	Range[DIM]	Function
Output up	B	N/A	Actuator control - Raise
Output down	B	N/A	Actuator control - Lower

Description

The block is a PID regulator with binary outputs up/down and adjustable regulation period. The function of the regulator can be disabled by the gate input.

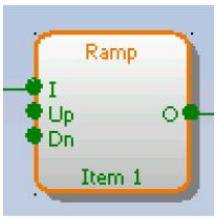


1. Rename the outputs.
2. Adjust regulation period. The period should be adjusted according to the speed of the response of the system, e.g. longer period for slower systems, shorter period for faster systems.
3. Adjust the actuator time. It is time that the actuator (servo etc.) needs for changing position from fully closed to fully open.
4. You may want to have some regulation parameters, as e.g. derivative part, constant. In such a case write the constant directly into the appropriate box. If there is a source configured, it must be deleted prior to writing of the constant.
5. If you need the regulator to run only if certain condition is fulfiled, use the gate input. Create a binary value representing the condition (e.g. using other plc blocks) and connect it to the gate input. The regulator will then work only if the gate input is active. If the gate input is not connected, the regulator works all the time the controller is switched on.

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Analog ramp

Symbol



Inputs

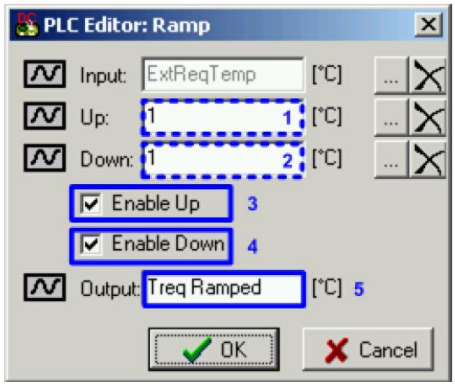
Input	Type	Range[DIM]	Function
Input	A	Any	Input value to be ramped
Up	A	Same as input	Maximal rising rate of the output per one second
Down	A	Same as input	Maximal lowering rate of the output per one second

Outputs

Output	Type	Range[DIM]	Function
Output	A	Same as input	Ramped value

Description

This block limits the maximal rate of change at the output. The maximal rates up and down are adjustable separately and ramping down and up can be enabled/disabled separately.

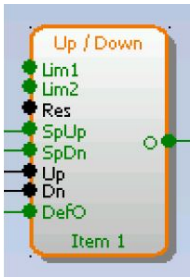


1. Adjust the maximal rising rate of the output per one second. If you want the delay to be a constant, write the constant into the box. Otherwise connect the input to any other analog object.
2. Adjust the maximal lowering rate of the output per one second. If you want the delay to be a constant, write the constant into the box. Otherwise connect the input to any other analog object.
3. Tick the checkbox to activate the rising rate limitation.
4. Tick the checkbox to activate the lowering rate limitation.
5. Rename the output.

***Note:** The inputs are assigned to their sources in the sheet by **dragging a wire** from the input to the source.*

Up/Down

Symbol



Inputs

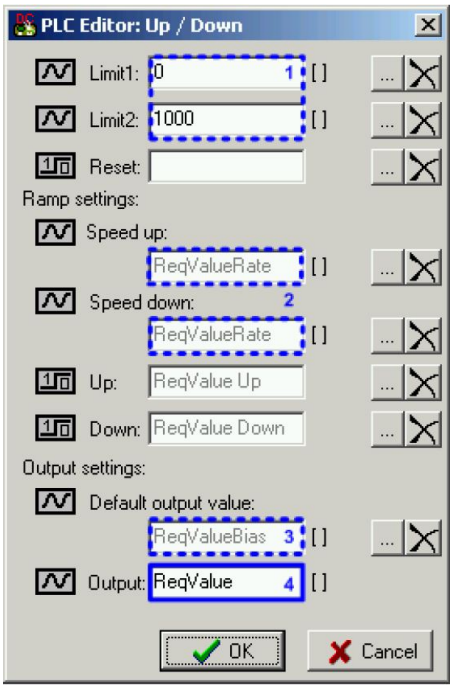
Input	Type	Range[DIM]	Function
Lim 1	A	-32768..32767 [-]	Lower limit of the analog output
Lim 2	A	-32768..32767 [-]	Upper limit of the analog output
Speed up	A	-32768..32767 [-]	Rising rate of the analog output per second
Speed down	A	-32768..32767 [-]	Lowering rate of the analog output per second
Default output value	A	-32768..32767 [-]	Bias value of the output. The output is initialized to this value when the controller is switched on, when the reset input is activated or when both Speed up and Speed down inputs are active.
Up	B	N/A	The output is raising it's value with the adjusted rate while this input is active.
Down	B	N/A	The output is lowering it's value with the adjusted rate while this input is active.
Reset	B	N/A	The output is set and held at bias value while this input is active.

Outputs

Output	Type	Range[DIM]	Function
Output	A	Lim1..Lim2 [-]	Output value

Description

This block works as an analog ramp controlled by binary inputs "up" and "down". The ramp rates and output limits are adjustable as well as bias value. The output can be reset to bias value by the reset input.

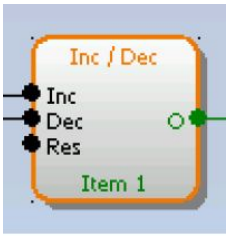


1. Adjust the output limits. If you want them to be constants, write the constants into the box. Otherwise connect the inputs to any other analog objects (e.g. PLC setpoints).
2. Adjust the output rates for raising and lowering. If you want them to be constants, write the constants into the box. Otherwise connect the inputs to any other analog objects (e.g. PLC setpoints).
3. Adjust the output bias value. If you want it to be constant, write the constant into the box. Otherwise connect the input to any other analog object (e.g. PLC setpoint).
4. Rename the output.

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Inc/Dec

Symbol



Inputs

Input	Type	Range[DIM]	Function
Inc	B	N/A	Rising edge of the input increments the output by 1.
Dec	B	N/A	Rising edge of the input decrements the output by 1.
Reset	B	N/A	Rising edge of the input sets the output to default value.

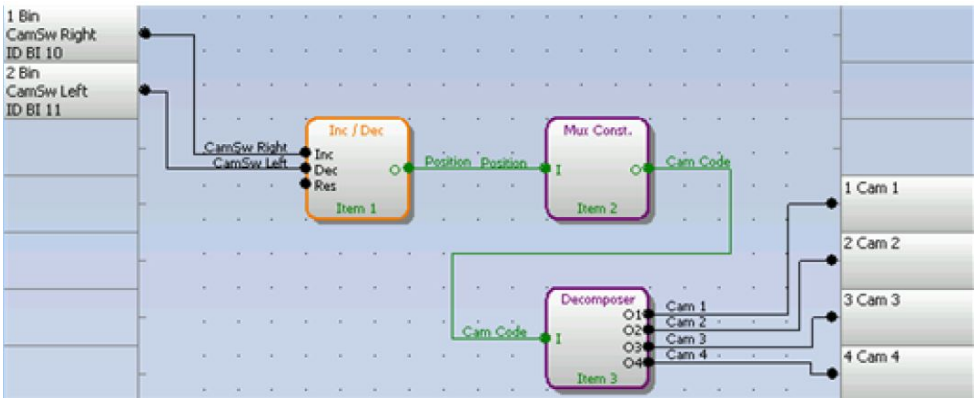
Outputs

Output	Type	Range[DIM]	Function
Output	A	0..Max [-]	Output value

Description

The output of the block is incremented/decremented by every rising edge at the input "Inc"/"Dec". The initial and maximal values of the output are adjustable. The output can be reset to the initial value by the input "Reset". The block can work in cyclical mode (e.g. ...4-5-0-1-2-3-4-5-0-1...) or non-cyclical mode (e.g. ...0-0-1-2-3-4-5-5...).

Example: The module can be used e.g. together with a Decomposer and Multiplexed constant for creation of a camswitch.



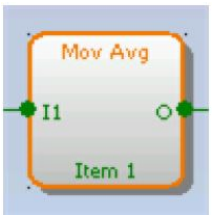
Position	Cam Code	Cam1	Cam2	Cam3	Cam4
1	3	0	0	1	1
2	10	1	0	1	0
3	11	1	0	1	1
4	6	0	1	1	0
5	5	0	1	0	1
6	12	1	1	0	0
7	9	1	0	0	1
8	0	0	0	0	0

1. Adjust the upper limit of the output.
2. Adjust the initial value of the output after reset.
3. Select whether the output will work in cyclic or non-cyclic mode.
4. Rename the output.

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Moving average

Symbol



Inputs

Input	Type	Range[DIM]	Function
Input	A	Any	Input value

Outputs

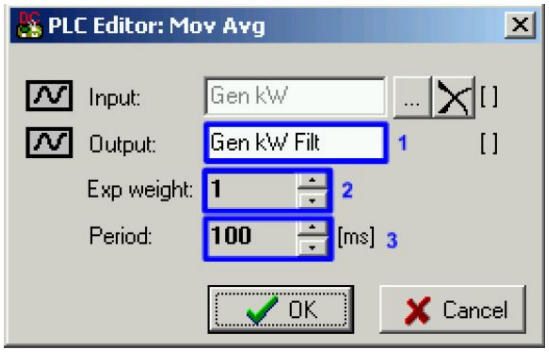
Output	Type	Range[DIM]	Function
Output	A	Same as input	Floating average of the input value

Description

The function calculates average of N last samples of the input value. The rate of sampling is adjustable.

Typical usage of this function is filtering of a value (quantity) whose instantaneous value fluctuates rapidly around it's mean, which is changing slower. Using a filered value may avoid problems with further processing of the value e.g. in other PLC blocks or in a supervisory system.

Example of such value can be genset power at a gas engine operating in parallel to mains mode. Even if the mean value is constant, the instantaneous value may fluctuate rapidly due to misfiring.

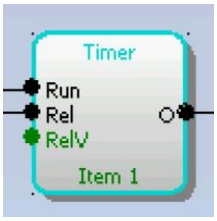


1. Rename the output.
2. The number of consequent samples N is given as $2^{exp\ weight}$. I.e. adjust 3 for 8 samples, 4 for 16 samples, 5 for 32 samples etc...
3. Adjust the sampling rate.

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Timer

Symbol



Inputs

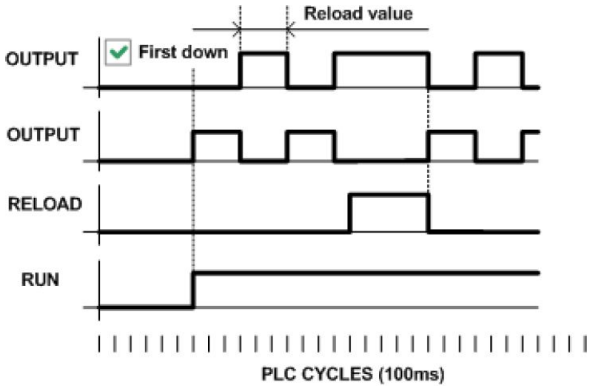
Input	Type	Range[DIM]	Function
Run	B	N/A	The timer runs only if this input is active or not connected
Reload	B	N/A	This input reloads the timer to the initial value
Reload val.	A	0..32767 [-]	Initial value of the timer

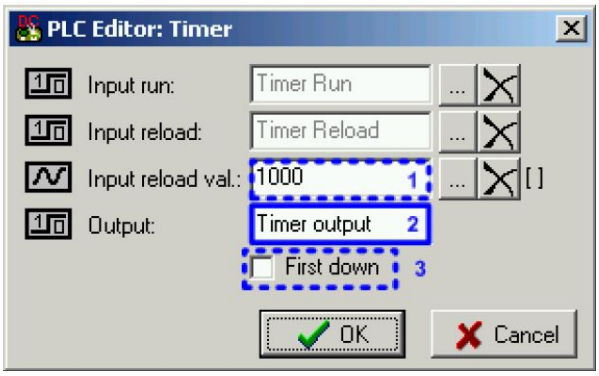
Outputs

Output	Type	Range[DIM]	Function
Output	B	N/A	Timer output

Description

The block works as a countdown timer which is decreased by 1 every PLC cycle. The timer initial value is adjustable by the "Reload val" input. As the PLC cycle lasts 100ms, the timer duration equals to "Reload val"/10 [s]. The timer is automatically reloaded with the initial value when it reaches zero or it can be reloaded in any other moment using the "reload" input. The timer is held at reload value until the reload input is deactivated. The timer output is inverted always when the timer is reloaded.



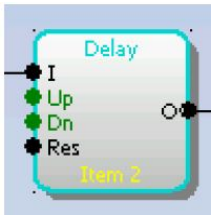


1. Adjust the reload value. The duration of the timer (in seconds) is given by the reload value divided by 10. The reload value can be either constant or a setpoint or any other analog object.
2. Rename the output.
3. If you want the output to start at logical 0, tick this checkbox. Otherwise the output will start at logical 1.

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Delay

Symbol



Inputs

Input	Type	Range[DIM]	Function
Input	B	N/A	Input signal to be delayed
Input time up	A	-3200.0..3200.0 [s]	Delay of the rising edge resp. pulse length generated by rising edge of the input
Input time down	A	-3200.0..3200.0 [s]	Delay of the falling edge resp. pulse length generated by falling edge of the input
Input reset	B	N/A	Resets the output to logical 0. The output remains in logical 0 while this input is active

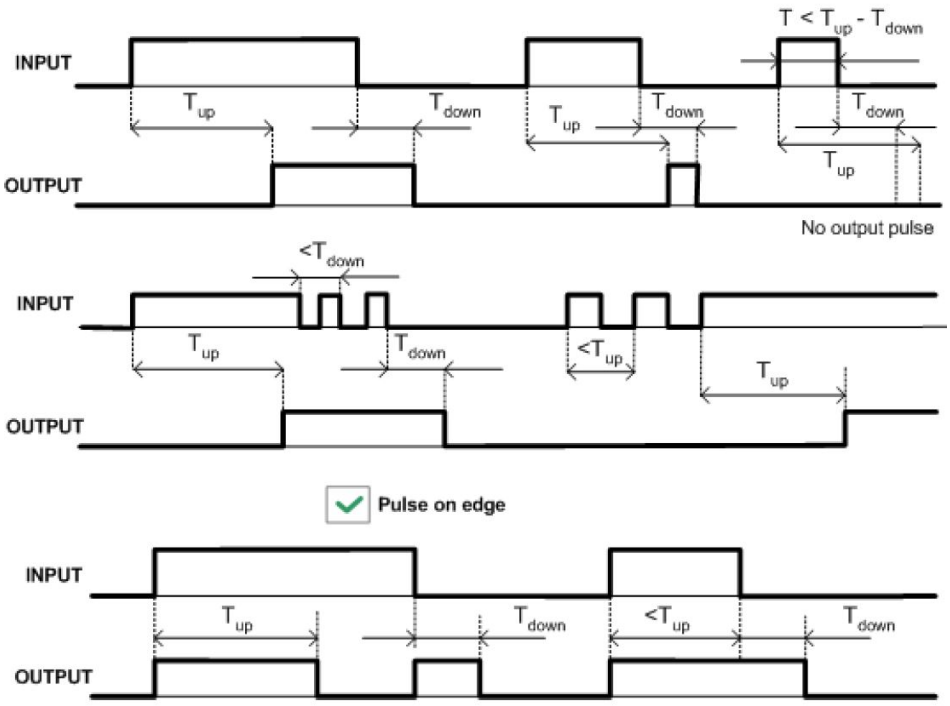
Outputs

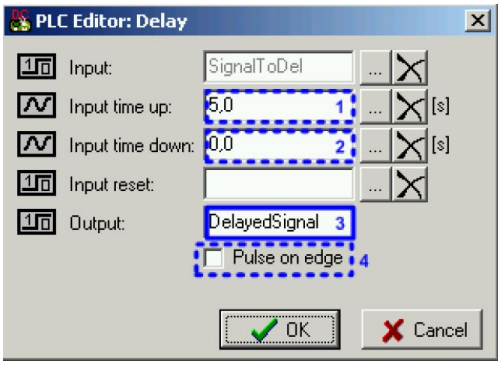
Output	Type	Range[DIM]	Function
Output	B	N/A	Output signal

Description

This block can work in two modes of operation:

- Delay mode - the rising edge at the output is generated with delay of "input time up" when a rising edge at the input is detected. The falling edge at the output is generated with delay of "input time down" when a falling edge at the input is detected. If the delayed falling edge at the output came earlier than the delayed rising edge, then no pulse would be generated at the output.
- Pulse mode - a pulse of "input time up" length is generated at the output when a rising edge is detected, a pulse of "input time down" length is generated at the output when a falling edge is detected.





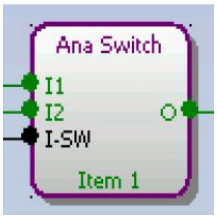
1. Adjust the delay of rising edge. If you want the delay to be a constant, write the constant into the box. Otherwise connect the input to any other analog object.
2. Adjust the delay of falling edge. If you want the delay to be a constant, write the constant to the box. Otherwise connect the input to any other analog object.
3. Rename the output.
4. Select the operation mode (described above).

Note: *If Input time up or Input time down value is <0, this input is internally set to zero.*

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Analog switch (Multiplexer)

Symbol



Inputs

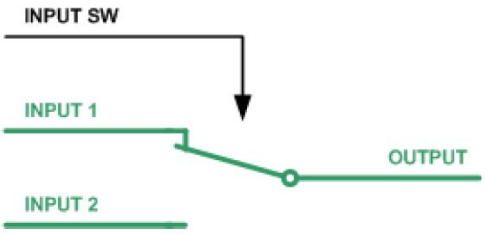
Input	Type	Range[DIM]	Function
Input 1	A	Any	Input value 1
Input 2	A	Same as 'Input 1'	Input value 2
Input SW	B	N/A	Switch input

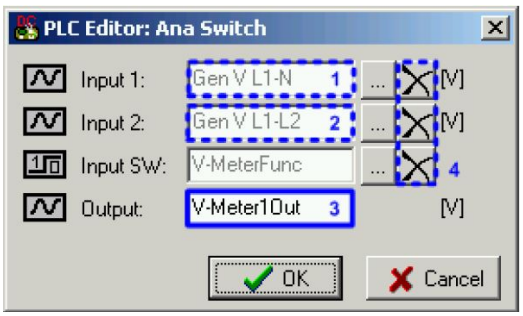
Outputs

Output	Type	Range[DIM]	Function
Output	A	Same as 'Input 1'	Copy of 'Input 1' or 'Input 2' depending of the 'Input SW' state

Description

The block works as a multiplexer. If the binary input SW is inactive, the block copies the value of analog input 1 onto the analog output. If the binary input SW is active, the block copies the value of analog input 2 onto the output.

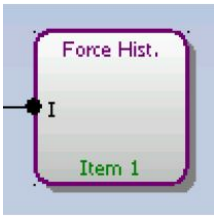




1. If you want the input 1 to be a constant, write the constant into this box. Otherwise go back to the sheet, create an input on it and connect the sheet input to the block input by dragging a wire.
2. If you want the input 2 to be a constant, write the constant into this box. Otherwise go back to the sheet, create an input on it and connect the sheet input to the block input by dragging a wire.

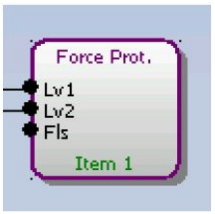
	3. Rename the output. ***Note:*** *Press the button (4) if you need to delete the currently configured source from the box.* ***Note:*** *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.* ***Note:*** *Up to 12 blocks can be used in application.*

Force history record

Symbol	
Inputs	<table><tr><th>Input</th><th>Type</th><th>Range[DIM]</th><th>Function</th></tr><tr><td>Input</td><td>B</td><td>N/A</td><td>A record with configured text is recorded into the controller history when the input is activated.</td></tr></table>
Outputs	
Description	This block writes a record with defined text into the history when the input is activated.  1. Enter the text, which will be used for the "reason" column of the record. ***Note:*** *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Force protection

Symbol



Inputs

Input	Type	Range[DIM]	Function
Lvl 1	B	N/A	The input activates yellow level of the configured protection if it is configured.
Lvl 2	B	N/A	The input activates red level of the configured protection if a red level protection is configured.
Fls	B	N/A	The input activates sensor fail if a red level protection is configured.

Outputs

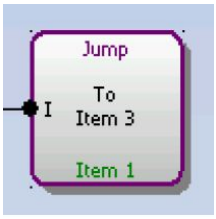
Description

This block issues alarms of configured type and text when appropriate binary input is activated.

1. Select the protection type from the list.
2. Enter the message, which will appear in the Alarmlist together with the prefix according to protection type when the protection is activated.
3. Go back to the drawing and attach wires to the inputs. Inputs are enabled and disabled according to selected protection type (e.g. if warning is selected, then "Lvl 2" input is disabled). Because of this the protection type must be configured first and then wires can be attached.

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Jump

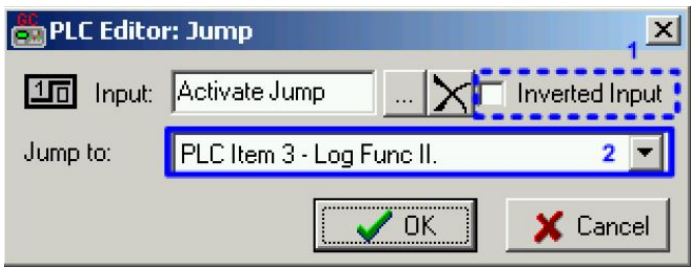
Symbol	
Inputs	

Input	Type	Range[DIM]	Function
Input	B	N/A	Input which activates the jump.

Outputs

Description

If the input is active, then a group of following PLC blocks is skipped and the PLC program continues execution at the block that is specified in the block jump.

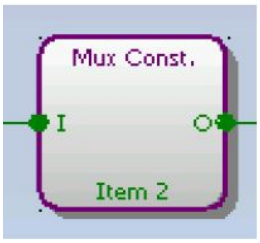


1. Select if the input will be inverted at the enter of the block.
2. Select the destination PLC block to which the block will jump.

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Multiplexed analog constant

Symbol



Inputs

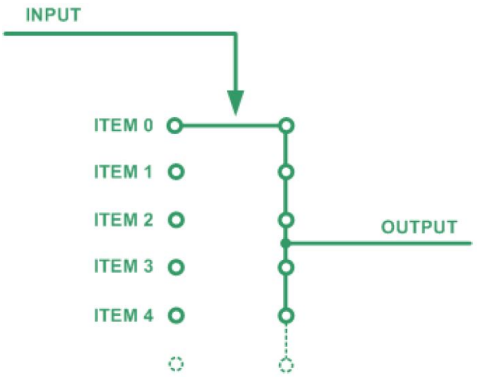
Input	Type	Range[DIM]	Function
Input	A	0..31 [-]	Selects which constant will be sent to the output

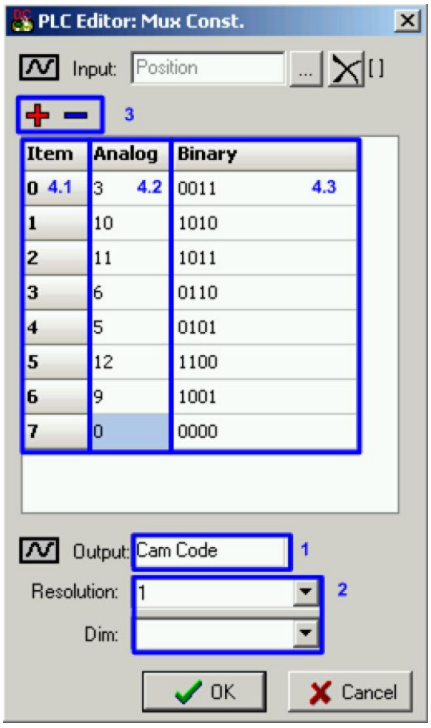
Outputs

Output	Type	Range[DIM]	Function
Output	A	Adjustable	Output value is one of the constants selected by the input

Description

The block works as a multiple constant selected by an analog value. The output value is set to the constant with index equal to the input value. The block can be used e.g for creation of a camswitch as described in the Inc/Dec module.



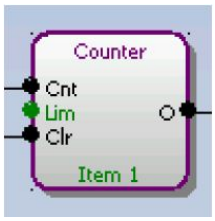


1. Rename the output.
2. Adjust resolution and dimension.
3. Use the buttons to add/remove constants (up to 32).
4. Adjust values of the constants. The column "Item" (4.1) represents indexes of the constants, which are used for selecting of the active constant. The value of the constant can be entered either in decimal form (4.2) or in binary form (4.3).

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Counter

Symbol



Inputs

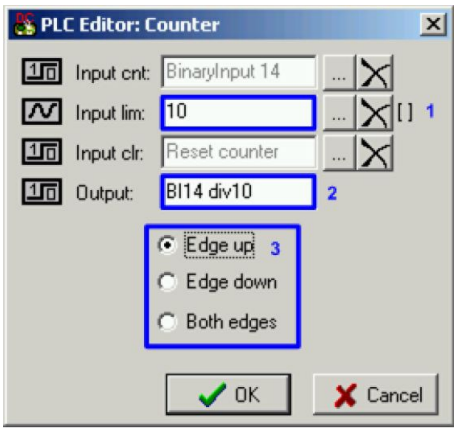
Input	Type	Range[DIM]	Function
Input Cnt	B	N/A	Input at which the edges are counted
Input Lim	A	0..32767 [-]	Counter value limit for activation of the output
Input Clr	B	N/A	Reset input

Outputs

Output	Type	Range[DIM]	Function
Output	B	N/A	Output is activated when the counter value exceeds the limit

Description

The block works as a counter of edges (selectable rising, falling or both) with reset input and adjustable counting limit. The maximal counter value is 32767. The counter value is lost when the controller is switched off. The output is activated when the counter value reaches equal or higher value than the adjusted limit and remain active until the block is reset. Activating of the reset input resets the counter value to 0, deactivates the output. Holding the reset input active blocks counting.

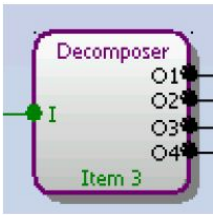


1. Adjust limit value. The counter output is activated when the counter gets over this value. The limit can be constant as well as a setpoint or any other analog value.
2. Rename the output.
3. Select edges which will be counted.

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Decomposer

Symbol



Inputs

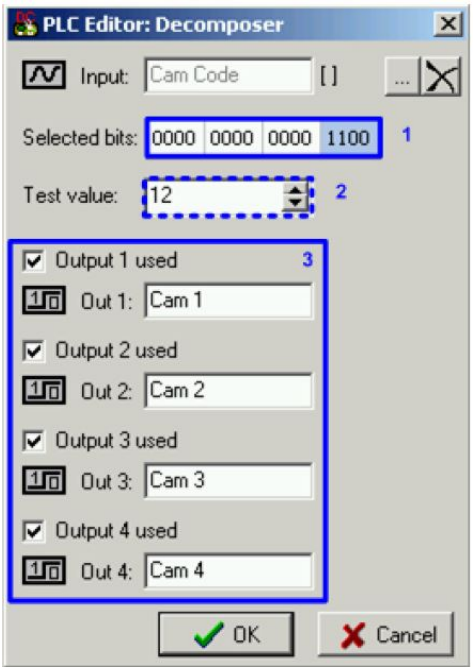
Input	Type	Range[DIM]	Function
Input	A	Any	Value to be "decomposed" to bits

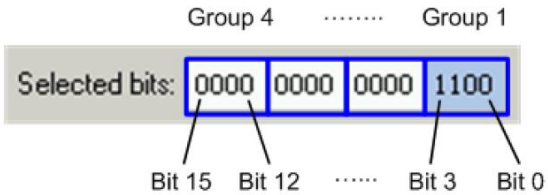
Outputs

Output	Type	Range[DIM]	Function
Out 1	B	N/A	Bit 0,4,8,12 - according to selected group of bits.
Out 2	B	N/A	Bit 1,5,9,13 - according to selected group of bits.
Out 3	B	N/A	Bit 2,6,10,14 - according to selected group of bits.
Out 4	B	N/A	Bit 3,7,11,15 - according to selected group of bits.

Description

The block converts the input analog value to binary form and provides selected bits as binary outputs. The block can be used e.g for creation of a camswitch as described in the Inc/Dec module.



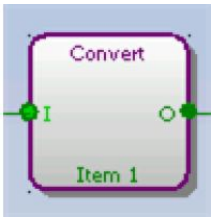


1. Select which group of bits will be mapped to the outputs.

	2. Write a number into this box to see the binary form of the number in the selector (1). This box is for test purpose only and does not influence the behavior of the block. 3. Select which outputs will be used and rename them. ***Note:*** *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

Convert

Symbol



Inputs

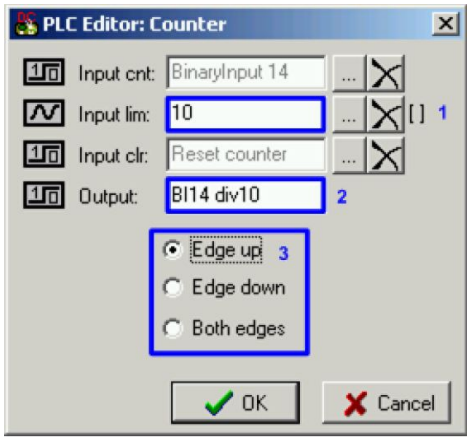
Input	Type	Range[DIM]	Function
Input	A	Any	Input

Outputs

Output	Type	Range[DIM]	Function
Output	A	Adjustable	Output

Description

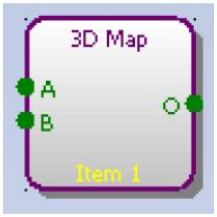
The block converts the input value of any data type to an INTEGER16 value. If the input value is out of INTEGER16 range, the output value is set to invalid status (0×8000).



Note: *The inputs are assigned to their sources in the sheet by dragging a wire from the input to the source.*

3D Map

Symbol



Inputs

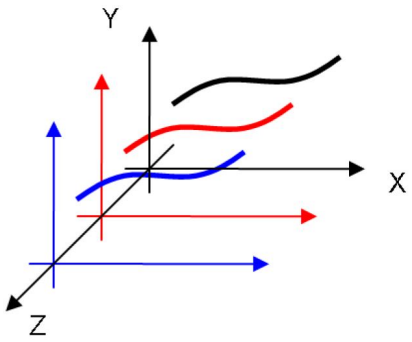
Input	Type	Range[DIM]	Function
Input X	A	Any	X Value
Input Z	A	Any	Z Value

Outputs

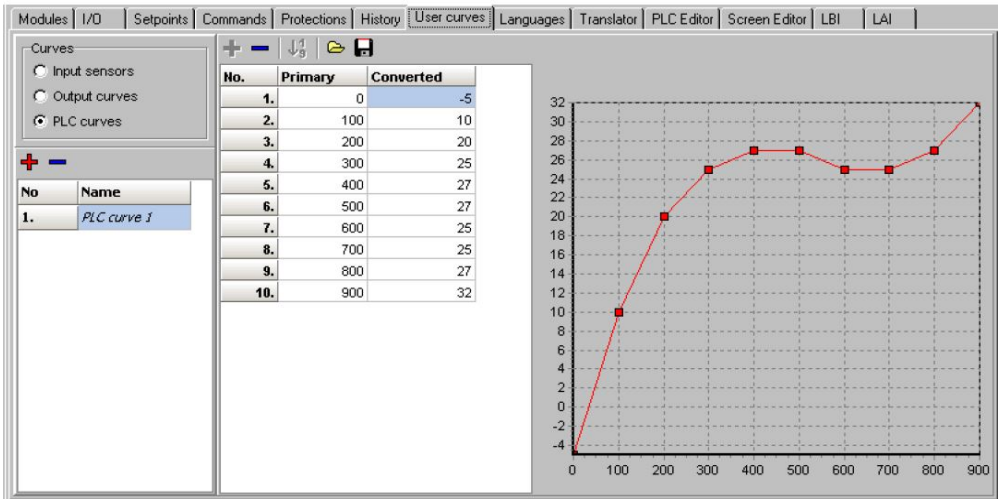
Output	Type	Range[DIM]	Function
Output Y	A	Adjustable	Interpolated Y Value

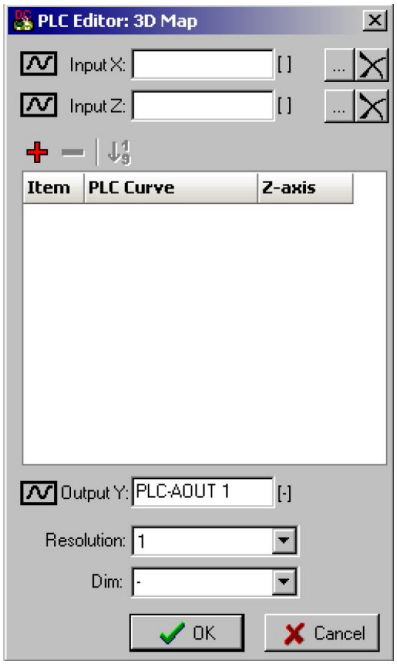
Description

The block interpolates **Y**-coordinate of point located in 3D Map based on **X** and **Z Inputs**.



The 3D Map is composed by set of PLC Curves **Y** = f(X) and its **Z-axis** parameter.





1. Create **PLC User Curves** on sheet **User Curves**.
2. Add **PLC Curves** into the block configuration using red "**+**" symbol, up to 10 curves can be added.
3. Set **Z-axis** parameter for every added **PLC Curve**.
4. Rename the **Output**.
5. Adjust **Resolution** (number of decimal positions) of the output.
6. Adjust **Dimension** of the output.

Note: *The inputs are assigned to their sources in the sheet by* ***dragging a wire*** *from the input to the source.*

> **IMPORTANT: PLC User Curves and Z-axis parameters are defined by whole numbers without decimal point. If there is connected analog value with a decimal resolution to X or Z input then the analog value will be interpretted in wrong way - the 3D Map block "does not see" the decimal resolution. Example: input value 1,56 would be interpretted as value 156.**

back to PLC toolbar functions

back to Appendix