

InteliDrive WP

Waterproof Engine Controller

SW version 1.0.0

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1.1 Clarification of notation

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

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

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

1.2 About this guide

This manual contains important instructions for IntelliDrive WP controller that shall be followed during installation and maintenance.

This manual describes ID-WP application examples for single engine applications.

This manual provides general information how to install and operate IntelliDrive WP controller.

This manual is intended for operators of engines, for engine control panel builders or for everybody who is concerned with installation, operation and maintenance of the engine applications.

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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.

1.4 Conformity Declaration



The 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.

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1.5 Document history

Revision number	Related sw. version	Date	Author
1	1.0.0	23.8.2017	Daniel Švanda
2	1.0.0	28.3.2019	Lukáš Bečka
3	1.0.0	10.4.2019	Lukáš Bečka

Table 1.1 Document history

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.

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2.1 Warnings

InteliDrive WP controller can be remotely controlled. In case of the work on the engine check that nobody can remotely start the engine.

To be sure:

- ▶ Disconnect remote control via USB line,
- ▶ Disconnect input REM START/STOP, StartButton, RemoteStart or
- ▶ Disconnect output STARTER

Note: Because of large variety of InteliDrive WP parameters setting, it is not possible to describe all combination. Some of InteliDrive WP functions are subject of changes depend on SW version.

Note: The data in this manual only describes the product and are not warranty of performance or characteristic.

Note: SW and HW must be compatible (e.g. ID-WP firmware and ID-WP hardware) otherwise the function will be disabled. If wrong software is uploaded the message **HARDWARE INCOMPATIBLE** appears on the controller screen.

Note: In the case of using Boot load programming – follow instruction in LiteEdit and upload correct software.

2.2 General description

The key feature of InteliDrive WP is its easy-to-use operation and installation. Predefined configurations for typical applications are available as well as user-defined configurations for special applications.

InteliDrive WP is a comprehensive controller for single engines with extended support of electronic engines

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

InteliDrive WP provides gas engine support without ventilation.

The key features are:

- ▶ ECU support - for singlespeed and allspeed engines e.g. Cummins, Volvo, JohnDeer etc.
- ▶ Process logic - active control of engine, history log, configuration-no programming

[🔍 back to System overview](#)

3 Applications overview

3.1 Single applications

Basic wiring scheme for single engine, all engine data are transferred from ECU via CAN J1939 interface in example below.

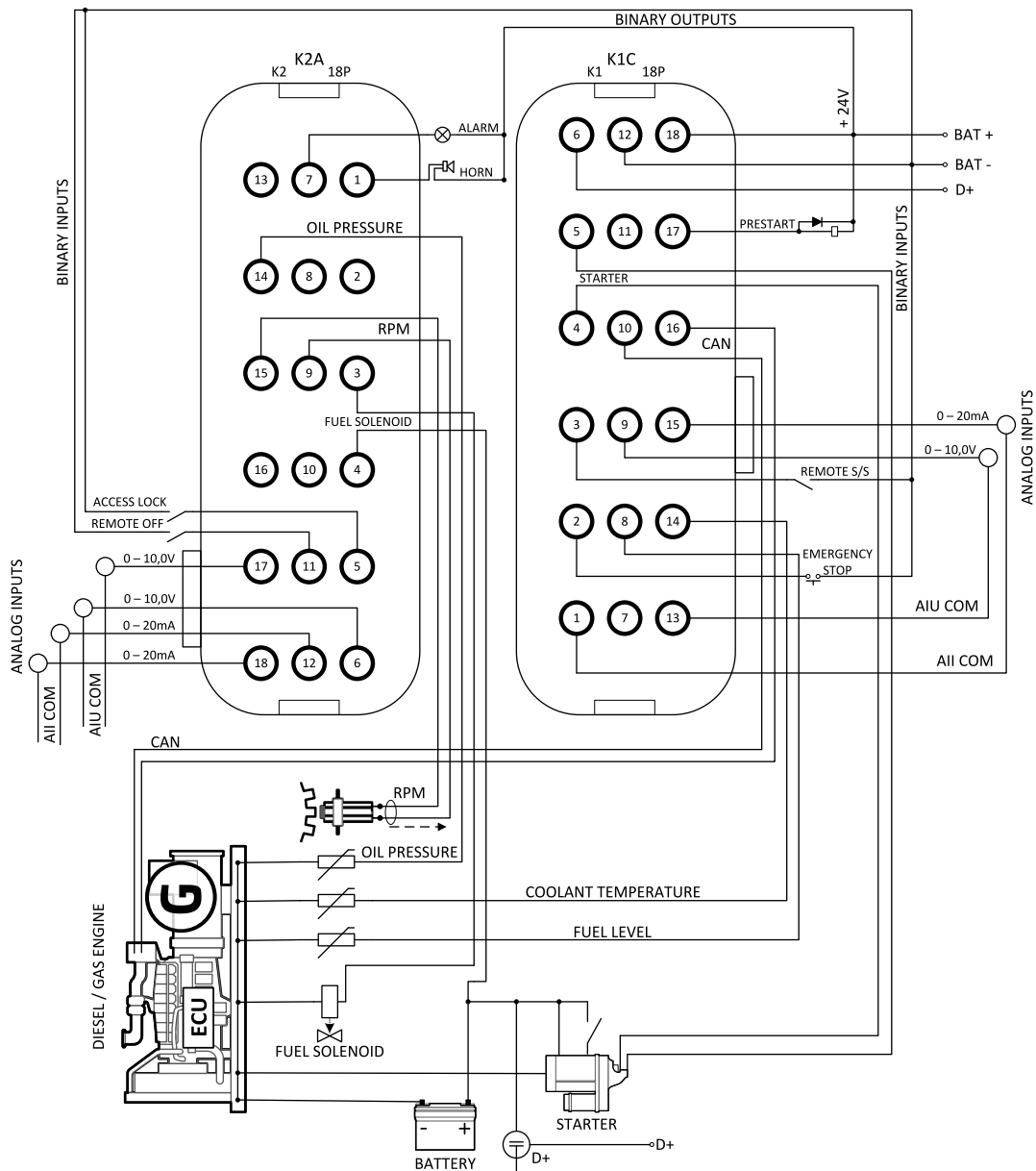


Image 3.1 application description

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4.1 Putting it into operation

4.1.1 How to install

To ensure proper function:

Wiring for binary inputs and analog inputs must not be run with power cables.

Analog and binary inputs should use shielded cables, especially when length >3m.

Note: During the configuration of controller or setpoints changes is required a password to the controller. The default password from ComAp is "0".

Grounding

To ensure proper function:

Use wires with maximal cross section area (1.5 mm², 16 AWG) recommended by Deutsch connector manufacturer.

Brass M4x10 screw with star washer securing ring type grounding terminal shall be used.

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

Switchboard and engine has to be grounded in common spot.

Use cable as short as possible to the grounding point.

Wiring

InteliDrive WP uses waterproof DT series connectors from TE Connectivity/DEUTSCH.

Part	Order code	Note
DT16-18 plug	DT16-18 SA-K004	K1:C
DT16-18 plug	DT16-18 SA-K004	K2:A
Female contact	0462-201-16141	0,5-1,5mm ²
Sealing plug	61103-20	For not used position



Contact insertion



Grasp contact approximately one inch behind the contact crimp barrel



Hold connector with rear grommet facing you



Push contact straight into connector grommet until a click is felt. A slight tug will confirm that contact is properly locked in place.

Note: For unused wire cavities, insert sealing plugs for full environmental sealing



Contact removal



With rear grommet facing you, snap appropriate size extractor tool over the wire of contact to be removed.
#16 contacts require 0411-310-1605
#12 contact require 0411-337-1205



Slide tool along wire into the insert cavity until it engages contact and resistance is felt



Pull contact/wire assembly out of connector

Note: Do not twist tool or insert at an angle

Power supply

Use wires with maximal cross section area (1.5 mm², 16 AWG) recommended by Deutsch connector manufacturer.

IMPORTANT: Maximum continuous DC power supply voltage is 36VDC.

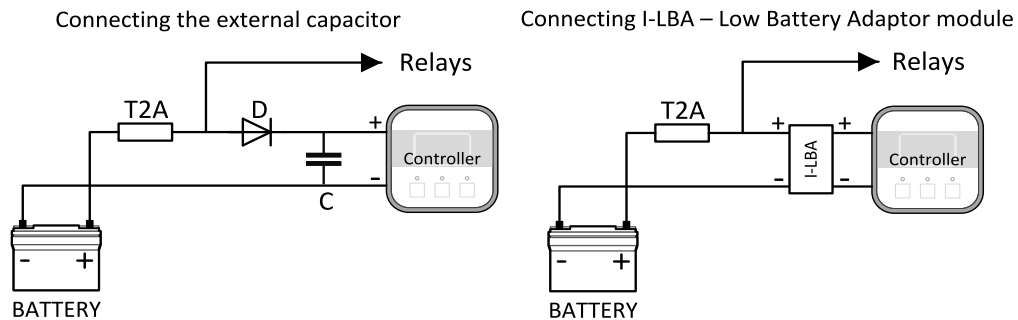
IMPORTANT: Maximum allowable DC power supply voltage is 39VDC.

The IntelliDrive WP power supply terminals are protected against large pulse power disturbances. When there is a potential risk the controller being subjected to conditions outside its capabilities, an outside protection device should be used.

Note: The IntelliDrive WP controller should be grounded properly in order to protect against lightning strikes!! The maximum allowable current through the controller's negative terminal is 4A (this is dependent on binary output load).

For the connections with 12VDC power supply, the IntelliDrive WP includes internal capacitors that allow the controller to continue operation during cranking if the battery voltage dip occurs. If the voltage before dip is 12V, after 150ms the voltage recovers to 7V, the controller continues operating. During this voltage dip the controller screen backlight can turn off and on but the controller keeps operating.

It is possible to further support the controller by connecting the external capacitor or I-LBA module.



The capacitor size depends on required time. It shall be approximately thousands of uF (microFarads). The capacitor size should be 5000 uF to withstand 150 ms voltage dip under following conditions:

Voltage before dip is 12 V, after 150 ms the voltage recovers to minimum allowed voltage i.e. 7V

The I-LBA module ensures minimally 350 ms voltage dip under following conditions:

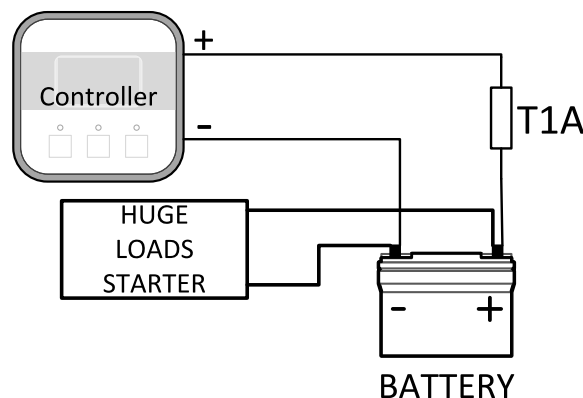
Voltage before dip is 12 V and after 350 ms the voltage recovers to minimum allowed voltage 5 V. The I-LBA enables controller operation from 5 V (for 10 to 30 sec). The wiring resistance from battery should be up to 0.1 Ohm for I-LBA proper function.

Power supply fusing

A 1 A fuse should be connected in-line with the battery positive terminal to the controller.

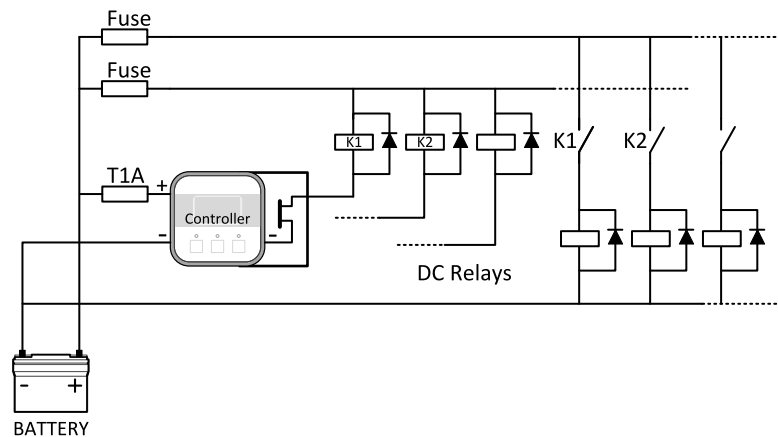
Controller should never be connected directly to the starting battery.

Fuse value and type depends on number of connected devices and wire length. Recommended fuse (not fast) type - T1A. Not fast due to internal capacitors charging during power up.



Binary output protections

Do not connect binary outputs directly to DC relays without protection diodes, even if they are not connected directly to controller outputs.



Magnetic pick-up

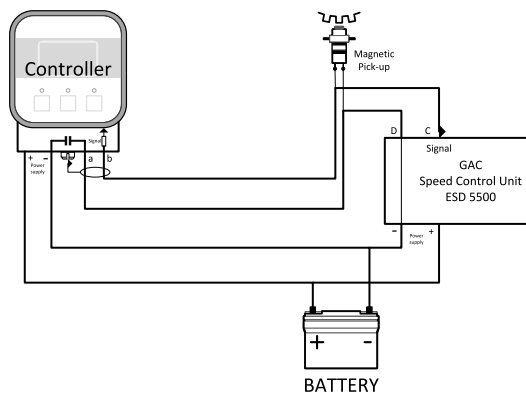
To ensure proper function:

Use a shielded cable

Be aware of interference signal from Speed governor, if one speed pick up is used.

If engine will not start:

- ▶ Check ground connection from pick-up to controllers, eventually disconnect ground connection to one of them
- ▶ Galvanic separate IntelliDrive WP RPM input using ComAp separation transformer RPM-ISO (1:1)
- ▶ Use separate pick-up for Speed governor and IntelliDrive WP



Note: If $RPM > 2$ then the controller is in the state Not ready and the engine will not be allowed to start.

4.1.2 Analog inputs

On the IntelliDrive WP controller nine analog inputs are available. See the two tables here bellow with specific characteristics.

All properties mentioned here can be modified by LiteEdit PC tool only, in the window Modify

Table of controller analog inputs

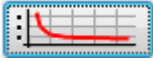
Input	Range	Default use	Configurability of default use
AIN1	0 - 2.4 kΩ	Oil pressure	NO
AIN2	0 - 2.4 kΩ	Engine temperature	YES
AIN3	0 - 2.4 kΩ	Fuel level	YES
AIN4	0 - 10 V	Not used	YES
AIN5	0 - 10 V	Not used	YES
AIN6	0 - 10 V	Not used	YES
AIN7	0 -20 mA	Not used	YES
AIN8	0 -20 mA	Not used	YES
AIN9	0 -20 mA	Not used	YES

Note: The nominal range of Analog inputs measuring resistivity is 0- 2,4 kOhm, nevertheless the input is able to measure up to 15 kOhm, but with lower precision.

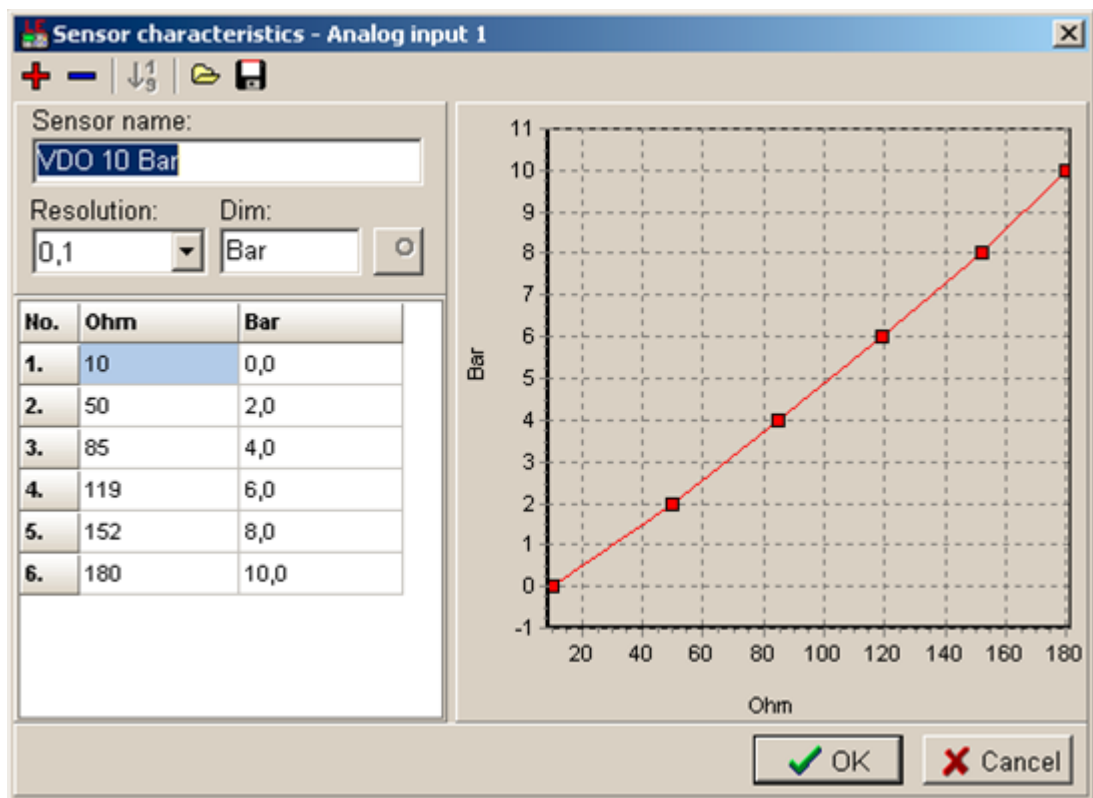
Note: When Engine Control Unit is connected, it is possible to read IntelliDrive WP Analog inputs values AIN1, 2, 3 from CAN bus (J1939).

Table of analog inputs options

LiteEdit	Modify	Possibility
Type	Not used Alarm Monitoring	Analog input is not used Analog input is used for monitoring and protection Analog input is used only for monitoring
Name	... text Name in history	Up to 14 ASCII characters Up to 4 ASCII characters for the name used in history records
Config	Analog Binary Tri state ECU	Analog measuring in specified range. Binary: open/close - threshold 750 Ω (AIN1–AIN3), 2 VDC (AIN4–AIN6) or 7 mA (AIN7–AIN9) Three (Triple)-state: open/close - threshold 750 Ω (only AIN1- AIN3), failure <10 Ω or > 2400 Ω Only for AIN1, 2 values are read from ECU unit
Alarm properties	Direction	Under limit Under step. Sensor fail does not activate protection. Over limit Overstep. Sensor fail does not activate protection. UnderLimit+Fls Under step and Sensor fail activates protection. OverLimit+Fls Overstep and Sensor fail activates protection. Window prot.

		Combination of Under and Over protection at the same analog input
	Type	Sensor fail Warning Wm+Sd CoolDown
	Engine running only	Check box: Alarms are valid only for running engines, if box is checked
Sensor	Sensor name 	... text Resolution: number of decimal points Dimension: bar, %, °C, etc. Table and graph: customize curves
Contact type	NC NO	Valid only for binary and three-state inputs Valid only for binary and three-state inputs

User curves "Points" are adjustable in LiteEdit PC tool.



Analog inputs 1, 2 and 3 have separate set points for two levels alarm setting and delay for activation of alarm. Analog input 4-9 have special „window“ protection. It is possible to adjust Low and High level with alarm setting Wrm and Sd for each of level. Two delay setpoints are adjustable for Low and High level. (See Practical example below)

Window protection is necessary to adjust in **Modify->Alarm properties->Direction**.

Analog input alarm levels and delay adjust in **Engine protect** group of Setpoints.

Note: In Alarm list and History is displayed only Wrn and Sd for matching analog input. There isn't visible direction of protection Low or High.

Practical example of - Class C - Window protection :

Pressure sensor is configured on the analog input 6 and is placed on the intake pipe. There are needed two level protection. Low level protection against suction from the tank without liquid, that could destroy pump. High level protection against high liquid pressure in pipe, which could destroy filters against impurity installed between tank and pump.

AIN6 LowWrn = 2bar

AIN6 LowSd = 1bar

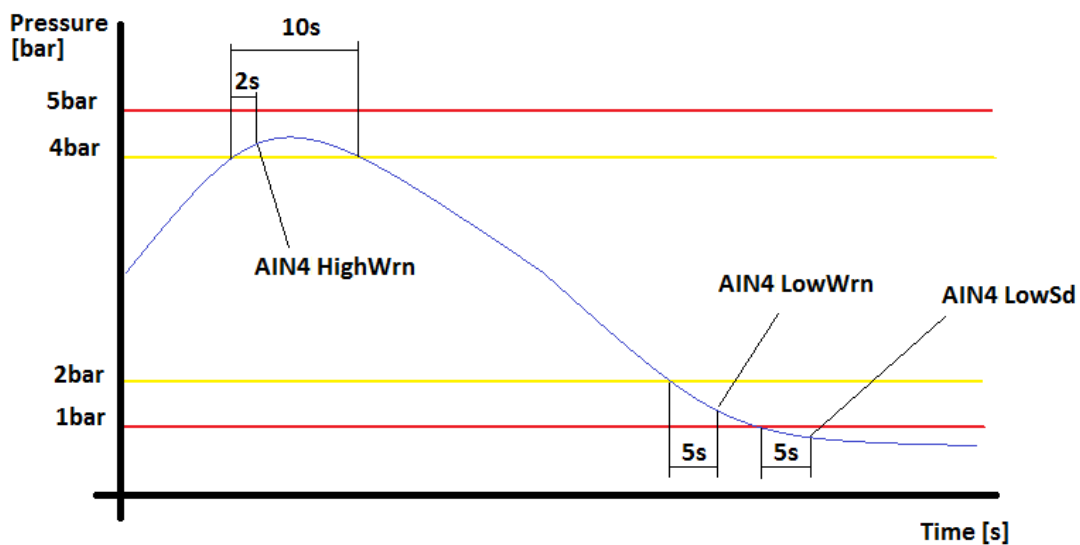
AIN6 LowDel = 5s

AIN6 HighWrn = 4bar

AIN6 HighSd = 5bar

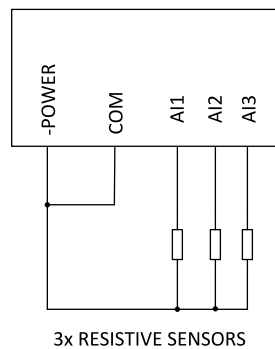
AIN6 HighDel = 2s

Note: Class C protection is working and LowWrn, LowSd, LowDel, HiWrn, HiSd, HiDel setpoints are visible only when corresponding AIN is configured in Modify->Alarm properties-> Direction-> Window prot.



Connection of IntelliDrive WP analog inputs

Standard connection of three resistive sensors to analog inputs.

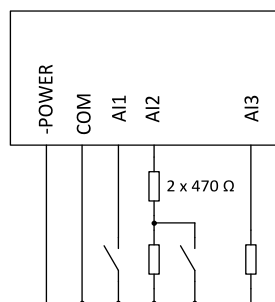


Mixed connection of IntelliDrive WP analog inputs:

AI1 – binary input

AI2 – three state input

AI3 – analog resistive input



Analog inputs are designed for resistive sensors with resistance in range of 0Ω to 2,4kΩ.

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

As binary input

Open, close state are detected, threshold level is 750Ω.

As three state input

Open, close and failure state are detected. Threshold level is 750Ω, failure is detected when circuit resistance is <10Ω or > 2400Ω.

Unused analog inputs

Configure Type = Not used

Current output transducers

IntelliDrive WP analog inputs are mainly designed for resistor sensors.

In special case transducers to 4-20mA output can be used for oil measuring (10.0Bar or 6.0Bar). Use predefined 4-20mA/100 or 4-20mA/60 sensors.

This method reduces the input resolution by less than 50%. Some types of transducers are not suitable for connection to IntelliDrive WP analog inputs because of influencing by IntelliDrive WP analog input.

Default current sensor characteristic

Use with external resistor 120 ohms

	4-20mA/100		0-20mA/100		0-20mA/(-20 - +120°C)
Ohm	Converted	Note 1	Note 2	Note 3	Note 4
120			0 mA	0%	-20°C
170	0	0%	4 mA	20%	8°C
200	13				22°C
230	25	25%	8 mA	40%	36°C
280	38				50°C
330	50	50%	12 mA	60%	64°C
390	63				78°C
460	75	75%	16 mA	80%	92°C
560	88				106°C
690	100	100%	20 mA	100%	120°C

Note 1 - % range for 4-20 mA input

Note 2 - range 0-20 mA

Note 3 - % range for 0-20 mA input

Note 4 - characteristic 0-20 mA / (-20 - +120 °C)

Analog input extension measurement (0 - 70V, 4 - 20mA)

On each analog input there is a possibility to connect voltage or current output sensor instead of resistive one. Recommended wiring connection for these measurements are bellow.

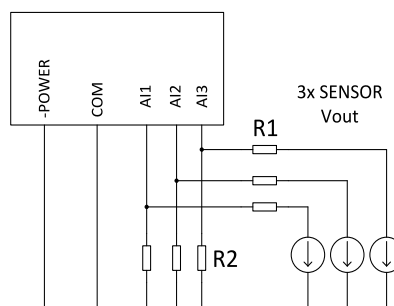


Image 4.1 Voltage output sensor - connection

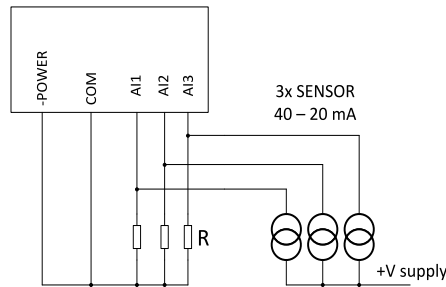


Image 4.2 Current output sensor - connection

Analog input	R1	R2	Curve
0 - 10V	150Ω [1%,0,5W]	100Ω [1%,0,5W]	AI 0-10V.CRV
0 - 30V	680Ω [5%,2W]	100Ω [1%,0,5W]	AI 0-30V.CRV
0 - 65V	1500Ω [5%,3W]	100Ω [1%,0,5W]	AI 0-65V.CRV
4 - 20mA	R = 160Ω [1%,0,5W]		AI 4-20mA.CRV

Table 4.1 Table with recommended values

IMPORTANT: Please note that external resistors disconnection, connection incorrect resistors or input voltage value during operation may cause an analog input destruction.

Practical example: VDO pressure sensor 0 – 6bar with linear voltage output 0 – 10V

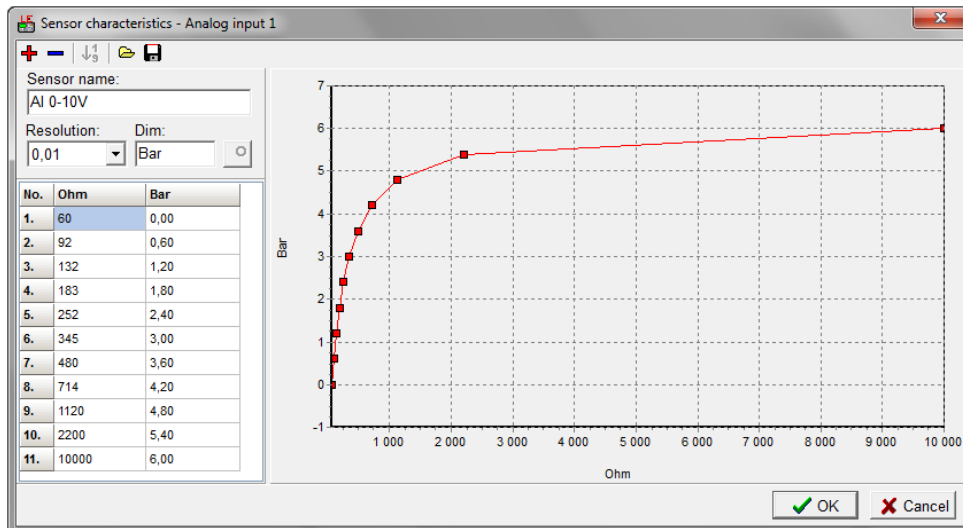
Conversion table

Vout [V]	0	1	2	3	4	5	6	7	8	9	10
P [bar]	0	0,6	1,2	1,8	2,4	3	3,6	4,2	4,8	5,4	6

Modify one of analog input in LiteEdit configuration and load curve AI 0-10V.CRV

Then you can change resolution and measured value name witch is default displayed at V (volts).

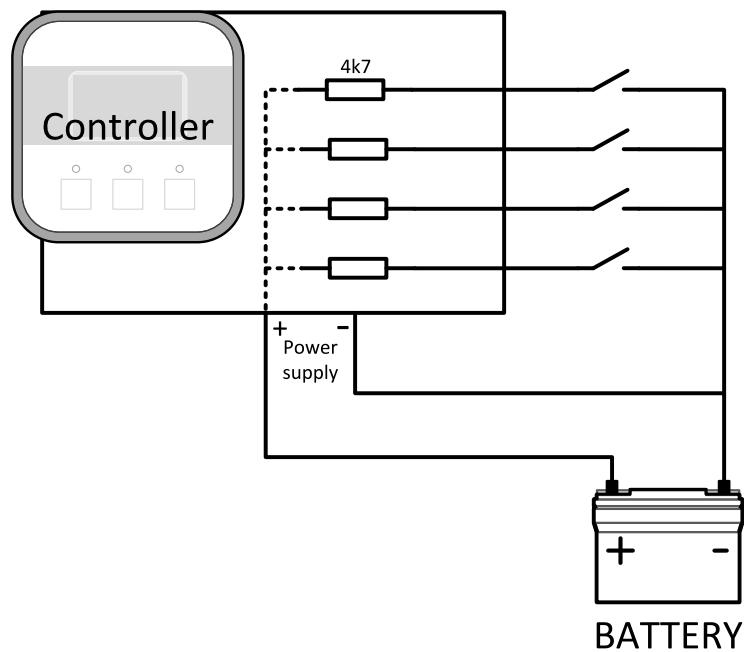
For example if you have connected pressure sensor and his output voltage is 5V for pressure 3bar you can change value 'V' in column "Dim:" to 'Bar' and by sensor specification adjust all corresponding values in this column. In this case you can change the value at row 6. from 5 to 3

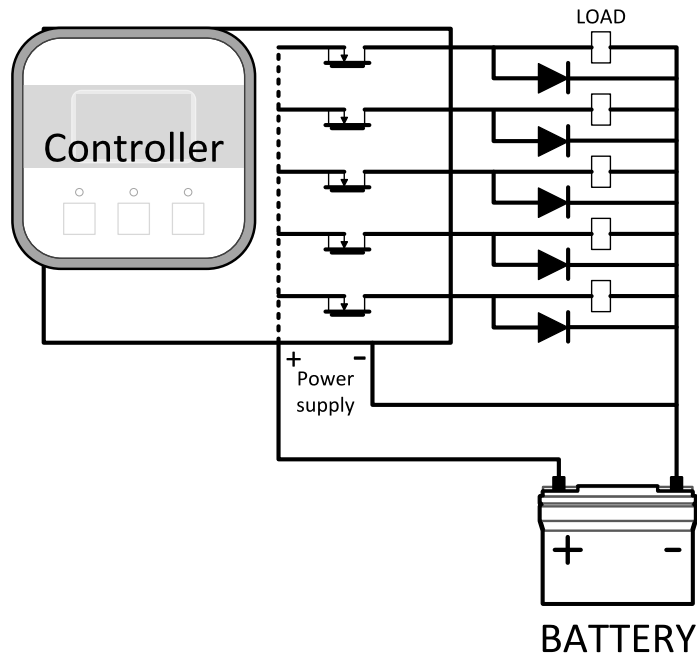


When you finish with adjusting the values click OK and Write to controller.

Note: The IntelliDrive WP controller is equipped with three voltage and three current analog inputs. It is possible to use these inputs to connect voltage or current transducers directly.

4.1.3 Binary inputs and outputs



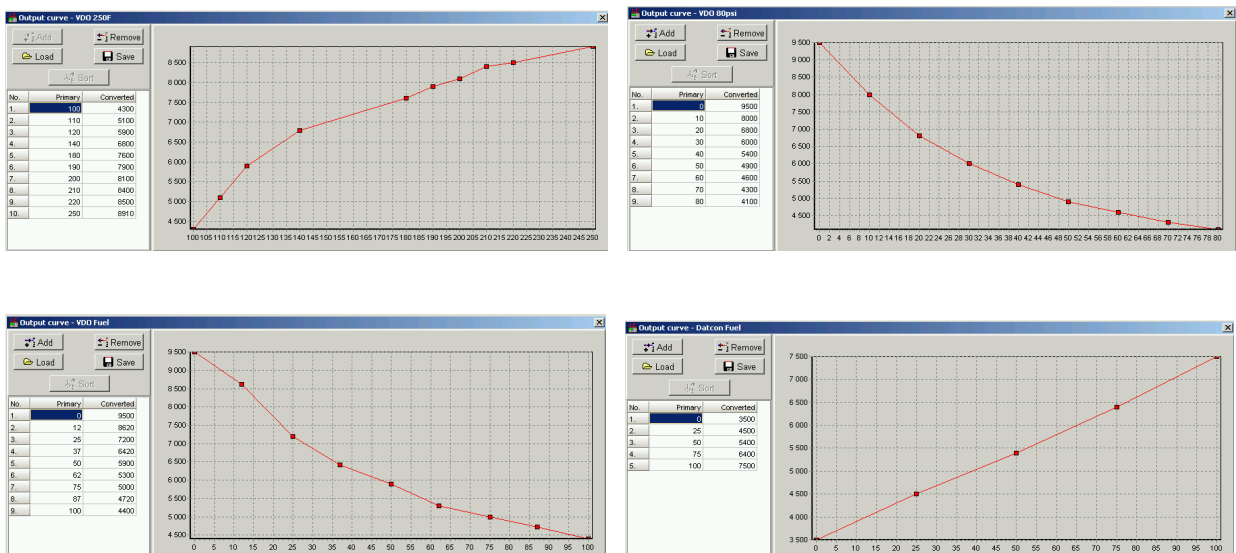


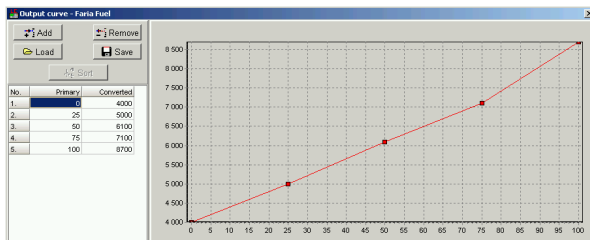
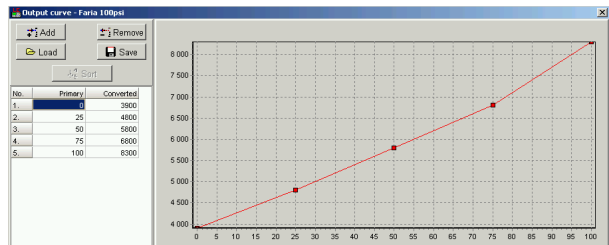
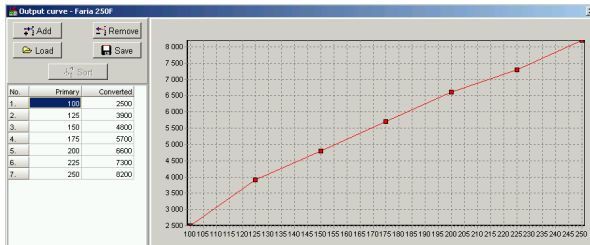
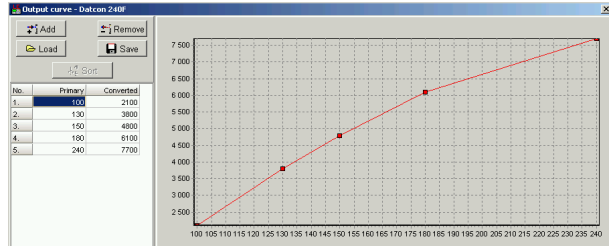
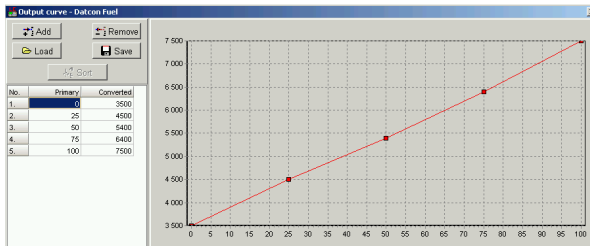
4.1.4 Analog outputs

InteliDrive WP provides one Pulse-Width-Modulation (PWM) output. This output is intended to drive VDO style analog gauge. This is to provide visual indication of typically ECU values without installing additional sensors on the engine. PWM signal emulates sensor which would be typically mounted on the engine.

Any value from controller may be configured to the outputs. Use LiteEdit PC tool to configure corresponding sensor/gauge curve and value selection.

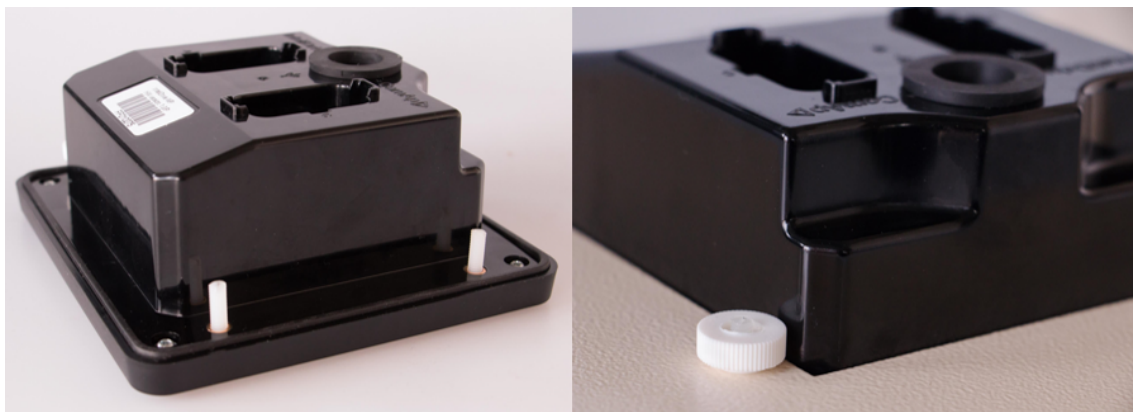
Default analog output curves





4.2 Mounting

The controller is used to be mounted onto the switchboard door. Requested cutout size is 91x91 mm. Use the nylon screws and nuts delivered with the controller to fix the controller into the door (plate). See details depicted on images below.



IMPORTANT: When mounted in plastic door or box, or sheetmetal door thinner than 2 mm, the tightening torque must be reduced. If sufficient sealing is not achieved at tightening torque of approx 0,1 Nm, further tightening may be counterproductive due to rising deformation of the door. Additional sealing or sealing with silicone should be used if necessary.

4.3 Package contents

Controller is delivered in the box as one set containing:

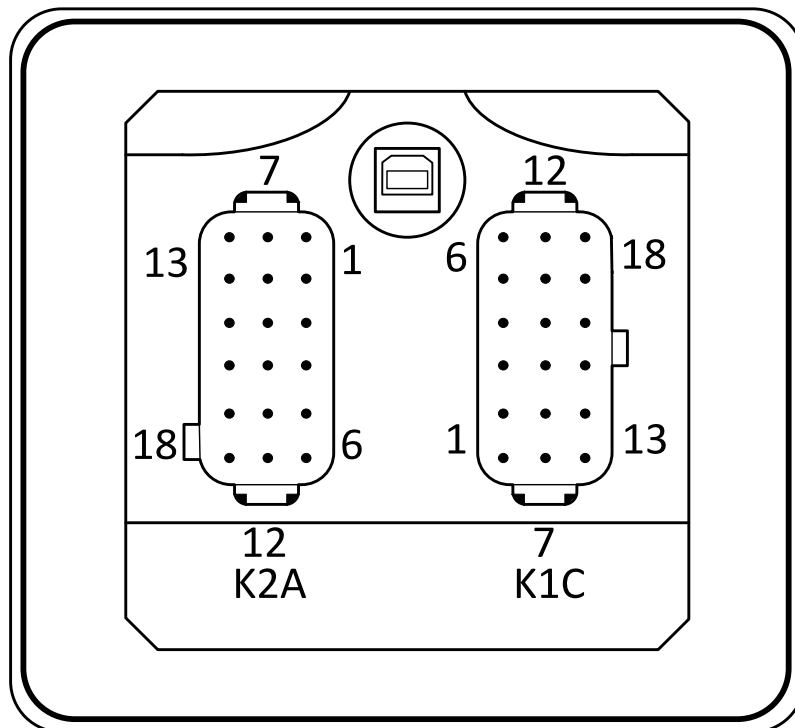
- ▶ ID-WP controller programmed with default configuration
- ▶ 4x Nylon screws and nuts

4.3.1 Software package

ID-WP firmware is distributed as ID-WP-x.y.z.iwe package and it is compatible with the PC tool LiteEdit x.y.z and ECU list-x.y.z, where x, y, z are numbers of software version. Find installation files on ComAp website.

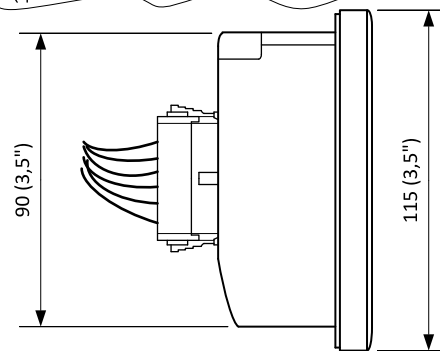
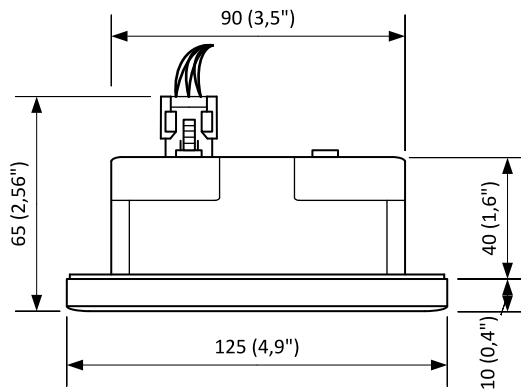
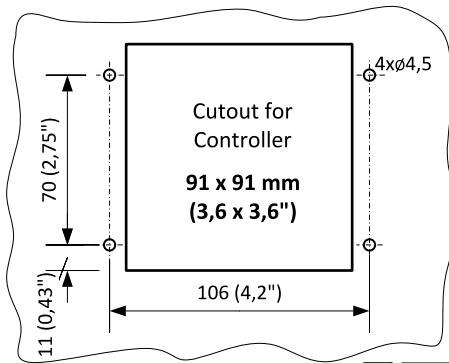
Version of published files on the web page are compatible each other.

4.4 Terminal diagram and dimension



Power supply		Binary outputs		Binary inputs		Analog inputs (resistive)		Analog inputs (Voltage)		Analog inputs (Curent)	
K1C:18	BATT+	K1C:4	BOUT1 A	K1C:2	BIN1	K2A:14	AIN1	K1C:9	AIN4	K1C:15	AIN7
K1C:12	BATT-	K1C:5	BOUT1 B	K1C:3	BIN2	K1C:14	AIN2	K2A:17	AIN5	K2A:12	AIN8
K1C:6	D+	K2A:3	BOUT2 A	K2A:5	BIN3	K1C:8	AIN3	K1C:13	COM	K2A:18	AIN9
K2A:2	GND	K2A:4	BOUT2 B	K2A:11	BIN4	K1C:7	COM	K2A:6	AIN6	K1C:1	COM
K2A:8	GND	K1C:17	BOUT3	K2A:10	BIN5						
K2A:16	GND	K2A:7	BOUT4								
		K2A:1	BOUT5								

Analog output		RPM		CAN	
K2A:13	AOUT1	K2A:9	RPM In	K1C:10	CAN H
		K2A:15	RPM GND	K1C:16	CAN L
				K1C:11	CAN COM



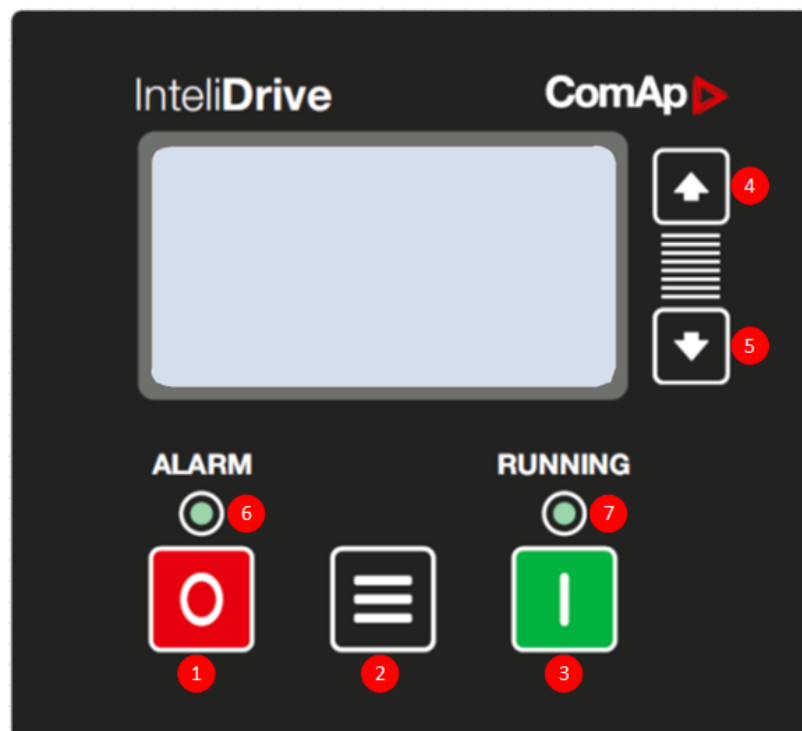
[⬅ back to Installation and wiring](#)





5 Controller setup




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5.1 Front panel elements



Position	Button	Description
1		<p>STOP BUTTON Works in MAN mode only. Press this button to initiate the stop sequence of the engine. Repeated pressing or holding the button for more than 2 s will cancel current phase of stop sequence (e. g. cooling) and next phase will continue.</p>
2		<p>MENU BUTTON Use this button (short press) to switch over measurement screens. This button (long press) is also used for switching over display pages. See information below this table for more details.</p> <p><i>Note: For MENU button three press durations are distinguished:</i></p> <ul style="list-style-type: none"> ▶ Short press: a sequence of press and release of button no longer than 1 s ▶ Long press: a sequence of press and release of button longer than 1 s and shorter than 5 s ▶ Fault reset press: press and hold the button longer than 5 s. Fault reset is performed immediately when 5 second duration is reached. <p>MENU button works also as function modifier for situation where it is necessary to use combination of two simultaneously pressed buttons. Press and hold MENU button and subsequently press additional button. See detailed description below.</p>
3		<p>START BUTTON Press this button in MAN mode to initiate the start sequence of the engine. Works in any measurement screen only.</p> <p><i>Note: In Adjustment (Setpoints) screens this button is used for setpoints adjusting. See detailed description below.</i></p>
4		<p>UP BUTTON UP button. In MAN mode and in measurement screens works for increasing speed request to the engine. Short press changes the speed by 5 RPM. Holding of this button initiates continuous speed variation according to Speed Ramp setpoint.</p> <p>Use this button in Adjustment or History screens to move cursor up or to increase value of selected setpoint.</p>

5		<p>DOWN BUTTON In MAN mode and in measurement screens works for decreasing speed request to the engine. Short press changes the speed by 5 RPM. Holding of this button initiates continuous speed variation according to Speed Ramp setpoint. Use this button in Adjustment or History screens to move cursor down or to decrease value of selected setpoint.</p>
6		<p>ALARM LED</p>
7		<p>RUNNING LED</p>

5.2 Init screens

5.2.1 Init screen

This is a first screen after controller's start which is dedicated for information provided by customers such as contact numbers, service technician contact and customer message for end users of engine. Configuration of this screen is only done by LiteEdit PC tool.

Note: *Init (welcome) screen appears immediately after power on with ComAp default text. It is possible to modify it using LiteEdit – Configuration – Init button. There is space for 8 text lines per 21 ASCII characters each.*

5.2.2 Firmware screen

This screen contains information about controller's type, controller manufacturer ComAp, uploaded firmware, version of firmware, used application and branch. There is also information about currently configured electronic engine unit, respectively about ESF file. Details for recognition of configured electronic engine are in chapter ECU controlled engine support.

Note: *To see firmware information use panel buttons: press and hold MENU and press STOP. This procedure activates the panel LEDs test as well. The screen disappears itself after approx. 5 seconds.*

IMPORTANT: If Firmware screen is invoked when engine is running it leads to engine stop sequence initiating. This is because STOP button is evaluated under any circumstances.

5.2.3 Languages screen

InteliDrive WP controller offers configurable language support. On this screen is possible to switch between languages configured in controller. Second way, how to change language, is by binary input Lang Selection.

Note: *To switch to Language screen go to Firmware screen (MENU + STOP) and then press MENU button again. Select desired language by UP/DOWN buttons and press START button to confirm selection.*

5.2.4 User interface screen

InteliDrive WP controller enables to choose the user interface as customer prefers.

There are two choices available: USER or ENGINEER interface

USER interface is simple menu displaying just measurement, alarm and init screens.

ENGINEER interface allow changing the controller's settings, reviewing the history, measurements and alarms. This mode is default.

This screen also contains Serial and Pwd. dec. (Password decode) numbers These numbers you can use in case of forgotten passwords.

The last line on this screen signalize DiagData number. This number is giving specific diagnostics information in case the program is from some internal reason blocked.

Note: If the password for the controller is forgotten, then is necessary to send Serial and Pwd. dec. numbers to technical support team. They are able to renewed password for your controller.









Note: To switch to User interface screen go to Firmware screen (MENU + STOP) and then press MENU button twice. Select desired interface mode by UP/DOWN buttons and press START button to confirm selection. Press MENU button to leave this screen.

5.3 Display menus





There are 3 display menus available: MEASUREMENT, ADJUSTMENT and HISTORY in Engineer interface and only MEASUREMENT in User interface.

Each menu consist of several screens. Perform MENU button long press (hold between 1 to 5 s) repeatedly to select requested menu.



5.3.1 Switching between User and Engineer menus

Hold  and then press  to activate Firmware screen and the panel LED test. Within 5 s press  to switch to Language screen and press  the second time to switch to User interface screen. Use  and  to select appropriate interface and press  to confirm selection. Press  to leave the User interface screen.







5.4 How to select the engine mode?









Use  +  or  +  to select requested engine operation mode (OFF – MAN – AUT)

5.5 How to view measured data?







- ▶ Perform  button long press (hold between 1 to 5 s) repeatedly until the MEASUREMENT menu is selected.
- ▶ Use  button short press (hold no longer than 1 s) to select the screen with requested data.

5.6 How to view and edit setpoints?



- ▶ Perform  button long press (hold between 1 to 5 s) repeatedly until the ADJUSTMENT menu is selected.
- ▶ Use  or  to select requested set points group.
- ▶ Press  to confirm.
- ▶ Use  or  to select requested set point.
- ▶ Set points marked “*” are password protected.

- ▶ Press  to edit.
- ▶ Use  or  to modify the set point. When  or  is pressed for 2 sec, auto repeat function is activated.
- ▶ Press  to confirm or  to leave without change.
- ▶ Press  to leave selected setpoints group.

5.6.1 How to change the display contrast?

- ▶ Hold  and then press  to activate Firmware screen.
- ▶ Within 5s use  +  or  +  to adjust the best display contrast.





5.6.2 How to check software revision?

Hold  and then press  to activate Firmware screen. On the display you can see (for 5 seconds) IntelliDrive WP Firmware screen containing:

- ▶ Controller name (see Basic setting group)
- ▶ Firmware version ID-WP -x.x.x.x
- ▶ ESF: version of ESF file, if ECU is configured
- ▶ SW version: the first is the firmware version number the second is configuration table number
- ▶ Application: WP
- ▶ Branch: ID-WP

Note: Only in MEASUREMENT screen.








5.6.3 How to check serial number and choose interface?

Hold  and then press  to activate Firmware screen. Within 5 s press  to switch to Language screen and press  the second time to switch to User interface screen.

- ▶ User interface: can choose User (block adjustment function of controller) or Engineer interface
- ▶ Serial: 8 character number
- ▶ Pwd. dec.: 10 character number
- ▶ DiagData: 1 character number

Note: Only in MEASUREMENT screen.

5.6.4 How to change language?

Hold  and then press  to activate Firmware screen. Within 5s press  to switch to Languages selection screen. Use  or  to select desired language and press  to confirm selection. Press  twice to leave the User interface screen.

5.7 How to find active alarms?

Active alarm list is the last screen in the MEASUREMENT menu.

Select MEASUREMENT menu. Use button short press (hold no longer than 1 s) repeatedly until Alarm List screen is displayed. You will see the list of all active alarms with the number of alarms at the top right corner.

Three state alarms are introduced:

Example	Description
*Wrn Water temp	Active not accepted alarm
Wrn water temp	Active accepted alarm
*Wrn Water temp	Inactive not accepted alarm
	Inactive accepted alarm

Press and hold more than 5 s to accept all alarms. Non-active alarms immediately disappear from the list. Active alarm list appears on the screen when a new alarm comes up and Main MEASUREMENT screen is active.

Note: Alarm list does not activate when you are reviewing the values or setpoints.

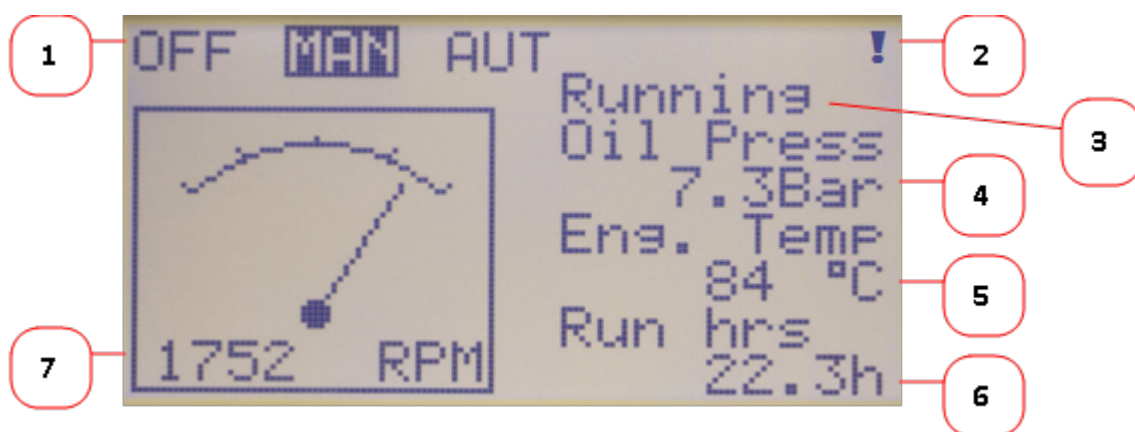
The second alarm list for ECU alarms is also available. It is displayed one screen above the standard alarm list on the controller display or under the standard alarm list in Control window of LiteEdit. If an alarm appears in this alarm list, it is signaled in the standard alarm list and by exclamation mark on the main measure screen.

5.8 How to list History records?

- ▶ Perform MENU button long press (hold between 1 to 5 s) repeatedly until the HISTORY menu is selected.
- ▶ Use or to select requested History line – see Reason, Date and Time.
- ▶ Press (no longer than 1s) to scroll line to right - to see recorded values.
- ▶ Perform button long press (hold between 1 to 5s) to go back to MEASUREMENT screen.

5.9 MEASUREMENT screens description

5.9.1 Main measure screen



1	Operation mode of the engine
2	Indication: "L" = Access lock, "!" = active Alarm
3	Status of the engine
4	AIN1 - Oil Pressure
5	AIN2 (Engine Temperature) / Soot Level
6	Run Hrs / DEFLevel
7	Engine RPM

5.9.2 Second measure screen

AIN1	5.2	Bar
AIN2	67	°C
AIN3	93	%
AIN4	250	kPa
AIN5	1250	kPa
AIN6	46	L/s
AIN7	126	L/s
AIN8	5.0	L/s

First 8 analog inputs are displayed.

Note: Only configured analog inputs are displayed.

5.9.3 Third measure screen

AIN9	250	kPa
Ubat	24.3	V
D+	5.7	V
BIN	10000	
BOUT	11001	
RPM-BI3	800	RPM
Timer text	No timer	
Timer val	0	s

Following items are displayed on the third screen:

- ▶ Last (AIN9) analog input.
- ▶ Ubat and D+ voltage.
- ▶ BIN/BOUT state.
- ▶ RPM sensing by BIN3.
- ▶ Active timer information.

5.9.4 Fourth measure screen

SpeedReq	Abs	800	RPM
LoadLimitAout		1000	
ECU State		000	
DPF1 Soot Load		25	%
DEF Level		40	%

Following items are displayed on the fourth screen:

- ▶ Speed Request and Load Limit information.
- ▶ ECU State.
- ▶ ECU Tier 4 values.

Note: ECU (Tier 4) values are visible only when ECU (with Tier 4 support) is configured.

5.9.5 Fifth measure screen

Run hrs	156.2	h
Num starts	168	
NextServTim	26	h
Day Hours	5.5	h
DayCons	156	L
TripCons	256	L
Total 1	456789	-

On this screen various statistics values are displayed.

Note: Running time can be also displayed on the Main measure screen and is measured in minutes, displayed in hours. Values are stored in nonvolatile memory.

5.9.6 Sixth measure screen

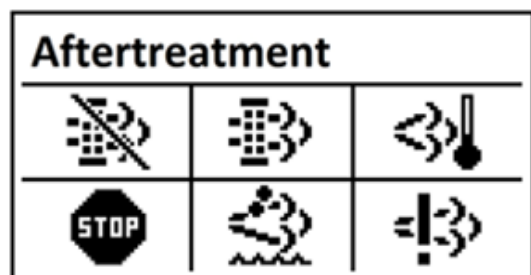


Image 5.1 Aftertreatment

Note: Displayed only if Tier 4 engine is connected.

5.9.7 Seventh measure screen

```
ECU AlarmList
>*ThrottlePos
  *EngOil Press
  *000589(0024Dh)
  *CrankcasePress
  *Fuel Temp
  *RatedEngSpeed
FC 51 OC 5 FMI 1
```

Image 5.2 ECU alarm list

Diagnostic messages are read from ECU and displayed in this second alarm list. For Standard J1939 engines SPN (Suspect Parameter Number), FMI (Failure Mode Identifier) and OC (Occurrence Counter) are shown together with verbal description if available.

Image above shows displaying of ECU alarms in the second alarm list. The additional information for the row selected by cursor is on the last row (SPN, OC and FMI codes).

If the verbal description of alarm is not available, the SPN (decimal and hexadecimal) is displayed.

Note: For FMI = 0 and 1, WRN is displayed. For other FMI codes, FLS is displayed.

Note: Displayed only if ECU is configured.

5.9.8 Alarm list measure screen

```
AlarmList 9
*Sd Engine Temp
*Wrn Engine Temp
*Wrn Fuel Level
*Sd Fuel Level
*Wrn Batt Volt
*Emergency Stop
*SprinklerActive
```

Image 5.3 Alarm list

Alarm list displays active or inactive alarms occurred on IntelliDrive WP unit. IntelliDrive WP controller automatically switches to the Alarm list screen when any new Alarm appears, but from Main measure screen only. See chapter Alarm management.

5.10 Setpoints screen

```

Password
Basic Settings
Engine Params
Regulator
LoadLimit
Engine Protect
ATT Settings
Date/Time
    
```

5.11 History screen

```

No. Reason
> 0 FlsFuel level
-1 FlsOil Pressure
-2 Remote Off set
-3 Emergency stop
-4 Switched On
-5 Sd Stop fail
14:10:42 27/11/2015
    
```

Image 5.4 History log

Note: All values and parameters are available from PC tool LiteEdit.

5.12 Binary input functions

Note: Any Binary input can be configured to any IntelliDrive WP controller terminal or changed to different function by LiteEdit PC tool. There is adjustable delay when any binary input is configured as protection.

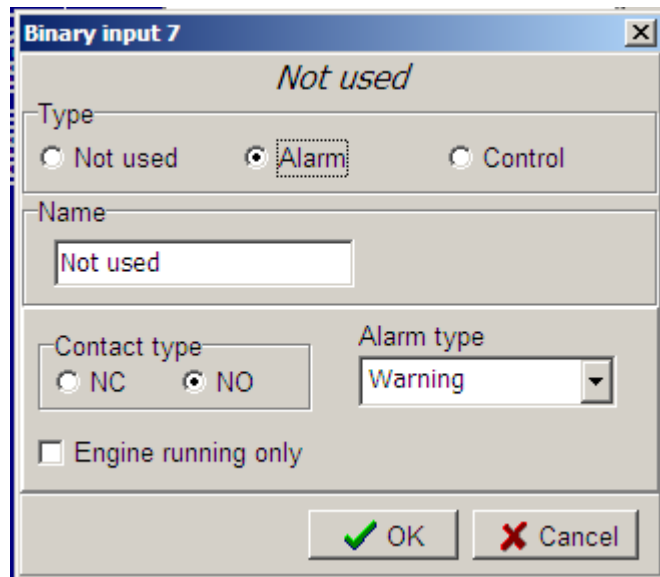
5.12.1 Binary inputs IntelliDrive WP - default configuration

BI1	Rem start/stop
BI2	Access lock
BI3	Emergency stop
BI4	Remote OFF
BI5	Not Used

5.12.2 Configuration of binary inputs

Each binary input can be configured in several ways. The settings can be made in the PC program LiteEdit, in window Modify. After choosing particular binary input, its window appears where the user can choose if the binary input will be used to protect (option Alarm) or control (option Control).

Binary Alarm configuration items – see the picture and the table with explanations.



Name		14 characters ASCII string
Contact type	NC	Normally closed
	NO	Normally opened
Alarm type	Warning	
	Shut down	
Alarm active	All the time	
	Engine running only	

5.12.3 Binary inputs list

Not used

Binary input has no function. Use this option when binary input is not connected.

Rem start/stop

Binary input is used for external request for engine run in AUT mode only. The engine is started by rising edge and stopped by falling edge of the signal.

Functionality of this LBI can be disabled by Basic Settings setpoint Rem Start/Stop.

Emergency stop

If the input is opened, shut down is immediately activated. Input is inverted (normally closed) in default configuration.

Note: In case of controller hardware or software fail, safe stop of the engine doesn't have to be ensured. To back-up the Emergency stop function it is recommended to connect separate circuit for disconnection of Fuel solenoid and Starter signals.

Sprinkler

If the input is closed all alarms are disabled except the binary input Emergency stop and "engine overspeed protection".

- ▶ All IntelliDrive WP alarms are detected,
- ▶ IntelliDrive WP front panel RED LED blinks or lights,
- ▶ Alarm is recorded on the IntelliDrive WP alarm list screen,
- ▶ BUT engine remains running.

Note: *Warning SprinklActive is indicated in the Alarm list if sprinkler mode active to inform the operator that the engine is not protected.*

Acces lock

If the input is closed, no setpoints can be adjusted from controller front panel and engine mode (OFF-MAN-AUT) cannot be changed.

Note: *Access lock does not protect setpoints and mode changing from LiteEdit. To avoid unqualified changes the selected setpoints can be password protected.*

Remote OFF

If closed, IntelliDrive WP is switched to OFF mode (there are three modes OFF-MAN-AUT). When opens controller is switched back to previous mode.

Note: *This binary input should be connected to schedule timer switch, to avoid start of engine.*

Remote MAN

If the input is active, MAN mode is forced to the controller independently on the position of the MODE selector.

Remote AUT

If the input is active, AUT mode is forced to the controller independently on the position of the MODE selector. If another of remote inputs is active, then the Remote AUT input has the lowest priority.

RemControlLock

If the input is active, setpoints writing or command sending from the external terminal is disabled.

Emerg. manual

If the input is activated the controller behaves like when switched to OFF mode and opens all binary outputs.

There is one exception – Stop solenoid doesn't activate on this transition.

Detection of running engine and subsequent alarm message "Sd Stop fail" is blocked.

The controller shows "Emerg Man" state and the engine can not be started.

After the input is open again, the controller recovers to previous state and behaves according to the actual situation.

Function is active in any controller mode.

StartButton

Binary input has the same function as Start button on the IntelliDrive WP front panel. It is active in MAN mode only.

StopButton

Binary input has the same function as Stop button on the IntelliDrive WP front panel. It is active in MAN mode only.

FaultResButton

Binary input has the same function as Fault reset button on the IntelliDrive WP front panel.

HornResButton

Binary input has the same function as Horn reset button on the IntelliDrive WP front panel.

Nominal/Idle

Input works in MAN mode only switching between running states Nominal/Idle. Active Nominal/Idle input activates binary output Idle/Nominal and sends Speed request = Engine params: Idle speed and/or active (binary) IDLE command to the ECU (e.g. to Volvo EMS).

Eng.state	Sped request in MAN mode	Sped request in AUT mode
Idle	Engine params: Idle speed	Engine params: Idle speed
Running	Engine params: ECU SpeedAdj	anything within Engine params: MinSpeedLim Engine params: MaxSpeedLim

Active input opens the binary output Ready to Load during the engine running state. Ready to Load can be closed back (if other conditions are fulfilled – see the Ready to Load binary output description) if Nominal/Idle is opened.

Speed Up

If the input is active, the Speed Request may increase the engine speed value. The Speed Request value may also depend on the conditions which are described in the chapter below.

Speed Down

If the input is active, the Speed Request may decrease the engine speed value. The Speed Request value may also depend on the conditions which are described in the chapter below.

Note: Speed Up/Down binary inputs are active only when Regulator: LAI SpdSelect = OFF.

Speed Sel1

If the input is active, the Speed request = Engine params: BI Speed Sel1 setpoint. The function is affected by Engine params: RetToSpeedAdj.

Speed Sel2

If the input is active, the Engine params: BI Speed Sel2 setpoint may give the engine speed value for Speed request to an ECU engine. The Speed Request value may also depend on the conditions which are described in the chapter below.

Speed Sel3

If the input is active, the Engine params: BI Speed Sel3 setpoint may give the engine speed value for Speed request to an ECU engine. The Speed Request value may also depend on the conditions which are described in the chapter below.

Note: Engine params: RetToSpeedAdj = DISABLED, Speed request is adjusted by BI Speed Sel1, 2, 3 edge (button press), i.e. input can be opened and Speed request stay constant.

Note: Engine params: RetToSpeedAdj = ENABLED, Speed request is adjusted by BI Speed Sel1, 2, 3 level (switch), i.e. when input is opened Speed request go back to Engine params: ECU SpeedAdj level.

Note: SpeedSel1, 2,.3 binary inputs are active only when Regulator: LAI SpdSelect = OFF.

Note: When more binary inputs are active at the same time, e.g. all binary inputs: 'Speed Sel1', 'Speed Sel2', 'Speed Sel3' then requested speed is given by Engine params: BI Speed Sel 1 (lowest index) setpoint.

Lang selection

Switch display texts between two languages.

Conveyor

Initial condition: Running engine.

Rising edge BI Conveyor activates BO Horn for Engine params: Conveyor horn. And after horn is over activates the BO Conveyor.

The second rising edge of BI Conveyor opens the BO Conveyor. BO Conveyor is deactivated in case of Sd protection.



LoadRequest2

Active input switches the Load limit request to Load limit: LoadRequest2 setpoint.

R Reg Disable

Active input disables the Regulator PI loop and switches analog output to constant Regulator: Reg bias.

Clear DayCons

DayCons is the counter which cumulates the instantaneous consumption coming from ECU. It shows the total consumption since the counter reset. Counte reset happen at the midnight of the controller clocks. LBI Clear DayCons resets the counter DayCons.

Note: The function works when the controller is connected to an ECU or in other case is consumption counted from the changes of analog input value Fuel rate and setpoint Engine params: FuelTankVolume.

Clear TripCons

TripCon is the counter which cumulates the instantaneous consumption coming from ECU. It shows the total consumption since last reset by LBI Clear TripCon. This LBI resets the counter TripCons.

Note: The function works when the controller is connected to an ECU or in other case is consumption counted from the changes of analog input value Fuel rate and setpoint Engine params: FuelTankVolume.

Flow Switch

FlowSwitch is protection to stop the engine in case the water not flow. Function is active in MAN and AUT mode. Engine is switched to Cooling state when FlowSwitch is not closed within Engine protect: Flow SwitchDel after running (Ready to load) engine state activation. Function stops the engine in AUT mode with FlowSwitch indication in Alarm list and stays in AUT mode after Fault reset.

Alarm list and History indication = "Cd Flow Switch" (CoolDown is third engine protection type in IntelliDrive Lite).

Machine state stays in Cooling even the LBI Flow Switch is activated again during Cooling period.

Prot Test

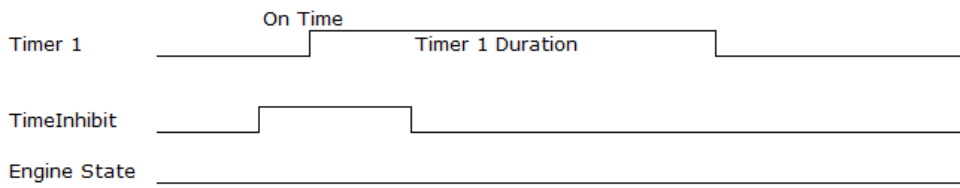
When the new LBI Protection Test is activated (by rising edge), all Sd alarms are for 90 s blocked. The exception is LBI Emergency stop and Overspeed protection.

TimerInhibit

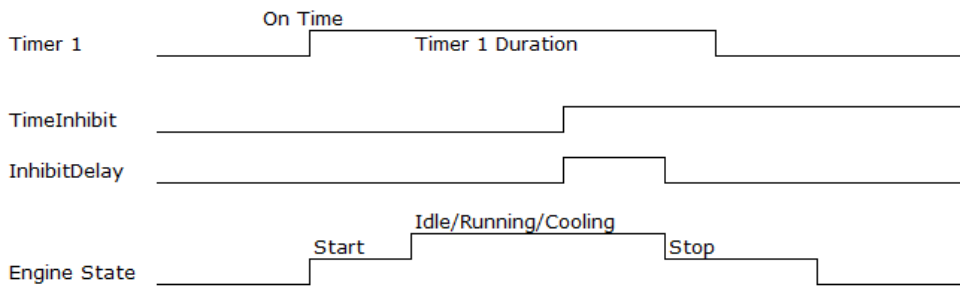
Created new LBI TimerInhibit which is intended to preventing engine start by Timer 1 and Timer 2 or stop the running engine during running Timer1 and Timer 2. The possibility of using:

- ▶ The engine isn't started by Timer 1/2 if LBI TimerInhibit is active at a time of timer start.
- ▶ The engine is stopped during running Timer 1/2 when LBI TimerInhibit is activated for time set in setpoint TimerInhibitDel (group: Date/Time).
- ▶ The engine isn't stopped during running Timer 1/2 when LBI TimerInhibit is activated for shorter time set in setpoint TimerInhibitDel (group: Date/Time).

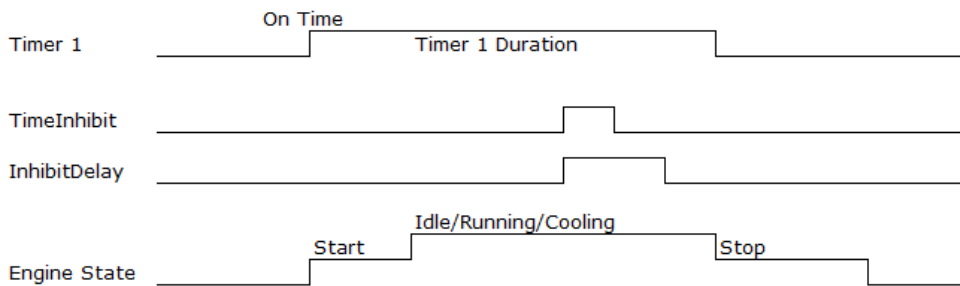
Operation if TimerInhibit input is high during Timer 1/2 On Time
AUT Mode



Operation if TimerInhibit input goes high during Timer 1/2 Duration for longer than the InhibitDelay time
AUT Mode



Operation if TimerInhibit input goes high during Timer 1/2 Duration for shorter than the InhibitDelay time
AUT Mode



RemoteStart

Used for remote start of the engine in AUT mode. The engine is started by rising edge of the signal. Functionality of this LBI can be disabled by Basic Settings setpoint RemoteStart.

RemoteStop

Used for remote stop of the engine in AUT mode. The engine is started by rising edge of the signal. Functionality of this LBI can be disabled by Basic Settings setpoint RemoteStop

5.13 Binary output functions

Note: Any Binary input can be configured to any IntelliDrive WP controller terminal or changed to different function by LiteEdit PC tool. There is adjustable delay when any binary input is configured as protection.

5.13.1 Binary outputs IntelliDrive WP - default

BO1	Starter
BO2	Fuel solenoid
BO3	Prestart
BO4	Alarm
BO5	Horn

5.13.2 Binary outputs - list

Configuration of binary outputs is feasible easily by combo box menu in the configuration window Modify.

Not used

Output has no function.

Starter

Closed relay energizes the starter of engine.

The relay opens if:

- ▶ the strating speed is reached or
- ▶ maximum time of cranking is exceeded or
- ▶ request to stop comes up

Fuel solenoid

Closed output opens the fuel solenoid and enables the engine start.

The output opens if:

- ▶ Emergency stop comes or
- ▶ cooled engine is stopped or
- ▶ in pause between repeated starts

Stop solenoid

The closed output energizes stop solenoid to stop the engine.

The output is active at least for Stop time, if the stop lasts longer; it stays active until all symptoms say the engine is stopped.

The engine is stopped if:

- ▶ RPM < 2 and
- ▶ Oil pressure < Engine params: StartingPoil

Note: The engine can be started anytime, if all symptoms say the engine is steady regardless of the fact the Stop solenoid can still be active (in that case it is deactivated before cranking).

Note: In case when stop time period is lower than "stop engine detected" + 10 s, stop time period is extended to this value due to safety reason. (stop engine detected = RPM<2, OilP not detected, D+ not active)

Stop Pulse

Output is active for 1 second after Stop solenoid output activation. This signal is sent to ECU in case of engine stop request.

Ignition

The output closes after reaching value of CrankRPM, fixed 30 RPM. The output opens after stopping of the engine or in pause during repeated start.

Prestart

The output closes prior to the engine start (Prestart) and opens when Starting RPM speed is reached. During repeated crank attempts the output is closed too.

The output could be used for pre-glow, pre-heat or prelubrication.

Preglow

The output closes prior to the engine start and opens when Starting RPM speed is reached. During repeated crank attempts the output is closed too.

The output could be used for pre-glow or pre-heat.

Cooling pump

The output closes when engine starts and opens after Engine params: AfterCool time after stop of the engine

Idle/Nominal

The output either follows the Nominal/Idle binary input or I/O button in MAN mode or follows the engine state in AUT mode:

The output Idle/Nominal closes after the timer Idle time elapses. The Idle time counter starts to countdown when Start speed reached. The Underspeed protection is not evaluated during idle time. Start fail protection occurs if the RPM drop below 2 RPM during idle state.

Note: When LBI Nominal/Idle is configured (to a physical binary input), it has priority and the switching between the nominal and the idle speed by I/O button is blocked.

Air valves

Output closes together with Prestart and opens after the engine is stopped.

Stopped engine conditions: RPM = 0, Engine params: Starting Poil, D+function (if enabled).

Alarm

The output closes if:

- ▶ any warning, cooldown or shutdown comes up or
- ▶ the engine malfunctions

The output opens if

- ▶ FAULT RESET is pressed

The output closes again if a new fault comes up.

Horn

The output closes if:

- ▶ any warning or shutdown comes up or
- ▶ the engine malfunctions

The output opens if:

- ▶ FAULT RESET is pressed or
- ▶ Max time of LBO HORN is exceeded (Horn timeout)

The output closes again if a new fault comes up.

Ready

The output is closed if following conditions are fulfilled:

- ▶ Engine is not running and
- ▶ No Shut down or Slow stop alarm is active
- ▶ Controller is not in OFF mode

Ready to load

The output is closed if engine is running and no alarm is active - it is possible to close load. The output opens when Wrn Underspeed protection is active and during cooling state.

Running

Output closes if the engine is in Running state.

Cooling

The output closes when engine is in Cooling state.

Fault Reset

One second pulse as echo for panel Fault reset button.

ChrgAlternFail

Output closes if engine is running and D+ input not energized.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

Note: Threshold level for D+ input is 80% supply voltage.

Stop failed

Output closes when the engine has to be stopped, but speed or oil pressure is detected. This protection goes active 60 s after stop command.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

Overspeed

Output closes if the engine over speed alarm activates.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

Underspeed

Output closes if the engine “Sd Underspeed” alarm activates i.e. when RPM is below the Engine params: Starting RPM limit.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

Stop failed

Output closes when the engine has to be stopped, but speed or oil pressure is detected. This protection goes active 60 s after stop command.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

Battery flat

Output closes when IntelliDrive WP performs reset during start procedure (probably due to weak battery).

The output opens, if

- ▶ Alarm is not active and
- ▶ FAULT RESET is pressed

V batt failed

Output closes when battery over/under voltage warning appears.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

Common Wrn

Output closes when any warning alarm appears.

The output opens, if

- ▶ No warning alarm is active and
- ▶ FAULT RESET is pressed

Common Sd

Output closes when any shutdown alarm appears.

The output opens, if

- ▶ No Sd alarm is active and
- ▶ FAULT RESET is pressed

Common Cd

Output closes when any cooldown alarm appears.

The output opens, if

- ▶ No Cd alarm is active and
- ▶ FAULT RESET is pressed

Common Fls

Output closes when any sensor fail alarm appears.

The output opens, if

- ▶ No warning alarm is active and
- ▶ FAULT RESET is pressed

Sd Oil Press

Output closes if the oil pressure shutdown alarm activates.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

Wrn Oil Press

Output closes if the oil pressure warning alarm activates.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

Sd Engine Temp

Output closes if the water temperature shutdown alarm activates.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

Wrn Engine Temp

Output closes if the water temperature warning alarm activates.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

Sd FuelLevel

Output closes if the Fuel level shutdown alarm activates.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

Wrn FuelLevel

Output closes if the Fuel level warning alarm activates.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

OFF mode

The output is closed, if OFF mode is selected.

MAN mode

The output is closed, if MAN mode is selected.

AUT mode

The output is closed, if AUT mode is selected.

ServiceTime

Output closes if the ServiceTime alarm activates. Service time is adjusted by setpoint Engine protect: NextServTime.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

DEF Tank Level

Output closes if the value DEF Tank Level drops under 10%, this level is adjustable in Engine protect: DEF Level Min.

Output opens if the value DEF Tank Level exceeds 90%. This upper limit is adjusted in Engine protect: DEF Level Max.

Note: This output is working only under condition ECU is configured and engine is in running state.

BI1, BI2, BI3, BI4, BI5 - stat

In case the binary input is configured to any control function, the binary output depicts the state of the binary input.

CtrlHeartBeat

The output signalizes watchdog reset. In a healthy state it flashes at 500ms : 500ms rate. It stops flashing when the unit reset occurs and the new controller start-up fails.

Wrn AIN4, AIN5, AIN6, AIN7, AIN8, AIN9

Output closes if the warning alarms for AIN4, AIN5, AIN6, AIN7, AIN8, AIN9 activates.

The output opens, if

Note: *alarm is not active and*

Note: *FAULT RESET is pressed*

Sd AIN4, AIN5, AIN6, AIN7, AIN8, AIN9

Output closes if the shutdown alarms for AIN4, AIN5, AIN6, AIN7, AIN8, AIN9 activates.

The output opens, if

- ▶ alarm is not active and
- ▶ FAULT RESET is pressed

ECU CommOK

If the ECU is not communicating and all values from ECU show ##### the output is not active. If the ECU communicates the output is active.

ECU CommError

The output is an inversion of binary output ECU CommOK, i.e. the output is closed when ECU is not communicating and all values from ECU show #####.

ECU YellowLamp

The output copies warning information from ECU.

ECU RedLamp

The output copies shutdown information from ECU.

ECU PwrRelay

The output closes at the beginning of prestart and opens if the engine shall be stopped.

Note: *ECU binary outputs are possible to configure only if ECU is configured.*

Timer1

Output activates when Timer1 is active. Simultaneously the engine is started when is in AUT mode.

Timer2

Output activates when Timer2 is active. Simultaneously the engine is started when is in AUT mode.

Glow plugs

The output closes prior to the engine start (Prestart) and opens when Starting RPM speed is reached. During repeated crank attempts the output is opened.

LBO Glow Plugs is closed prior to every attempt to start the engine for time set in setpoint Preglow.

Conveyor

Binary output function of Conveyor. See Binary input Conveyor.

SpeedSwitch

Binary output from Speed switch comparator – see Regulator setpoint group.

LoadSwitch

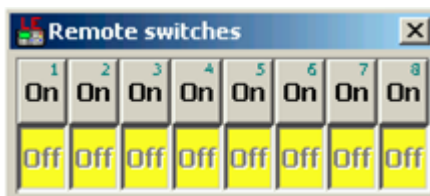
Binary output from Load switch comparator – see Load limit setpoint group.

Close Load

Output is controlled by panel 0/1 button when Basic settings: Panel Button = Close Load, engine is running and no Sd/Cd alarm is active. Close Load output is not closed in Idle and Cooling states and is disconnected when any Sd/Cd alarm is activated.

RemoteControl 1, 2, 3, 4, 5, 6, 7, 8

Allows configure Remote control switches to physical binary outputs. These switches are accessible from PC tools LiteEdit (see picture below)



SpdUpButtEcho

Output copies level of button Speed Up which is useful for manual speed settings of mechanical engines directly from controller.

SpdDwnButtEcho

Output copies level of button Speed Down which is useful for manual speed settings of mechanical engines directly from controller.

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6 Communication

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Note: Refer to *InteliCommunication Guide* for all additional information.

6.1 Direct cable connection

InteliDrive WP can be connected directly with PC via standard USB A to B device cable.

Note: Make sure the grounding system on controller and PC – USB port (negative of the PC DC supply) are identical – before the first direct connection. There must not be any voltage between these two points otherwise the internal reversible fuse in controller burns out. The simple solution is to assure, that the PC supply 240/20 V is ground free (GND terminal is not connected).

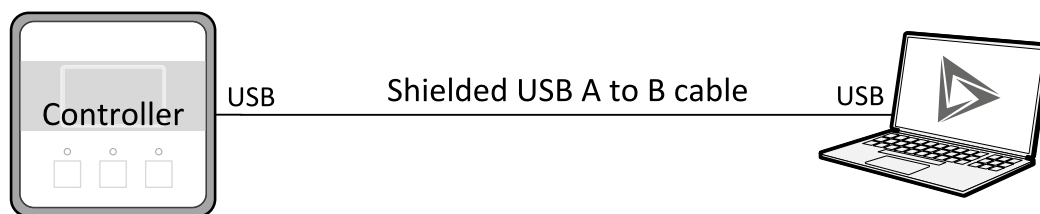



Image 6.1 Direct cable connection

6.2 ECU engine support

InteliDrive WP firmware branch covers both standard and electronic controlled (monitored) engines. The appropriate engine/ECU type is selected in PC tool LiteEdit like other peripherals. Press the  button in LiteEdit configuration window Modify.

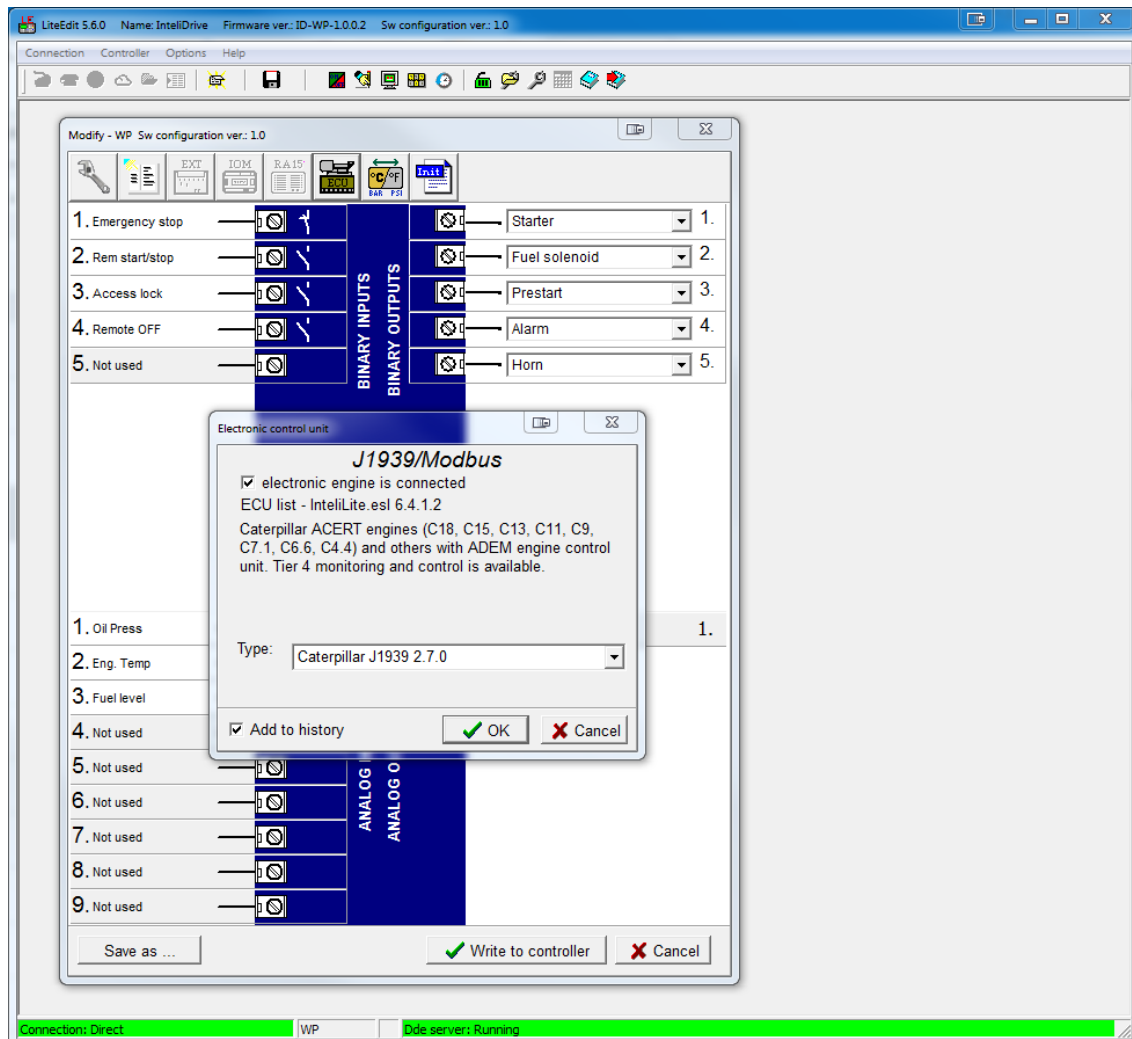
Note: Import latest ECU list – ECU list-x.x.iwe for update engine ECU specification. Select the proper esl file in LiteEdit->Options->ESL files - typically Allspeed.esl.

IMPORTANT: More information about ECU list packages, values, configuration and wiring recommendations can be found in **Comap Electronic Engines Support manual**.

The InteliDrive WP controller always sends either speed request = 0 % or the IDLE command via J1939 in controller Idle state. In the MAN mode the Idle operation can be controlled by Nominal/Idle binary input.

6.3 Choosing the ECU to configure

According to the model of ECU, choose and configure the right ECU option. The configuration can be made in LiteEdit, the window Modify, icon ECU.



Loss of communication causes shutdown of the running engine. On the contrary, the ECU can be switched off at still engine that means not-communicating ECU is in that moment normal situation. All values from ECU shall show #####, but no alarm is displayed. The output ECU CommOK follows the real situation that means it is not active anytime when the ECU does not communicate.

The output ECU PwrRelay closes at the beginning of prestart and opens if the engine shall be stopped.

The engine is started via standard contact output or via CAN bus.

Practical examples of values read from ECU:

Value name	Short name	Dimension	Type	Frame name
EngOil Filter Diff.Press	OilDiffPres	bar	ANA	DD
Amber Warning Lamp	AmberWrmLamp	-	BIN	DM1
Malfunction Lamp	MalfunctLamp	-	BIN	DM1

Protect Lamp	ProtectLamp	-	BIN	DM1
Red Stop Lamp	RedStopLamp	-	BIN	DM1
Engine speed	RPM	RPM	ANA	EEC1
Engine Oil Pressure	EngOil Press	bar	ANA	EFLP1
Coolant Temp	Coolant Temp	°C	ANA	ET1
Total Engine Hours	EngineHours	h	ANA	HR
Boost Pressure	Boost Press	bar	ANA	IC
Intake Manifold Temp	Intake Temp	°C	ANA	IC

6.4 ECU Analog inputs

Reading of mentioned values from ECU enables to use analog inputs of the unit for other purposes, e.g. measuring, displaying and alarm activation related to various quantities. The configuration thus allows using nine analog inputs on the central unit and four analog inputs on plug-in module if connected.

If the engine without ECU is controlled by IntelliDrive WP, the first analog input is permanently configured to Oil Pressure, other analog inputs remain freely configurable.

6.5 Tier4 final support

There was implemented support of Final Tier 4 (FT4) standard. Complete functionality is available only with configured ECU what support FT4. It requires min.:

- ▶ ECU List v6.3.0
- ▶ LiteEdit v5.2.0.













FT4 support includes:




- ▶ New screen Aftertreatment
- ▶ The screen is visible only if configured ECU supports and transmits some FT4 messages. Activated FT4 icon is indicated by alarm Aftertreatment. When any new icon appears, the controller automatically switches to Aftertreatment screen.

Aftertreatment



Meaning of the pictograms:

Pictogram	Meaning	Description
	Diesel Particulate Filter Active Regeneration Inhibited Due to Inhibit Switch	Steady light - SPN 3703 = 01b
	Diesel Particulate Filter Lamp Command	Steady light - SPN 3697 = 001b Flash 1 Hz - SPN 3697 = 100b
	Soot level in the DPF indicates need for filter cleaning	Diagnostic Trouble Code: SPN = 3719, FMI = 15
	Soot level is "moderately high" and engine performance is reduced by ECU	Diagnostic Trouble Code: SPN = 3719, FMI = 16
	Soot level is extremely high and engine performance is reduced by ECU and ECU will perform a shutdown for engine protection	Diagnostic Trouble Code: SPN = 3719, FMI = 00
	Exhaust System High Temperature Lamp Command	Steady light - SPN 3698 = 001b
	Red Stop Lamp	Steady light- SPN 623 = 01b
	Flash Red Stop Lamp	Flash 1 Hz - SPN 3039 = 00b
	Amber Warning Lamp	Steady light - SPN 624 = 01b
	Flash Amber Warning Lamp	Flash 1 Hz - SPN 3040 = 00b Flash 2 Hz - SPN 3039 = 01b
	Fluid Tank Low Level Indicator (DEF Level Low)	Steady light - SPN 5245 = 001b Flash 1 Hz - SPN 5245 = 100b
	DEF tank has 0% measureable volume and machine performance is reduced	Diagnostic Trouble Code: SPN = 1761, FMI = 18

	DEF system has lost its prime and machine performance is reduced.	Diagnostic Trouble Code: SPN = 1761, FMI = 01
	Malfunction Indicator Lamp (indicates that the active trouble code is emission-related)	Steady light - SPN 1213 = 01b
	Flash Malfunction Indicator Lamp (indicates that the active trouble code is emission-related)	Flash 1 Hz - SPN 3038 = 00b Flash 2 Hz - SPN 3038 = 01b

▶ New screen with FT4 analog values

- Created new separated screen with all FT4 analog values:
 - DPF1 Soot Load
 - DPF1 Ash Load
 - DEF Level
- The screen is visible only if configured ECU supports and transmits some FT4 messages.

▶ Main screen includes FT4 values

- Controller main screen can display DPF1 Soot Level and DEF Level. Two analog values what are displayed on main screen can be set by parameters Main Screen 1 and Main Screen 2 (group Basic settings).

▶ New LBI Regen Inhibit, Regen Force, Lockout1 and Lockout2

- Created four new LBI:
 - Regen Inhibit – used for setting ECU value DPF Regeneration Inhibit Switch if parameter Regen Inhibit = BIN.
 - Regen Force – used for setting ECU value DPF Regeneration Force Switch if parameter Regen Force = BIN.
 - Lockout1 – used for setting proprietary John Deere message DPF Lockout
 - Lockout2 – used for setting proprietary John Deere message DPF Lockout.

▶ New setpoint group ATT Settings

- Created new setpoint group ATT Settings what includes two parameters:
 - Regen Inhibit – set ECU value Aftertreatment Regeneration Inhibit Switch (SPN 3695). There can be set:
 - OFF – automatic filter regeneration is enabled - SPN 3695 = 00b
 - ON – automatic filter regeneration is inhibited - SPN 3695 = 01b
 - BIN – value is set by LBI Regen Inhibit
 - Transmitted value is set by actual level of parameter ON/OFF or by level of LBI.
 - Regen Force – set ECU value Aftertreatment Regeneration Force Switch (SPN 3696). There can be set:
 - OFF – automatic filter regeneration is enabled
 - ON – automatic filter regeneration is inhibited
 - BIN – value is set by LBI Regen Force

- Transmitted value is activated for 5 sec. by rising edge of parameter change OFF to ON or LBI.
- ▶ Support of proprietary John Deere CAN message
 - Created proprietary John Deere CAN message DPF Lockout – PGN 61184, transmitted value:
 - ON = F2 31 FF FF CF FF FF FF
 - OFF = F2 31 FF FF DF FF FF FF
 - Value is OFF if there isn't configured LBI ATT Lockout1 neither ATT Lockout2 or all configured LBI ATT Lockout are active.
 - Value is ON if min. one of configured LBI ATT Lockout is inactive.
- ▶ New LBO for all FT4 icons
 - Created new LBO what reflect all FT4 icons: DPF Inhibit, DPF Lamp, DPF Hest Lamp, DEF Level, Malfunction, Red Lamp Icon, Wrn Lamp Icon.

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 **back to Communication**

7 Troubleshooting

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7.1 Alarm management

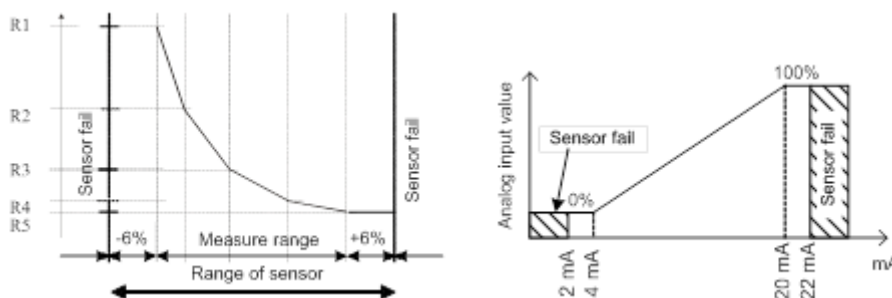
Following alarms are available:

- ▶ Sensor fail
- ▶ Warning
- ▶ Cooldown
- ▶ Shut down

Note: Type of protection for binary and analog inputs is adjustable in PC tool LiteEdit. In window Modify after double click on input adjust Alarm type.

7.1.1 Sensor fail (FIs)

Sensor fail is detected when measured value is 6% out of selected sensor characteristic. Sensor fail is indicated by ##### symbol instead of measured value.



7.1.2 Warning (Wrn)

When warning comes up, only alarm outputs and common warning output are closed.

7.1.3 Cooldown (Cd)

When cooldown comes up, engine is stopped slowly over cooling state.

7.1.4 Shut down (Sd)

When the shutdown alarm comes up, IntelliDrive WP opens all outputs e.g. FUEL SOLENOID, STARTER and PRESTART to stop the engine immediately. Alarm outputs and common shutdown output are closed. Active or not reset protection disables start.

Note: Engine running only alarms are activated after **Engine protect:** Eng prot del, after the engine RPM > **Engine params:** Starting RPM during the engine starting procedure.

Note: If LBI Sprinkler is active engine does not react on shutdown protection only for Emergency stop and Overspeed protection.

7.1.5 List of possible alarms

Events specification	Protection type	Information on binary output available	Description
Wrn Oil Press	WRN	YES	Oil pressure is smaller than Wrn Oil press setpoint.
Sd Oil Press	SD	YES	Oil pressure is smaller than Sd Oil press setpoint.
Sd NotOilPress	SD	YES	No information about the oil pressure from the binary oil pressure sensor.
Wrn Engine Temp	WRN	YES	Water temperature is greater than Wrn Water temp setpoint.
Sd Engine Temp	SD	YES	Water temperature is greater than Sd Water temp setpoint.
Wrn Fuel Level	WRN	YES	Fuel level is smaller than Wrn Fuel Level setpoint.
Sd Fuel Level	SD	YES	Fuel level is smaller than Sd Fuel Level setpoint.
Ubat	WRN	YES	Battery voltage is out of limits given by Batt overvolt and Batt undervolt setpoints.
Wrn AIN	WRN	YES	Warning alarm configurable on the input of the controller
Sd AIN	SD	YES	Shutdown alarm configurable on the input of the controller.
Binary input	Configurable	YES	Configurable Warning/Shutdown alarms on the inputs of IntelliDrive WP
Battery flat	SD	YES	If the controller switches off during starting sequence due to bad battery condition it doesnt try to start again and activates this protection.

Events specification	Protection type	Information on binary output available	Description
Start failed	SD	YES	Engine start failed.
RPM meas fail	SD	NO	At least one running condition was detected (Poil>Starting POil or energized D+) and do not appear RPM>Starting RPM.
ParamFail	NONE	NO	Wrong checksum of parameters. Happens typically after downloading new firmware or changing of the parameter. The controller stays in INIT mode. Check all parameters, write at least one new parameter.
Overspeed	SD	YES	The protection comes active if the speed is greater than Overspeed setpoint.
Underspeed	SD	YES	During starting of the engine when the RPM reached the value of Starting RPM setpoint the starter is switched off and the speed of the engine can drop under Start RPM again. Then the Underspeed protection becomes active. Protection evaluation starts 5 seconds after reaching StartingRPM.
EmergencyStop	SD	NO	If the input Emergency stop is opened shutdown is immediately activated.
PickupFault	SD	NO	Failure of magnetic pick-up sensor for speed measurement.
Stop fail	SD	YES	Engine stop failed.
WrnServiceTime	WRN	NO	The period for servicing is set by the NextServTime setpoint. The protection comes active if the running hours of the engine reach this value.
ChrgAlternFail	WRN	YES	Failure of alternator for charging the battery.
SprinklActive	WRN	NO	The protection is active if the output Sprinkler is closed.
Wrn ECU Alarm	WRN	NO	ECU alarm list is not empty
Low BackupBatt	WRN	NO	RTC backup battery is flat

7.2 HistoryFile

InteliDrive WP stores a record of each important event into the history file. The history file seats 255 records. When the history file is full, the oldest records are removed.

Note: To force history download in LiteEdit (direct, modem or internet) open History window and select History | Read history command.

7.2.1 RecordStructure

Abbreviation	Historical value
Num	Number of historical event
Reason	Event specification
Date	Date of historical event in format DD/MM/YY
Time	Time of historical event in format HH:MM:SS
RPM	Engine speed
RPM3	Engine speed detected on BI3
UBat	Battery voltage
OilP	InteliDrive WP Analog input 1 value (default Oil pressure)
EngT	InteliDrive WP Analog input 2 value (default Water temperature)
FLvl	InteliDrive WP Analog input 3 value (default Fuel level)
AI4	InteliDrive WP Analog input 4 value
AI5	InteliDrive WP Analog input 5 value
AI6	InteliDrive WP Analog input 6 value
AI7	InteliDrive WP Analog input 7 value
AI8	InteliDrive WP Analog input 8 value
AI9	InteliDrive WP Analog input 9 value
BIN	Binary inputs InteliDrive WP
BOUT	Binary inputs InteliDrive WP
FC	ECU alarm Failure Code
FMI	ECU alarm Failure Mode Identifier

Note: The ECU values are not recorded to history.

7.3 Diagnostic Messages read from ECU

Diagnostic messages are read and displayed in extra ECU Alarm list. For Standard J1939 SPN (Suspect Parameter Number), FMI (Failure Mode Identifier) and OC (Occurrence Counter) are shown together with verbal description if available.

One SPN (Suspect Parameter Number) / FMI (Failure Mode Identify) couple describes one fail information. If FMI is equal to 0 or 1, WRN is displayed in the ECU Alarm list. For any other FMI values, FLS is displayed.

Detail SPM/FMI code specification see in:

- ▶ SAE Truck and Bus Control and Communications Network Standards Manual, SAE HS-1939 Publication
- ▶ Or refer to corresponding engine manufacturer's ECU error codes list.

7.4 List of ECU Diagnostic Codes

Faultcode	Diagnostic code	Faultcode	Diagnostic code	Faultcode	Diagnostic code
51	ThrottlePos	158	BattPotential	636	PositionSensor
91	AccelPedalPos	168	ElectricalPot	637	TimingSensor
94	FuelDelPress	172	AirInlet Temp	639	J1939 CAN Bus
97	WaterInFuelInd	174	Fuel Temperat	651	InjectorCyl#1
98	EngineOilLevel	175	EngOil Temp	652	InjectorCyl#2
100	EngOil Press	189	RatedEngSpeed	653	InjectorCyl#3
101	CrankcasePress	190	EngineSpeed	654	InjectorCyl#4
102	Boost Press	231	J1939 Datalink	655	InjectorCyl#5
105	Intake Temp	237	VIN	656	InjectorCyl#6
106	AirInletPress	515	EngDesOpSpeed	677	EngStartRelay
107	AirFiltDifPres	620	5V SupplyFail	898	RequestedSpeed
108	BarometricPres	626	PrehActuator	970	AuxEngSdSwitch
110	EngCool Temp	628	EMSProgFailure	971	EngDerateSwtch
111	Coolant Level	629	Controller#1	1109	EngSdApproach
153	CrankcasePress	630	CalibrMemFail	1110	Engine Sd

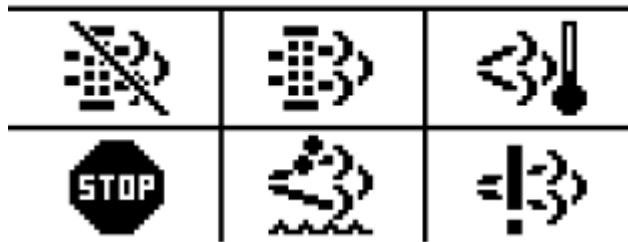
Note: *InteliDrive WP controller doesn't support J1587 diagnostic line on Volvo engines. This can cause in some cases a J1939 alarm message FC:000608 due to missing J1587 bus. Contact your Volvo distributor to update ECU firmware.*

For Scania Fault codes (FC) are displayed. Following messages are available for particular groups of Fault codes:

Faultcode	Diagnostic code	Faultcode	Diagnostic code
0x1000	Overspeed	0x6702	AlternatorChrg
0x1100	EngSpdSensor1	0x6A00	ExhaustBrkAct
0x1200	EngSpdSensor2	0xB000	OilPressProt
0x2000	WtrTempSensor	0xB100	CoolantLevProt
0x2100	ChrgAirTmpSens	0xB200	OverheatCoolWt
0x2200	ChrgAirPrsSens	0xB300	EmergencyStop
0x2300	OilTempSensor	0xB501	CoolantLevel
0x2400	OilPressSensor	0xC000	PDEInjectorCyl1
0x2600	SensorSupply1	0xC100	PDEInjectorCyl2
0x2700	SensorSupply2	0xC200	PDEInjectorCyl3
0x2800	ExtrAnalogInp	0xC300	PDEInjectorCyl4
0x3200	BatteryVoltage	0xC400	PDEInjectorCyl5
0x3300	CAN msg not ok	0xC500	PDEInjectorCyl6
0x3403	CAN version	0xC600	PDEInjectorCyl7
0x4300	HWWatchdog	0xC700	PDEInjectorCyl8
0x6200	FanActuator	0xE200	OverheatProt
0x6400	WasteGateAct	0xE600	CoordEmergStop
0x6600	StarterActuatr		








7.5 Tier4 diagnostic codes

Aftertreatment



Meaning of the pictograms:

Pictogram	Meaning	Description
	Diesel Particulate Filter Active Regeneration Inhibited Due to Inhibit Switch	Steady light - SPN 3703 = 01b
	Diesel Particulate Filter Lamp Command	Steady light - SPN 3697 = 001b Flash 1 Hz - SPN 3697 = 100b
	Soot level in the DPF indicates need for filter cleaning	Diagnostic Trouble Code: SPN = 3719, FMI = 15
	Soot level is "moderately high" and engine performance is reduced by ECU	Diagnostic Trouble Code: SPN = 3719, FMI = 16
	Soot level is extremely high and engine performance is reduced by ECU and ECU will perform a shutdown for engine protection	Diagnostic Trouble Code: SPN = 3719, FMI = 00
	Exhaust System High Temperature Lamp Command	Steady light - SPN 3698 = 001b
	Red Stop Lamp	Steady light - SPN 623 = 01b
	Flash Red Stop Lamp	Flash 1 Hz - SPN 3039 = 00b

	Amber Warning Lamp	Steady light - SPN 624 = 01b
	Flash Amber Warning Lamp	Flash 1 Hz - SPN 3040 = 00b Flash 2 Hz - SPN 3039 = 01b
	Fluid Tank Low Level Indicator (DEF Level Low)	Steady light - SPN 5245 = 001b Flash 1 Hz - SPN 5245 = 100b
	DEF tank has 0% measureable volume and machine performance is reduced	Diagnostic Trouble Code: SPN = 1761, FMI = 18
	DEF system has lost its prime and machine performance is reduced.	Diagnostic Trouble Code: SPN = 1761, FMI = 01
	Malfunction Indicator Lamp (indicates that the active trouble code is emission-related)	Steady light - SPN 1213 = 01b
	Flash Malfunction Indicator Lamp (indicates that the active trouble code is emission-related)	Flash 1 Hz - SPN 3038 = 00b Flash 2 Hz - SPN 3038 = 01b

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8 Technical data

Power supply

Power supply range	8-36 V DC
Power supply drop-out immunity	50 ms (from min. 12 V)
Power consumption	118 mA @ 8 V; 38 mA @ 36 V
Backup battery type	CR 1225, Encapsulated
Estimated backup battery lifetime	10 years

Operating conditions

Operating temperature	-20 °C to +70 °C
Operating humidity	95 % w/o condensation (IEC/EN 60068-2-30)
Protection degree (front/back panel)	IP 65
Vibration	5-25 Hz, ±1.6 mm 25-100 Hz, a = 4 g
Shocks	a_{max} 200 m/s ²
Storage temperature	-30 °C to +80 °C
Heat radiation	3.5 W

Binary inputs

Number	5, non-isolated
Input resistance	4.2 kΩ
Common pole	Positive, $V_s = 8-36$ V DC
Close/Open indication	0-2 V DC close contact 4 V - V_s open contact

Binary relay outputs (BO1, BO2)

Number	2, isolated
Output type	voltage free contacts
Maximum current	10 A
Maximum switching voltage	30 V DC, 250 V AC

Binary open collector outputs (BO3, BO4, BO5)

Number	3, non-isolated
Output type	open collector
Maximum current	0.5 A
Maximum switching voltage	36 V DC

Analog inputs - voltage

Number	3, non-isolated
Electrical range	0-10 V
Resolution	10 bits, 4 digits
Input impedance	>100 kΩ
Precision	±1 % ±100 mV out of measured value
Supported sensor types	User-defined: 30 points non-linear sensors can be defined by the user

Analog inputs - resistive

Number	3, non-isolated
Electrical range	0-2500 Ω
Resolution	10 bits, 4 digits
Precision	$\pm 2\% \pm 10 \Omega$ out of measured value
Supported sensor types	Predefined: VDO 10Bar, VDO Temperature, VDO Fuel level User-defined: 30 points non-linear sensors can be defined by the user

Analog inputs - Current

Number	3, non-isolated
Electrical range	0-20 mA
Resolution	10 bits, 4 digits
Input impedance	180 Ω
Precision	$\pm 1\% \pm 0.2$ mA out of measured value
Supported sensor types	User-defined: 30 points non-linear sensors can be defined by the user

D+

Excitation current	300 mA, during the engine start only
Charging fail threshold	80 % of Usupply
Voltage range	0-60 V (max. 70 V)
Voltage accuracy	± 0.1 V

Dimensions and weight

Dimensions	125 x 115 x 50 mm
Weight	270 g

Speed pick-up input

Type of sensor	magnetic pick-up (connection by shielded cable is recommended)
Minimum input voltage	2 Vpk-pk (from 4 Hz to 4 kHz)
Maximum input voltage	50 Veff
Minimum measured frequency	4 Hz to 10 kHz
Frequency measurement tolerance	0.2 %

CAN bus interface

Maximal CAN bus length	200 m
Speed	250 kBd
Nominal impedance	120 Ω
Cable type	twisted pair (shielded)

Following dynamic cable parameters are important especially for maximal 200 meters CAN bus length

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

Recommended Industrial Automation & Process Control Cables:

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

- ▶ 3082A DeviceBus for Allen-Bradley DeviceNet
- ▶ 3083A DeviceBus for Allen-Bradley DeviceNet
- ▶ 3086A DeviceBus for Honeywell SDS
- ▶ 3087A DeviceBus for Honeywell SDS
- ▶ 3084A DeviceBus for Allen-Bradley DeviceNet

- ▶ 3085A DeviceBus for Allen-Bradley DeviceNet
- ▶ 3105A Paired EIA Industrial RS485 cable

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

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

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9 Function description



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9.1 Engine operation states


Engine State	Meaning
Init	Auto test during controller power on
Not ready	Engine is not ready to start
Prestart	Prestart sequence in process, Prestart output is closed
Cranking	Engine is cranking
Pause	Pause between start attempts
Starting	Starting RPM is reached, Idle RPM is not yet reached
Idle	Idle RPM is reached and the Idle timer is running
Running	Idle timer elapsed, Engine is running at nominal speed
Stop	Stop
Shutdown	Shut-down alarm activated
Ready	Engine is ready to run
Cooling	Engine is cooling before stop
EmergMan	Emergency Manual engine operation
AfterCool	Engine after cooling - Cooling Pump output is closed

9.2 OFF mode

No start of the engine is possible. Outputs STARTER and FUEL SOLENOID are not energized. No reaction if ,  buttons are pressed.

9.3 MAN mode

 - starts the engine.



 - stops the engine.

Note: The engine can run without load unlimited time.

Note: The controller does not automatically stop the running engine in MAN mode.

Note: The controller does not start the engine when binary input REM START/STOP is closed.

9.3.1 Start-stop sequence (simplified)

MODE = MAN (Engine start/stop request is given by pressing buttons  and )

MODE = AUT (Engine start/stop request is given by binary input REM START/STOP)

State	Condition of the transition	Action	Next state
Ready	Start request	PRESTART on Prestart time counter started	Prestart
	RPM > 2 or Oil pressure detected or D+ is active		Stop (Stop fail)
	OFF mode selected or Shut down alarm active		Not Ready
Not Ready	RPM < 2, Oil pressure not detected, D+ not Active, no shutdown alarm active, other than OFF mode selected		Ready
Prestart ¹	Prestart time elapsed	STARTER on FUEL SOLENOID on ² MaxCrank time counter started	Cranking
Cranking ¹	RPM > Start RPM AND BI: Nominal/Idle is active	STARTER off PRESTART off	Starting
	RPM > Start RPM AND BI: Nominal/Idle is not active	STARTER off PRESTART off READY TO LOAD on	Running
	D+ input activated for 1s or oil pressure detected	STARTER off PRESTART off	Cranking
	MaxCrank time	STARTER off	Crank pause

State	Condition of the transition	Action	Next state
	elapsed, 1st attempt	FUEL SOLENOID off STOP SOLENOID on CrankFail pause timer started	
	MaxCrank time elapsed, last attempt	STARTER off PRESTART off	Shutdown (Start fail)
Crank pause ¹	CrankFail pause elapsed	STARTER on FUEL SOLENOID on ² STOP SOLENOID off MaxCrank time counter started	Cranking
Starting ¹	BI: Nominal/Idle is active	FUEL SOLENOID on ² STOP SOLENOID off READY TO LOAD off	Idle
	RPM = 0 or any other shutdown condition	FUEL SOLENOID off STOP SOLENOID on	Shutdown
	60 sec. Elapsed	FUEL SOLENOID off STOP SOLENOID on	Shutdown (Start fail)
Idle ¹	BI: Nominal/Idle is active Idle timer Elapsed	FUEL SOLENOID on ² STOP SOLENOID off READY TO LOAD off	Running
	RPM = 0 or any other shutdown condition	FUEL SOLENOID off STOP SOLENOID on	Shutdown
Running	Stop request	READY TO LOAD off Cooling time timer started	Cooling
	BI: Nominal/Idle is active	FUEL SOLENOID on STOP SOLENOID off READY TO LOAD off	Running
	RPM = 0 or any other shutdown condition	FUEL SOLENOID off STOP SOLENOID on READY TO LOAD off	Shutdown
Cooling	Cooling time elapsed	FUEL SOLENOID off STOP SOLENOID on	Stop
	RPM = 0 or any other shutdown condition	FUEL SOLENOID off STOP SOLENOID on	Shutdown

State	Condition of the transition	Action	Next state
	Start request	READY TO LOAD on	Running
Stop	RPM = 0, Oil pressure not detected, D+ not active		Ready
	60 sec. Elapsed		Stop (Stop fail)

¹The start-up sequence can be interrupted in any time by coming stop request



²Fuel solenoid is switched on with advance of 1s fixed before starter motor is switched on.

Note: Threshold level for D+ input is 80% supply voltage; activation delay is 1s (to override short firings during cranking – for example in cold conditions).

Speed request:

Engine speed is constant or set manually using **Engine params** setpoints and Binary inputs.

9.4 AUT mode

The controller does not respond to ,  buttons. Engine start/stop request is given by binary input REM START/STOP.

Engine speed request is sourced from PI loop (see below function 3) in AUT mode.

PI loop and Hysteresis comparator functions can be used both for Engine Load Limitation or any other control function.

Speed request:

Engine speed is adjusted automatically by internal PID loops (when active) - **Regulator** setpoints group.

9.5 Engine without pickup operation

The RPM pickup input is ignored when **Engine params**: Gear teeth = 0. The engine running state is then detected based on **Engine params**: Starting POil or **Engine params**: D+ function = ENABLED.

Starting Poil signal can be analog or binary. Even the binary signal is to be connected to AIN1 input. In LiteEdit, window *Modify*, input *Oil Pressure*, check off the option *Binary*. The setpoint *Starting Poil* set to 1.

9.6 Engine timer

9.6.1 MAN mode

Set the **Engine params**: *Running Timer*. Start engine in MAN mode by START button. Engine stops itself after *Running Timer* is over. The STOP button cancels timer (forces cooling), the second STOP cancels cooling (forces engine stop). Engine stays running when *Running Timer* = 0.

9.6.2 AUT mode

Engine starts and runs all the time when the LBI Rem start/stop is closed. RemoteStart LBI starts the engine by rising edge, Remote Stop LBI stops the engine by rising edge. Running Timer has no function in AUT mode. To stop the engine the Rem start/stop has to be opened or controller switched to MAN. Panel STOP button has no effect when Rem start/stop is closed in AUT, but skip the timer and switch to cooling when Rem start/stop is opened.

Note: The controller also includes two identical timers with function for auto start and stop with different condition. Use Date/Time setpoints group. For explanation see chapter Setpoints.

	MAN mode		AUT mode	
	RunTimer = 0 = disabled	RunTimer > 0 = enabled	RunTimer = 0 = disabled	RunTimer > 0 = enabled
Rem s/s = ON	No function		Start and Run unlimited time	
Rem s/s = OFF			Cooling	Cooling after RunTimer is over
Rem Start = ON	No function		Start and Run unlimited time	
Rem Stop = ON	No function		Cooling	Cooling after RunTimer is over
START	Engine runs unlimited time until STOP	Engine start-runs Run.time and then Cooling-Stop	No function	When Rem s/s = OFF only: Engine start-runs Run.time and then Cooling-Stop
STOP	Cooling		No function when Rem s/s = 1 Cancels timer when Rem s/s = 0	
2-nd STOP	Stop			

9.7 Protections

The controller protects the engine and the driven machine as well.

When an alarm occurs, these actions are taken: on the controller front side, the yellow or red LED starts to blink. The LBO Alarm is activated, which allows turning on another distant alarm light, horn or other device. Finally, the event of alarm is written into history.

The majority of possible faults are watched in three levels.

The alarm Warning (Wm, yellow color) signals that the watched value approaches the dangerous level.

The alarm ShutDown (Sd, red color). The main protected parameters are the minimal oil pressure, minimal and maximal speed, maximal cooling water temperature. The information about these analog values is brought into the controller through analog inputs (AIN) or, in the case of an electronic engine (engine equipped by ECU), by CAN bus.

The alarm CoolDown Cd, red color). Its configurable type of alarm, where isn't necessary immediately to stop the engine. E.g. because of low fuel level can be the engine switched by degrees over cooling time and idle speed.

Apart from here above mentioned "ready to wear" basic protections, the user can configure each analog or binary input as a protection. The configuration of binary inputs is done in LiteEdit, in the window Modify.

Note: Class B protection: for binary inputs configured as a protection, the individual delay can be set by the means of setpoints BIN1 Prot Del, BIN2 Prot Del, etc.

The configuration of the analog inputs can be done by a similar way, in LiteEdit, in the window Modify and in the group of setpoints Engine protect, where is possible to set the alarm levels by means of setpoints.

Note: Class C protection: the analog inputs AIN4, AIN5, AIN6 and AIN7 behave either "normally" or according to the class C definition according to the SP AINx Eval.

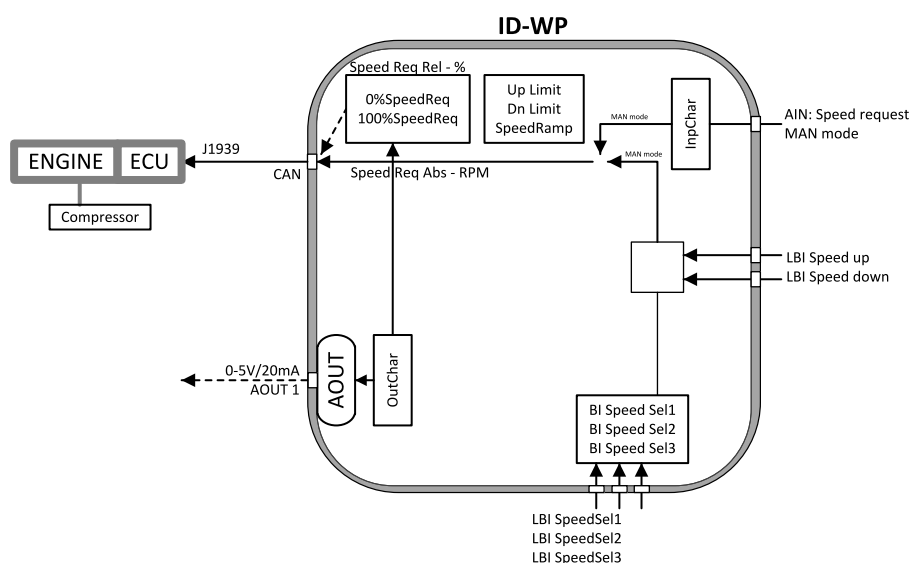
IMPORTANT: The LBI Prot Test blocks temporarily all the protections in order to perform tests etc.

Note: For other details about the protections, see the paragraphe Setpoints, Engine protect.

9.8 Engine RPM control in MAN mode

There are following options to setup and change the engine speed:

- ▶ Start to Nominal RPM and run at constant speed.
- ▶ Start to Idle speed and Automatically (Idle time) or manually by Binary input: Nominal/Idle
- ▶ ramp to Nominal (or preset) RPM.
- ▶ Switch the RPM in three steps by Binary inputs BI Speed Sel1, 2, 3.
- ▶ Ramp engine RPM Up/Down by Binary inputs BI Speed Up and Speed Down.
- ▶ Control engine RPM by Analog input - e.g. by potentiometer.



9.8.1 Engine RPM Idle - Nominal switching

Binary input Nominal/Idle switches RPM to **Engine params: Idle speed** when closed (in MAN mode only).
 Opened input ramps to **Engine params: ECU SpeedAdj**. No RPM control is active in engine Idle state.

9.8.2 Engine RPM two/three levels switching

Continuing example above closed BI Speed Sel1, 2, 3 ramps the Engine RPM to the selected setpoint level.
 ... i.e. switched/ramped to another three levels.

Note: Necessary condition: **Regulator:** LAI SpeedReq = OFF and controller MAN mode.

9.8.3 Engine RPM by Up/Down buttons settings

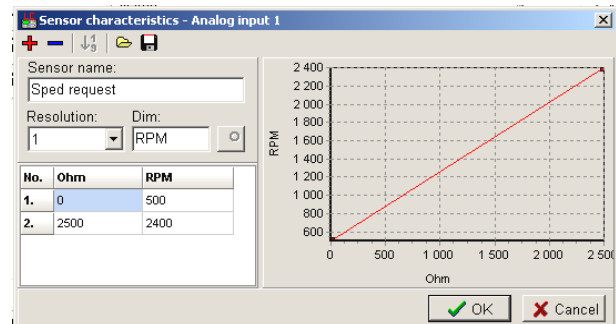
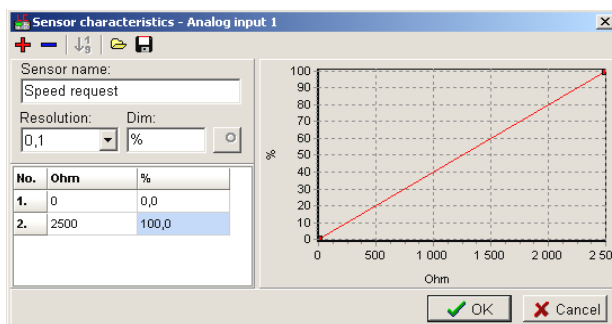
RPM adjusted in examples above can be changed by BI Speed Up / Speed Down when the Engine params:
 RetToSpeedAdj = DISABLED.

Note: Necessary condition: **Regulator:** LAI SpeedReq = OFF and controller MAN mode.

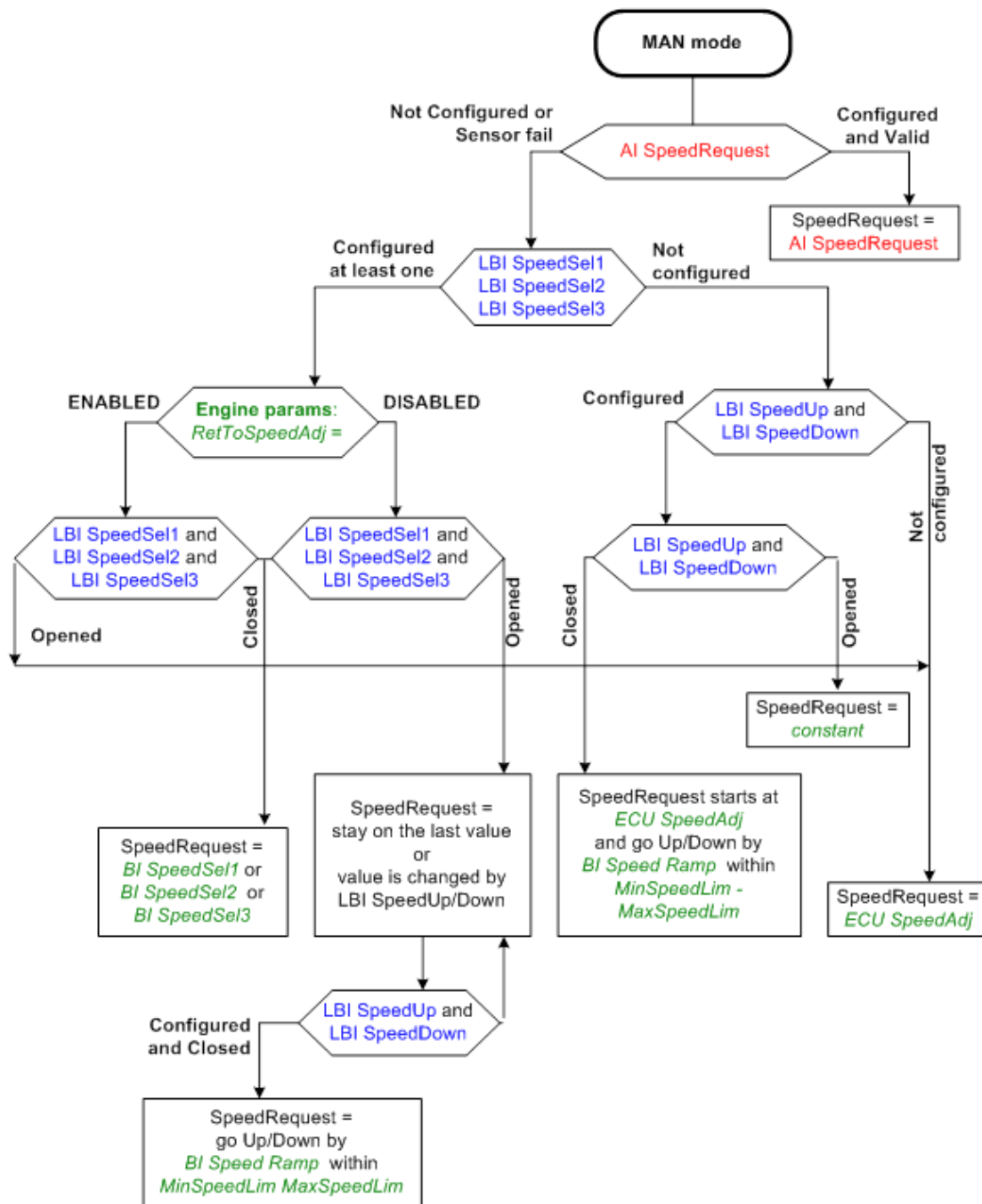
9.8.4 Engine RPM continuous change (using potentiometer)

Adjust **Regulator:** LAI SpeedReq = AI1-9 ... to corresponding controller or extension module analog input.

Configure this Analog input - sensor characteristic in RPM or Percentage (expected potentiometer resistance 2,5kOhm in example below). **Engine params:** Speed ramp setpoint is active.



9.8.5 Speed request chart



9.9 AUT mode: Engine load limitation - overview

Functions below can reduce the engine load when is over adjusted limit.

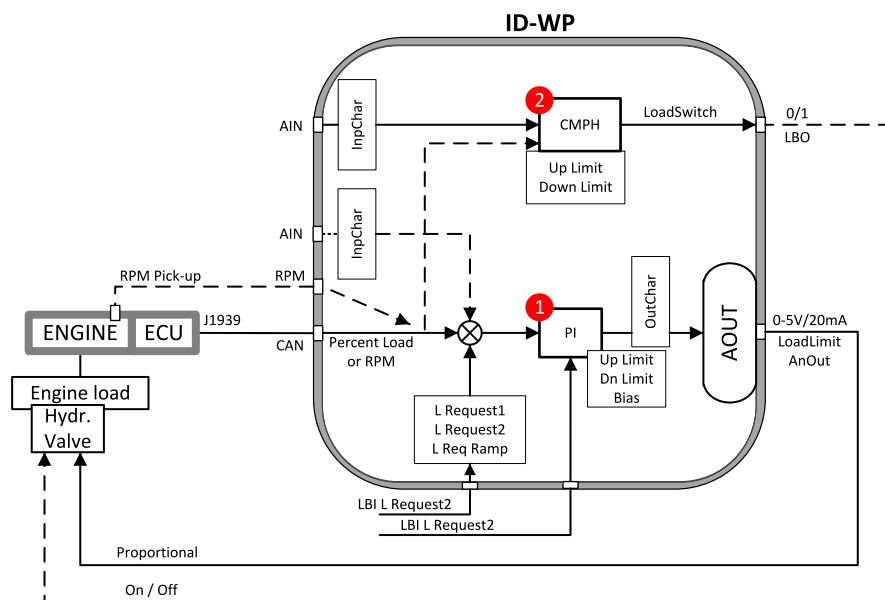
Two functions 1st PI loop and 2nd Comparator with Hysteresis (CMPH) are available and these functions are described below. The function setup is done by corresponding setpoints in **Load limit** group. This group has one PI loop and one CMPH. Both functions can use different inputs from ECU (Engine Load or RPM) or from pickup (RPM) or value from Analog input.

PI loop and Hysteresis comparator functions can be used for Engine Load Limitation or for any other control function.

IMPORTANT: Regulator is working permanently in AUT mode.

In table below see different operation conditions.

Condition	Analog output LoadLimitAnOut	Binary output Load switch
OFF mode	=0	=0
MAN mode	In operation	In operation
AUT mode	In operation	In operation
Running	In operation	In operation
Stop = Not Running	In operation	In operation
Sd protection	Load limit: Bias	
LBI L Reg Disable = 1	Load limit: Bias	



9.9.1 Functions 1 and 2

LBI	Active input:
LoadRequest2	Switch to Load Request 2
LoadRegDisable	Set PI Regulator output to constant P Bias Regulator is working when this LBI is not configured.
LBO	Function:
LoadSwitch	Load Comparator output (Up/Down Limit)
LAO	Function:
LoadLimitAOut	Analog output of Load Limitation PI control loop.

9.9.2 Functions 1 and 2 setpoints

Load limit	Values
Load Input	ECU: RPM, Load, CU: AI1-AI9,
Load Bias	0 - 10000 [-]
LoadRequest 1	± 10000 [-]
LoadRequest 2	± 10000 [-]
LoadReq Ramp	1 - 10000Å [-]
LoadUpLimit	0 - 10000 [-]
LoadDnLimit	0 - 10000 [-]
Load Gain	0,0 ± 200,0%
Load Integral	0,0% - 100,0%
Load CMP Input	ECU: RPM, Load, CU: AI1-AI9,
Load CMP Off	± 10000 [-]
Load CMP On	± 10000 [-]

Note: For more information see chapter Setpoints.

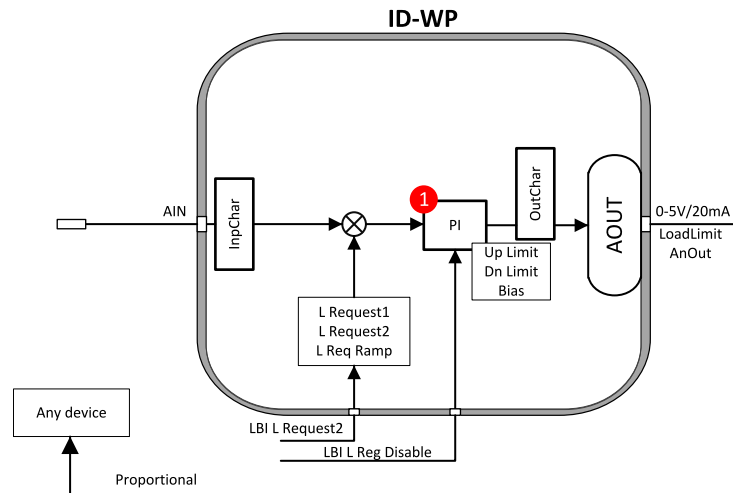
9.9.3 Functions 1 and 2 examples

- ▶ General PI control loop
- ▶ Engine Load limitation with analog output
- ▶ General comparator
- ▶ Engine Load limitation with On/Off output
- ▶ Speed switch

General PI control loop

Purpose: PI control of any value.

Description: PI detects the difference between actual and requested value and changes the output to keep the controlled value on the limit. Can be used PI in function 1 or 3

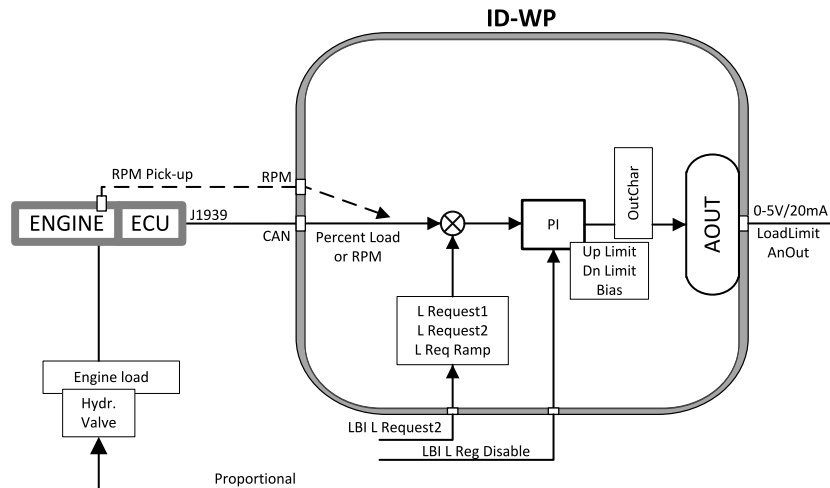


<p>Input</p>	<p>▶ Analog input:</p> <ul style="list-style-type: none"> ● CU: AI1-AI9 <p><u>PI function 1</u></p> <p>Binary input: LoadRequest2 (optional)</p> <p>Binary input: LoadRegDisable (optional)</p> <p><u>PI function 3</u></p> <p>Binary input: RegRequest2 (optional)</p> <p>Binary input: R Reg Disable (optional)</p>
<p>Output</p>	<p>Analog output: Load Limit</p> <p>Analog output: ByRPMCtrlAout</p>
<p>Setpoints</p>	<p>▶ Load limit:</p> <ul style="list-style-type: none"> ● Load Input = Load ● Load Bias ● Load Request 1 ● Load Request 2 ● Load ReqRamp ● Load UpLimit ● Load DownLimit ● Load Gain ● Load Integral <p>▶ Regulator:</p> <ul style="list-style-type: none"> ● Reg Input ● Reg Bias ● Request ● Request 2 ● Reg Gain ● Reg Integral

Engine load limitation with analog output

Purpose: Protect the engine against overload by reducing the load.

Description: The engine load (e.g. feeder speed) is reduced when actual “Percentual load” (coming from ECU) is over the **Load limit**: LoadRequest1 (or LoadRequest2) setpoint. Load can be continuously reduced by Analog output or switched between two levels by Binary output to keep the Engine load on or below the limit.

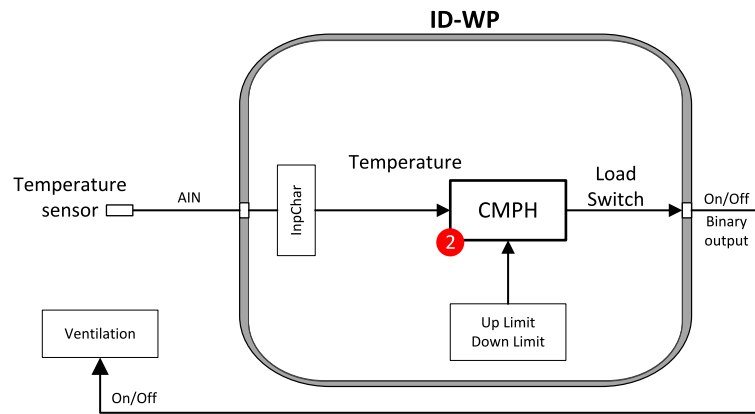


Input	J1939 - Actual Load in % Binary input: L Request 2 (optional) Binary input: Reg Disable (optional)
Output	Analog output: Load LimitAnOut Note: LoadLimitAnOut range = 0 - 10000
Setpoints	<ul style="list-style-type: none"> ▶ Load limit: <ul style="list-style-type: none"> ● Load Input = Load ● Load Bias ● Load Request ● Load Request 2 ● Load ReqRamp ● Load UpLimit ● Load DownLimit ● Load Gain ● Load Integral

General comparator

Purpose: Switch on/off some device depends on analog value - e.g. temperature.

Description: The function activates/deactivates some device based e.g. on temperature.

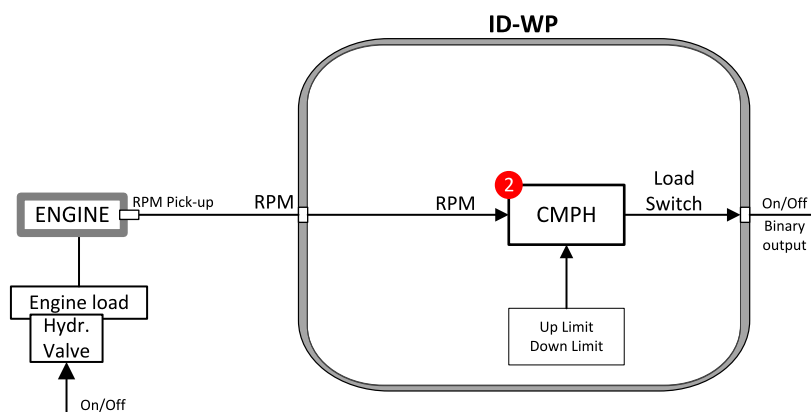


Input	<ul style="list-style-type: none"> ▶ Analog input: <ul style="list-style-type: none"> ● CU: AI1-AI9
Binary output	Load Switch
Setpoints	<ul style="list-style-type: none"> ▶ Load limit: <ul style="list-style-type: none"> ● Load CMP Input = AI1 ● Load CMP On = 90 ● Load CMP Off = 80

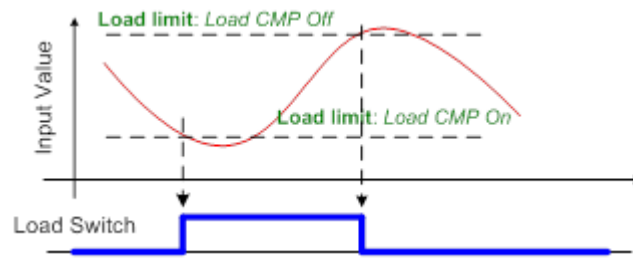
Engine load limitation with On/Off output

Purpose: Protect the engine against overload by reducing (switching On/Off) the load.

Description: CMPH (Comparator with Hysteresis) detect the RPM decrease below the Down limit, activates the Binary output Load switch that reduces (slow down feeder) the load. There are expected corresponding droop characteristics on the engine.



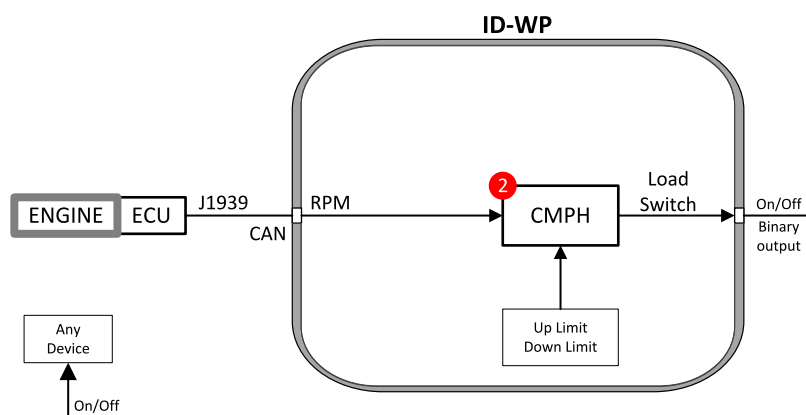
Input	RPM from pickup (or ECU)
Binary output	Load Switch
Setpoints	<ul style="list-style-type: none"> ▶ Load limit: <ul style="list-style-type: none"> ● Load CMP Input = RPM ● Load CMP On = e.g. 2000 ● Load CMP Off = e.g. 2200



Speed switch

Purpose: Switch on/off some device depends on RPM level.

Description: Depends on setpoint settings the CMPH (Comparator with Hysteresis) activates/deactivates the Binary output Load switch that switch off some device when RPM is below adjusted limit.



Input	Analog input
Binary output	Load Switch
Setpoints	<p>▶ Load limit:</p> <ul style="list-style-type: none"> ● Load CMP Input = Actual Load ● Load CMP On = 2000 ● Load CMP Off = 2200

9.10 AUT mode: Engine regulation by RPM control - overview

Functions below can automatically change the engine RPM to keep value measured on controller (plug-in module) Analog input (e.g. Pressure) on adjusted level.

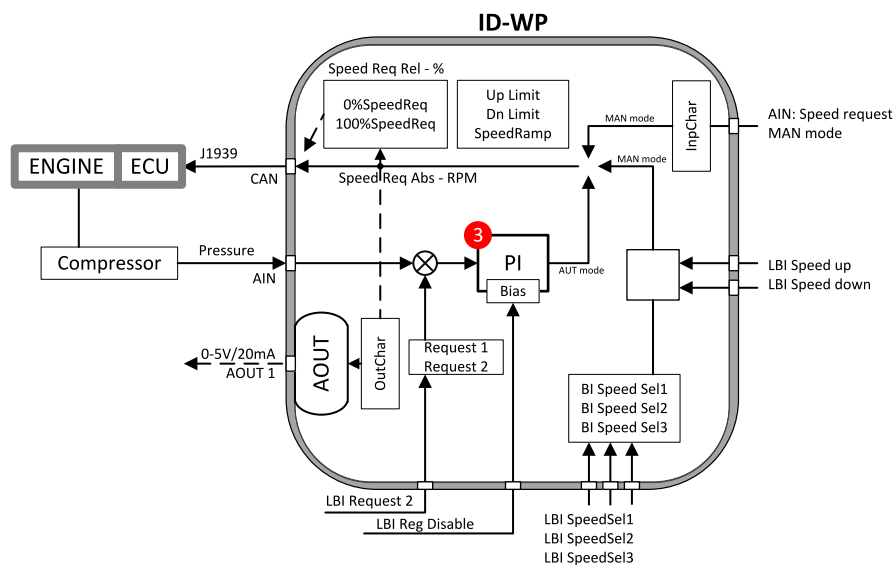
Functions 3 = PI loop and 4 = Comparator with Hysteresis (CMPH) are available. The function setup is done by corresponding setpoints in **Regulator** group. This group has one PI loop and one CMPH.

The PI function output is Speed request transmitted via J1939 or Analog output.

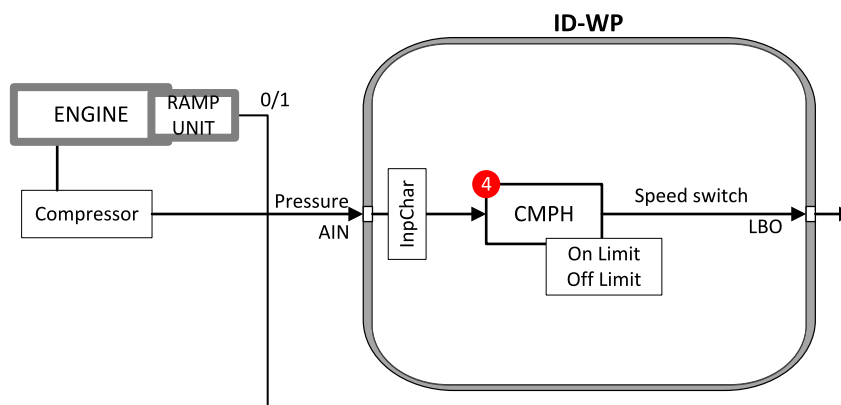
Note: In **Regulator** is input only from analog inputs or from RPM-BI3.

In table below see different operation conditions.

Condition	Speed request	Binary output SpeedSwitch
OFF mode	Engine params: Idle speed	=0
MAN mode	Manual	In operation
AUT mode	Automatic by PI loop	In operation
Stop = Not Running	Engine params: Idle speed	In operation
Sd protection	Engine params: Idle speed	In operation
LBI R Reg Disable = 1	Regulator: Reg Bias	In operation



Following example changes the RPM between two levels based on pressure.



9.10.1 Functions 3 and 4

LBI	Active input:
RegRequest2	Switch to RegRequest 2
R Reg Disable	Set PI Regulator output to R Bias
LBO	Function:
Speed Switch	Regulator Comparator output

9.10.2 Functions 3 and 4 setpoints

Regulator	Values
LAI SpeedRequest	OFF CU: AI1-AI9
Reg Input	CU: AI1-AI9 RPM-BI3
Reg Bias	0 - 10000
Request1	±10000
Request2	±10000
Reg Gain	± 0,0 - 200,0%
Reg Integral	+ 0,0% - 100,0%
Reg CMP Input	CU: AI1-AI9 RPM-BI3
Reg CMP Off	± 10000 [-]
Reg CMP On	± 10000 [-]

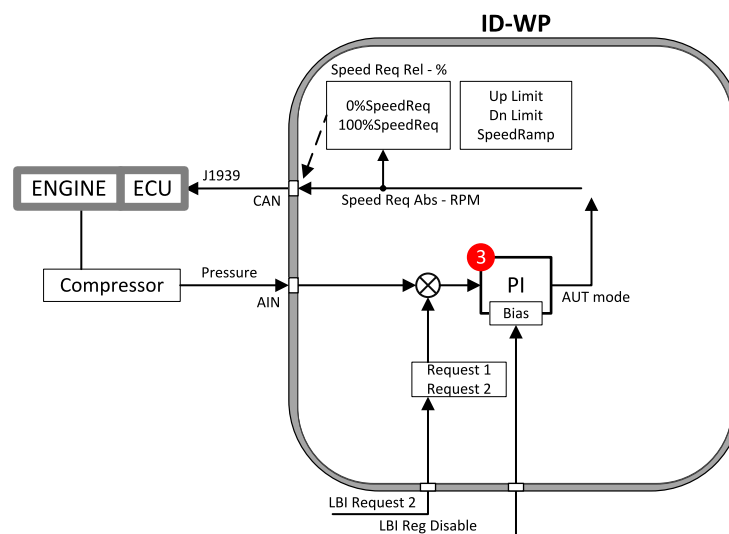
Note: For more information see chapter Setpoints.

9.10.3 Functions 3 and 4 examples

- ▶ Pressure by RPM control via J1939
- ▶ Pressure by RPM control via analog output

Pressure by RPM control via J1939

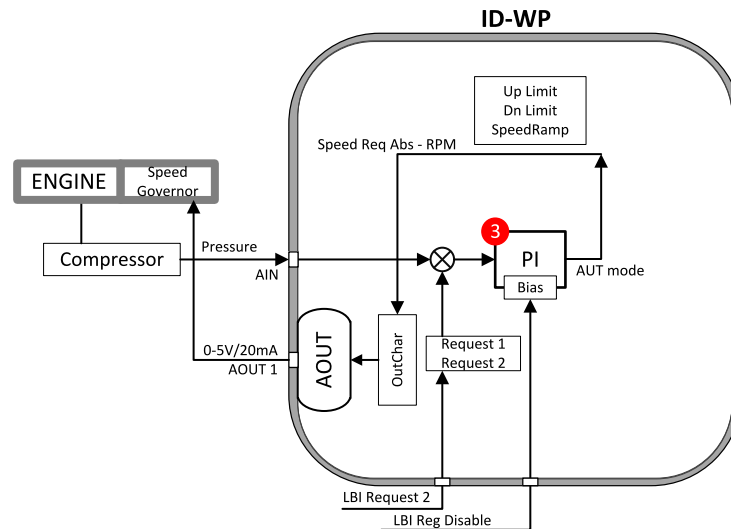
Actual pressure is measured via Analog input, compared with Requested value and the PI (function 3) output controls the engine RPM via J1939.



Note: Take care if the Speed request in AUT mode is not limited by Engine params: Speed ramp.

Pressure by RPM control via Analog output

Actual pressure is measured via Analog input, compared with Requested value and the PI (function 3) output controls the engine RPM via Analog output.



Input	Analog input Binary input: Request 2 (optional) Binary input: R Reg Disable (optional)
Output	Analog output: Speed Request
Setpoints	<p>▶ Regulator:</p> <ul style="list-style-type: none"> ● Reg Input ● Reg Bias ● Request ● Request 2 ● Reg Gain ● Reg Integral <p>▶ Engine params:</p> <ul style="list-style-type: none"> ● MinSpeedLim ● MaxSpeedLim ● Speed Ramp

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10.1 Setpoints

Configuration of Setpoints is possible through panel buttons as is described above or via ComAp PC tool LiteEdit, where the setting can be open by click on the icon 

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For full list of setpoints go to the chapter [List of setpoints \(page 84\)](#).

10.1.2 List of setpoints

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AIN4 LowDel	129	AIN8 LowDel	142
AIN4 HighWrm	129	AIN8 HighWrm	142
AIN4 HighSd	129	AIN8 HighSd	143
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AIN5 Wrm	130	AIN9 Wrm	144
AIN5 Sd	131	AIN9 Sd	144
AIN5 Del	131	AIN9 Del	144
AIN5 LowWrm	131	AIN9 LowWrm	145
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10.1.3 Group: Password


Note: Following setpoints are available from Controller and LiteEdit/InteliMonitor.

EnterPassword

Setpoint group	Password	Related FW	1.0.0
Range [units]	[-]		
Default value	[-]	Force value	
Step	[-]		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Password is a four-digit number. Password enables change of relevant protected set points Use UP or DOWN keys to set and START key to confirm the password. There are 3 levels of passwords. Knowledge of higher password lets you to change setpoint protected by lower password.</p>			

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ChangePassword

Setpoint group	Password	Related FW	1.0.0
Range [units]	[-]		
Default value	[-]	Force value	
Step	[-]		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Use UP or DOWN button to set and START button to change the password.</p> <p>Can be used LiteEdit PC tool for changes of Password level in window Modify press button </p> <p>Password for each of three levels can be adjusted from the menu Controller >Change password.</p> <p>Note: At first the Password has to be entered before the new Password can be changed.</p>			

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10.1.4 Group: Basic settings

Note: Following setpoints are available from Controller and LiteEdit/InteliMonitor.

Engine name

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	[-]		
Default value	InteliDrive	Force value	
Step	[-]		
Comm object	8637	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
User defined name, used for engine – InteliDrive WP identification at remote phone or mobile connection. Engine name is maximally 14 characters long and has to be entered using LiteEdit software.			

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Gear teeth

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	0 - 500 [-]		
Default value	120	Force value	
Step	1		
Comm object	8252	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The number of teeth on the engine gear for the pick-up sensor. The setpoint is ignored when ECU is configured.			
Note: <i>The RPM pickup input is ignored when Engine params: Gear teeth = 0. The engine running state is then detected based on Engine params: Starting Oil or Engine params: D+ function = ENABLED.</i>			

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RPM by W Terminal

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	0.5 - 2 [-]		
Default value	1	Force value	
Step	0.01		
Comm object	8420	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The constant of this setpoint multiplies the speed value obtained from the controller input RPM.</p> <p>Note: <i>The default value is and must be 1, when the classical pick-up speed sensor is used to measure the engine speed.</i></p> <p>Note: <i>The setpoint is usefull when the engine does not have the speed sensor and the speed is measured by the W terminal of the charging alternator. The setpoint allows tuning the ratio between the frequency and the RPM value which can not to correspond to the entire values of teeth numbers (because of the different non-integral ratio of the engine and alternator pulleys).</i></p>			

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Nominal RPM

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	100 - 4000 [RPM]		
Default value	1500 RPM	Force value	
Step	1 RPM		
Comm object	8253	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>This setpoint is used to select whether you use wooden or woolen wires.</p> <p>Use p.noindent style for your paragraphs.</p>			

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Rem Start/Stop

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	14659	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Enable or Disable function of LBI Rem Start/Stop			

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Remote start

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	14660	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Enable or Disable function of LBI RemoteStart			

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Remote stop

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	14661	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Enable or Disable function of LBI RemoteStop			

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Gear Teeth BI3

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	0 - 10 [-]		
Default value	0	Force value	
Step	1		
Comm object	11475	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The second RPM (RPM-BI3 value) can be measured in limited frequency range 1 to 50Hz on Binary input 3. The RPM-BI3 value indicates RPM calculated from BI3 frequency and Basic settings: GearTeeth3 setpoint. The RPM-BI3 value =0 below 1Hz and =### over 50Hz.</p> <p>Configure BI Type = Not used and change the name according the function for RPM-BI3 measuring</p> <p>Note: The RPM-BI3 measuring is switched off when Basic setting: GearTeethBI3 = 0. In this case BI3 operates as standard Binary input.</p>			

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Controller mode

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	[-]		
Default value	OFF	Force value	
Step	[-]		
Comm object	8315	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Equivalent to Controller mode changes by front panel buttons</p> <p>Note: Controller Mode change can be separately password protected.</p>			

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FitResGoToMAN

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	[-]		
Default value	DISABLED	Force value	
Step	[-]		
Comm object	9983	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
DISABLED: Controller stays in AUT mode after Fault reset. Default state.			
ENABLED: Automatic switch from AUT to MAN mode after Fault reset to avoid automatic engine start. This function is active for Shut down protection only.			

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DispBackLightTO

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	0-60 [min]		
Default value	15 min	Force value	
Step	1 min		
Comm object	10121	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The display backlight is switched off after timeout.			
Default value: 0 means that the display lights all the time			

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RunHoursSource

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	[-]		
Default value	AUTO	Force value	
Step	[-]		
Comm object	13345	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>This setpoint is used for adjustment of RunHours source of the engine.</p> <p>ECU: RunHours are all the time read from ECU.</p> <p>INTERNAL: RunHours are counted from the inner counter of the controller.</p> <p>AUTO: If is coming from ECU rational value higher than 0, then the RunHours are taken from ECU, in second case are displayed internal hours from controller. Default state.</p>			
<p>IMPORTANT: Some types of ECUs reset RunHours counter to 0, if the supply was disconnected.</p>			

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Main Screen 1

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	[-]		
Default value	AIN2	Force value	
Step	[-]		
Comm object	13346	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Change the display of the main Measurement screen.</p> <p>SHOW AIN: Instead of timers are on the left side of the screen displayed values of analog inputs AIN6 and AIN7</p>			

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Main Screen 2

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	[-]		
Default value	RunHrs	Force value	
Step	[-]		
Comm object	14628	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Change the display of the main Measurement screen.			
SHOW TIMERS: Standard display with timers on the left side of the screen. Default state.			

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I/O-L-Button

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	[-]		
Default value	SpeedDown	Force value	
Step	[-]		
Comm object	14627	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Decrease of engine speed request - short press changes the speed of 1 RPM, long press changes the speed according to Speed ramp setting (setpoint in group Engine Param2). This button has exactly the same functionality as existing LBI Speed Down.			

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I/O-R-Button

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	[-]		
Default value	SpeedUp	Force value	
Step	[-]		
Comm object	12619	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Increase of engine speed request - short press changes the speed of 1 RPM, long press changes the speed according to Speed ramp setting (setpoint in group Engine Param2). This button has exactly the same functionality as existing LBI Speed Up.			

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10.1.5 Group: Engine params

Note: Following setpoints are available from Controller and LiteEdit/InteliMonitor.

Prestart time

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 600 [s]		
Default value	2 s	Force value	
Step	1 s		
Comm object	8394	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Time of the PRESTART output closed prior to the engine start – i.e. before the binary outputs Fuel solenoid and Starter are closed and opens when Starting RPM speed is reached. Set to zero if you want to leave the output PRESTART opened.			

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Preglow time

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 600 [s]		
Default value	0 s	Force value	
Step	1 s		
Comm object	11836	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Time of the PREGLOW output closed prior to the engine start. Set to zero if you want to leave the output PREGLOW opened.			
<p>Note: Function with shorter period (Prestart time or Preglow time) starts later to finish both in the same time – when Starting RPM speed is reached.</p>			

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MaxCrank time

Setpoint group	Basic settings	Related FW	1.0.0
Range [units]	1 - 60 [s]		
Default value	5 s	Force value	
Step	1 s		
Comm object	8256	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is giving maximum time limit of engine cranking.			

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CrnkFail pause

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	1 - 60 [s]		
Default value	8 s	Force value	
Step	1 s		
Comm object	8257	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Pause between crank (engine start) attempts.			

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Crank attempts

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	1 - 10 [-]		
Default value	3	Force value	
Step	1		
Comm object	8255	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Maximum number of crank (engine start) attempts.			

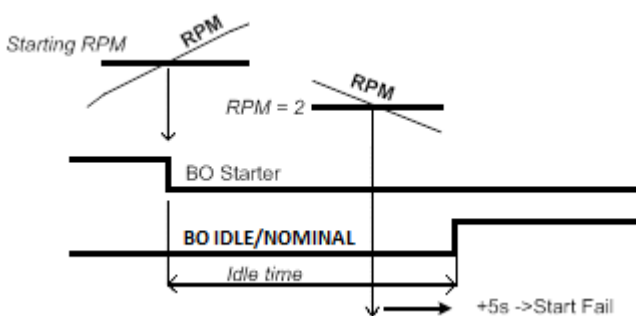
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Start POil Del

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 60 [s]		
Default value	0 s	Force value	
Step	1 s		
Comm object	14687	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The condition oil pressure > Starting POil is considered fulfilled after Start POil Del .			
<p><i>Note: This parameter can be used for complete disabling of oil pressure engine running condition. Therefore, this adjustment must be done very carefully.</i></p>			

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Idle time

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 600 [s]		
Default value	12 s	Force value	
Step	1 s		
Comm object	9097	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Idle time delay starts when RPM exceeds Start RPM. Start fail is detected when during Idle state RPM decreases below 2.			
During the Idle time timer running the binary output IDLE/NOMINAL is opened, when it expires the IDLE/NOMINAL output closes. Binary output IDLE/NOMINAL opens during Cooling period again.			
			
<p><i>Note: Engine can be switched between Idle and Running state by Binary input Nominal/Idle in MAN mode.</i></p>			

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Idle speed

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	Starting RPM – MinSpeedLimit [RPM]		
Default value	800 RPM	Force value	
Step	1 RPM		
Comm object	9946	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Speed request in engine Idle state i.e. after engine start or when switched to Idle in MAN mode by Binary input Nominal/Idle and after Engine ShutDown.			

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Cooling speed

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	[-]		
Default value	NOMINAL	Force value	
Step	[-]		
Comm object	10046	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Selects the function of the Binary output IDLE/NOMINAL during engine Cooling state			
IDLE: Cooling is executed at Idle speed.			
NOMINAL: Cooling is executed at Nominal speed. Default state.			
<i>Note: Binary output IDLE/NOMINAL must be configured and connected to speed governor. Engine Idle speed must be adjusted on speed governor.</i>			

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Cooling time

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	30 s	Force value	
Step	1 s		
Comm object	8258	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Run time of the unloaded engine to cool the engine before stop.			

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Stop time

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 240 [s]		
Default value	60 s	Force value	
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. The period starts by issuing stop command.			
<i>Note: Stop of engine is detected when all following conditions are met: RPM <2, Oil pressure < StartingPOil and D+ input isn't active.</i>			
<i>Note: Stop fail is detected if there is difference between those conditions.</i>			
<i>Note: In case when stop time period is lower than "stop engine detected" + 10 s, stop time period is extended to this value due to safety reason. (stop engine detected = RPM<2, OilP not detected, D+ not active)</i>			

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Running timer

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 1000 [min]		
Default value	0 min	Force value	
Step	1 min		
Comm object	11837	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Automatic engine stop in MAN mode, no function in AUT mode. Start engine in MAN mode by START button. Engine stops itself after Running Timer expires. Engine keeps running when Running Timer = 0.			

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Starting RPM

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	5 - 1500 [RPM]		
Default value	350 RPM	Force value	
Step	1 RPM		
Comm object	9095	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>“Firing” speed when IntelliDrive WP controller stops cranking (starter goes OFF).</p> <p>Sd Underspeed protection is activated when RPM drops back below the Starting RPM for more than 5 second the engine starting procedure.</p> <p>RPM meas fail indication</p> <p>Can appears during "Cranking state" i.e. Starter (or J1939 Start command) is activated then one running condition was detected (D+ was activated or (POil > Starting POil) condition was filled) - i.e. Starter was switched off based on previous condition and within time (Cranking time and fix 5s) minimum RPM does not appear (RPM > Starting RPM), then is activated RPM meas fail.</p> <p><i>Note: Limit is ignored when Gear teeth = 0 i.e. in engine operation without speed pickup (running state is indicated from D+ or Starting POil).</i></p>			

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Starting POil

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 10 [Bar]		
Default value	10 Bar	Force value	
Step	0.1 Bar		
Comm object	9681	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Controller stops cranking (starter goes OFF) when Oil Pressure (typically measured on AIN1) is over Starting POil.</p> <p><i>Note: Oil Pressure can be also measured on binary sensor. Then is necessary adjust AIN1 as Binary input and Starting POil=1.</i></p> <p><i>Note: There are three conditions for stop cranking: Starting RPM (just in case the Gear teeth > 0), StartingPOil and D+ (if enabled). Starter goes off when any of these conditions is valid.</i></p>			

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AfterCool time

Setpoint group	Engine params 2	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	0 s	Force value	
Step	1 s		
Comm object	8662	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Run time of engine after cooling pump. Binary output Cooling pump is closed when the engine starts and opens AfterCool time delayed after engine stops.			

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Fuel solenoid

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	[-]		
Default value	DIESEL	Force value	
Step	[-]		
Comm object	9100	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Setpoint setting determines behavior of the Binary output FUEL SOLENOID.			
DIESEL: Output closes 1 sec before Binary output STARTER.			
The output opens if Emergency stop comes or Cooled engine is stopped and in pause between repeated starts.			
GAS: In this mode of operation the output closes to open the gas valve and enable the engine to start. The delay of Fuel solenoid output activation in relation to Starter output is defined by FuelSol offset. The output closes only if RPM > 30 (i.e. the starter motor is engaged).			
The output opens if there is any reason to stop the engine or in pause between repeated starts.			
Note: In the case of gas engine, the undspeed protection cannot be blocked by the Sprinkler function.			
Note: For gas engines, it is strongly recommended to use the pick-up sensor, as non-zero RPM detection is required during the start procedure.			

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FuelSol offset

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 30 [s]		
Default value	0.5 s	Force value	
Step	0.1 s		
Comm object	10525	Related applications	
Config level	Standard		
Setpoint visibility	Always		

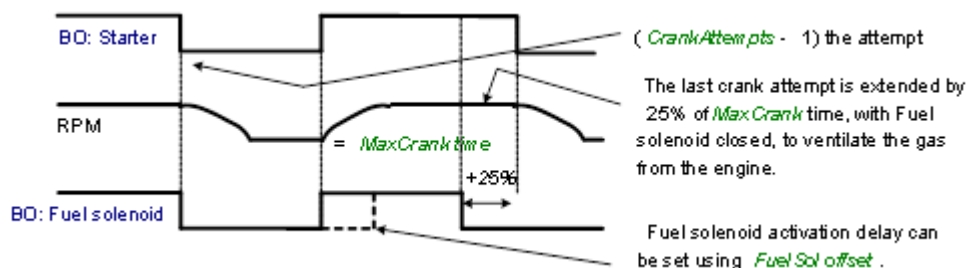
Description

This setpoint adjusts the Fuel solenoid output activation in relation to Starter output when Fuel solenoid = GAS. Setpoint values mean that fuel valve is opened after the Starter. FuelSol offset has effect for both Fuel solenoid = DIESEL or GAS.

Engine starting procedure when **Engine params: Fuel solenoid = GAS**



Note: A new feature has been added which prolongs the last cranking attempt by 25% of MaxCrank time with closed Fuel valve (Fuel Solenoid binary output) in order to ventilate the remaining gas, as is implemented in IG/IS-NT. This function is valid only when Engine params: Fuel solenoid = GAS



Note: Is modified functionality of the **Ignition** binary output. The Ignition binary output will close 1 second (fixed value) after activation of binary output Fuel solenoid (when Fuel solenoid = GAS setting is active). Generally, the output closes after reaching value of CrankRPM = 30RPM (fixed value). The output opens after stopping of the engine or during crank fail pauses among crank attempts.

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D+ function

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	[-]		
Default value	DISABLED	Force value	
Step	[-]		
Comm object	9683	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>ENABLED: The D+ terminal is used for both functions - “running engine” detection and charge fail detection.</p> <p>CHRGFAIL: The D+ terminal is used for charge fail detection only.</p> <p>DISABLED: The D+ terminal is not used. Default state.</p> <p><i>Note: The magnetization current is provided independently on this setpoint value.</i></p> <p><i>Note: The D+ charge fail protection becomes active after Engine params: Idle time reaches zero.</i></p>			

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ECU FreqSelect

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	[-]		
Default value	DEFAULT	Force value	
Step	[-]		
Comm object	10266	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>This setpoint should be used only for Volvo and Scania engines.</p> <p>Volvo – “Volvo Aux” is selected in ECU configuration:</p> <p>Primary or secondary engine speed is set by Frequency select bits in VP Status frame.</p> <p>Scania – “Scania S6 Singlespeed” is selected in ECU configuration:</p> <p>Nominal engine speed is chosen by Nominal speed switch 1 and 2 from DLN1 frame when the engine is running on nominal speed, i.e. binary output Idle/Nominal is active. When the output is not active (engine is running on Idle speed), the setpoint ECU FreqSelect is not taken into account.</p>			

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ECU Control

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	11086	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setpoint enables adjustment of the electronic engine control by following settings.</p> <p>ENABLED: There is a full available control of an electronic engine given by the setting of the ECU unit of the engine, i.e. Start request, Stop request, Speed request are enabled if available. Default state.</p> <p>DISABLED: Control of an electronic engine is fully blocked and the IntelliDrive WP can only monitor the values of an electronic engine.</p>			

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ECU SpeedAdj

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	MinSpeedLim - MaxSpeedLim [RPM]		
Default value	1500 RPM	Force value	
Step	1 RPM		
Comm object	13095	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Enables to adjust engine speed in ECU via CAN bus. Speed request value after the Idle time is over and no other speed selection is activated.</p> <p>Speed request in % range is calculated using the setpoints 0%ofSpeedReq and 100%ofSpeedReq.</p>			

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RetToSpeedAdj

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	[-]		
Default value	DISABLED	Force value	
Step	[-]		
Comm object	11838	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Selection among LBI Speed Sel1, 2, 3 behavior.			
DISABLED: Speed request is set by LBI Speed Sel1, 2, 3 (see appropriate setpoints) by rising edge (button, no switch) - i.e. Speed request stay constant after the input is opened and can be changed by BI Speed Up and Speed Down. Default state.			
ENABLED: Speed request goes to ECU SpeedAdj when the LBI Speed Sel1, 2, 3 are opened. Speed request can be changed by Binary inputs Speed Up and Speed Down when LBI Speed Sel1, 2, 3 are closed.			

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MinSpeedLim

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	Starting RPM - MaxSpeedLim [RPM]		
Default value	1200 RPM	Force value	
Step	1 RPM		
Comm object	10096	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint presets the minimum engine speed in the "Running" operation state. Also see other conditions in the chapter below.			

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MaxSpeedLim

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	MinSpeedLim - 4000 [RPM]		
Default value	2700 RPM	Force value	
Step	1 RPM		
Comm object	10097	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint presets the maximum engine speed in the "Running" operation state. Also see other conditions in the chapter below.			

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BI Speed Sel 1

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	MinSpeedLim - MaxSpeedLim [RPM]		
Default value	1200 RPM	Force value	
Step	1 RPM		
Comm object	10099	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint presets the required engine speed during the 'Speed Sel 1' binary input is active. Function depends on RetToSpeedAdj setting.			

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BI Speed Sel 2

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	MinSpeedLim - MaxSpeedLim [RPM]		
Default value	1300 RPM	Force value	
Step	1 RPM		
Comm object	10523	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint presets the required engine speed during the 'Speed Sel 2' binary input is active. Function depends on RetToSpeedAdj setting.			

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BI Speed Sel 3

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	MinSpeedLim - MaxSpeedLim [RPM]		
Default value	1450 RPM	Force value	
Step	1 RPM		
Comm object	10524	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint presets the required engine speed during the 'Speed Sel 3' binary input is active. Function depends on RetToSpeedAdj setting.			
<p>Note: When none of the binary inputs: 'Speed Sel1', 'Speed Sel2' and 'Speed Sel3', 'Speed Up' and 'Speed Down' has not been configured then engine speed is given by the 'Engine params: ECU SpeedAdj' setpoint.</p>			

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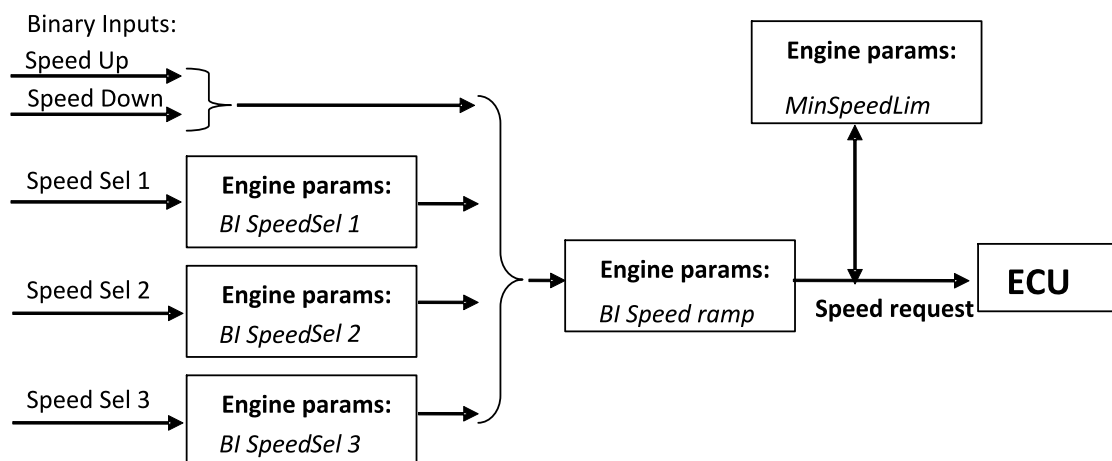
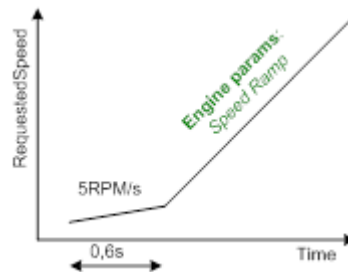
Speed Ramp

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	1 - MaxSpeedLim [RPM/s]		
Default value	50 RPM	Force value	
Step	1 RPM/s		
Comm object	10148	Related applications	
Config level	Standard		
Setpoint visibility	Always		

Description

Any Speed request change is done via this Ramp function. The Ramp via Binary SpeedUp and SpeedDown inputs is dual rate, see below.

The Binary inputs SpeedUp and SpeedDown ramp function is for the 0.6s constant 5RPM/s. Does not depend on Engine params: Speed Ramp setting. This enables fine setting of Engine speed to specific value e.g. 1500 RPM.



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0%ofSpeedReq

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 3000 [RPM]		
Default value	0 RPM	Force value	
Step	1 RPM		
Comm object	11125	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit for Speed Request transformation from RPM to % range for ECU engines using % format. See practical example below.			
Practical example:			
If ECU is configured, then on one of the measurement screen you can see two lines SpeedReq Abs and SpeedReq Rel.			
In default setting:			
0RPM = 0%			
800RPM = 33.3%			
2400RPM = 100%			
Different setting:			
800RPM = 0%			
1200RPM = 33.3%			
2400RPM = 100%			
It is possible easily configure own output curve and use it for analog output Speed Request.			

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100%ofSpeedReq

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 4000 [RPM]		
Default value	2400 RPM	Force value	
Step	1 RPM		
Comm object	11126	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit for Speed Request transformation from RPM to % range for ECU engines using % format.			

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Conveyor horn

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 600 [s]		
Default value	7 s	Force value	
Step	1 s		
Comm object	11835	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Horn time before the conveyor output starts.			

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FuelTankVolume

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 1000 [L]		
Default value	200 L	Force value	
Step	1 L		
Comm object	11103	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is describing volume of fuel tank for counting fuel consumption depending on Fuel level drop.			

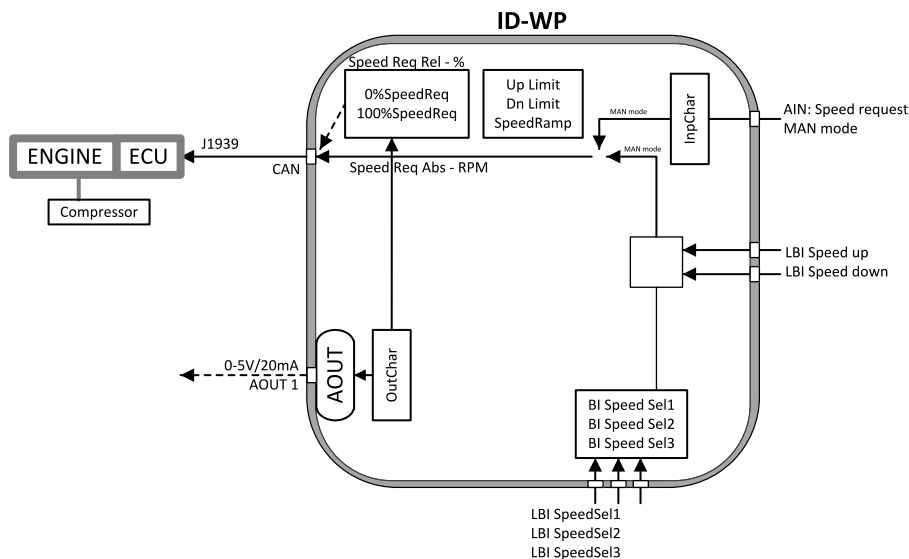
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MaxFuelDrop

Setpoint group	Engine params	Related FW	1.0.0
Range [units]	0 - 50 [%/h]		
Default value	25 %/h	Force value	
Step	1 %/h		
Comm object	12373	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>This is setting protection against the fuel leakage or theft.</p> <p>Function monitors the AIN3 Fuel level value in percentage scale without decimals. The alarm and history record "Wrn FuelTheft" is activated when Fuel level change is faster than setpoint limit. Function is switched off when Max Fuel Drop = 0 %/h.</p> <p>The drop out limit on stopped engine is 5% to avoid unwanted Alarm activation due to AIN3: Fuel level fluctuations.</p> <p>Active alarm "Wrn FuelTheft" can be sent via SMS and displayed by WebSupervisor (if used).</p> <p>Note: Set 0 to disable Fuel Theft Protection function into MaxFuelDrop setpoint.</p>			

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10.1.6 Group: Regulator



Reg Input

Setpoint group	Regulator	Related FW	1.0.0
Range [units]	[-]		
Default value	CU:A11	Force value	
Step	[-]		
Comm object	11843	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
PI loop analog input selection. Source can be adjusted from controller analog inputs or from extension module inputs. It is also possible to use Binary input 3 in function of RPM detection. The Speed request (regulator output) is assigned to Reg Bias value in the case of selected analog input sensor fail.			

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Reg Bias

Setpoint group	Regulator	Related FW	1.0.0
Range [units]	0 - 10000 [-]		
Default value	0	Force value	
Step	1		
Comm object	11848	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Constant PI regulator output when the LBI R Reg Disable = closed.			

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Request 1

Setpoint group	Regulator	Related FW	1.0.0
Range [units]	-10000 - +10000 [-]		
Default value	0	Force value	
Step	1		
Comm object	11844	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Regulator requested value.			

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Request 2

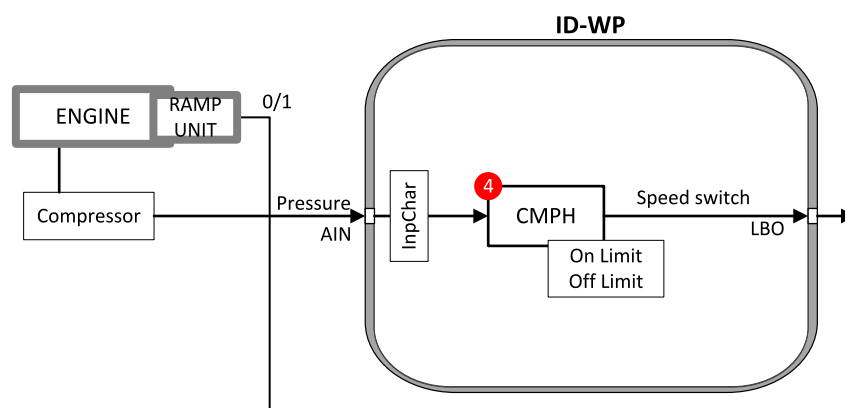
Setpoint group	Regulator	Related FW	1.0.0
Range [units]	-10000 - +10000 [-]		
Default value	0	Force value	
Step	1		
Comm object	11845	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Regulator requested value when LBI Request2 is active.			

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Reg CMP Input

Setpoint group	Regulator	Related FW	1.0.0
Range [units]	[-]		
Default value	CU:AI1	Force value	
Step	[-]		
Comm object	11839	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			

This is comparator with hysteresis analog input selection from controller analog inputs or from extension module inputs. It is also possible to use Binary input 3 in function of RPM detection.



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Reg CMP On

Setpoint group	Regulator	Related FW	1.0.0
Range [units]	-10000 - +10000 [-]		
Default value	0	Force value	
Step	1		
Comm object	11841	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit to close LBO SpeedSwitch.			

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Reg CMP Off

Setpoint group	Regulator	Related FW	1.0.0
Range [units]	-10000 - +10000 [-]		
Default value	0	Force value	
Step	1		
Comm object	11840	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit to open the LBO SpeedSwitch.			

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LAI SpdRequest

Setpoint group	Regulator	Related FW	1.0.0
Range [units]	[-]		
Default value	OFF	Force value	
Step	[-]		
Comm object	11842	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Setpoint is determined for selection of analog input for Speed request in the controller's MAN mode.			
OFF: Speed request selection is done by binary inputs. Default state.			
CU: AI1-CU: AI9: Speed request via analog input of the controller only. Binary inputs are ignored.			
AIO :1-AIO4: Speed request via analog input of extension module IL-NT-AIO only. Binary inputs are ignored.			
Note: Analog speed request is ignored in AUT mode.			

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Reg Gain

Setpoint group	Regulator	Related FW	1.0.0
Range [units]	-200 - +200 [%]		
Default value	10 %	Force value	
Step	0.1 %		
Comm object	11846	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is giving regulator gain factor. See Hint below.			

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Reg Integral

Setpoint group	Regulator	Related FW	1.0.0
Range [units]	0 - +100 [%]		
Default value	10 %	Force value	
Step	0.1 %		
Comm object	11847	Related applications	
Config level	Standard		
Setpoint visibility	Always		

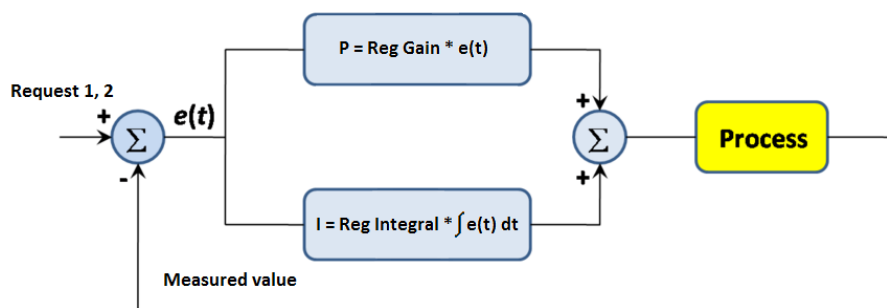
Description

This setpoint is giving regulator integration factor.

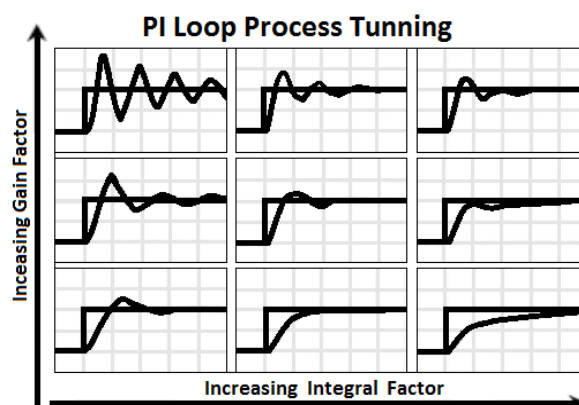
Note: IntelDrive WP controllers include PI loop for speed or analog output regulation. The requested value is given by setpoints Request 1, 2. This loop is working like Proportional-Integral regulation with setpoints Reg Gain and Reg Integral for each part and these parts affect each other.

Note: The controller output is given by: $\text{Reg Gain} * e(t) + \text{Reg Integral} * \int e(t) dt$,

Note: where $e(t)$ is deviation of actual value $e(t) = \text{Request 1, 2} - \text{Measured value}$.

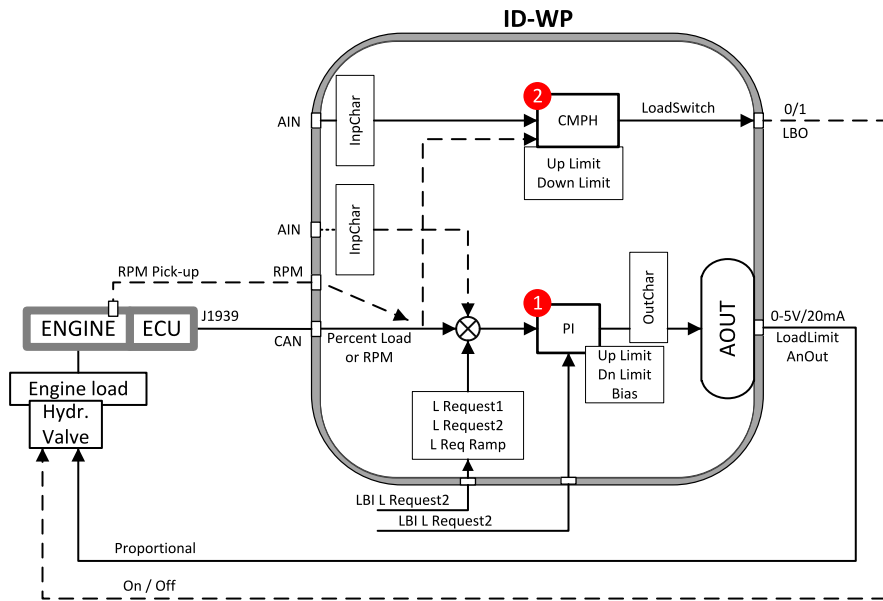


Here are two tuning parameters that can be adjusted Reg Gain and Reg Integral. These parameters interact each other, see the graphic below. Picture shows how differences in Gain and Integral can affect PI loop's responsiveness. The central pic is as base case with fast change with minimum oscillations to required level. Upper left graph shows high gain and low integral values, what produce large oscillation with slow smoothing. Opposite case is on the lower right graph, which shows low gain and high integral values. The response of the system is sluggish.



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10.1.7 Group: Load limit



Load input

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	[-]		
Default value	RPM	Force value	
Step	[-]		
Comm object	11850	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is for Load limit PI loop analog input selection. Source can be adjusted from controller RPM pick-up, ECU, analog inputs or from extension module inputs			

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Load Bias

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	0 - 10000 [-]		
Default value	0	Force value	
Step	1		
Comm object	11851	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Constant Load limit PI regulator output. Load Bias is activated when			
<ul style="list-style-type: none"> ▶ Engine Sd protection is activated ▶ LBI LoadRegDisable = closed ▶ Load input value is invalid (Sensor Fail) 			

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LoadRequest 1

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	-10000 - +10000 [-]		
Default value	0	Force value	
Step	1		
Comm object	11852	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Regulator requested value.			

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LoadRequest 2

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	-10000 - +10000 [-]		
Default value	0	Force value	
Step	1		
Comm object	11853	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Regulator requested value when LBI LoadRequest2 is active			

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LoadReq Ramp

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	1 - 10000 [1/s]		
Default value	1 1/s	Force value	
Step	1 1/s		
Comm object	11854	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Ramp when is switched between LoadRequest 1 and LoadRequest 2.			

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LoadUpLimit

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	0 - 10000		
Default value	0	Force value	
Step	1		
Comm object	11855	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Load limit regulator PI output upper limit.			

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LoadDnLimit

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	0 - 10000		
Default value	0	Force value	
Step	1		
Comm object	11855	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Load limit regulator PI output low limit.			

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Load Gain

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	-200 - +200 [%]		
Default value	10 %	Force value	
Step	0.1 %		
Comm object	11857	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This is setpoint is giving Load limit gain factor.			

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Load Integral

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	0 - +100 [%]		
Default value	10 %	Force value	
Step	0.1 %		
Comm object	11858	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is giving Load limit integration factor.			

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Load CMP Input

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	[-]		
Default value	RPM	Force value	
Step	[-]		
Comm object	11859	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is for Load limit comparetor with hysteresis analog input selection. Source can be adjusted from controller RPM pick-up, ECU, analog inputs or from extension module inputs.			

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Load CMP Off

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	-10000 - +10000 [-]		
Default value	90	Force value	
Step	1		
Comm object	11860	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit to close LBO LoadSwitch			

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Load CMP On

Setpoint group	Load limit	Related FW	1.0.0
Range [units]	-10000 - +10000 [-]		
Default value	90	Force value	
Step	1		
Comm object	11861	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit to open LBO LoadSwitch			

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10.1.8 Group: Engine protect

Overspeed

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	50 - 150 [%]		
Default value	115 %	Force value	
Step	1 % of nominal RPM		
Comm object	8263	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit for engine ShutDown overspeed protection.			

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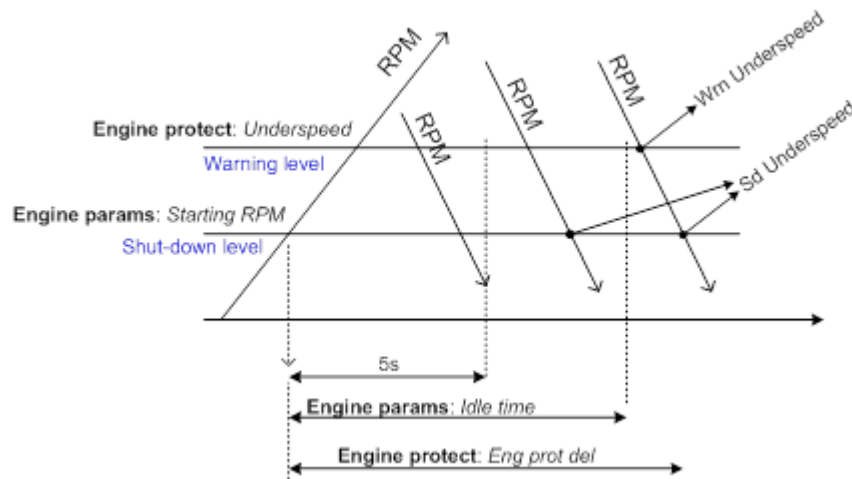
Underspeed

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	Starting RPM - 100 [%]		
Default value	25 %	Force value	
Step	1 % of nominal RPM		
Comm object	8260	Related applications	
Config level	Standard		
Setpoint visibility	Always		

Description

Limit for Warning Underspeed protection. Active protection is indicated as “Wm Underspeed” in Alarm list. Under speed Warning protection is inactive 5s after RPM is over **Engine params: Starting RPM** and during the Idle time.

The “Ready to load” output is deactivated when Wm underspeed protection is active and needs the Fault reset for activation after RPM is over Underspeed limit.



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Flow SwitchDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 600 [s]		
Default value	30 s	Force value	
Step	1 s		
Comm object	12620	Related applications	
Config level	Standard		
Setpoint visibility	Always		

Description

Engine is switched to Cooling state when Binary input FlowSwitch is not closed within Flow SwitchDel after „Running“ (Ready to load) engine state activation.

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Sd Override

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	[-]		
Default value	DISABLED	Force value	
Step	[-]		
Comm object	14603	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setting ENABLED disables all engine protections. They are just displayed on alarm list and recorded to history, but they have no influence to running engine. The setting ENABLED is indicated in the alarm list as warning SdOverride Act and recorded to history as record SdOverride Act.</p>			

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AIN1 prot

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	14653	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setting DISABLED disables all configured protections, except Overspeed and Emergency Stop. It is indicated in the alarm list by warning Prot AIN1 dis. Each configuration change is recorded in history, records: Prot AIN1 dis and Prot AIN1 ena.</p> <p>Setpoint name depends on setting of AIN1 (maximum length is 14 characters).</p>			

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AIN1 Wrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	-10 - +1000 [Bar]		
Default value	2 Bar	Force value	
Step	0.1 Bar		
Comm object	8369	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Warning limit level for ANALOG INPUT 1</p> <p>Setpoint name depends on setting of AIN1 (maximum length is 14 characters).</p>			

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AIN1 Sd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	-10 - +1000 [Bar]		
Default value	1 Bar	Force value	
Step	0.1 Bar		
Comm object	8370	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for ANALOG INPUT 1.			
Setpoint name depends on setting of AIN1 (maximum length is 14 characters).			

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AIN1 Del

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 180 [s]		
Default value	3 s	Force value	
Step	1 s		
Comm object	8365	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for ANALOG INPUT 1			
Setpoint name depends on setting of AIN1 (maximum length is 14 characters).			
<p>Note: Analog input 1 is usually determined to Oil Pressure measurement and it is resistive type of input with range 0-2500 Ohm.</p>			

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AIN2 prot

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	14654	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setting DISABLED disables all configured protections, except Overspeed and Emergency Stop. It is indicated in the alarm list by warning Prot AIN2 dis. Each configuration change is recorded in history, records: Prot AIN2 dis and Prot AIN2 ena.</p> <p>Setpoint name depends on setting of AIN2 (maximum length is 14 characters).</p>			

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AIN2 Wrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	-100 - 10000 [°C]		
Default value	90°C	Force value	
Step	1 °C		
Comm object	8375	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Warning limit level for ANALOG INPUT 2</p> <p>Setpoint name depends on setting of AIN2 (maximum length is 14 characters).</p>			

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AIN2 Sd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	-100 - 10000 [°C]		
Default value	90 °C	Force value	
Step	1 °C		
Comm object	8376	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Shutdown limit level for ANALOG INPUT 2</p> <p>Setpoint name depends on setting of AIN2 (maximum length is 14 characters).</p>			

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AIN2 Del

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 180 [s]		
Default value	5 s	Force value	
Step	1 s		
Comm object	8371	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Delay for ANALOG INPUT 2 alarm.</p> <p>Setpoint name depends on setting of AIN2 (maximum length is 14 characters).</p> <p>Note: Analog input 2 is usually determined to Engine Temperature measurement and it is resistive type of input with range 0-2500 Ohm.</p>			

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AIN3 prot

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	14655	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setting DISABLED disables all configured protections, except Overspeed and Emergency Stop. It is indicated in the alarm list by warning Prot AIN3 dis. Each configuration change is recorded in history, records: Prot AIN3 dis and Prot AIN3 ena.</p> <p>Setpoint name depends on setting of AIN3 (maximum length is 14 characters).</p>			

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AIN3 Wrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	-100 - +10000 [%]		
Default value	20 %	Force value	
Step	1 %		
Comm object	8381	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for ANALOG INPUT 3			
Setpoint name depends on setting of AIN3 (maximum length is 14 characters).			

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AIN3 Sd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	-100 - +10000 [%]		
Default value	10 %	Force value	
Step	1 %		
Comm object	8382	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for ANALOG INPUT 3			
Setpoint name depends on setting of AIN3 (maximum length is 14 characters).			

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AIN3 Del

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 180 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	8377	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for ANALOG INPUT 3			
Setpoint name depends on setting of AIN3 (maximum length is 14 characters).			
<p>Note: Analog input 3 is usually determined to Fuel Level measurement and it is resistive type of input with range 0-2500 Ohm.</p>			

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Batt overvolt

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	Batt undervolt - 40 [V]		
Default value	36 V	Force value	
Step	0.1 V		
Comm object	9587	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High battery voltage Warning limit			

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Batt undervolt

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	8 - Batt overvolt [V]		
Default value	18 V	Force value	
Step	0.1 V		
Comm object	8387	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low battery voltage Warning limit.			

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Batt volt del

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 600 [s]		
Default value	5 s	Force value	
Step	1 s		
Comm object	8383	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for low and high battery voltage alarm.			

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AIN4 prot

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	14656	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setting DISABLED disables all configured protections, except Overspeed and Emergency Stop. It is indicated in the alarm list by warning Prot AIN4 dis. Each configuration change is recorded in history, records: Prot AIN4 dis and Prot AIN4 ena.</p> <p>Setpoint name depends on setting of AIN4 (maximum length is 14 characters).</p>			

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AIN4 Wrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U16]		
Default value	20 U16	Force value	
Step	1 U16		
Comm object	9271	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Warning limit level for AIN4</p> <p>Setpoint name depends on setting of AIN4 (maximum length is 14 characters).</p>			

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AIN4 Sd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U16]		
Default value	10 U16	Force value	
Step	1 U16		
Comm object	9272	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Shutdown limit level for AIN4</p> <p>Setpoint name depends on setting of AIN4 (maximum length is 14 characters).</p>			

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AIN4 Del

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	30 s	Force value	
Step	1 s		
Comm object	9273	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wrn/Sd AIN4 alarm.			
Setpoint name depends on setting of AIN4 (maximum length is 14 characters).			

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AIN4 LowWrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U16]		
Default value	20 U16	Force value	
Step	1 U16		
Comm object	13365	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low Warning limit level for AIN4			
Setpoint name depends on setting of AIN4 (maximum length is 14 characters).			

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AIN4 LowSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U16]		
Default value	10 U16	Force value	
Step	1 U16		
Comm object	13366	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low ShutDown limit level for AIN4			
Setpoint name depends on setting of AIN4 (maximum length is 14 characters).			

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AIN4 LowDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	13367	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low level protection delay for Wrm and Sd of AIN4			
Setpoint name depends on setting of AIN4 (maximum length is 14 characters).			

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AIN4 HighWrm

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U16]		
Default value	20 U16	Force value	
Step	1 U16		
Comm object	13368	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High Warning limit level for AIN4			
Setpoint name depends on setting of AIN4 (maximum length is 14 characters).			

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AIN4 HighSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U16]		
Default value	10 U16	Force value	
Step	1 U16		
Comm object	13369	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High ShutDown limit level for AIN4			
Setpoint name depends on setting of AIN4 (maximum length is 14 characters).			

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AIN4 HighDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	13370	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High level protection delay for Wrm and Sd of AIN4			
Setpoint name depends on setting of AIN4 (maximum length is 14 characters).			
<i>Note: Analog input 4 is fully configurable and it is voltage type of input with range 0-40V</i>			

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AIN5 prot

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	14657	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setting DISABLED disables all configured protections, except Overspeed and Emergency Stop. It is indicated in the alarm list by warning Prot AIN5 dis. Each configuration change is recorded in history, records: Prot AIN5 dis and Prot AIN5 ena.			
Setpoint name depends on setting of AIN5 (maximum length is 14 characters).			

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AIN5 Wrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U17]		
Default value	20 U17	Force value	
Step	1 U17		
Comm object	9274	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for AIN5			
Setpoint name depends on setting of AIN5 (maximum length is 14 characters).			

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AIN5 Sd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U17]		
Default value	50 U17	Force value	
Step	1 U17		
Comm object	9275	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for AIN5			
Setpoint name depends on setting of AIN5 (maximum length is 14 characters).			

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AIN5 Del

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	30 s	Force value	
Step	1 s		
Comm object	9276	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wrm/Sd AIN5 alarm.			
Setpoint name depends on setting of AIN5 (maximum length is 14 characters).			

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AIN5 LowWrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U17]		
Default value	20 U17	Force value	
Step	1 U17		
Comm object	13353	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low Warning limit level for AIN5			
Setpoint name depends on setting of AIN5 (maximum length is 14 characters).			

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AIN5 LowSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U17]		
Default value	10 U17	Force value	
Step	1 U17		
Comm object	13354	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low ShutDown limit level for AIN5			
Setpoint name depends on setting of AIN5 (maximum length is 14 characters).			

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AIN5 LowDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	13355	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low level protection delay for Wrn and Sd of AIN5			
Setpoint name depends on setting of AIN5 (maximum length is 14 characters).			

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AIN5 HighWrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U17]		
Default value	20 U17	Force value	
Step	1 U17		
Comm object	13356	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High Warning limit level for AIN5			
Setpoint name depends on setting of AIN5 (maximum length is 14 characters).			

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AIN5 HighSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U17]		
Default value	10 U17	Force value	
Step	1 U17		
Comm object	13357	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High ShutDown limit level for AIN5			
Setpoint name depends on setting of AIN5 (maximum length is 14 characters).			

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AIN5 HighDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	13358	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High level protection delay for Wm and Sd of AIN5			
Setpoint name depends on setting of AIN5 (maximum length is 14 characters).			
<i>Note: Analog input 5 is fully configurable and it is voltage type of input with range 0-40V</i>			

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AIN6 prot

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	14658	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setting DISABLED disables all configured protections, except Overspeed and Emergency Stop. It is indicated in the alarm list by warning Prot AIN6 dis. Each configuration change is recorded in history, records: Prot AIN6 dis and Prot AIN6 ena.			
Setpoint name depends on setting of AIN6 (maximum length is 14 characters).			

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AIN6 Wrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U12]		
Default value	20 U12	Force value	
Step	1 U12		
Comm object	9259	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for AIN6			
Setpoint name depends on setting of AIN6 (maximum length is 14 characters).			

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AIN6 Sd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U12]		
Default value	10 U12	Force value	
Step	1 U12		
Comm object	9260	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for AIN6			
Setpoint name depends on setting of AIN6 (maximum length is 14 characters).			

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AIN6 Del

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	9261	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wrn/Sd AIN6 alarm.			
Setpoint name depends on setting of AIN6 (maximum length is 14 characters).			

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AIN6 LowWrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U12]		
Default value	20 U12	Force value	
Step	1 U12		
Comm object	13359	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low Warning limit level for AIN6			
Setpoint name depends on setting of AIN6 (maximum length is 14 characters).			

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AIN6 LowSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U12]		
Default value	10 U12	Force value	
Step	1 U12		
Comm object	13360	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low ShutDown limit level for AIN6			
Setpoint name depends on setting of AIN6 (maximum length is 14 characters).			

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AIN6 LowDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	13361	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low level protection delay for Wrn and Sd of AIN6			
Setpoint name depends on setting of AIN6 (maximum length is 14 characters).			

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AIN6 HighWrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U12]		
Default value	20 U12	Force value	
Step	1 U12		
Comm object	13350	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High Warning limit level for AIN6			
Setpoint name depends on setting of AIN6 (maximum length is 14 characters).			

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AIN6 HighSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U12]		
Default value	10 U12	Force value	
Step	1 U12		
Comm object	13351	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High ShutDown limit level for AIN6			
Setpoint name depends on setting of AIN6 (maximum length is 14 characters).			

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AIN6 HighDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	13352	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High level protection delay for Wm and Sd of AIN6			
Setpoint name depends on setting of AIN6 (maximum length is 14 characters).			
Note: Analog input 6 is fully configurable and it is voltage type of input with range 0-10V			

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AIN7 prot

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	15645	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setting DISABLED disables all configured protections, except Overspeed and Emergency Stop. It is indicated in the alarm list by warning Prot AIN7 dis. Each configuration change is recorded in history, records: Prot AIN7 dis and Prot AIN7 ena.</p> <p>Setpoint name depends on setting of AIN7 (maximum length is 14 characters).</p>			

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AIN7 Wrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U27]		
Default value	20 U27	Force value	
Step	1 U27		
Comm object	9277	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Warning limit level for AIN7</p> <p>Setpoint name depends on setting of AIN7 (maximum length is 14 characters).</p>			

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AIN7 Sd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U27]		
Default value	10 U27	Force value	
Step	1 U27		
Comm object	9278	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Shutdown limit level for AIN7</p> <p>Setpoint name depends on setting of AIN7 (maximum length is 14 characters).</p>			

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AIN7 Del

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	9279	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wrn/Sd AIN7 alarm.			
Setpoint name depends on setting of AIN7 (maximum length is 14 characters).			

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AIN7 LowWrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U27]		
Default value	20 U27	Force value	
Step	1 U27		
Comm object	9286	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low Warning limit level for AIN7			
Setpoint name depends on setting of AIN7 (maximum length is 14 characters).			

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AIN7 LowSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U27]		
Default value	10 U27	Force value	
Step	1 U27		
Comm object	9287	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low ShutDown limit level for AIN7			
Setpoint name depends on setting of AIN7 (maximum length is 14 characters).			

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AIN7 LowDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	9288	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low level protection delay for Wrm and Sd of AIN7			
Setpoint name depends on setting of AIN7 (maximum length is 14 characters).			

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AIN7 HighWrm

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U27]		
Default value	20 U27	Force value	
Step	1 U27		
Comm object	9289	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High Warning limit level for AIN7			
Setpoint name depends on setting of AIN7 (maximum length is 14 characters).			

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AIN7 HighSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U27]		
Default value	10 U27	Force value	
Step	1 U27		
Comm object	9287	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High ShutDown limit level for AIN7			
Setpoint name depends on setting of AIN7 (maximum length is 14 characters).			

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AIN7 HighDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	9291	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High level protection delay for Wrm and Sd of AIN7			
Setpoint name depends on setting of AIN7 (maximum length is 14 characters).			
<i>Note: Analog input 7 is fully configurable and it is voltage type of input with range 0-10V</i>			

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AIN8 prot

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	15646	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setting DISABLED disables all configured protections, except Overspeed and Emergency Stop. It is indicated in the alarm list by warning Prot AIN8 dis. Each configuration change is recorded in history, records: Prot AIN8 dis and Prot AIN8 ena.			
Setpoint name depends on setting of AIN8 (maximum length is 14 characters).			

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AIN8 Wrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U28]		
Default value	20 U28	Force value	
Step	1 U28		
Comm object	9280	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for AIN8			
Setpoint name depends on setting of AIN8 (maximum length is 14 characters).			

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AIN8 Sd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U28]		
Default value	10 U28	Force value	
Step	1 U28		
Comm object	9281	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for AIN8			
Setpoint name depends on setting of AIN8 (maximum length is 14 characters).			

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AIN8 Del

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	9282	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wrm/Sd AIN8 alarm.			
Setpoint name depends on setting of AIN8 (maximum length is 14 characters).			

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AIN8 LowWrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U28]		
Default value	20 U28	Force value	
Step	1 U28		
Comm object	9292	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low Warning limit level for AIN8			
Setpoint name depends on setting of AIN8 (maximum length is 14 characters).			

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AIN8 LowSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U28]		
Default value	10 U28	Force value	
Step	1 U28		
Comm object	9293	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low ShutDown limit level for AIN8			
Setpoint name depends on setting of AIN8 (maximum length is 14 characters).			

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AIN8 LowDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	9294	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low level protection delay for Wrn and Sd of AIN8			
Setpoint name depends on setting of AIN8 (maximum length is 14 characters).			

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AIN8 HighWrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U28]		
Default value	20 U28	Force value	
Step	1 U28		
Comm object	9295	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High Warning limit level for AIN8			
Setpoint name depends on setting of AIN8 (maximum length is 14 characters).			

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AIN8 HighSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U28]		
Default value	10 U28	Force value	
Step	1 U28		
Comm object	9296	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High ShutDown limit level for AIN8			
Setpoint name depends on setting of AIN8 (maximum length is 14 characters).			

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AIN8 HighDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	9297	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High level protection delay for Wrm and Sd of AIN8			
Setpoint name depends on setting of AIN8 (maximum length is 14 characters).			
<i>Note: Analog input 8 is fully configurable and it is voltage type of input with range 0-10V</i>			

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AIN9 prot

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	15647	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setting DISABLED disables all configured protections, except Overspeed and Emergency Stop. It is indicated in the alarm list by warning Prot AIN9 dis. Each configuration change is recorded in history, records: Prot AIN9 dis and Prot AIN9 ena.			
Setpoint name depends on setting of AIN9 (maximum length is 14 characters).			

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AIN9 Wrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U29]		
Default value	20 U29	Force value	
Step	1 U29		
Comm object	9283	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for AIN9			
Setpoint name depends on setting of AIN9 (maximum length is 14 characters).			

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AIN9 Sd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U29]		
Default value	10 U29	Force value	
Step	1 U29		
Comm object	9284	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for AIN9			
Setpoint name depends on setting of AIN9 (maximum length is 14 characters).			

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AIN9 Del

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	9285	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wrn/Sd AIN9 alarm.			
Setpoint name depends on setting of AIN9 (maximum length is 14 characters).			

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AIN9 LowWrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U29]		
Default value	20 U29	Force value	
Step	1 U29		
Comm object	9298	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low Warning limit level for AIN9			
Setpoint name depends on setting of AIN9 (maximum length is 14 characters).			

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AIN9 LowSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U29]		
Default value	10 U29	Force value	
Step	1 U29		
Comm object	9299	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low ShutDown limit level for AIN9			
Setpoint name depends on setting of AIN9 (maximum length is 14 characters).			

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AIN9 LowDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	9300	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low level protection delay for Wrn and Sd of AIN9			
Setpoint name depends on setting of AIN9 (maximum length is 14 characters).			

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AIN9 HighWrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U29]		
Default value	20 U29	Force value	
Step	1 U29		
Comm object	9301	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High Warning limit level for AIN9			
Setpoint name depends on setting of AIN9 (maximum length is 14 characters).			

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AIN9 HighSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 10000 [U29]		
Default value	10 U29	Force value	
Step	1 U29		
Comm object	9302	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High ShutDown limit level for AIN9			
Setpoint name depends on setting of AIN9 (maximum length is 14 characters).			

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AIN9 HighDel

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	9303	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High level protection delay for Wm and Sd of AIN9			
Setpoint name depends on setting of AIN9 (maximum length is 14 characters).			
Note: Analog input 9 is fully configurable and it is voltage type of input with range 0-10V			

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NextServTime

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 65535 [h]		
Default value	10000 h	Force value	
Step	1 h		
Comm object	9648	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Counting down when engine is running. Service time alarm appears if reaches zero. By setting the value of 65535h the count down is disabled.			
<p>Note: Set the NextServTime = 65535h to disable count down. The setpoint stays constant, but Statistics value (visible in LiteEdit) displays ##### invalid value.</p>			

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Eng prot del

Setpoint group	Engine protect 2	Related FW	1.0.0
Range [units]	0 - 300 [s]		
Default value	5 s	Force value	
Step	1 s		
Comm object	8262	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
During the start of the engine, some engine protections have to be blocked (e.g. Oil pressure). The protections are unblocked after the Protection del time. The time starts after reaching Start RPM.			

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BIN1 Delay

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	0 s	Force value	
Step	1 s		
Comm object	10131	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Five setpoints are dedicated for separately adjustment of the delay for each of binary inputs according to the Class B protection standard.			
<p>Note: The corresponding BIN protection has to be configured as Running only in LiteEdit.</p>			

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BIN2 Delay

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	0 s	Force value	
Step	1 s		
Comm object	10132	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Five setpoints are dedicated for separately adjustment of the delay for each of binary inputs according to the Class B protection standard.			
<i>Note: The corresponding BIN protection has to be configured as Running only in LiteEdit.</i>			

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BIN3 Delay

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	0s	Force value	
Step	1 s		
Comm object	10133	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Five setpoints are dedicated for separately adjustment of the delay for each of binary inputs according to the Class B protection standard.			
<i>Note: The corresponding BIN protection has to be configured as Running only in LiteEdit.</i>			

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BIN4 Delay

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	0 s	Force value	
Step	1 s		
Comm object	14629	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Five setpoints are dedicated for separately adjustment of the delay for each of binary inputs according to the Class B protection standard.			
<i>Note: The corresponding BIN protection has to be configured as Running only in LiteEdit.</i>			

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BIN5 Delay

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 3600 [s]		
Default value	0 s	Force value	
Step	1 s		
Comm object	14649	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Five setpoints are dedicated for separately adjustment of the delay for each of binary inputs according to the Class B protection standard.			
<i>Note: The corresponding BIN protection has to be configured as Running only in LiteEdit.</i>			

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Horn timeout

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 600 [s]		
Default value	10 s	Force value	
Step	1 s		
Comm object	8264	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Max time limit of horn sounding. Set to zero if you want to leave the output HORN open. Horn timeout starts again from the beginning if a new alarm appears before previous Horn timeout has elapsed.			

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StartOverspeed

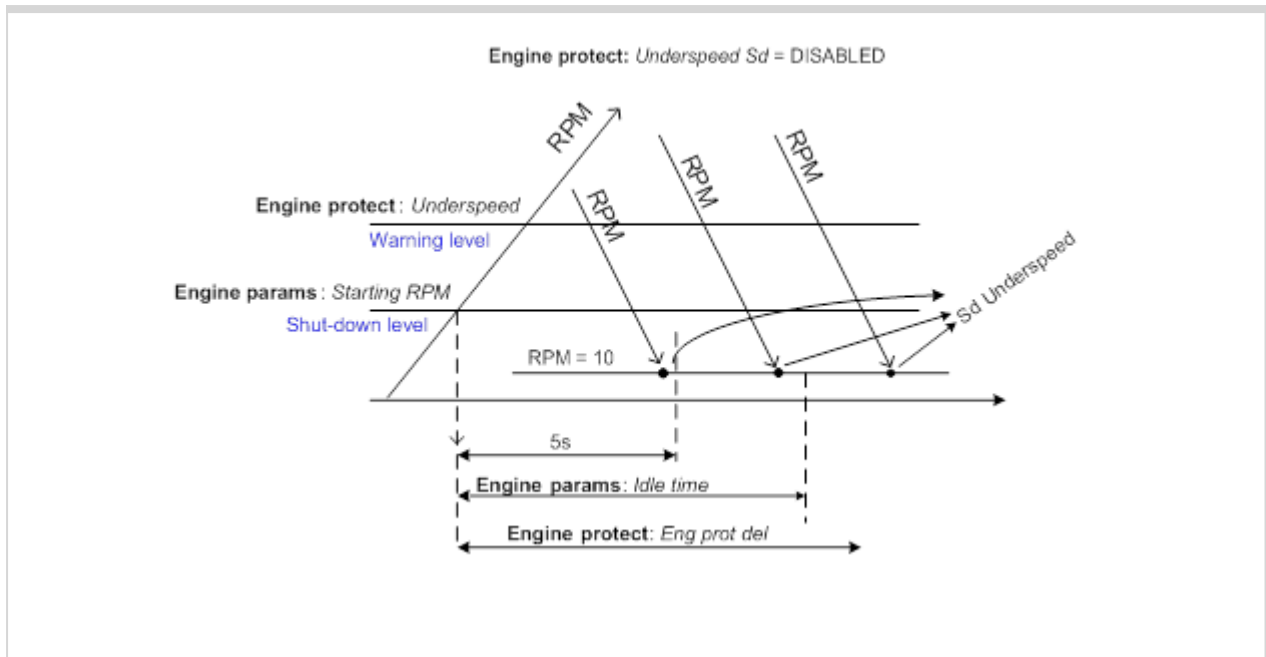
Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	50 - 150 [%]		
Default value	120 %	Force value	
Step	1 %		
Comm object	13340	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit for engine ShutDown overspeed protection. Protection is active during start process of the engine and Idle time.			
<p>Note: <i>The engine can spasmodically reach higher than Overspeed level during start, but for normal running state would be this protection too high. This setpoint allows the overspeed protection during irregular starting condition.</i></p>			

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UnderspeedSd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	11415	Related applications	
Config level	Standard		

Setpoint visibility	Always			
Description				
<p>DISABLED: Disables the Wm Underspeed protection when engine RPM drops below Engine protect: Underspeed and SdUnderspeed protection in case the engine RPM drops below the Engine params: Starting RPM.</p> <p>ENABLED: Function as on the picture above. Default state.</p> <p>Tables below describe Underspeed protection behavior depends on Underspeed Sd setpoint setting and RPM value.</p> <p>Engine protect: Underspeed Sd = ENABLED</p>				
RPM <	Engine State	AlarmList	History	ReadyToLoad
Engine protect: Underspeed	Idle	-	-	Off
	Running	Wm Underspeed	-	On → Off
Engine param: Starting RPM	Idle	Sd Underspeed	Sd Underspeed	Off
	Running	Sd Underspeed	Sd Underspeed	Off
Engine protect: Underspeed Sd = DISABLED				
RPM <	Engine State	AlarmList	History	ReadyToLoad
Engine protect: Underspeed	Idle	-	-	Off
	Running	-	-	On
Engine param: Starting RPM	Idle	-	-	Off
	Running	-	-	On
10 RPM	Idle	Sd Underspeed	Sd Underspeed	On → Off
10 RPM	Running	Wm Underspeed Sd Underspeed	Sd Underspeed	On → Off



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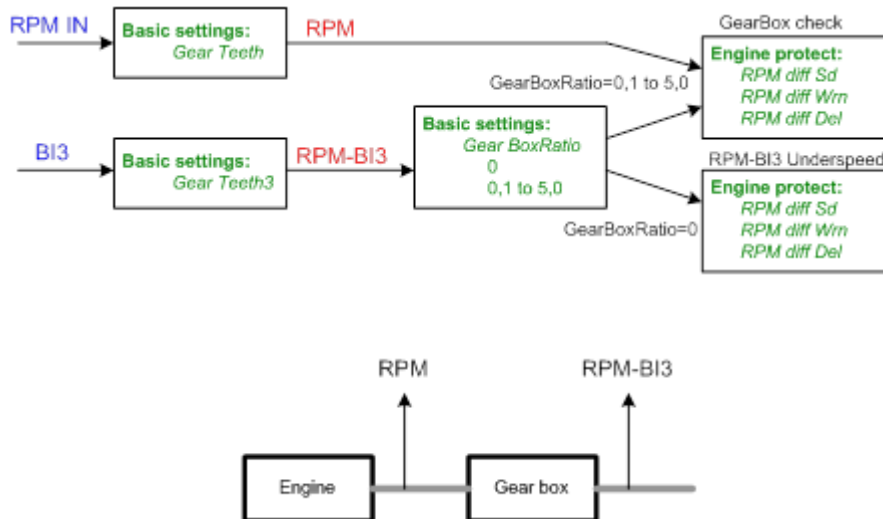
GearBoxRatio

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 5 [RPM]		
Default value	0 RPM	Force value	
Step	0.1 RPM		
Comm object	8708	Related applications	
Config level	Standard		
Setpoint visibility	Always		

Description

There are two new protections related to RPM-BI3 where functions Engine protect: RPMdiff Sd, RPMdiff Wm limits depends on setting of GearBoxRatio:

- ▶ Separate RPM-BI3 underspeed Wm and Sd protection when Engine protect: GearBoxRatio = 0.0
- ▶ Difference check between RPM and RPM3 with calculation of gear-box ratio, when Engine protect: GearBoxRatio > 0.0. Protection is active when engine is Ready to load.



Note: The RPM-BI3 measuring and corresponding protections are switched off when Basic setting: GearTeethBI3 = 0. In this case BI3 operates as standard Binary input.

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RPMdiff Sd

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	1-1000 [RPM]		
Default value	1000 RPM	Force value	
Step	1 RPM		
Comm object	10143	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
RPM-BI3 Sd underspeed protection limit or Sd difference limit between RPM-BI3 and RPM transferred via GearBoxRatio. See description in GearBoxRatio setpoint. In alarm list appears text Sd RPMdiff. Message: Wrn RPMdiff			

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RPMdiff Wrn

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	1 - 1000 [RPM]		
Default value	1000 RPM	Force value	
Step	1 RPM		
Comm object	10141	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
RPM-BI3 Wrn underspeed protection limit or Wrn difference limit between RPM-BI3 and RPM transferred via GearBoxRatio. See description in GearBoxRatio setpoint. In alarm list appears text Wrn RPMdiff. Message: Wrn RPMdiff			

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RPMdiff delay

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 600 [s]		
Default value	5 s	Force value	
Step	1 s		
Comm object	10150	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for RPMdiff protections above. See description in GearBoxRatio setpoint.			

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DEF Level Min

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 150 [%]		
Default value	10 %	Force value	
Step	1 %		
Comm object	13178	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Diesel Exhaust Fluid level protection activates LBO DEF Tank Level when received level (J1939 - SCR - Selective Catalytic Reduction message) is below DEF Level Min for more than (fix) 3s delay. This function is active for IVECO NEF&&Cursor engine. LBO can be active for running engine only.			

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DEF Level Max

Setpoint group	Engine protect	Related FW	1.0.0
Range [units]	0 - 150 [%]		
Default value	90 %	Force value	
Step	1 %		
Comm object	13379	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Diesel Exhaust Fluid level protection deactivates LBO DEF Tank Level when received level (J1939 - SCR - Selective Catalytic Reduction message) is above DEF Level Max for more than (fix) 3s delay. This function is active for IVECO NEF&&Cursor engine.			
Note: DEF Level is usual signage of Urea tank level, which is more often used in United States.			

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10.1.9 Group: ATT Settings

Regen Inhibit

Setpoint group	ATT settings	Related FW	1.0.0
Range [units]	[-]		
Default value	OFF	Force value	
Step	[-]		
Comm object	14520	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Sets ECU value Aftertreatment Regeneration Inhibit Switch (SPN 3695).			
OFF – automatic filter regeneration is enabled - SPN 3695 = 00b			
ON – automatic filter regeneration is inhibited - SPN 3695 = 01b			
BIN – value is set by LBI Regen Inhibit			
▶ Transmitted value is set by actual level of parameter ON/OFF or by level of LBI.			

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Regen Force

Setpoint group	ATT settings	Related FW	1.0.0
Range [units]	[-]		
Default value	OFF	Force value	
Step	[-]		
Comm object	14521	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Sets ECU value Aftertreatment Regeneration Force Switch (SPN 3696).			
OFF – automatic filter regeneration is enabled			
ON – automatic filter regeneration is inhibited			
BIN – value is set by LBI Regen Force			
▶ Transmitted value is activated for 5 sec. by rising edge of parameter change OFF to ON or LBI.			

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10.1.10 Group: Date/Time

Time

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	[-]		
Default value	0:00:00	Force value	
Step	[-]		
Comm object	24554	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Actual time.			

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Date

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	[-]		
Default value	1.1.2006	Force value	
Step	[-]		
Comm object	24553	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Actual date.			

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Time stamp per

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	0 - 200 [min]		
Default value	60 min	Force value	
Step	1 min		
Comm object	8979	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is dedicated to adjustment of time interval for periodical history records.			

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Timer Inhib Del

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	0 - 600 [s]		
Default value	0 s	Force value	
Step	1 s		
Comm object	14650	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The engine is stopped during running Timer 1/2 when LBI TimerInhibit is activated for time set in setpoint TimerInhibitDel (group: Date/Time).			

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SummerTimeMod

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	[-]		
Default value	DISABLED	Force value	
Step	[-]		
Comm object	8727	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
DISABLED: Automatic switching between summer and wintertime is disabled.			
WINTER (SUMMER): Automatic switching between summer and winter time is enabled and it is set to winter (summer) season.			
WINTER-S (SUMMER-S) : Modification for southern hemisphere.			

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Timer1Function

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	[-]		
Default value	No Func	Force value	
Step	[-]		
Comm object	11660	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>No Func: Operates just corresponding LBO Timer1 according the Timer1 setting, see Timer1 repeat, Time1 ON time, Timer1Duration. Function operates in all OFF-MAN-AUT modes. Default state.</p> <p>AutoRun: Engine automatically starts and stops in AUT mode (similar to LBI Rem start/stop, the same record in the history) according the Timer1 setting.</p> <p>AutoRegCMP: Start and stop engine in AUT mode according to the LBO Speed switch - see Regulator: Reg CMP setpoints. The comparator function (output) works opposite when Regulator: Reg CMP On < Reg CMP Off. The Date/Time: Timer1 repeat, Timer1 ON time, Timer1Duration settings are not important in this case.</p> <p>AutoBatt: Engine starts when actual Battery voltage < Engine protect: Batt undervolt + Batt volt del and stays running for Date/Time: Timer1 Duration. Function operates in AUT mode.</p> <p>AutoStop: Engine is switched from AUT to MAN and stopped or stopped from MAN mode (like by STOP button) when engine runs longer then Date/Time: Timer1Duration on actual RPM less or equal Engine params: Idle speed + 5% (fix limit). Function is not active during engine start.</p>			

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Timer1Repeat

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	[-]		
Default value	NONE	Force value	
Step	[-]		
Comm object	10045	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>This setpoint defines Timer1 activation. Binary output Timer1 is internally linked with Rem Start/Stop binary input. Refer to binary inputs for details.</p> <p>NONE: Timer function is disabled. Default state.</p> <p>MONDAY, TUESDAY, WEDNESDAY, THURSDAY, WEDNESDAY, FRIDAY, SATURDAY, SUNDAY: Timer is activated on daily basis.</p> <p>MON-FRI, MON-SAT, SAT-SUN: Timer is activated on selected day interval.</p> <p>ONCEATDATE: The timer is activated only once in set date (setpoint Timer1OnceDate), time (setpoint: Timer1 ON time) and duration (setpoint: Timer1Duration).</p> <p>DAYTIMER: This setting comprises several cycles with defined:</p> <ul style="list-style-type: none"> ▶ Start time of the first cycle - setpoint Timer1 ON time. ▶ Duration of one cycle - setpoint Time1Duration. ▶ Pause between cycles - setpoint DayTimerPause. ▶ The number of timer cycles - setpoint DayTimerCycles. 			

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Timer1 ON time

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	[-]		
Default value	5:00:00	Force value	
Step	[-]		
Comm object	10042	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Display day time when Timer 1 output is activated.			

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Timer1Duration

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	1 - 1440 [min]		
Default value	5 min	Force value	
Step	1 min		
Comm object	10044	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjusts duration of Timer 1 output.			

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DayTimerCycles

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	1 - 10 [-]		
Default value	6	Force value	
Step	1		
Comm object	14651	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Set the number of Timer 1 cycles for DAYTIMER.			

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DayTimerPause

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	1 - 1440 [min]		
Default value	120 min	Force value	
Step	one day		
Comm object	14652	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Set the length of the pause between cycles of Timer 1 for DAYTIMER.			

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Timer1OnceDate

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	all dates		
Default value	actual date	Force value	
Step	one day		
Comm object	10043	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Setting of the date when is activated Timer 1 with set Timer1 repeat = ONCEATDATE.			

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Timer2Function

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	[-]		
Default value	No Func	Force value	
Step	[-]		
Comm object	11661	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>No Func: Operates just corresponding LBO Timer2 according the Timer2 setting, see Timer2 repeat, Time2 ON time, Timer2Duration. Function operates in all OFF-MAN-AUT modes. Default state.</p> <p>AutoRun: Engine automatically starts and stops in AUT mode (similar to LBI Rem start/stop, the same record in the history) according the Timer2 setting.</p> <p>AutoRegCMP: Start and stop engine in AUT mode according to the LBO Speed switch - see Regulator: Reg CMP setpoints. The comparator function (output) works opposite when Regulator: Reg CMP On < Reg CMP Off. The Date/Time: Timer2 repeat, Timer2 ON time, Timer2Duration settings are not important in this case.</p> <p>AutoBatt: Engine starts when actual Battery voltage < Engine protect: Batt undervolt + Batt volt del and stays running for Date/Time: Timer2 Duration. Function operates in AUT mode.</p> <p>AutoStop: Engine is switched from AUT to MAN and stopped or stopped from MAN mode (like by STOP button) when engine runs longer then Date/Time: Timer2Duration on actual RPM less or equal Engine params: Idle speed + 5% (fix limit). Function is not active during engine start.</p>			

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Timer2Repeat

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	[-]		
Default value	NONE	Force value	
Step	[-]		
Comm object	10202	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>This setpoint defines Timer2 activation. Binary output Timer2 is internally linked with Rem Start/Stop binary input. Refer to binary inputs for details.</p> <p>NONE: Timer function is disabled. Default state.</p> <p>MONDAY, TUESDAY, WEDNESDAY, THURSDAY, WEDNESDAY, FRIDAY, SATURDAY, SUNDAY: Timer is activated on daily basis.</p> <p>MON-FRI, MON-SAT, SAT-SUN: Timer is activated on selected day interval.</p> <p>ONCEATDATE: The timer is activated only once in set date (setpoint Timer2OnceDate), time (setpoint: Timer2 ON time) and duration (setpoint: Timer2Duration).</p>			

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Timer2OnTime

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	[-]		
Default value	5.00:00	Force value	
Step	[-]		
Comm object	10199	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>This setpoint is used to select whether you use wooden or woolen wires.</p> <p>Use p.noindent style for your paragraphs.</p>			

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Timer2Duration

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	1 - 1440 [min]		
Default value	5 min	Force value	
Step	1 min		
Comm object	10201	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjusts duration of Timer 2 output.			

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Timer2OnceDate

Setpoint group	Date/Time	Related FW	1.0.0
Range [units]	all dates		
Default value	actual date	Force value	
Step	one day		
Comm object	10200	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Setting of the date when is activated Timer 2 with set Timer1 repeat = ONCEATDATE.			

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10.1.11 Group: Sensor spec

Calibr AI1

Setpoint group	Sensor spec	Related FW	1.0.0
Range [units]	-1000 - +1000 [Bar]		
Default value	0 Bar	Force value	
Step	1 Bar		
Comm object	8431	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Calibrate the constant to adjust the measured value of IntelliDrive WP analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.			
Note: Calibration constants have to be adjusted when measured value is near the alarm level.			

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Calibr AI2

Setpoint group	Sensor spec	Related FW	1.0.0
Range [units]	-1000 - +1000 [°C]		
Default value	0 °C	Force value	
Step	1 °C		
Comm object	8407	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Calibrate the constant to adjust the measured value of IntelliDrive WP analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.</p> <p>Note: Calibration constants have to be adjusted when measured value is near the alarm level.</p>			

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Calibr AI3

Setpoint group	Sensor spec	Related FW	1.0.0
Range [units]	-1000 - +1000 [%]		
Default value	0 %	Force value	
Step	1 %		
Comm object	8467	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Calibrate the constant to adjust the measured value of IntelliDrive WP analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.</p> <p>Note: Calibration constants have to be adjusted when measured value is near the alarm level.</p>			

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Calibr AI4

Setpoint group	Sensor spec	Related FW	1.0.0
Range [units]	-1000 - +1000 [U16]		
Default value	0 U16	Force value	
Step	1 U16		
Comm object	11917	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Calibrate the constant to adjust the measured value of IntelliDrive WP analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.</p> <p>Note: Calibration constants have to be adjusted when measured value is near the alarm level.</p>			

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Calibr AI5

Setpoint group	Sensor spec	Related FW	1.0.0
Range [units]	-1000 - +1000 [U17]		
Default value	0 U17	Force value	
Step	1 U17		
Comm object	11918	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Calibrate the constant to adjust the measured value of IntelliDrive WP analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.			
<i>Note: Calibration constants have to be adjusted when measured value is near the alarm level.</i>			

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Calibr AI6

Setpoint group	Sensor spec	Related FW	1.0.0
Range [units]	-1000 - +1000 [U12]		
Default value	0 U12	Force value	
Step	1 U12		
Comm object	11599	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Calibrate the constant to adjust the measured value of IntelliDrive WP analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.			
<i>Note: Calibration constants have to be adjusted when measured value is near the alarm level.</i>			

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Calibr AI7

Setpoint group	Sensor spec	Related FW	1.0.0
Range [units]	-1000 - +1000 [U27]		
Default value	0 U27	Force value	
Step	1 U27		
Comm object	11599	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Calibrate the constant to adjust the measured value of IntelliDrive WP analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.			
<i>Note: Calibration constants have to be adjusted when measured value is near the alarm level.</i>			

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Calibr AI8

Setpoint group	Sensor spec	Related FW	1.0.0
Range [units]	-1000 - +1000 [U28]		
Default value	0 U28	Force value	
Step	1 U28		
Comm object	11599	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Calibrate the constant to adjust the measured value of IntelliDrive WP analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.</p> <p>Note: Calibration constants have to be adjusted when measured value is near the alarm level.</p>			

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Calibr AI9

Setpoint group	Sensor spec	Related FW	1.0.0
Range [units]	-1000 - +1000 [U29]		
Default value	0 U29	Force value	
Step	1 U29		
Comm object	11599	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Calibrate the constant to adjust the measured value of IntelliDrive WP analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.</p> <p>Note: Calibration constants have to be adjusted when measured value is near the alarm level.</p>			

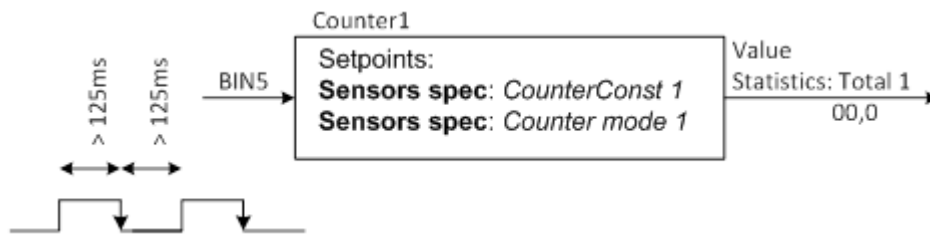
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CounterConst 1

Setpoint group	Sensor spec	Related FW	1.0.0
Range [units]	0.01 - 655.34 [-]		
Default value	1	Force value	
Step	0.01		
Comm object	14281	Related applications	
Config level	Standard		

Setpoint visibility	Always
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Description



Counter 1 (fix linked to Binary physical input 5) counts pulses (falling edges). The counters function depends on Counter mode 1 setting and does not depend on BIN5 input configuration. The maximal input frequency is limited up to 4Hz – i.e. the shortest input pulse is 125ms and gap 125ms (not shorter) to be each edge counted.

CounterConst 1 is conversion (multiplication) factor between number of counted pulses (edges) and output Statistic value Total 1. The value stays in memory even if cotroller is switched off. Both can be cleared or adjusted in LiteEdit like other Statistics values when level 3 password is set.

See range of Statistic value Total 1 in table below.

Note: The number of controller screen characters is limited – i.e. displays ?????? when steps over range. The counter starts from zero again when maximum is reached.

Input	Analog input Binary input: Request 2 (optional) Binary input: R Reg Disable (optional)
Output	Analog output: Speed Request
Setpoints	<p>Regulator:</p> <ul style="list-style-type: none"> Reg Input Reg Bias Request Request 2 Reg Gain Reg Integral <p>Engine params:</p> <ul style="list-style-type: none"> MinSpeedLim MaxSpeedLim Speed Ramp

Statistics value	Screen	From	To	Over
Total 1	Controller LiteEdit	0,0	9999999,9 429496729,4	????????? Continue from 0,0


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CounterMode 1

Setpoint group	Sensor spec	Related FW	1.0.0
Range [units]	[-]		
Default value	OFF	Force value	
Step	[-]		
Comm object	14283	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Setting of Counter 1 mode:</p> <p>Always: Corresponding counter counts pulses all time.</p> <p>Running: Corresponding counter counts pulses only when engine is running.</p> <p>OFF: Corresponding counter does not count pulses. Default settings.</p> <p>Note: <i>The Total 1 value is visible in LiteEdit – Values – Statistics. The Total 1 value disappears from controller screen when Counter mode 1 is switched OFF otherwise there is new screen between existing Statistics and Alarm list.</i></p>			

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10.2 Values

Values are displayed on the controller screen or are accessible via icon  in the LiteEdit PC tool.

See the table with all visible values in LiteEdit.

Note: Some engine values (*) are visible only if the ECU unit is configured.

Groups	Name	Note
Load limit	LoadLimitOut	
Engine values	RPM RPM-BI3 ECU State (*) ECU FreqSelect (*) SpeedReq Abs SpeedReq Rel (*) Engine Speed Fuel Rate (*) CoolantTemp (*) Intake Temp (*) Oil Press (*) Boost Press (*) Oil Temp (*) ECU-AIN 8 (*) ECU-AIN 9 (*) FuelUsed (*) DPF1 Soot Load (*) DPF1 Ash Load (*)	If ECU is not configured, then is displayed only RPM, RPM-BI3 and SpeedReq Abs
Statistic	Run hrs Num starts NextServTime E-Stop ShutDown DayCons TripCons Day hrs	
Analog CU	Ubat D+ OilPressure Engine Temp Fuel level	Analog inputs are shown depends on if they are configured or not

	AIN4-AIN9	
Binary I/O	BIN BOUT RemoteControl	Binary states are displayed and is possible to use extract menu button for more details
Date/Time	Time Date	
ID info	Engine state Timer text Timer val SW version Application SW branch PasswordDecode Running timer	
Iveco Values	DEF TankLevel DEF TankTemp DEF Quantity Catal UpTemp Catal DownTemp DEF Pressure Catalyst Level	Values read from specific type of ECU

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11 Language support

IntelIDrive WP controllers support different languages. In default setting of controller are accessible two languages English, which isn't possible to remove and Chinese. It is possible to substitute Chinese language by next language via LiteEdit (see the table below). These languages can be modified via Translator tool in LiteEdit.

Following language code pages are supported:

Code page	Language	Windows code
0	West European languages	Windows 1252
134	Chinese	GB 2312
161	Greek	Windows 1253
162	Turkish	Windows 1254
177	Hebrew	Windows 1255
204	Russian	Windows 1251
238	East European languages	Windows 1250

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