

# InteliDrive IPU

## Industrial Power Unit Controller

### SW version 1.1.0

1 Document information .....	8
2 System overview .....	11
3 Applications overview .....	16
4 Installation and wiring .....	17
5 Controller setup .....	46
6 Communication .....	73
7 Troubleshooting .....	82
8 Technical data .....	89
9 Function description .....	95
10 Appendix .....	113
11 Language support .....	232

# Table of contents

<b>1 Document information</b>	<b>8</b>
1.1 Clarification of notation .....	8
1.2 About this guide .....	8
1.3 Legal notice .....	8
1.4 Document history .....	10
1.5 Conformity Declaration .....	10
<b>2 System overview</b>	<b>11</b>
2.1 Warnings .....	11
2.2 General description .....	11
2.3 Configurability and monitoring .....	12
2.3.1 Open connection from LiteEdit .....	12
2.3.2 Open connection from web browser .....	13
2.3.3 Open connection from WinScope .....	14
<b>3 Applications overview</b>	<b>16</b>
3.1 Single applications .....	16
<b>4 Installation and wiring</b>	<b>17</b>
4.1 Putting it into operation .....	17
4.1.1 How to install .....	17
4.1.2 Analog inputs .....	21
4.1.3 Binary inputs and outputs .....	28
4.1.4 Analog outputs .....	29
4.1.5 Remote modules – CAN bus connection .....	30
4.2 Mounting .....	31
4.3 Package contents .....	31
4.3.1 Software package .....	31
4.3.2 Components .....	32
4.4 Terminal diagram and dimension .....	32
4.5 Extension plug-in modules .....	33
4.5.1 Extensions plug-in modules installation .....	33
4.5.2 IL-NT AOUT8 .....	34
4.5.3 IL-NT AIO .....	36
4.5.4 IL-NT IO1 .....	37
4.5.5 IL-NT BIO8 .....	38
4.6 Communication modules .....	39
4.6.1 IL-NT RS232 .....	39

4.6.2 IL-NT RS233-485 .....	40
4.6.3 IL-NT S-USB .....	40
4.6.4 IB-Lite .....	41
4.6.5 IL-NT GPRS .....	42
4.7 Remote modules .....	43
4.7.1 IL-NT RD (SW) .....	43
4.7.2 IGL-RA15 .....	44
4.7.3 IB-NT .....	45
<b>5 Controller setup</b> .....	<b>46</b>
5.1 Front panel elements .....	46
5.2 Init screens .....	48
5.2.1 Init screen .....	48
5.2.2 Firmware screen .....	48
5.2.3 Languages screen .....	48
5.2.4 User interface screen .....	48
5.3 Display menus .....	49
5.3.1 Switching between User and Engineer menus .....	49
5.4 How to select the engine mode? .....	49
5.5 How to view measured data? .....	49
5.6 How to view and edit setpoints? .....	49
5.6.1 How to change the display contrast? .....	50
5.6.2 How to check software revision? .....	50
5.6.3 How to check serial number and choose interface? .....	50
5.6.4 How to change language? .....	50
5.7 How to find active alarms? .....	50
5.8 How to list History records? .....	51
5.9 MEASUREMENT screens description .....	52
5.9.1 Main measure screen .....	52
5.9.2 IntelliDrive Lite Analog inputs screens .....	52
5.9.3 IL-NT-AIO Analog inputs screens .....	52
5.9.4 IL-NT-BIO8 Binary inputs screen .....	53
5.9.5 IL-NT-IO1 Binary inputs screen .....	53
5.9.6 ECU State .....	53
5.9.7 ECU Values .....	53
5.9.8 Statistic .....	54
5.9.9 ECU AlarmList .....	54
5.9.10 Alarm list .....	55
5.10 Display screens and pages structure .....	55
5.11 Binary input functions .....	58

5.11.1 Binary inputs IntelliDrive Lite - default configuration .....	58
5.11.2 Configuration of binary inputs .....	58
5.11.3 Binary inputs list .....	59
5.12 Binary output functions .....	64
5.12.1 Binary outputs IntelliDrive Lite - default .....	64
5.12.2 Binary outputs - list .....	64
<b>6 Communication</b> .....	<b>73</b>
6.1 Direct cable connection .....	73
6.2 Remote connection .....	74
6.2.1 Internet connection .....	74
6.2.2 AirGate connection .....	74
6.2.3 Modem connection .....	75
6.3 Modbus connection .....	75
6.3.1 Modbus step by step .....	75
6.4 ECU engine support .....	76
6.5 Choosing the ECU to configure .....	76
6.6 ECU Analog inputs .....	78
6.7 Tier4 final support .....	78
<b>7 Troubleshooting</b> .....	<b>82</b>
7.1 Alarm management .....	82
7.1.1 Sensor fail (Fls) .....	82
7.1.2 Warning (Wrm) .....	82
7.1.3 Cooldown (Cd) .....	82
7.1.4 Shut down (Sd) .....	83
7.1.5 List of possible alarms .....	83
7.2 HistoryFile .....	85
7.2.1 RecordStructure .....	85
7.3 Diagnostic Messages read from ECU .....	86
7.4 List of ECU Diagnostic Codes .....	86
7.5 Tier4 diagnostic codes .....	87
<b>8 Technical data</b> .....	<b>89</b>
8.1 IL-NT RS232 (Optional card) .....	91
8.2 IL-NT RS232-485 (optional card) .....	91
8.3 IL-NT S-USB (optional card) .....	91
8.4 IB-Lite (optional card) .....	92
8.5 IL-NT GPRS (optional card) .....	92
8.6 IL-NT AOUT8 (optional card) .....	92



8.7 IL-NT AIO (optional card) .....	92
8.8 IL-NT IO1 (optional card) .....	93
8.9 IL-NT BIO8 (optional card) .....	93
8.10 IL-NT BIO8 (optional Remote Annunciator) .....	93
8.10.1 Power supply .....	93
8.10.2 Operating conditions .....	93
8.10.3 Dimensions and weight .....	94
8.10.4 Horn output .....	94
<b>9 Function description</b> .....	<b>95</b>
9.1 Engine operation states .....	95
9.2 OFF mode .....	95
9.3 MAN mode .....	95
9.3.1 Start-stop sequence (simplified) .....	96
9.4 AUT mode .....	98
9.5 Engine without pickup operation .....	98
9.6 Engine timer .....	98
9.6.1 MAN mode .....	98
9.6.2 AUT mode .....	99
9.7 Protections .....	99
9.8 Engine RPM control in MAN mode .....	100
9.8.1 Engine RPM Idle - Nominal switching .....	101
9.8.2 Engine RPM two/three levels switching .....	101
9.8.3 Engine RPM by Up/Down buttons settings .....	101
9.8.4 Engine RPM continuous change (using potentiometer) .....	101
9.8.5 Speed request chart .....	102
9.9 AUT mode: Engine load limitation - overview .....	102
9.9.1 Functions 1 and 2 .....	103
9.9.2 Functions 1 and 2 setpoints .....	104
9.9.3 Functions 1 and 2 examples .....	104
9.10 AUT mode: Engine regulation by RPM control - overview .....	108
9.10.1 Functions 3 and 4 .....	110
9.10.2 Functions 3 and 4 setpoints .....	110
9.10.3 Functions 3 and 4 examples .....	110
<b>10 Appendix</b> .....	<b>113</b>
Setpoints .....	114
10.1 List of setpoint groups .....	114
10.1.1 List of setpoints .....	115
10.1.2 Group: Password .....	117

10.1.3 Group: Basic settings .....	117
10.1.4 Group: Basic settings 2 .....	119
10.1.5 Group: Comms settings .....	124
10.1.6 Group: Engine params .....	131
10.1.7 Group: Engine params 2 .....	136
10.1.8 Group: Regulator .....	147
10.1.9 Group: Regulator 2 .....	150
10.1.10 Group: Load limit .....	153
10.1.11 Group: Engine protect .....	157
10.1.12 Group: Engine protect 2 .....	163
10.1.13 Group: ATT Settings .....	172
10.1.14 Group: Date/Time .....	173
10.1.15 Group: Sensor spec .....	179
10.1.16 Group: AIO module .....	183
10.1.17 Group: SMS_E-Mail .....	188
10.2 Values .....	190
10.3 Logical binary inputs .....	192
10.3.1 List of LBI .....	192
Logical binary outputs .....	201
10.4 Alphabetical groups of Logical binary outputs .....	201
10.4.1 List of LBO .....	202
10.4.2 LBO: A .....	203
10.4.3 LBO: B .....	203
10.4.4 LBO: C .....	208
10.4.5 LBO: D .....	210
10.4.6 LBO: E .....	211
10.4.7 LBO: F .....	212
10.4.8 LBO: G .....	213
10.4.9 LBO: H .....	213
10.4.10 LBO: I .....	214
10.4.11 LBO: L .....	214
10.4.12 LBO: M .....	214
10.4.13 LBO: O .....	215
10.4.14 LBO: P .....	215
10.4.15 LBO: R .....	216
10.4.16 LBO: S .....	221
10.4.17 LBO: T .....	224
10.4.18 LBO: U .....	225
10.4.19 LBO: V .....	225

10.4.20 LBO: W .....	225
10.5 Accessibility of setpoints and values .....	228
10.5.1 Available setpoints .....	228
<b>11 Language support</b>	<b>232</b>

# 1 Document information

1.1 Clarification of notation .....	8
1.2 About this guide .....	8
1.3 Legal notice .....	8
1.4 Document history .....	10
1.5 Conformity Declaration .....	10

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

## 1.1 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 ID-FLX-Lite controllers family that shall be followed during installation and maintenance of the IntelliDrive Lite engine controllers.

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

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

## 1.3 Legal notice

**This End User's Guide/Manual** as part of the Documentation is an inseparable part of ComAp's Product and may be used exclusively according to the conditions defined in the "END USER or Distributor LICENSE AGREEMENT CONDITIONS – COMAP CONTROL SYSTEMS SOFTWARE" (License Agreement) and/or in the "ComAp a.s. Global terms and conditions for sale of Products and provision of Services" (Terms) and/or in the "Standardní podmínky projektů komplexního řešení ke smlouvě o dílo, Standard Conditions for Supply of Complete Solutions" (Conditions) as applicable.

ComAp's License Agreement is governed by the Czech Civil Code 89/2012 Col., by the Authorship Act 121/2000 Col., by international treaties and by other relevant legal documents regulating protection of the intellectual properties (TRIPS).

The End User and/or ComAp's Distributor shall only be permitted to use this End User's Guide/Manual with ComAp Control System Registered Products. The Documentation is not intended and applicable for any other purpose.

Official version of the ComAp's End User's Guide/Manual is the version published in English. ComAp reserves the right to update this End User's Guide/Manual at any time. ComAp does not assume any responsibility for its use outside of the scope of the Terms or the Conditions and the License Agreement.

Licensed End User is entitled to make only necessary number of copies of the End User's Guide/Manual. Any translation of this End User's Guide/Manual without the prior written consent of ComAp is expressly prohibited!

Even if the prior written consent from ComAp is acquired, ComAp does not take any responsibility for the content, trustworthiness and quality of any such translation. ComAp will deem a translation equal to this End User's Guide/Manual only if it agrees to verify such translation. The terms and conditions of such verification must be agreed in the written form and in advance.

**For more details relating to the Ownership, Extent of Permitted Reproductions Term of Use of the Documentation and to the Confidentiality rules please review and comply with the ComAp's License Agreement, Terms and Conditions available on [www.comap-control.com](http://www.comap-control.com).**

### **Security Risk Disclaimer**

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

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

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

General security recommendations and set of measures

#### 1. AccessCode

- Change the AccessCode BEFORE the device is connected to a network.
- Use a secure AccessCode – ideally a random string of 8 characters containing lowercase, uppercase letters and digits.
- For each device use a different AccessCode.

#### 2. Password

- Change the password BEFORE the device enters a regular operation.
- Do not leave displays or PC tools unattended if an user, especially administrator, is logged in.

#### 3. Controller Web interface

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

#### 4. MODBUS/TCP

- The MODBUS/TCP protocol (port TCP/502) is an instrumentation protocol designed to exchange data between locally connected devices like sensors, I/O modules, controllers etc. From it's nature it does not

contain any kind of security – neither encryption nor authentication. Thus it is intended to be used only in closed private network infrastructures.

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

#### 5. SNMP

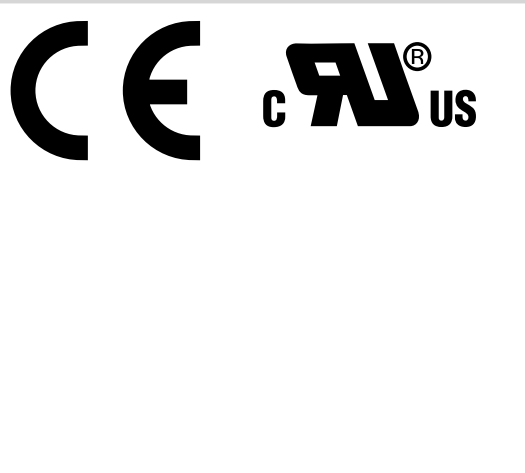
- The SNMP protocol (port UDP/161) version 1,2 is not encrypted. Thus it is intended to be used only in closed private network infrastructures.
- Avoid exposing the port UDP/161 to the public Internet.

## 1.4 Document history

Revision number	Related sw. version	Date	Author
3	1.1.0	16.2.2020	Lukáš Bečka
2	1.1.0	8.10.2019	Lukáš Bečka
1	1.1.0		Petr Weinfurt

Table 1.1 Document history

## 1.5 Conformity Declaration

<ul style="list-style-type: none"> <li>▶ EN 61000-6-2</li> <li>▶ EN 61000-6-4</li> <li>▶ EN 60068-2-30</li> <li>▶ EN 60068-2-1 (-20 °C/16 h)</li> <li>▶ EN 60068-2-2 (70 °C/16 h)</li> <li>▶ EN 60068-2-6 (2÷25 Hz / ±1.6 mm, 25÷100 Hz / 4.0 g)</li> <li>▶ EN 60068-2-27 (a=500 m/s<sup>2</sup>; T=6 ms)</li> <li>▶ EN 60068-2-30:2005 25/55°C, RH 95%, 48hours</li> <li>▶ EN 60529 (front panel IP67)</li> <li>▶ EN 62262, EN 50102 (IK04)</li> </ul>	
<p>List of standards is available on: <a href="https://webstore.iec.ch/">https://webstore.iec.ch/</a></p>	

 [back to Document information](#)

## 2 System overview

2.1 Warnings .....	11
2.2 General description .....	11
2.3 Configurability and monitoring .....	12

 [back to Table of contents](#)

### 2.1 Warnings

InteliDrive Lite 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 RS232 line,
- ▶ Disconnect input REM START/STOP or
- ▶ Disconnect output STARTER

**Note:** *Because of large variety of InteliDrive Lite parameters setting, it is not possible to describe all combination. Some of InteliDrive Lite 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-FLX-Lite firmware and ID-FLX-Lite 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 (jumper) programming – close Boot jumper, follow instruction in LiteEdit and upload correct software.*

### 2.2 General description

The key feature of InteliDrive Lite 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 Lite is a comprehensive controller for single engines with extended support of electronic engines and plug-in modules.

InteliDrive Lite 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 Lite provides gas engine support without ventilation.

Controller supports WebSupervisor system. This system enables engine fleet and assets management as well as pure monitoring. Visit [www.comap-control.com](http://www.comap-control.com) and [www.websupervisor.net](http://www.websupervisor.net) for more details about WebSupervisor

The key features are:

- ▶ ECU support - for singlespeed and allspeed engines e.g. Cummins, Volvo, JohnDeer etc.
- ▶ Flexibility - with our extension modules e.g. IL-NT-AIO, IL-NT-BIO8 etc.

- ▶ Communication - via communication modules e.g. IL-NT-GPRS, IB-Lite, IL-NT-S-USB and PC tools WebServer, WebSupervisor, IntelliMonitor etc.
- ▶ Process logic - active control of engine, history log, configuration-no programming

## 2.3 Configurability and monitoring

InteliDrive IPU is used as configuration, monitoring and controlling tool LiteEdit software. For simple configuration, monitoring and controlling can be used IntelliMonitor.

### 2.3.1 Open connection from LiteEdit

PC tool LiteEdit is used for monitoring, programming and configuration of ID-FLX-Lite controllers.

1. Go to menu Connection and select the type of connection you desire.

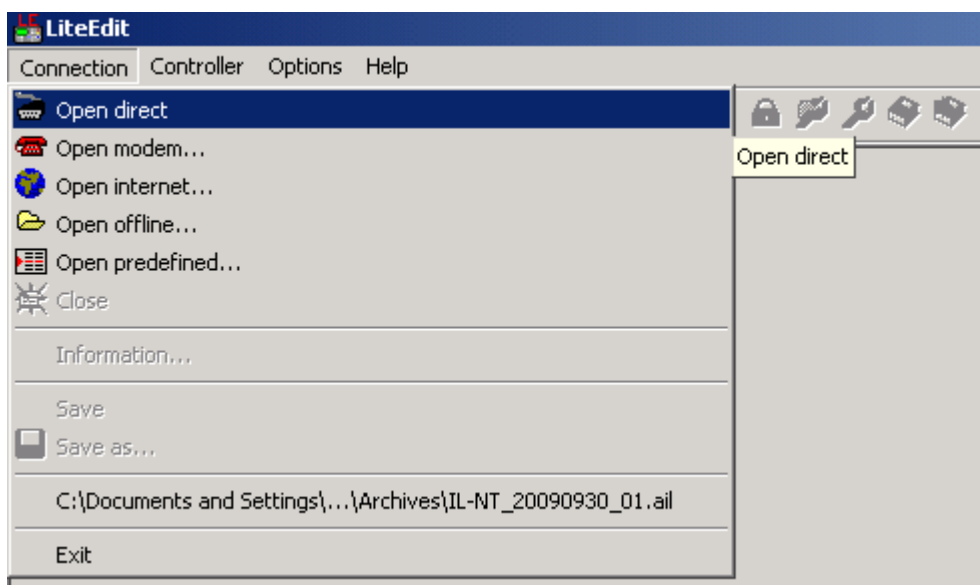
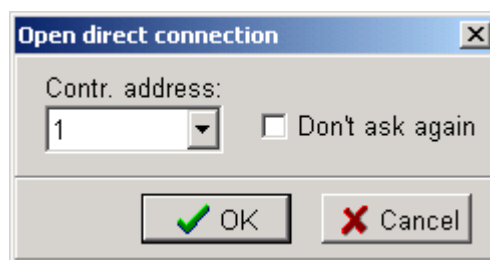


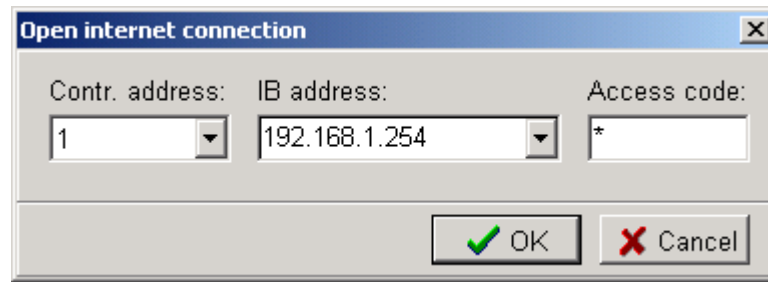
Image 2.1 LiteEdit – connection menu

2. Enter controller address and further information depending on the selected connection type.



**Note:** For direct connection enter controller address.





**Note:** For internet connection enter controller address, IP address of the IB-LITE Module fitted in the controller you want to reach, access code.

- You will see the Control window and you can continue with configuration of setpoints, inputs, outputs etc.

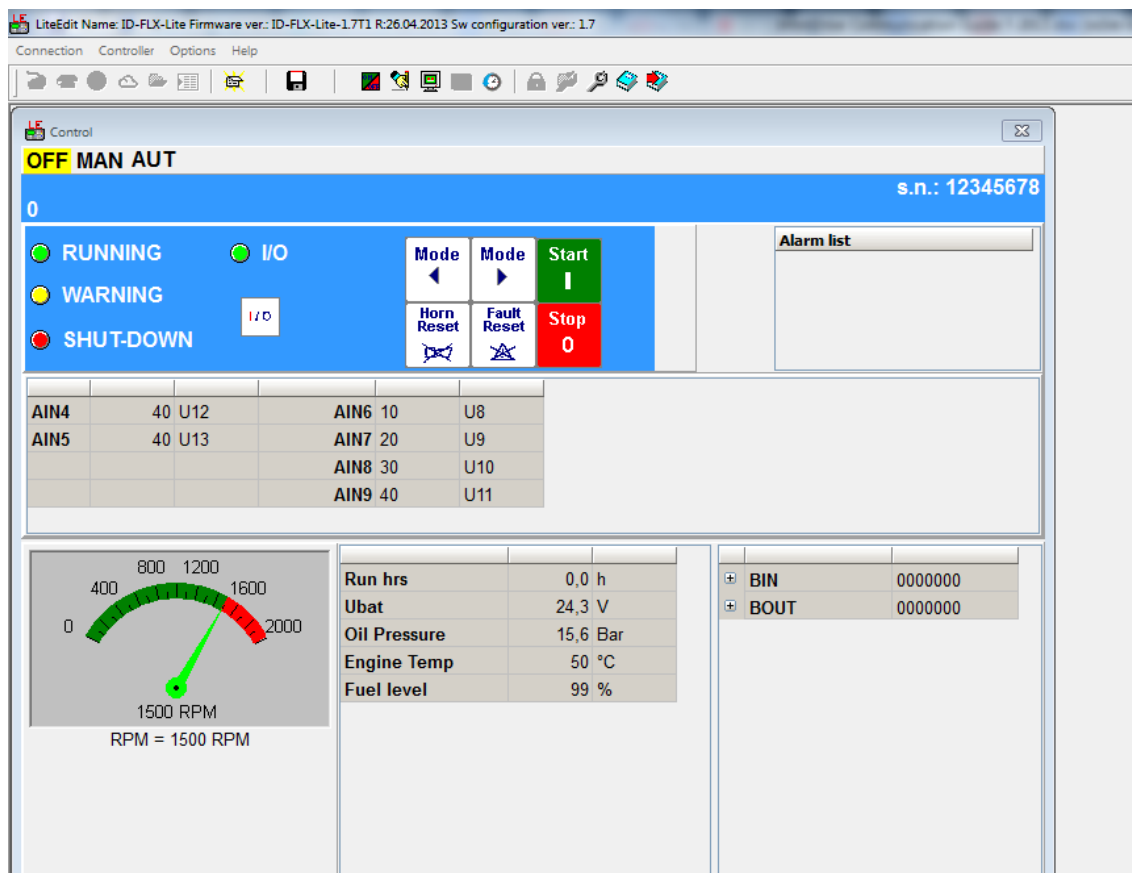


Image 2.2 LiteEdit control window

**Note:** For detail description of LiteEdit and IntelliMonitor PC tools see the LiteEdit Reference Guide, IntelliMonitor Reference Guide and IntelliDrive Communication Guide

## 2.3.2 Open connection from web browser

It is possible to connect from a web browser to IntelliDrive IPU controllers, mounted with IB-Lite module (or IB-NT with specific conditions) and connected to internet.

- Open web browser
- Enter IP address from controller **Comms Settings: IBLite IP Addr**
- Access verification page appears

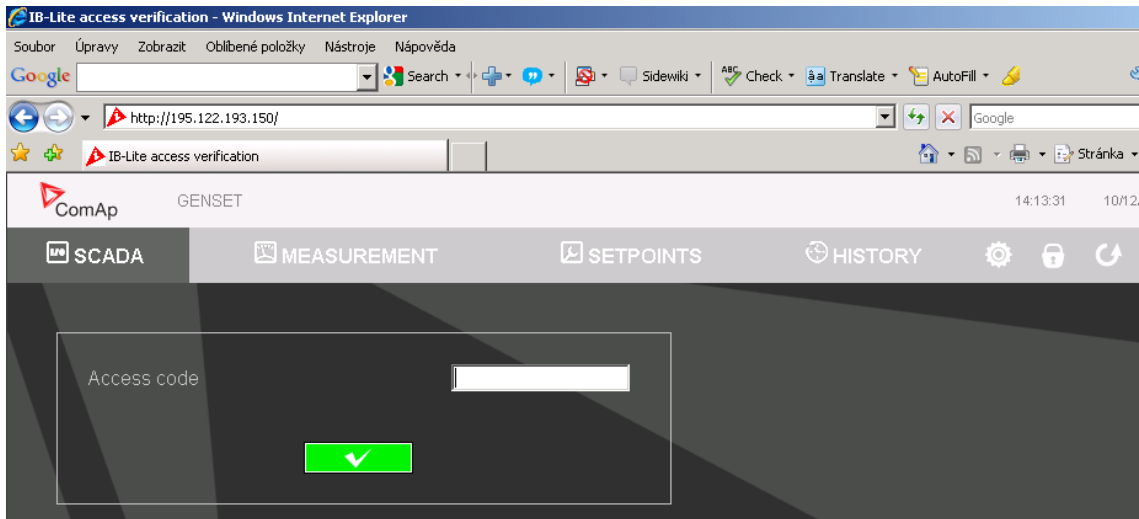


Image 2.3 Access verification page

4. Enter access code and Scada page appears

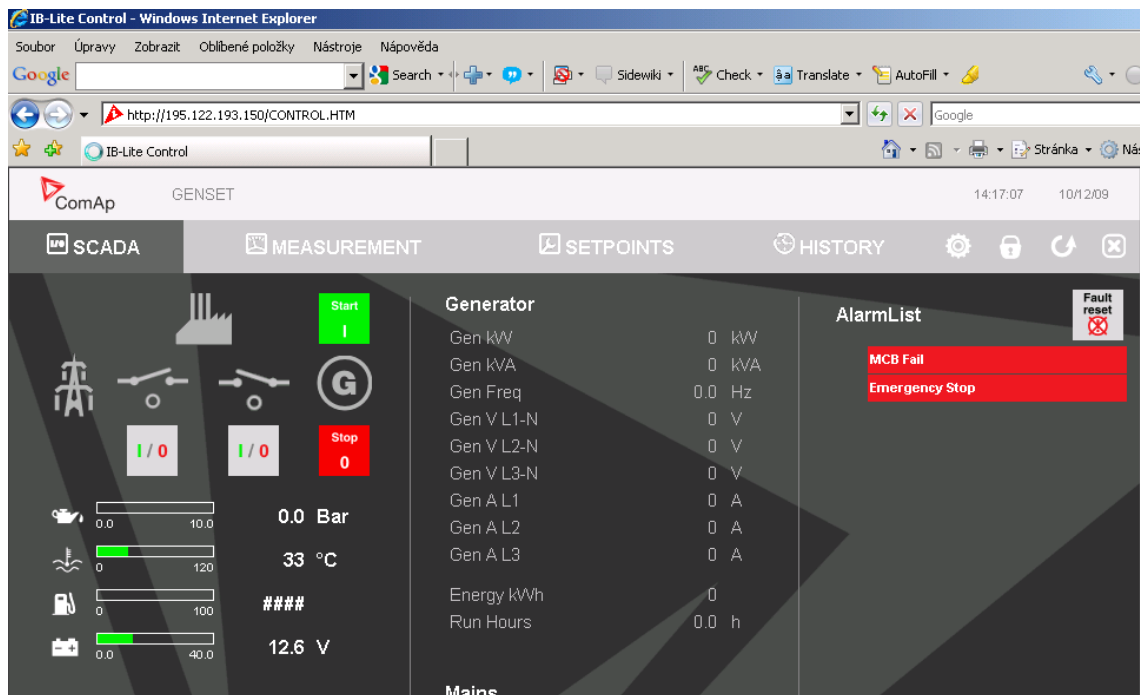


Image 2.4 Scada page

**Note:** You can try the WebServer from ComAp webpage. The access code is 0.

**Note:** WebSupervisor is possible to use as a control and monitor tool. For access is necessary to be registered. Connection setting and other information you can find in the WebSupervisor Reference Guide.

### 2.3.3 Open connection from WinScope

WinScope is powerful PC tool for observation of controller's states and measurements.

1. Go to menu **Connection** → **Open connection...** and select the type of connection you desire in Open connection window (Inteli controllers).

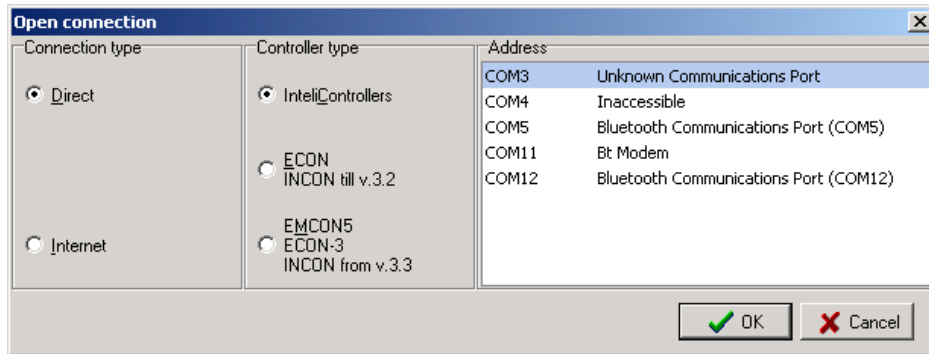
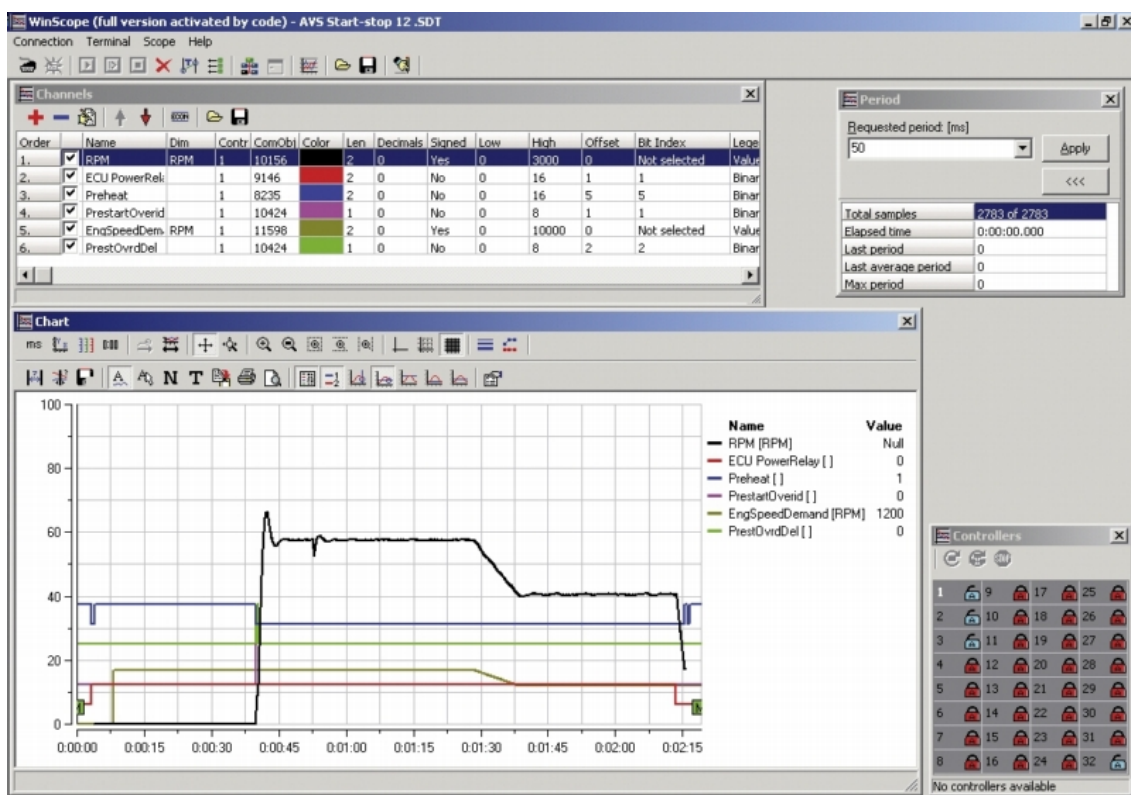


Image 2.5 WinScope - open connection window

- Proceed with selection of channels etc. according to WinScope Reference Guide



⏪ 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.

**Note:** The extension IGL-RA15 modules can be connected to CAN bus together with ECU.

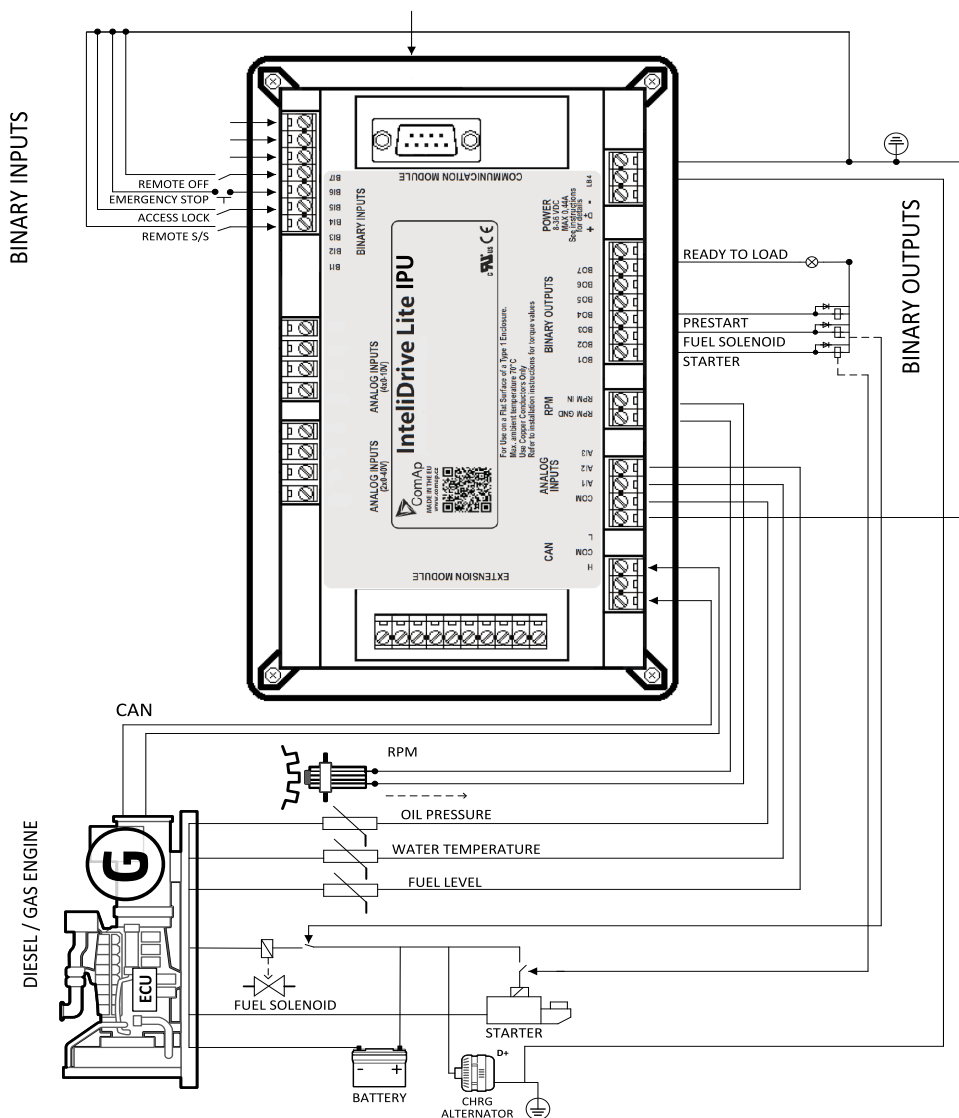


Image 3.1 application description

[back to Table of contents](#)

# 4 Installation and wiring

4.1 Putting it into operation .....	17
4.2 Mounting .....	31
4.3 Package contents .....	31
4.4 Terminal diagram and dimension .....	32
4.5 Extension plug-in modules .....	33
4.6 Communication modules .....	39
4.7 Remote modules .....	43

[◀ back to Table of contents](#)

## 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 cable min. 2.5 mm<sup>2</sup>.

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

Tightening torque, allowable wire size and type, for the Field-Wiring Terminals:

Based on terminal type PA256:



Specified tightening torque 0.5 Nm (4.4 In-lb) 2EDGK:



Specified tightening torque 0.4 Nm (3.5 In-lb)

- ▶ For field type terminals:
  - Use only diameter 2.0-0.5 mm (12-26 AWG) conductor, rated for 75 °C minimum.
- ▶ For Generator Voltage terminals
  - Use only diameter 2.0-0.5 mm (12-26 AWG) conductor, rated for 90 °C minimum.
  - Use copper conductors only.

## Power supply

Use minimally power supply cable of 1.5 mm<sup>2</sup>.

**IMPORTANT: Maximum continuous DC power supply voltage is 36 V DC.**

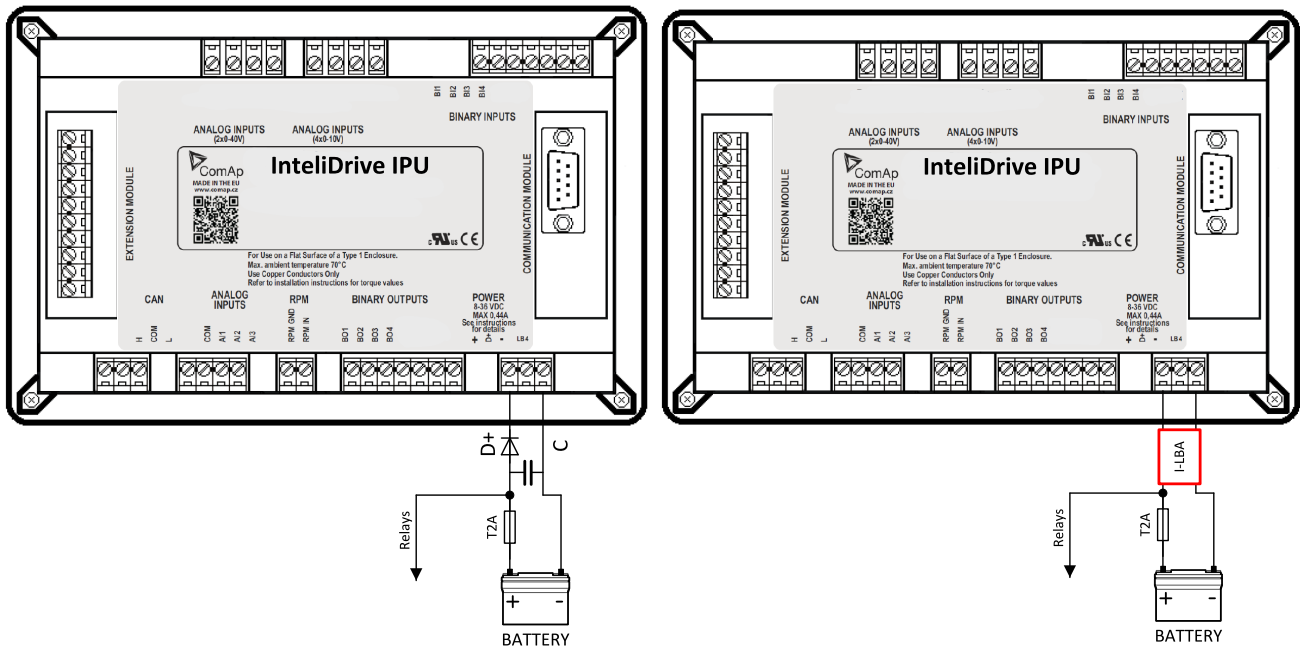
**IMPORTANT: Maximum allowable DC power supply voltage is 39 V DC.**

The IntelliDrive IPU 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 IPU 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 12 V DC power supply, the IntelliDrive IPU includes internal capacitors that allow the controller to continue operation during cranking if the battery voltage dip occurs. If the voltage before dip is 12 V, after 150 ms the voltage recovers to 7 V, 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 with stand 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. 8V

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

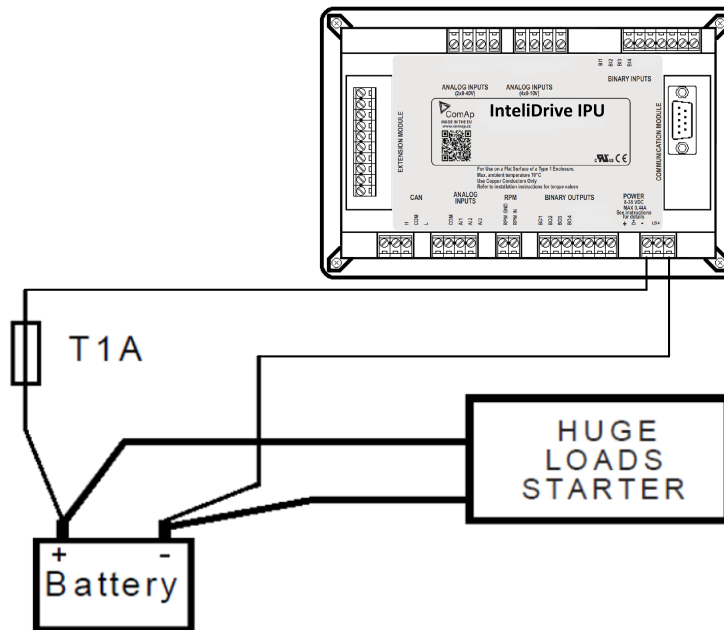
RS232 and other plug-in module is connected. Voltage before dip is 12 V and after 350 ms the voltage recovers to minimum allowed voltage 5 V. The I-LBA enables controller operation from 5 V (for 10 to 30 sec). The wiring resistance from battery should be up to 0.1 Ohm for I-LBA proper function.

## Power supply fusing

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

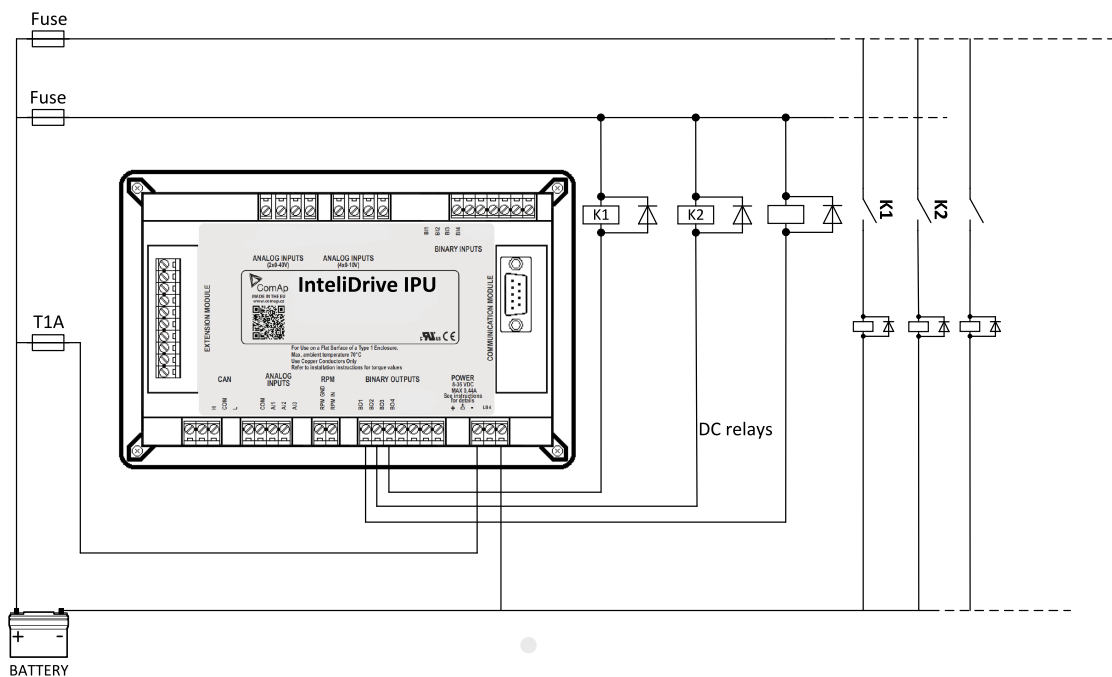
These items should never be connected directly to the starting battery.

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:

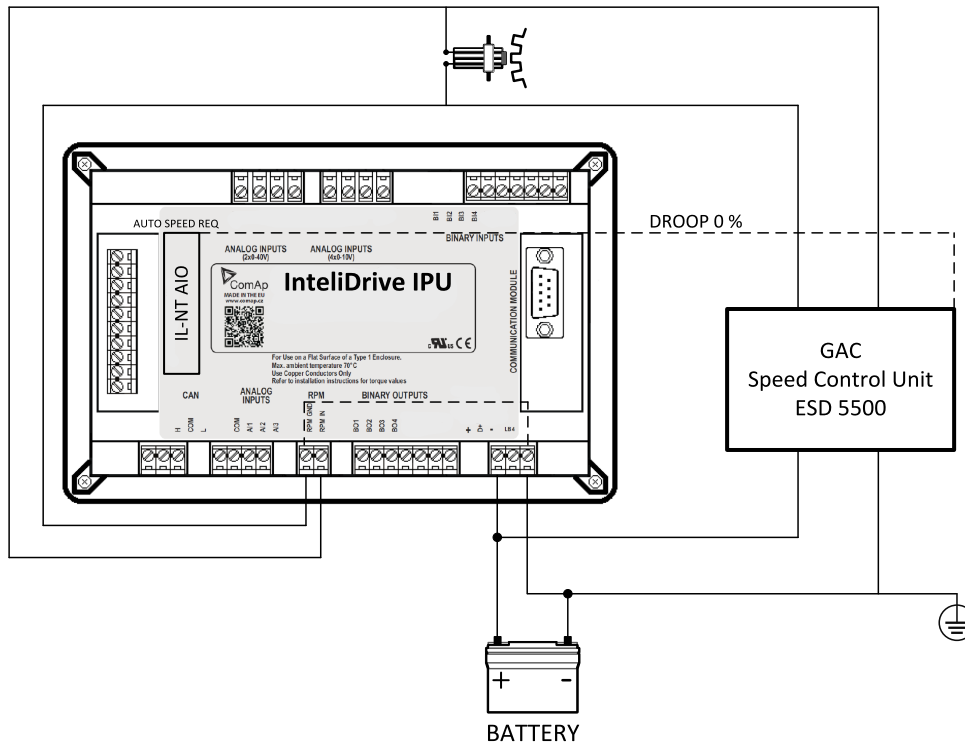
Use a shielded cable

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 IPU RPM input using ComAp separation transformer RPM-ISO (1:1)
- ▶ Use separate pick-up for Speed governor and IntelliDrive IPU



**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 IPU 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

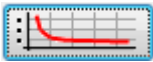
### Table of controller analog inputs

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

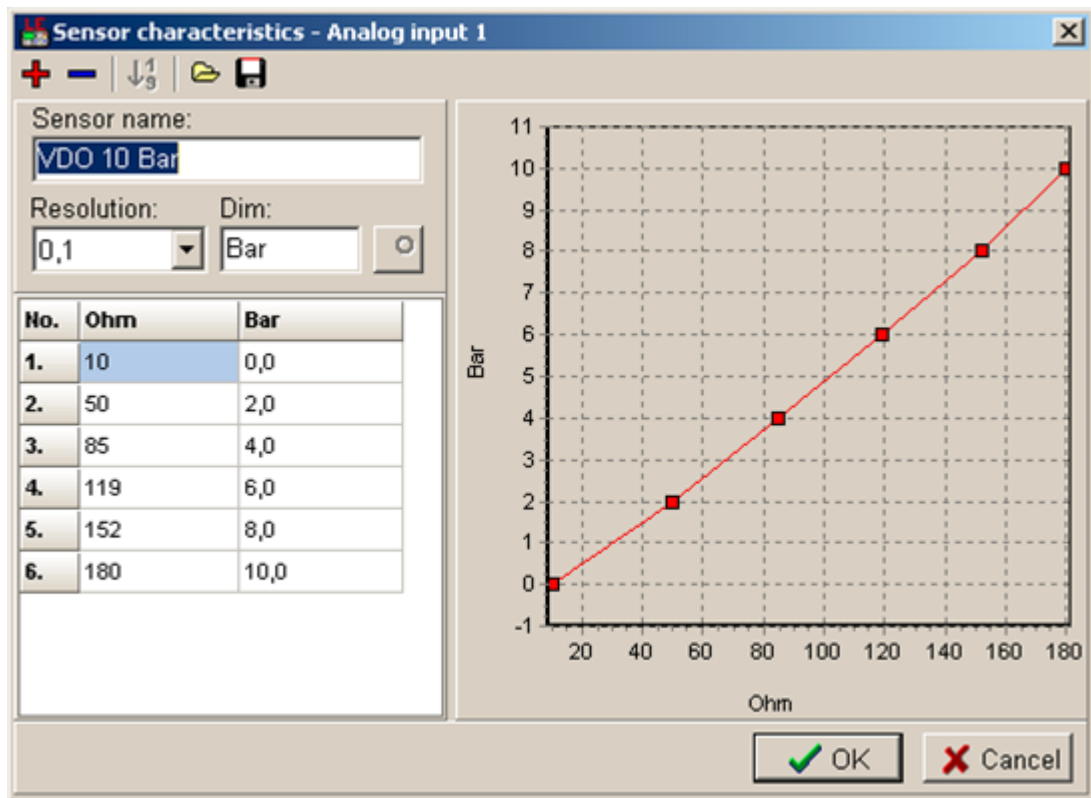
**Note:** Precision is 4 % ±5 Ω.

**Note:** When Engine Control Unit is connected, it is possible to read IntelliDrive IPU 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 $\Omega$ or 2 V DC (AIN6-AIN9) Three (Triple)-state: open/close – threshold 750 $\Omega$ (only AIN1-AIN3), failure <10 $\Omega$ or > 2400 $\Omega$ 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+FIs Under step and Sensor fail activates protection. OverLimit+FIs 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 have special „window“ protection. It is possible to adjust Low and High level with alarm setting W<sub>rn</sub> and S<sub>d</sub> 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 W<sub>rn</sub> and S<sub>d</sub> 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 LowW<sub>rn</sub> = 2 bar

AIN6 LowS<sub>d</sub> = 1 bar

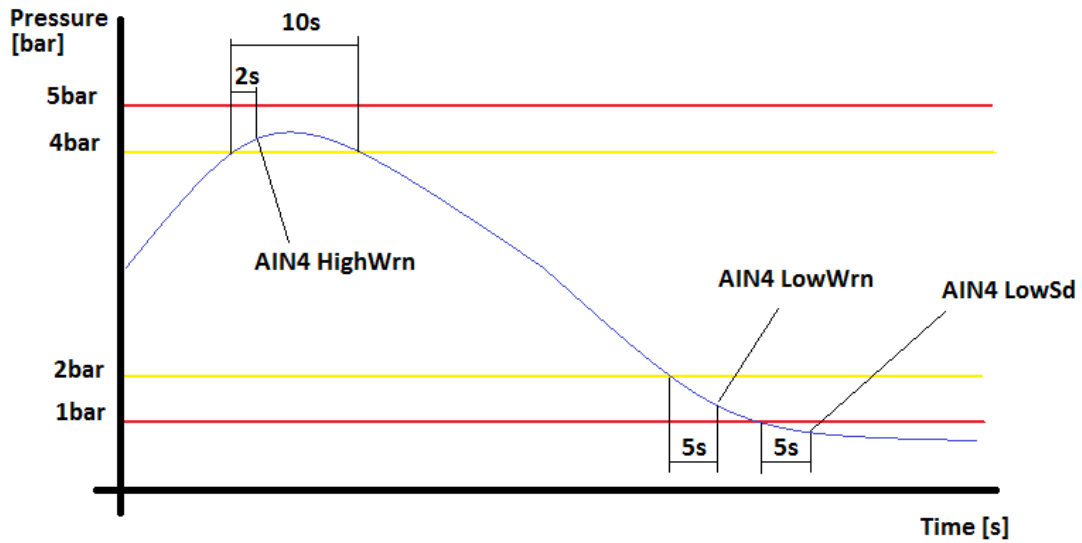
AIN6 LowDel = 5 s

AIN6 HighW<sub>rn</sub> = 4 bar

AIN6 HighS<sub>d</sub> = 5 bar

AIN6 HighDel = 2 s

**Note:** Class C protection is working and LowW<sub>rn</sub>, LowS<sub>d</sub>, LowDel, HiW<sub>rn</sub>, HiS<sub>d</sub>, HiDel setpoints are visible only when corresponding AIN is configured in Modify->Alarm properties-> Direction-> Window prot.



## Connection of IntelliDrive IPU analog inputs

Standard connection of three resistive sensors to analog inputs.

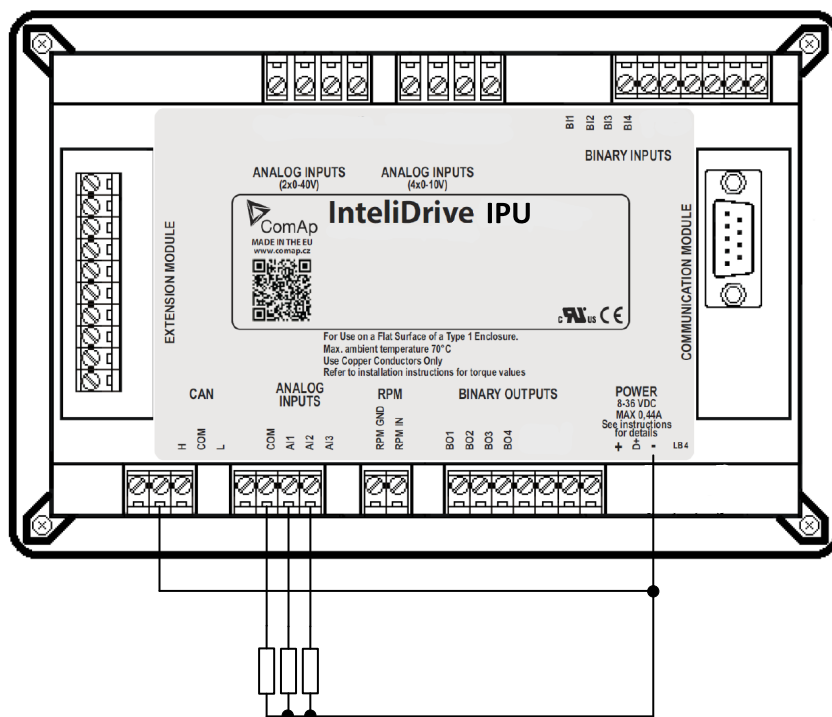


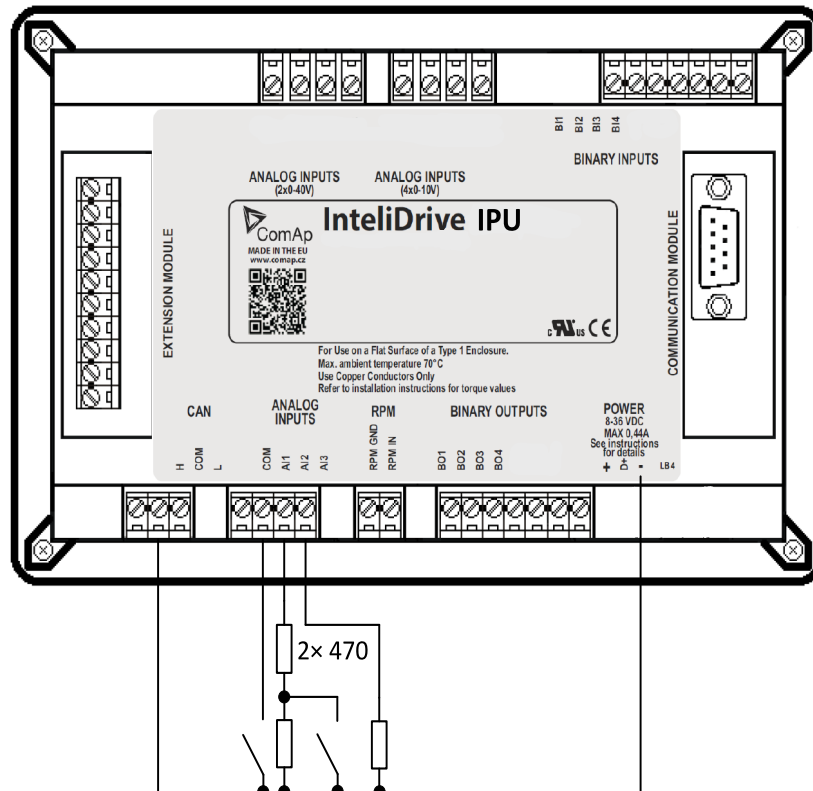
Image 4.1 3x Resistive sensors

Mixed connection of IntelliDrive IPU 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 0  $\Omega$  to 2.4 k $\Omega$ .

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

### As binary input

Open, close state are detected, threshold level is 750  $\Omega$ .

### As three state input

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

### Unused analog inputs

Configure Type = Not used

## Current output transducers

**IntelliDrive IPU analog inputs are mainly designed for resistor sensors.**

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

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

### Default current sensor characteristic

Use with external resistor 120  $\Omega$

	4-20mA/100		0-20mA/100		0-20 mA/(-20 to +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 to +120 °C)

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

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.

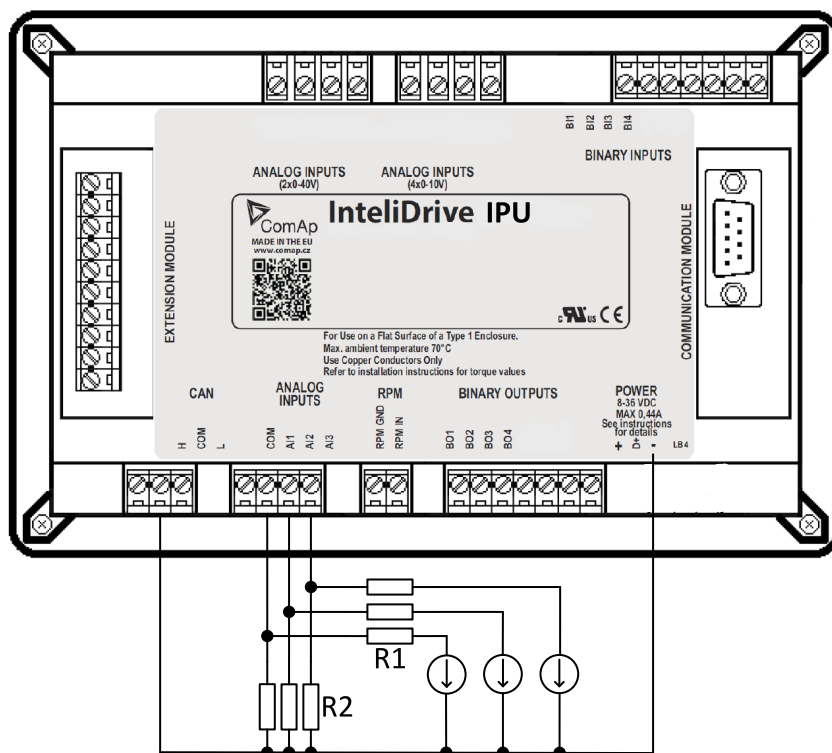


Image 4.2 Voltage output sensor – connection

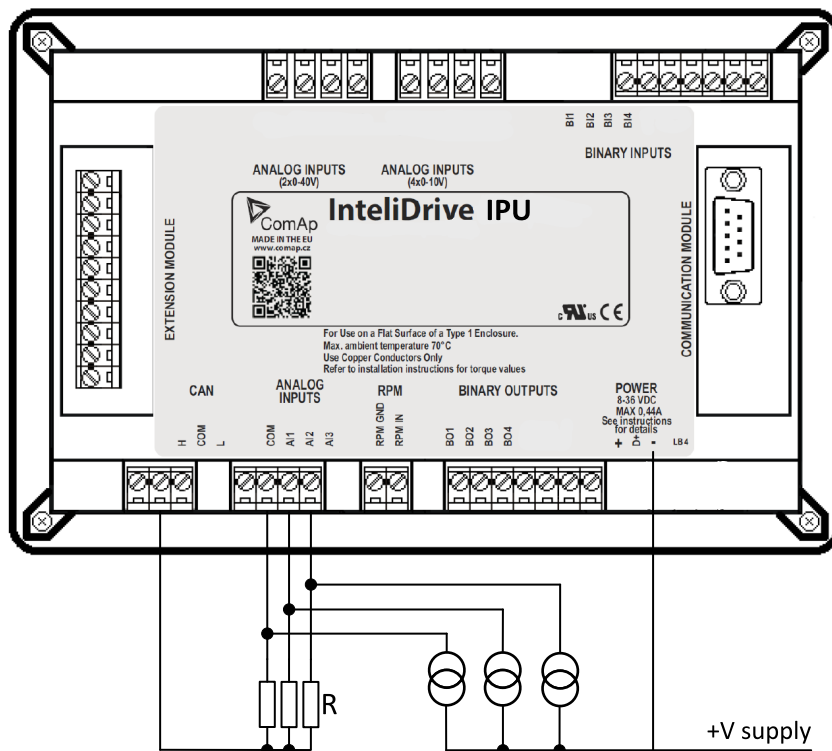


Image 4.3 Current output sensor – connection

Analog input	R1	R2	Curve
0 – 10 V	150 Ω [1%, 0.5 W]	100 Ω [1%, 0.5 W]	AI 0-10 V.CRV
0 – 30 V	680 Ω [5%, 2 W]	100 Ω [1%, 0.5 W]	AI 0-30 V.CRV
0 – 65 V	1500 Ω [5%, 3 W]	100 Ω [1%, 0.5 W]	AI 0-65 V.CRV
4 – 20 mA	R = 160 Ω [1%, 0.5 W]		AI 4-20 mA.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 0-6 bar with linear voltage output 0-10 V**

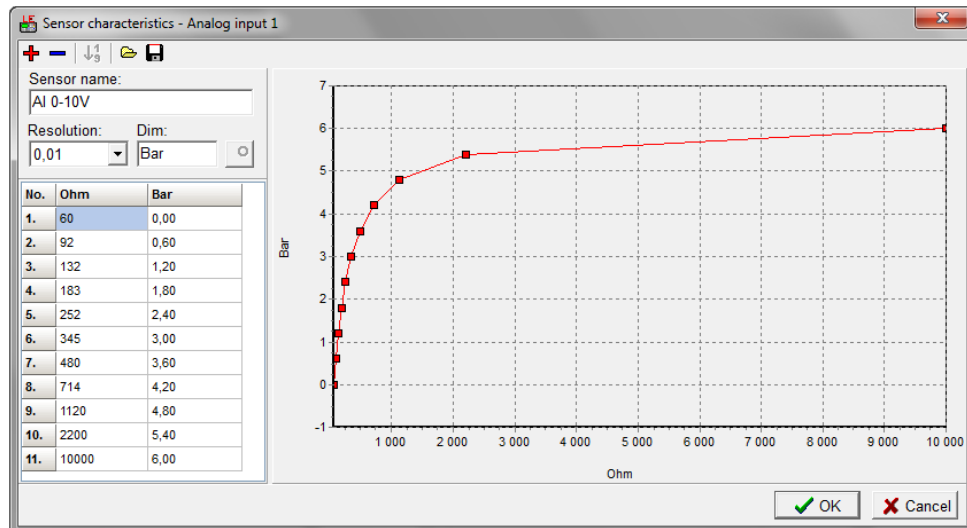
Conversion table

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

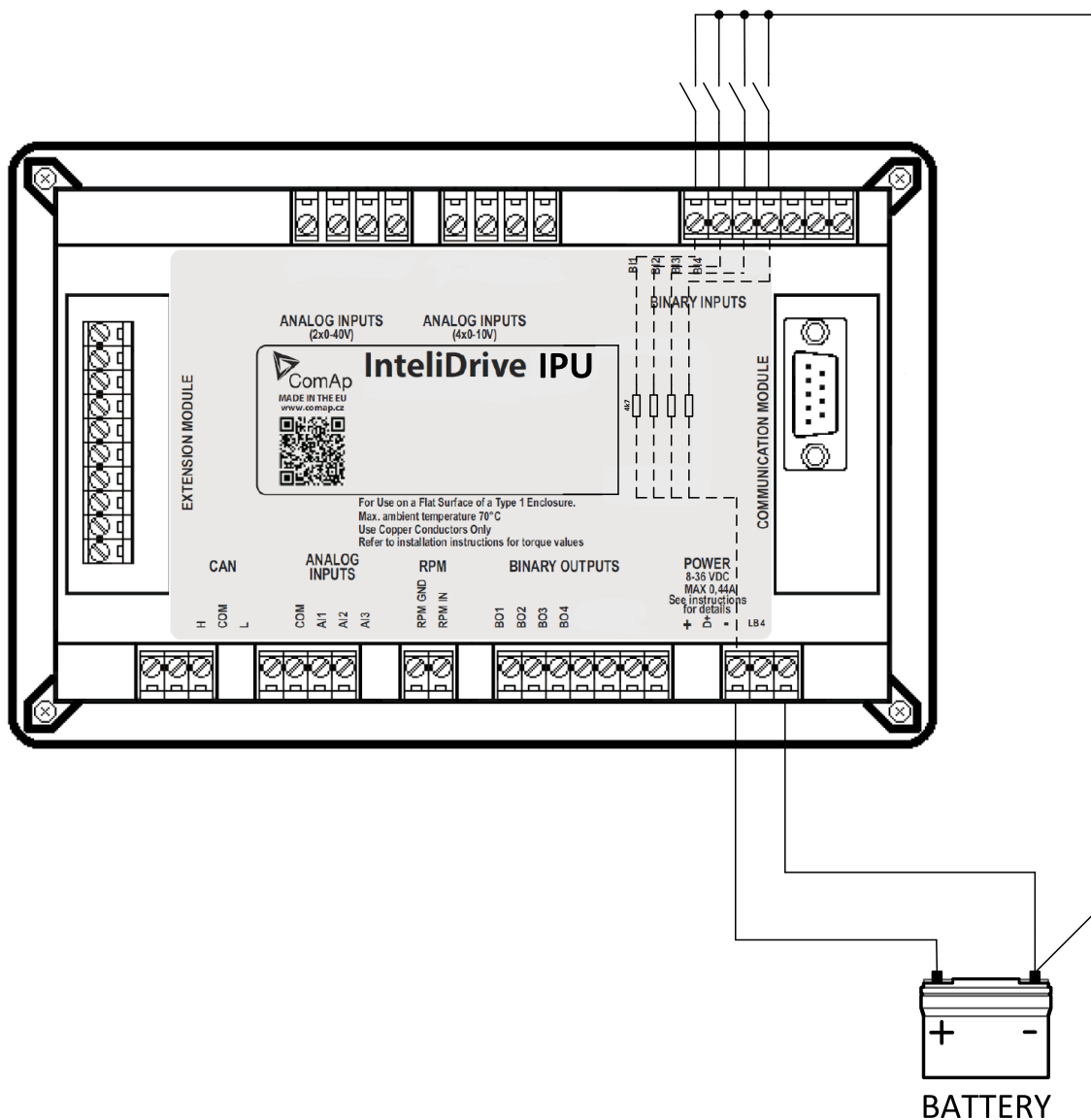
Then you can change resolution and measured value name witch is default displayed at V (volts).

For example if you have connected pressure sensor and his output voltage is 5 V for pressure 3 bar 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

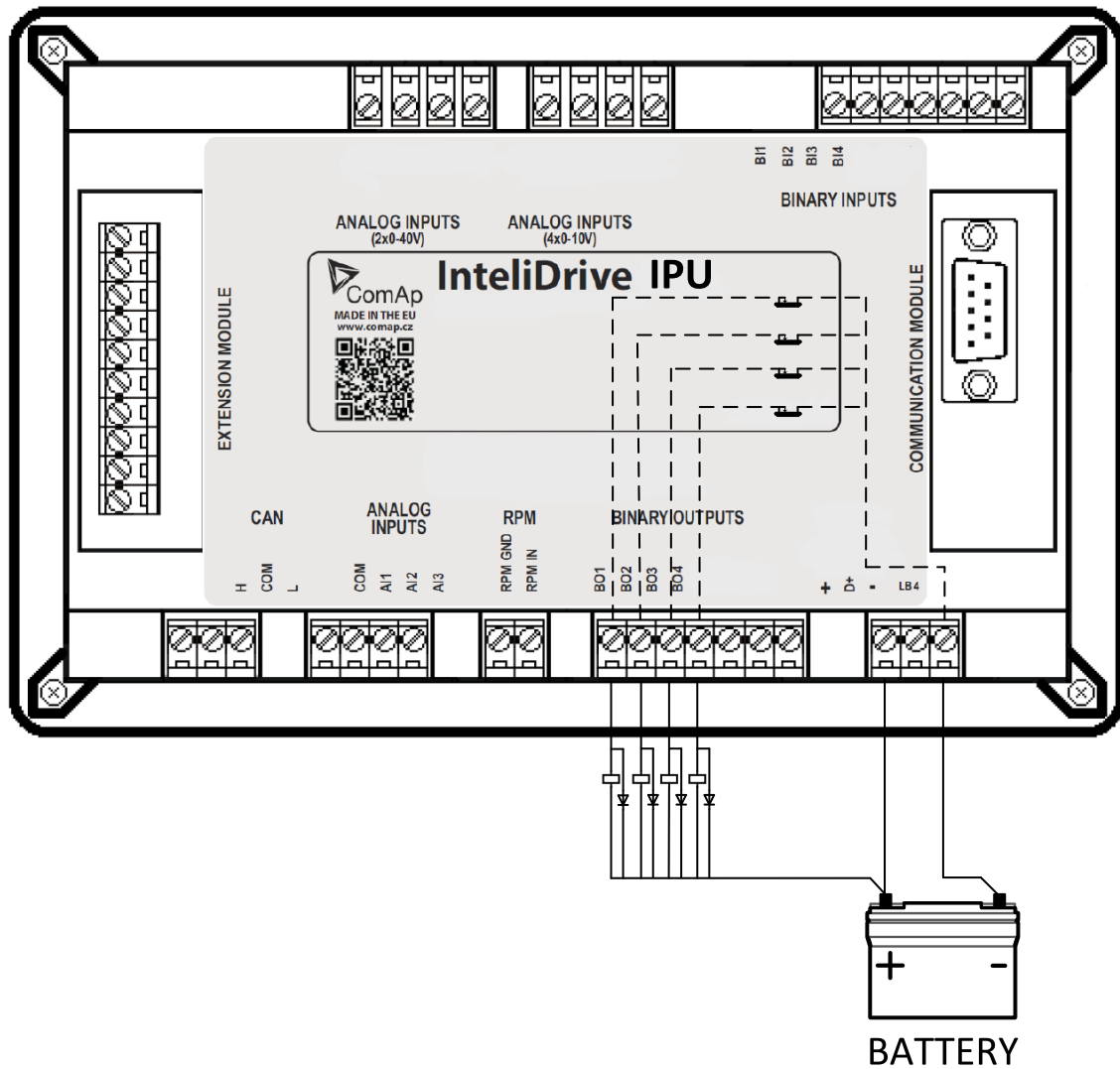


When you finish with adjusting the values click OK and Write to controller.

### 4.1.3 Binary inputs and outputs





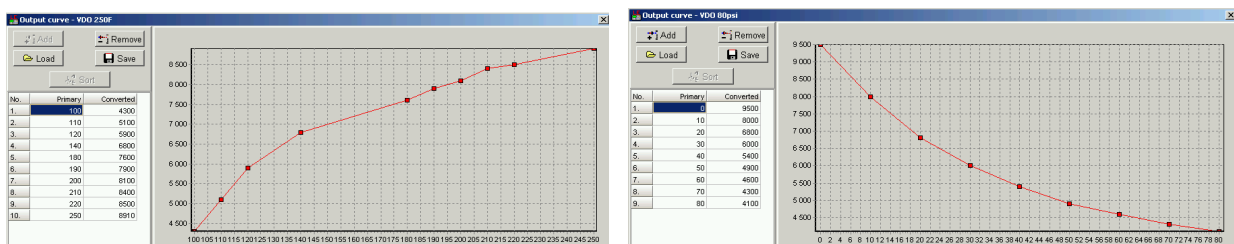


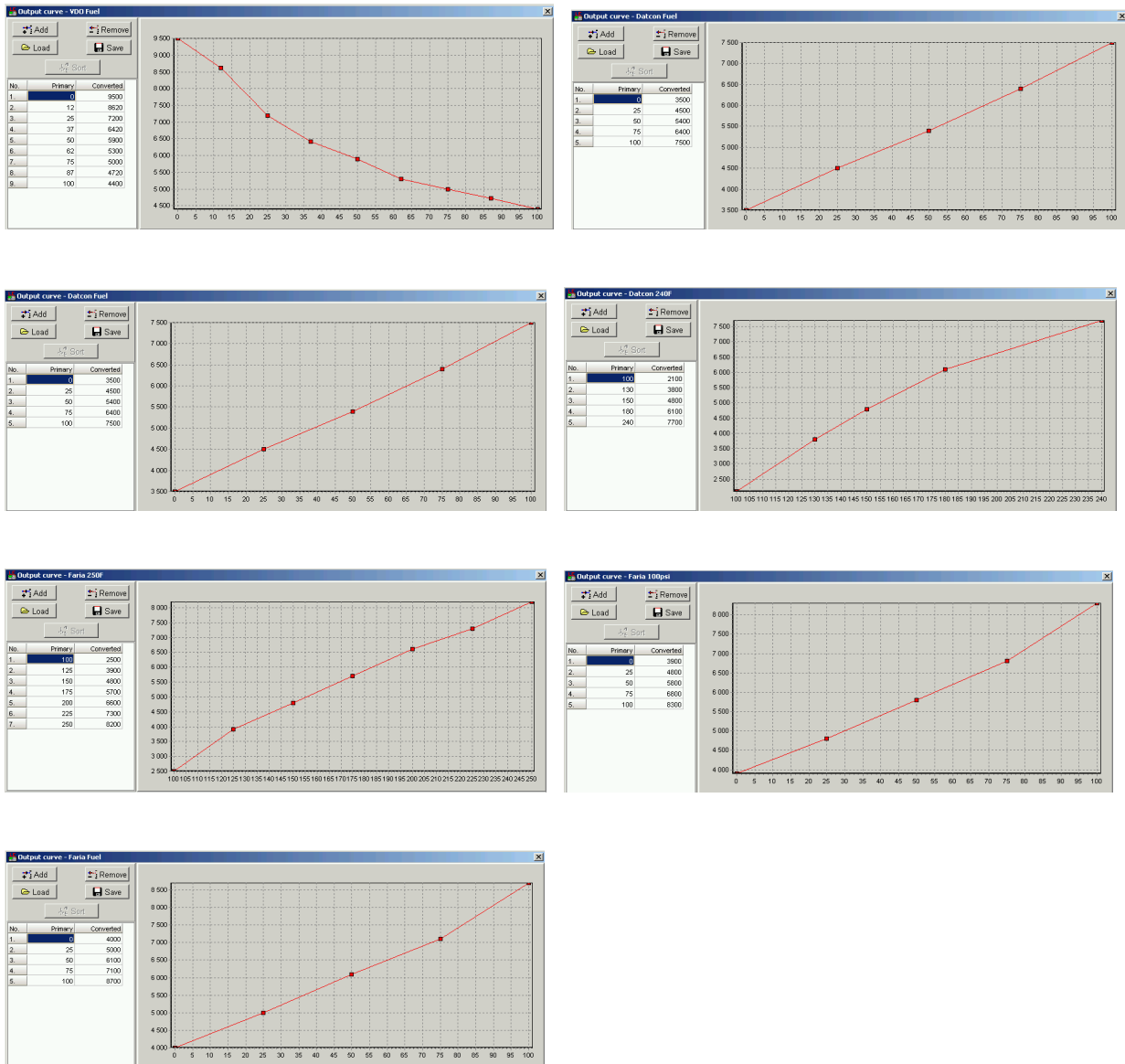
### 4.1.4 Analog outputs

First option is extension plug-in card IL-NT AOUT8. This card provides eight Pulse-With-Modulation (PWM) outputs. These are intended to drive VDO style analog gauges. 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.

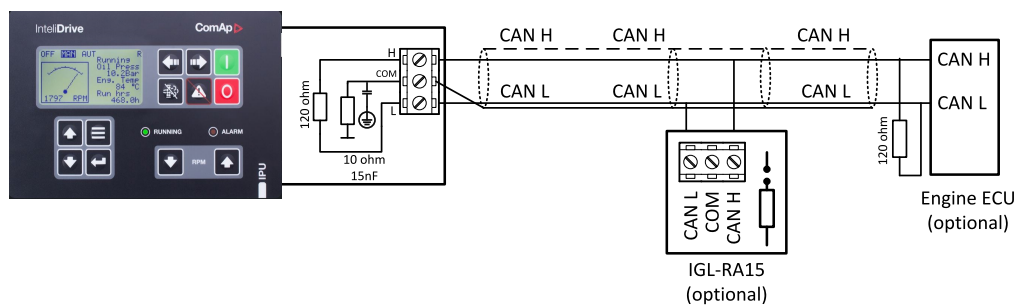
Second option is extension plug-in card IL-NT AIO. This card provides one current or voltage or PWM output. Any value from controller may be configured to the outputs. Use LiteEdit PC tool to configure corresponding sensor/gauge curve and value selection.

### Default analog output curves





## 4.1.5 Remote modules – CAN bus connection



### Connection rules


CAN bus line must be connected in series, from one unit to the next (no star, no cable stubs, no branches) both ends must be by the 120 Ω (internal or external) resistor terminated. Maximal CAN bus length is up to 200 meters.

For CAN data cables details see chapter Technical data – Communication interface.

CAN cable shielding is connected to IntelliDrive IPU COM terminal.

IntelliDrive IPU contains internal fix 120  $\Omega$  resistor and must be located on the CAN bus end.

It is possible to connect only one IGL-RA15 to IntelliDrive IPU controller.

Use  button in LiteEdit Modify window to activate CAN interface.

## 4.2 Mounting

The controller is used to be mounted onto the switchboard door. Requested cutout size is 91 × 91 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.



## 4.3 Package contents

Controller is delivered in the box as one set containing:

- ▶ IntelliDrive IPU controller programmed with default configuration
- ▶ 4x Fixing clips
- ▶ Complete connectors (female) set for controller wiring

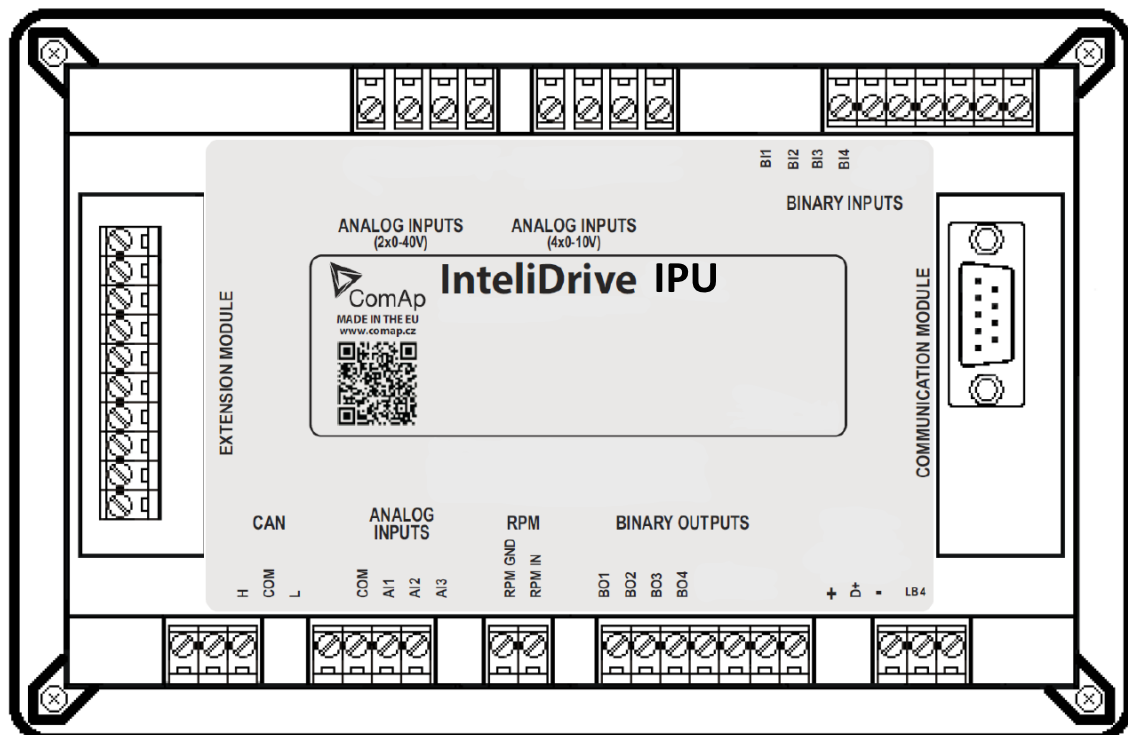
### 4.3.1 Software package

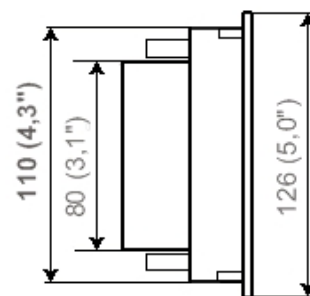
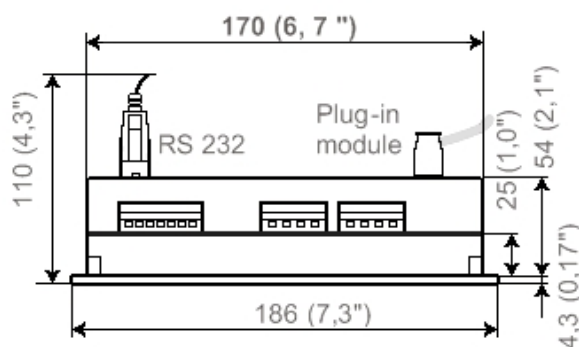
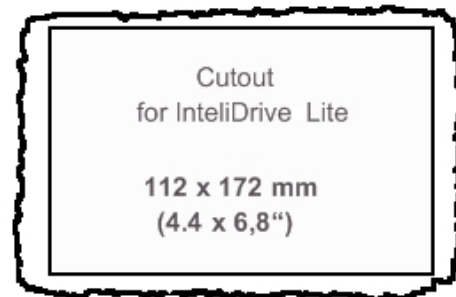
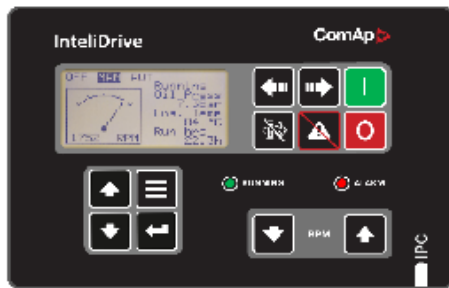
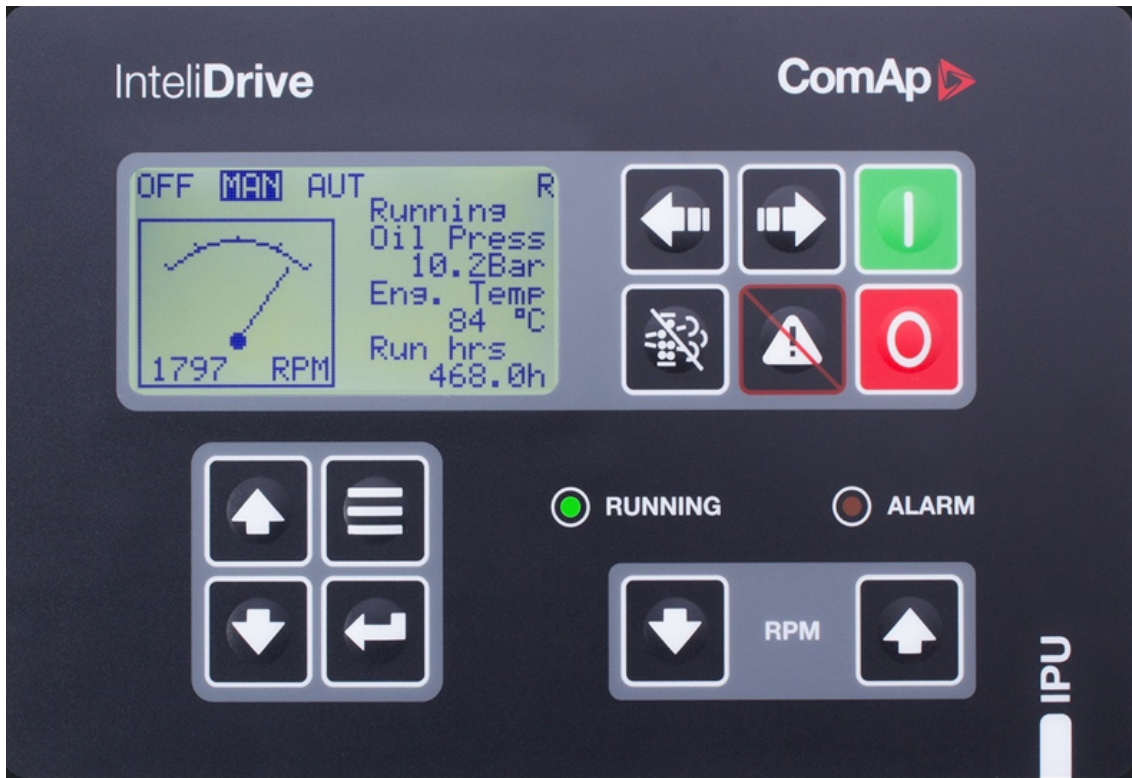
ID-FLX-Lite is distributed as ID-FLX-Lite-x.y.iwe package and it is compatible with the PC tool LiteEdit x.y.z and ECU list-x.y, where x, y, z are numbers of software version. Find installation files on ComAp web. Version of published files on the web page are compatible each other.

### 4.3.2 Components

Accessories	Description	Optional / Obligatory
InteliDrive IPU	InteliDrive Lite central unit	Obligatory
<b>Communication plug-in</b>		
IL-NT RS232	RS232 communication card	Optional plug-in
IL-NT RS232-485	Combined communication card	Optional plug-in
IL-NT S-USB	USB communication card	Optional plug-in
IB-Lite	Ethernet/Internet interface	Optional plug-in
IL-NT GPRS	GSM/GPRS modem	Optional plug-in
<b>Extension plug-in</b>		
IL-NT AOUT8	8 AOUT Gauge driver card	Optional plug-in
IL-NT AIO	4xAIN + 1x AOUT	Optional plug-in
IL-NT IO1	4xBIN + 4xAOUT	Optional plug-in
IL-NT BIO8	8x BIN or BOUT	Optional plug-in
<b>External modules</b>		
IL-NT RD	Remote display	Optional external
IGL-RA15	Remote annunciator	Optional external
IB-NT	Communication module (3G, Ethernet)	Optional external

## 4.4 Terminal diagram and dimension






## 4.5 Extension plug-in modules

### 4.5.1 Extensions plug-in modules installation

To insert the module, you must open the cover first (use screwdriver to open) and then insert the module into slot. Once you have inserted it, the module will snap under plastic teeth. It is supposed to be installed

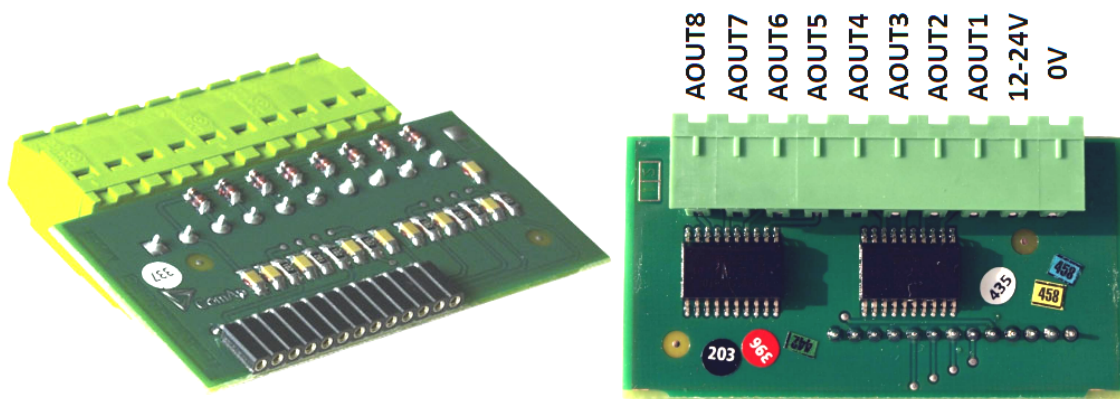


permanently. Should you need to remove it, the safest way is to remove whole back cover and than remove module manually.

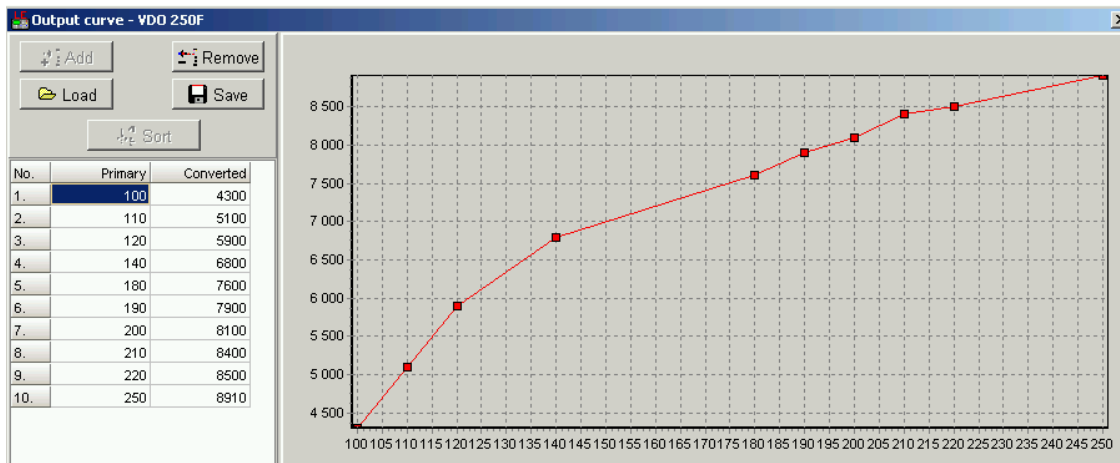
For configuration of extension plug-in modules go to LiteEdit and press  button in Modify configuration window.

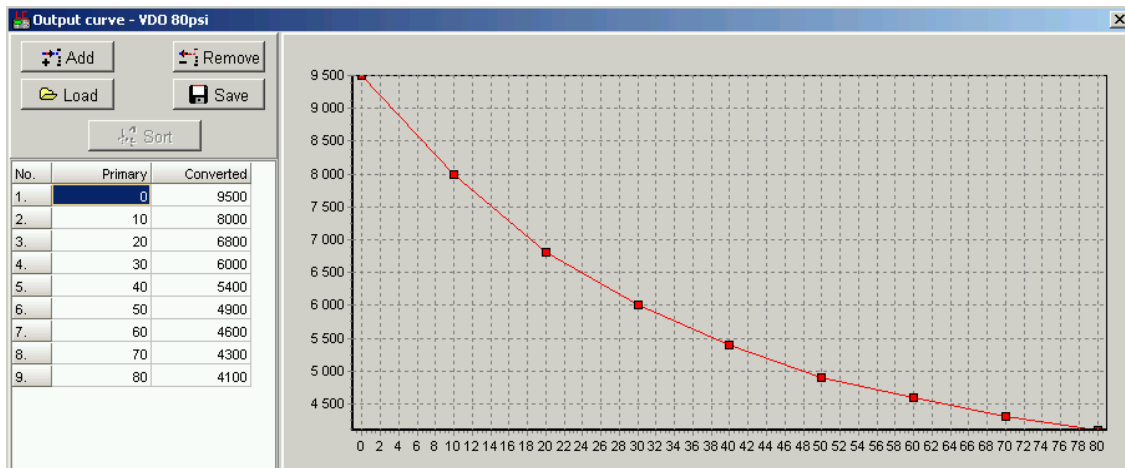
### 4.5.2 IL-NT AOUT8

IL-NT AOUT8 is optional plug-in card. Through this card can the controller drive up to 8 VDO style industrial/automotive gauges. 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. Sensor/gauge curve and value are configured in LiteEdit PC tool. Any analog value from the controller may be configured to the outputs. All outputs operate as PWM signal at 1200 Hz.

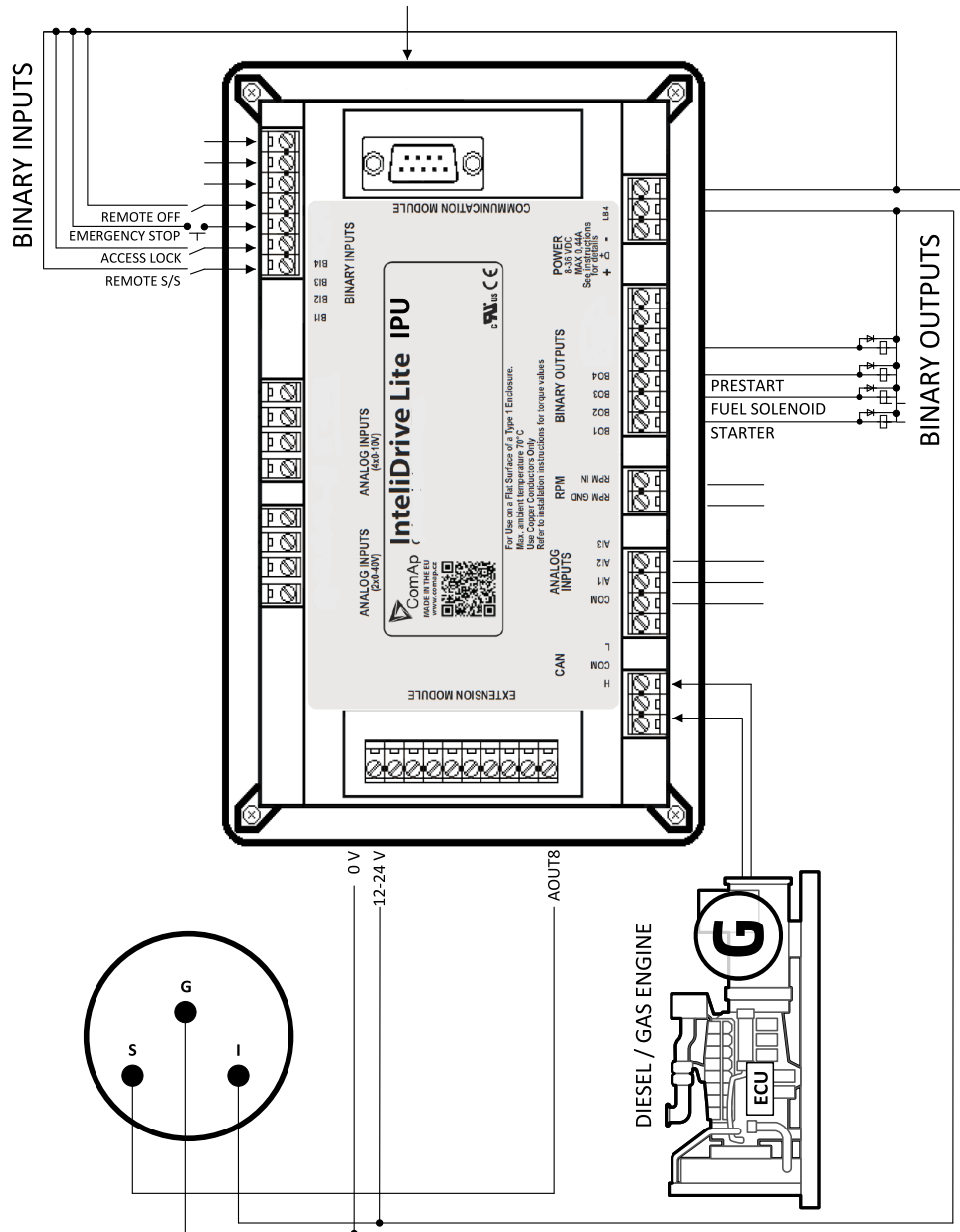


Examples of default analog output curves:





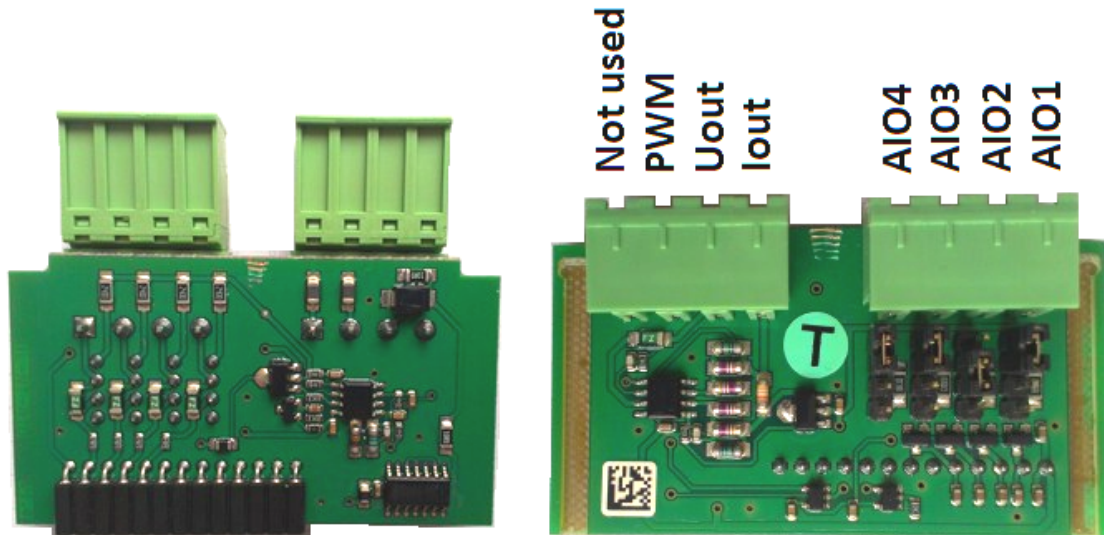
Example of wiring for Dacon gauges and IL-NT-AOUT8:



### 4.5.3 IL-NT AIO

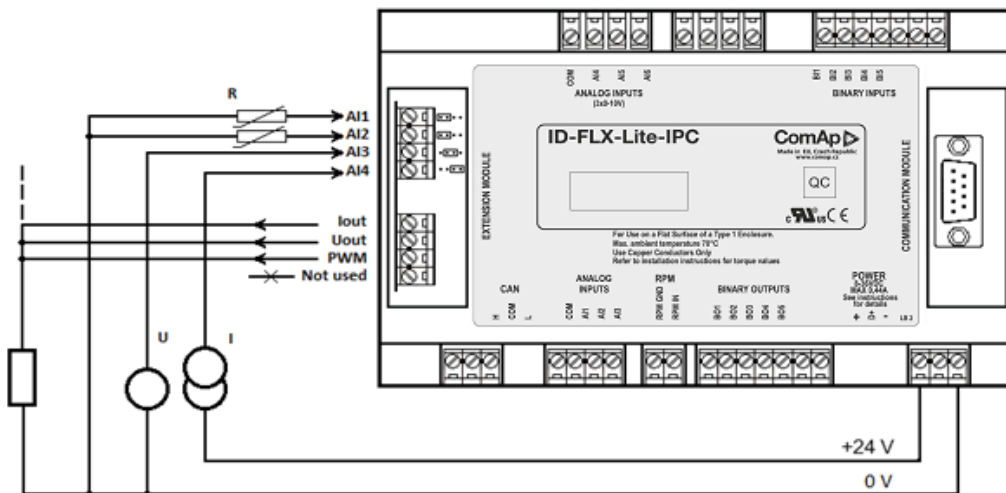
IL-NT AIO is optional plug-in card. This card offers additional four analog inputs and one analog output. Analog inputs can be use for different types of sensor (resistive, current and voltage) and variable analog output, which can be used as PWM. Adjustment of extension plug-in module is possible via LiteEdit too.





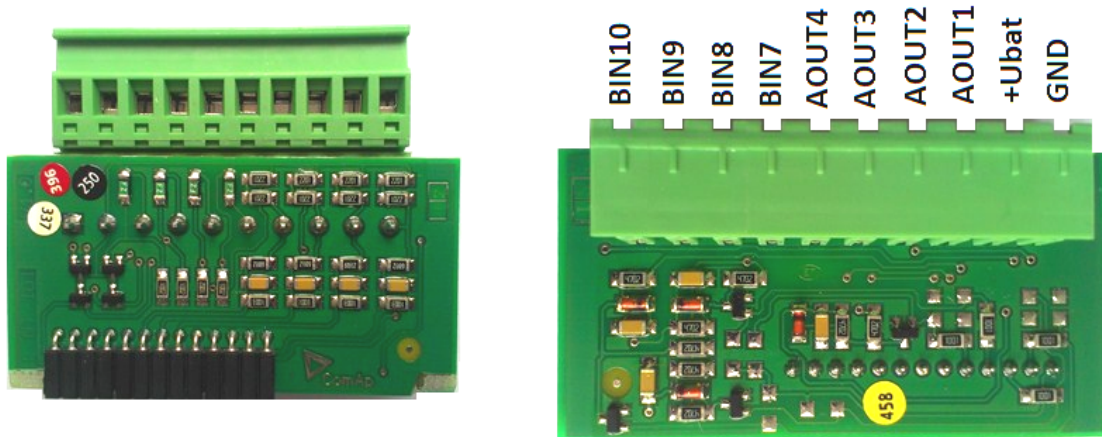
Type of analog input is selectable by jumper. Each analog input has own line of jumper position. The top position (closest to green connector on the pic above) is for resistive input, central position for voltage input and lowest position is for current input.

AI1 - AI4	2600 $\Omega$ / 4 V / 20 mA
Iout	0-20 mA (max 22 mA) max 100 $\Omega$ load
Uout	0-4.5 V (max 10 mA)
PWM	PWM 5 V / 15 mA / 500 Hz
Not used	Do not connect!



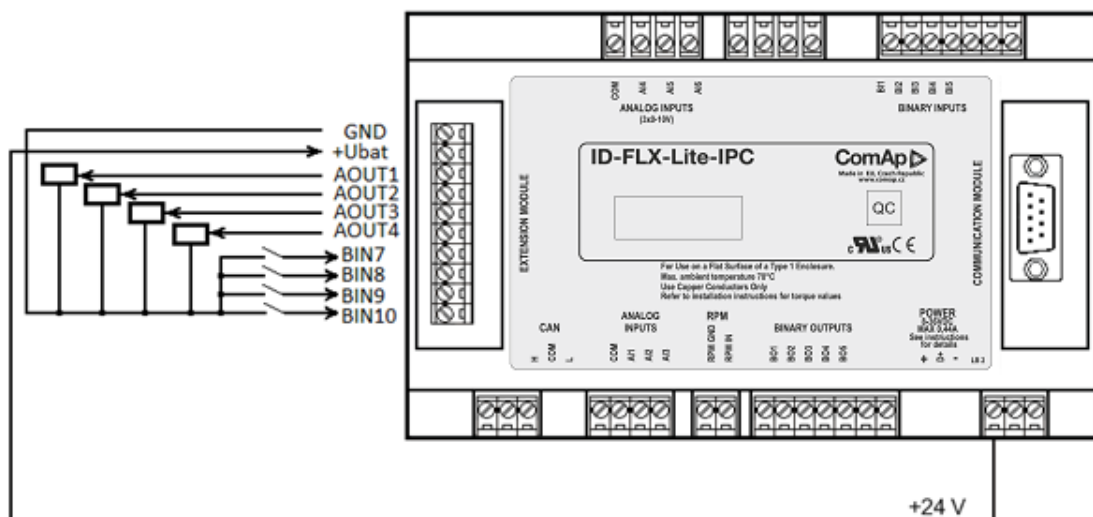
#### 4.5.4 IL-NT IO1

IL-NT IO1 is optional plug-in card. Through this card controller can drive up to 4 proportional valves and to use 4 additional binary inputs. The 0 V (GND) terminal is internally wired with battery minus internally, the 12-24 V (+Ubat) terminal is wired to battery plus power supply of IntelliDrive Lite controller.



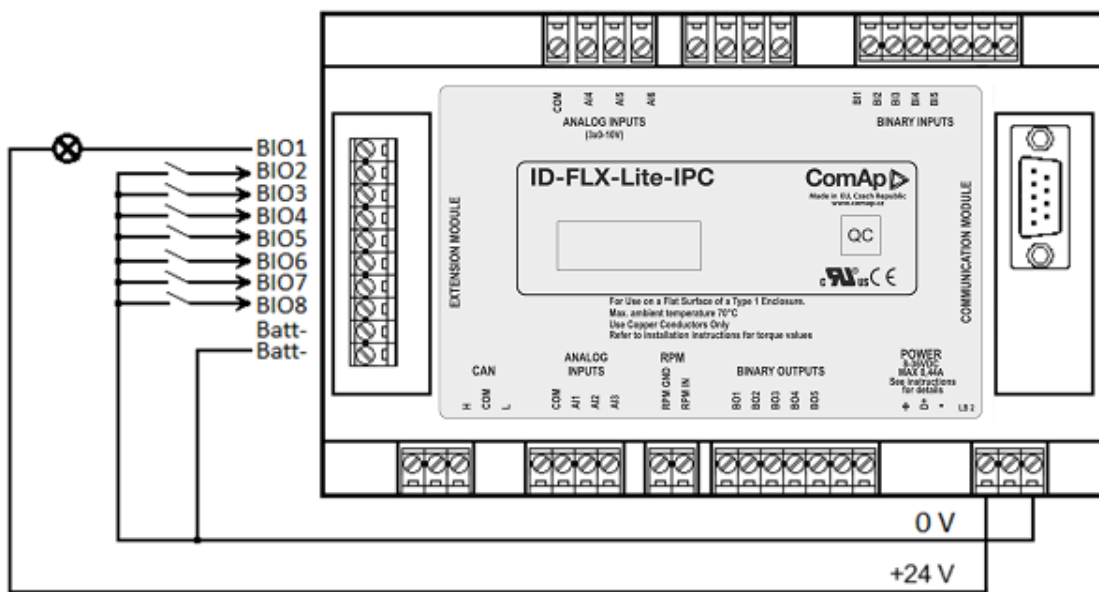
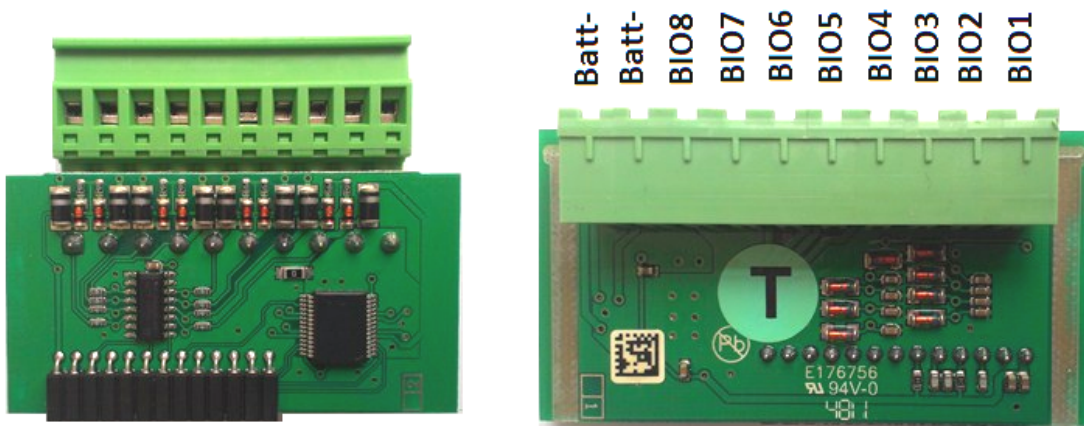
There should be, not more than 1 V, lower voltage compare to adjusted % of +Ubat voltage.

**Note:** Analog output shorted to ground more than one second can damage the output circuit.



### 4.5.5 IL-NT BIO8

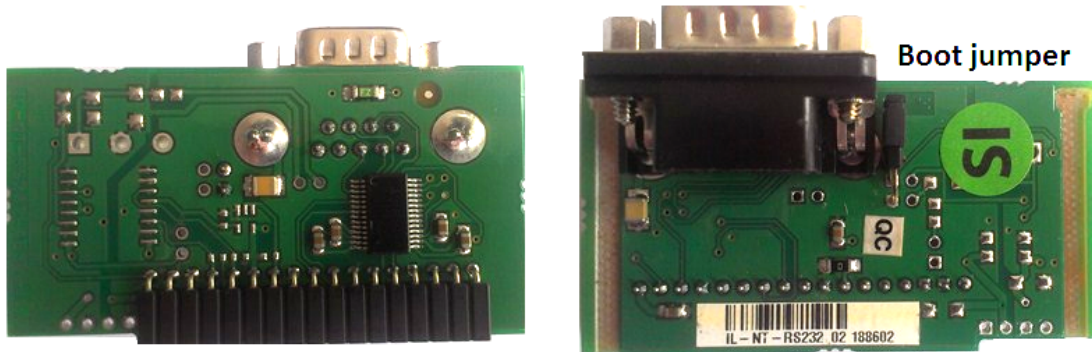
IL-NT BIO8 is optional plug-in card. Through this card controller can use up to 8 additional binary inputs or outputs. At least one Batt- terminal has to be connected to battery minus power supply of IntelliDrive controller, if at least one binary output is configured. In case more than 4 binary outputs are configured is necessary to connect both Batt- terminals.



## 4.6 Communication modules

### 4.6.1 IL-NT RS232

IL-NT RS232 is optional plug-in card, which enables controller to RS232 serial communication. This is required for computer or ModBus connection. The card has to be inserted into the expansion “Communication module” slot back on the controller, similarly to extension modules.

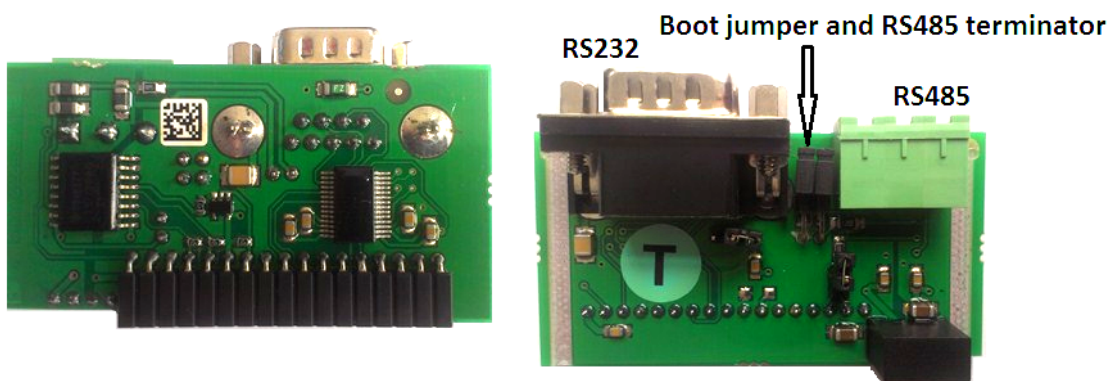


**Note:** *Boot jumper programming – In case of interrupted programming or other software failure is possible to use the boot jumper programming to restore controller to working order. Connect the controller to PC, run LiteEdit and wait until connection bar at bottom turns red. Then run programming process via menu Controller -> Programming and cloning – Programming. Select correct firmware and confirm dialog. Then follow instructions in LiteEdit.*

**Note:** *Or follow video guide “Boot Jumper Programming“ at [www.comap-control.com](http://www.comap-control.com)*

## 4.6.2 IL-NT RS233-485

IL-NT RS232-485 is optional plug-in card, which enables controller to RS232 and RS485 serial communication. This is required for computer or Modbus connection. The IL-NT RS232-485 is a dual port module with RS232 and RS485 interfaces at independent COM channels. The RS232 is connected to COM1 and RS485 to COM2. Adjustment of communication type, baud rate etc. is via Comms Setting group of setpoint in LiteEdit or the controller screen.

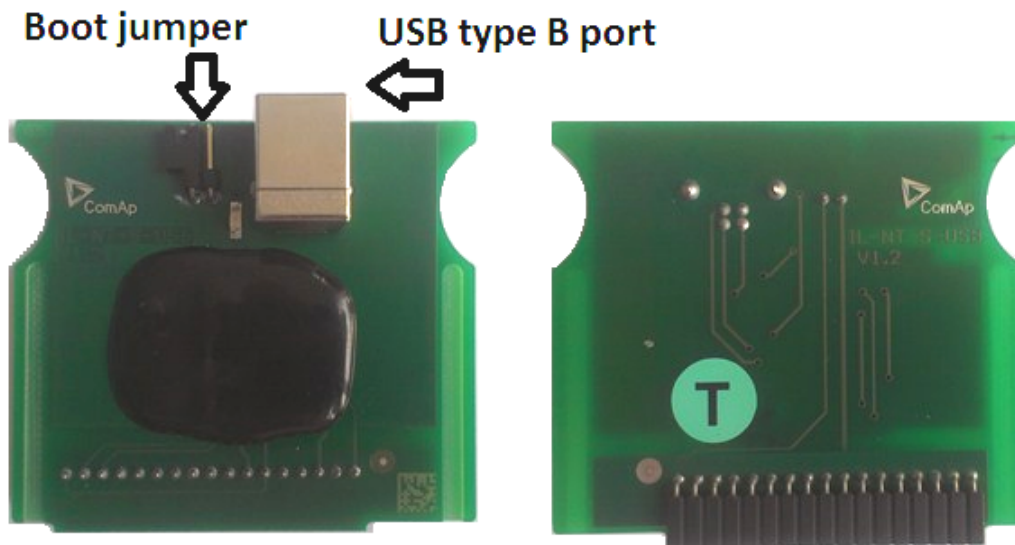


## 4.6.3 IL-NT S-USB

IL-NT S-USB is optional plug-in card to enable communication of controller via USB port. This is required for computer or Modbus connection. This module contains USB slave port, which is connected internally to the COM1 of the controllers. It is designed as an easy removable service module.

This module requires a FTDI USB Serial converter driver installed in the PC. The driver creates a virtual serial port (COM) in the PC, which must be used in LiteEdit as communication port when a connection is being opened.





**Note:** The FTDI driver is installed together with LiteEdit.

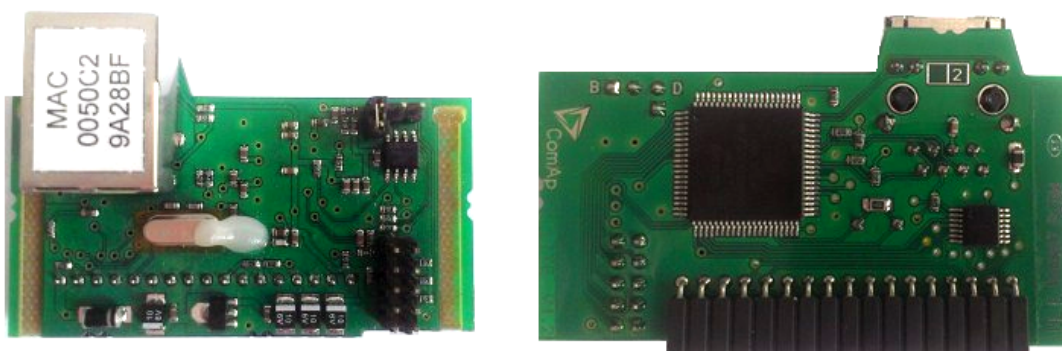
**Note:** When the USB cable from the controller is plugged-in first time into different USB ports on the PC including USB hubs, it can be recognized as new hardware and the drivers are installed again with different number of the virtual serial port.

**IMPORTANT:** Use shielded USB cable only! (ComAp order code: USB-LINK CABLE 1.8m)

#### 4.6.4 IB-Lite

IB-Lite is a optional plug-in card with Ethernet 10/100 Mbps interface in RJ45 connector. The card is internally connected to both COM1 and COM2 serial channels and provides an interface for connecting a PC with LiteEdit or IntelliMonitor through Ethernet network, for sending active e-mails and for integration of the controllers into a building management (Modbus/TCP protocol).

This card also enables to monitor and control the consumption engines over web browser from any location with internet access using appropriate security measures.



**Note:** Use Ethernet UTP cable with RJ45 connector for connection of the module into your ethernet network. The module can be also connected directly to a PC using cross-wired UTP cable.

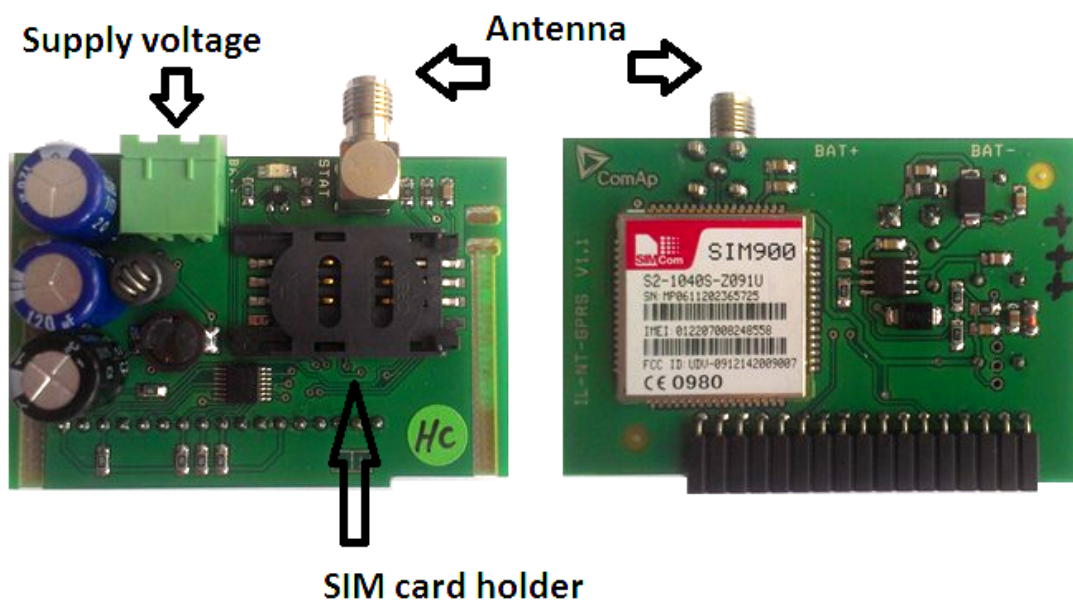
**Note:** The module requires configuration settings before usage. See IB-Lite 1.x Reference Guide.

## 4.6.5 IL-NT GPRS

IL-NT GPRS is optional plug-in card, which works as GSM/GPRS modem which can work in two modes of operation based on settings in setpoint COM1 Mode.

- ▶ Settings DIRECT = module works in GPRS network and enables connection via AirGate to LiteEdit and WebSupervisor as well as sending SMS alarms.
- ▶ Settings MODEM = module works as standard GSM modem enabling CSD (Circuit Switch Data) connection to controller with LiteEdit or other ComAp PC SW and sending alarm SMSes.

Module is usually used for connection to remote monitoring and controlling system WebSupervisor [www.websupervisor.net](http://www.websupervisor.net) or to PC tools. Module is capable of sending alarm SMS based on settings in SMS/Email setpoint group.



**IMPORTANT:** Any manipulation with plug-in module shall be done with disconnected power supply to both controller and module. Power supply shall be switched on also is same time to both module and controller. Fail to follow these instructions (power supply active only in controller or only in module) can lead to module or controller failure!

**IMPORTANT:** GPRS and CSD connection is not suitable for firmware update process, kindly used wired connection instead like RS232, USB, RS485 or ethernet via IB-Lite!

**Note:** Quick guide how to start using this module is in chapter Remote Communication - Short guide how to start using IL-NT-GPRS module or on ComAp webpage <http://www.comap.cz/products/detail/IL-NT-GPRS>

**Note:** Use of this plug-in brings WSUP Locate function. This function allows monitoring actual engine position based on GSM signal information. The position is automatically updated and stored in WSV history. You can track the position of the engine in WebSupervisor even in history.

**Note:** Unlike GPS system, the function works indoor or wherever the GSM signal is. Precision of localization is not as precise as with GPS and depends on density of operator's GSM/BTS tower around the controller.

## 4.7 Remote modules

Remote modules allow monitoring and displaying of values and states away from main controller.

### 4.7.1 IL-NT RD (SW)

IL-NT RD is remote display software for a controller. Remote display provides the same control and monitoring functions as controller itself. Remote display for IntelliDrive controllers uses standard IntelliDrive Lite controller with Remote display software. No further programming of the display is required – unit is self configurable from the main controller.

All remote display's LEDs show the same state as corresponding LEDs on master controller. Front panel buttons on both controllers work in the same way. Engine can be controlled from remote display as well as from master controller. User can switch screens, set password, change setpoints and view history records.

All IL-NT RD screens Init, Measure, Setpoints and History display the same data like in the master controller.

Master device is always able to work without connected Remote display.

Interruption of the serial line between master device and Remote display has no effect to the master controller.

If the serial line between master device and remote display is interrupted, or communication cannot be established, remote display shows it's Init screen and message "Trying" and all LED's are off.

Once remote display finds compatible master it shows "Preparing" and downloads configuration table from master controller.

After the configuration from master is downloaded remote display jump to master controllers Init screen and all LEDs and blinking.

It is possible to switch to remote displays Init screen to check it's version and serial number of used controller and communication status by pressing PAGE button for 3 seconds

**IMPORTANT: It is highly recommended to use the same type and model of controller for master and remote display. Only in such case is assured the proper function of all buttons, LED diodes and display. Another combinations of HW types and models from Master controller and remote display are neither supported nor tested**

### IL-NT RD software installation

The IL-NT-RD remote display firmware is installed in the same way as any other IntelliDrive firmware using LiteEdit . Please see LiteEdit Reference guide for details about upgrading firmware. IL-NT-RD consists only firmware, not an archive.

However when there is IL-NT-RD firmware installed in the controller the procedure to install back the original standard firmware is following:

- ▶ Open any type of online connection.
- ▶ DDE server will try to open the connection, but it will fail and write red error message in the status bar.
- ▶ In this moment go to **CONTROLLER -> PROGRAMMING AND CLONING -> PROGRAMMING** and select **proper** firmware you want program to the controller. Choosing the wrong type of firmware may result in non-functional controller.
- ▶ Press "OK" button to program the firmware to the controller.
- ▶ It may be required to switch off power supply of the controllers, close the boot jumper and switch on controller again. Follow the information windows accordingly.

- ▶ After programming is finished (it may be required to power off controller, open the boot jumper and power it on again) open configuration window and perform the configuration process manually. There is no compatibility of the configuration between different firmware versions.
- ▶ In some cases the "wrong setpoints" message can occur in the DDE server status line and controller is blocked showing "Init" state. Use CONTROLLER -> RESET FROM INIT STATE menu item to put the controller to normal operation. Be sure you have checked all setpoints before.

**IMPORTANT: Check the statistic value "Engine hours" after firmware upgrade. Change of statistical values if necessary is possible only by LiteEdit software (password is required).**

## IL-NT-RD Wiring

IL-NT-RD can be connected to IntelliDrive Lite controller via RS232 or RS485 communication line. It is possible to connect only up to two remote displays to one master controller, if they are using different communication COMs. It is not supported to connect two or more remote displays to one communication line, eg. RS485. It is possible to monitor only one master controller from one remote display at the time.

### Connection proces:

Remote display after power on automatically starts to search for any master controller connected. It starts to search on COM1 from master controllers address 1 to 32 and later on COM2 from address 1 to 32. Remote display tries two communication speeds 38400 bps and 56000 bps.

During this process is displayed text "Detecting..." on screen and progress bar below counts from 0 to 100 %. This process takes approx. 10-15 seconds. Than is 5 seconds pause and process continues again until compatible master controller is found.

Not supported types of controllers, not supported application, or controllers that are not properly communicating are skipped during the search.

### Controller type selection:

IL-NT-RD automatically detects controller type.

### Troubles with connection:

There are few reasons why remote display can not connect with master controller:

1. Not supported type of controller connected (Eg. IGS-NT, ID-DCU, IC-NT, IGS-CU, etc.)
2. Not supported firmware in master controller
3. Configuration table error in master controller
4. Wrong settings of setpoint COMx Mode in master controller
5. Wrong connection, wiring, communication fail

### Communication lines:

It is connected with the controller via IL-NT-RS232 communication modules using RS232 line (up to 10 m). Longer distances (up to 1200 m) are possible using IL-NT-RS232-485 communication module or when RS232/RS485 converters are used.

It is possible to make a RS232 direct connection... with IL-NT-RS232 module on one side and IL-NT-RS232-485 module on the other side.

## 4.7.2 IGL-RA15

The remote annunciator IGL-RA15 can be connected to the controller via CAN bus. Any of the binary outputs can be configured (using LiteEdit) to each LED diode on the RA15. The module can be also enabled or disabled using LiteEdit.



If IGL-RA15 remote annunciator is not communicating with a controller via CAN bus, it activates a warning.

**Note:** See the documentation of IGL-RA15 for the technical description.



### 4.7.3 IB-NT

Internet bridge allows different type of communication and multiple controllers communication. Single controller is possible to connect via serial line RS232. For multiple controllers connection is necessary to use RS485 communication port.

IB-NT offers direct, internet, AirGate and cellular network type of communication.

**Note:** See the documentation of IB-NT for the detail description.



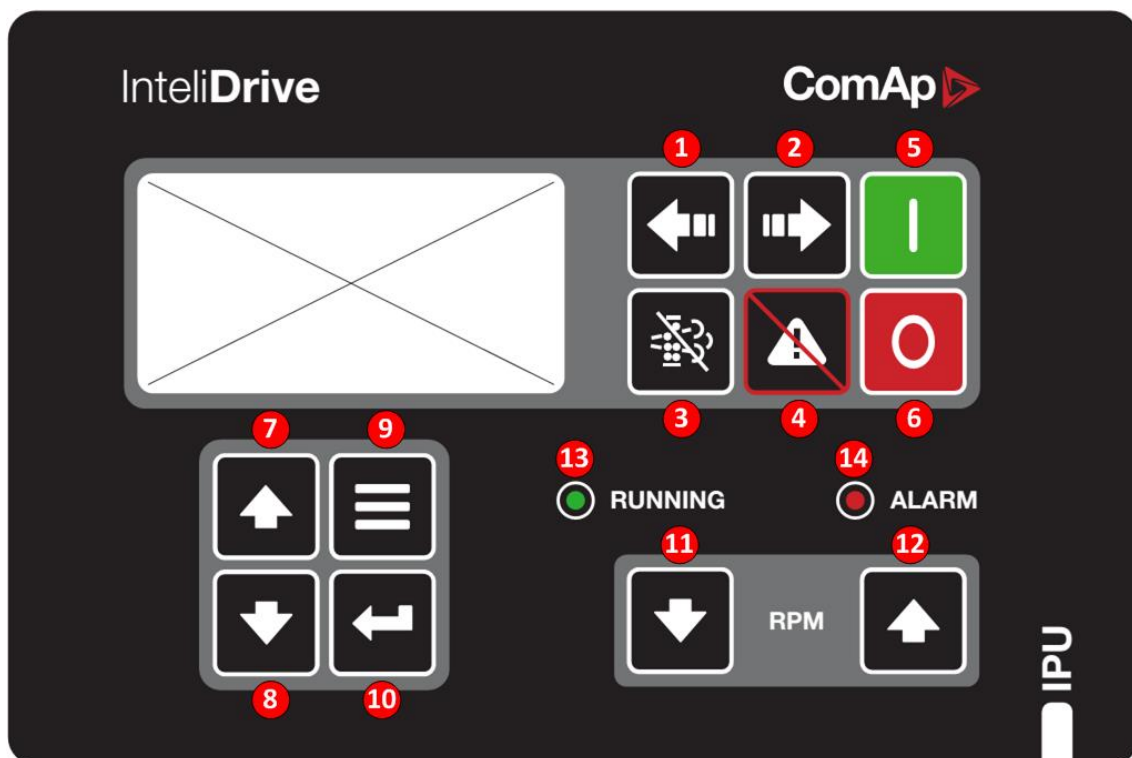
[◀ back to Installation and wiring](#)










# 5 Controller setup





- 5.1 Front panel elements ..... 46
- 5.2 Init screens ..... 48
- 5.3 Display menus ..... 49
- 5.4 How to select the engine mode? ..... 49
- 5.5 How to view measured data? ..... 49
- 5.6 How to view and edit setpoints? ..... 49
- 5.7 How to find active alarms? ..... 50
- 5.8 How to list History records? ..... 51
- 5.9 MEASUREMENT screens description ..... 52
- 5.10 Display screens and pages structure ..... 55
- 5.11 Binary input functions ..... 58
- 5.12 Binary output functions ..... 64

 [back to Table of contents](#)

## 5.1 Front panel elements



Position	Button	Description
1		<p><b>MODE LEFT</b> button. Use this button to change the mode. The button works only if the main screen with the indicator of currently selected mode is displayed.</p> <p><i>Note: This button will not work if the controller mode is forced by one of binary inputs Remote OFF, Remote MAN, Remote AUT.</i></p>
2		<p><b>MODE RIGHT</b> button. Use this button to change the mode. The button works only if the main screen with the indicator of currently selected mode is displayed.</p> <p><i>Note: This button will not work if the controller mode is forced by one of binary inputs Remote OFF, Remote MAN, Remote AUT.</i></p>
3		<p><b>TIER 4</b> button. Use this button for fast access to after treatment setpoints.</p>
4		<p><b>FAULT RESET</b> button. Use this button to acknowledge alarms and deactivate the horn output. Inactive alarms will disappear immediately and status of active alarms will be changed to "confirmed" so they will disappear as soon as their reasons dismiss.</p>
5		<p><b>START</b> button. Works in MAN mode only. Press this button to initiate the start sequence of the engine.</p>
6		<p><b>STOP</b> 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>
7		<p><b>SPEED DOWN</b> button. Works in MAN mode only. Use this button for decreasing speed request to the engine. Short pressing changes the speed by 5 RPM/s during 0,6 s, after this period the speed change is according to setpoint Engine Params / Speed Ramp.</p>
8		<p><b>SPEED UP</b> button. Works in MAN mode only. Use this button for increasing speed request to the engine. Short pressing changes the speed by 5 RPM/s during 0,6 s, after this period the speed change is according to setpoint Engine Params / Speed Ramp.</p>
9		<p><b>PAGE</b> button. Use this button to switch over display pages. See Display Screens and Pages Structure chapter below this table for more details.</p>
10		<p><b>UP</b> button. Use this button to move up or increase value of selected setpoint.</p>

Position	Button	Description
11		<b>DOWN</b> button. Use this button to move down or decrease value of selected setpoint.
12		<b>ENTER</b> button. Use this button to finish editing a setpoint or moving right in the history page.
13		<b>RUNNING LED</b>
14		<b>ALARM LED</b>

## 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: hold ENTER and press PAGE. This procedure activates the panel LEDs test as well. The screen disappears itself after app 5 seconds.*

### 5.2.3 Languages screen

InteliDrive IPU 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 use panel buttons: hold ENTER and press PAGE twice. Press ENTER to leave this screen.*

### 5.2.4 User interface screen

InteliDrive IPU 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 use panel buttons: hold ENTER and press PAGE three times. Press ENTER 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 consists of several screens. Press repeatedly  button to select requested menu.




### 5.3.1 Switching between User and Engineer menus

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








## 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?




1. Use  repeatedly button to select the MEASUREMENT menu.
2. Use  and  to select the screen with requested data.

## 5.6 How to view and edit setpoints?



1. Use repeatedly  button to select the ADJUSTMENT menu.
2. Use  or  to select requested set points group.
3. Press  to confirm.
4. Use  or  to select requested set point.
5. Set points marked “\*” are password protected.
6. Press  to edit.

7. Use  or  to modify the set point. When  or  is pressed for 2 sec, auto repeat function is activated.
8. Press  to confirm or  to leave without change.
9. Press  to leave selected set points group.

### 5.6.1 How to change the display contrast?

Press  and  or  at the same time to adjust the best display contrast



### 5.6.2 How to check software revision?

Hold  and then press . This activates the panel LED test and controller's display is switched to Firmware screen. On the display you can see (for 10 seconds) IntelliDrive Lite Firmware screen containing:

1. Controller name (see **Group: Basic settings (page 117)**)
2. Firmware version ID-FLX-Lite-x.x
3. ESF: version of ESF file, if ECU is configured
4. SW version: the first is the firmware version number the second is configuration table number
5. Application: DCU
6. Branch: DCU

**Note:** Only in MEASUREMENT screen.






### 5.6.3 How to check serial number and choose interface?

Hold  and then three times press . On the display you can see IntelliDrive IPU User Interface screen containing:

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


**Note:** Only in MEASUREMENT screen.

### 5.6.4 How to change language?


Hold  and then two times press  to get to Languages selection screen. Use  or  to select desired language and press  to confirm selection.

## 5.7 How to find active alarms?

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

Select MEASUREMENT menu. Press  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  accepts 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.

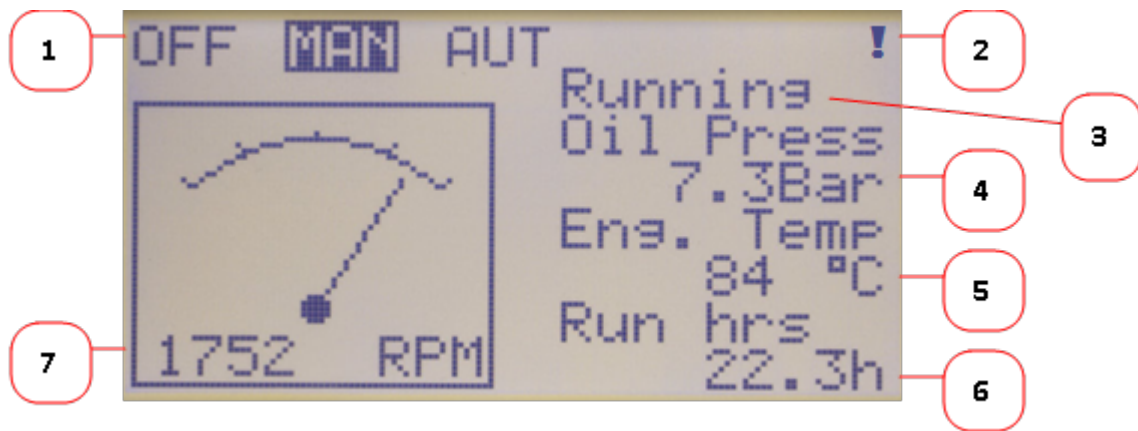
Control from the front panel	
	One screen up/down
	Cursor move within the ECU alarm list
 + 	ECU fault code reset

## 5.8 How to list History records?

1. Use repeatedly  button to select the History menu.
2. Use  or  to select requested History line – see Reason, Date and Time.
3. Press  to go-on line to right – see recorded values.
4. Use repeatedly  button 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 IntelliDrive Lite Analog inputs screens

▶ First screen:

- Operation mode of engine
- Oil pressure (AI1 bargraph with protection limits indication)
- Water temperature (AI2 bargraph with protection limits indication) or SootLevel indicator
- Run Hrs or DEFLevel

▶ Second screen (Analog and binary input/Output values) :

- AIN3 (Fuel level, displayed only if is configured)
- AIN4 (Pump suction, displayed only if is configured)
- AIN5 (Pupm discharge, displayed only if is configured)
- AIN6 (Pump flow, displayed only if configured)

▶ Third screen: (Engine values)

### 5.9.3 IL-NT-AIO Analog inputs screens

- ▶ AI1 (AI1 bargraph with protection limits indication, displayed only if is configured)
- ▶ AI2 (AI2 bargraph with protection limits indication, displayed only if is configured)



- ▶ AI3 (AI3 bargraph with protection limits indication, displayed only if is configured)
- ▶ AI4 (AI4 bargraph with protection limits indication, displayed only if is configured)

**Note:** This screen is shown/hidden depending on whether the IL-NT-AIO is configured or not. Analog output AO1 is not displayed on any screen!

## 5.9.4 IL-NT-BIO8 Binary inputs screen

- ▶ IN: BIO8 BI1 Alarm
- ▶ IN: BIO8 BI2 Alarm
- ▶ IN: BIO8 BI3 Alarm
- ▶ IN: BIO8 BI4 Alarm
- ▶ IN: BIO8 BI5 Alarm
- ▶ IN: BIO8 BI6 Alarm
- ▶ IN: BIO8 BI7 Alarm
- ▶ IN: BIO8 BI8 Alarm
  - line is displayed on the following screen

**Note:** These screens are shown/hidden depending on whether the IL-NT-BIO8 is configured or not.

## 5.9.5 IL-NT-IO1 Binary inputs screen

- ▶ IN: BIO8 BI1 Alarm
- ▶ IN: BIO8 BI2 Alarm
- ▶ IN: BIO8 BI3 Alarm
- ▶ IN: BIO8 BI4 Alarm

**Note:** This screen is shown/hidden depending on whether the IL-NT-IO1 is configured or not. Analog outputs are not displayed on any screen!

## 5.9.6 ECU State

- ▶ ECU State
- ▶ ECU YellowLamp
- ▶ ECU RedLamp
- ▶ WaitToStart
- ▶ SpeedReq Abs
  - Required RPM of the engine
- ▶ SpeedReq Rel
  - %

**Note:** This screen is shown/hidden depending on whether the ECU is configured or not.

## 5.9.7 ECU Values

It depends on the ESF file which is configured. See practical example of the screen below for Caterpillar J1939 2.1.

Practical example:

- ▶ Fuel rate
  - L/h or gph
- ▶ CoolantTemp
  - °C or °F
- ▶ IntakeTemp
  - °C or °F
- ▶ Oil pressure
  - Bar or psi
- ▶ Boost pressure
  - Bar or psi
- ▶ Load
  - % (Percentual load at current speed)

**Note:** This screen is shown/hidden depending on whether the ECU is configured or not.

## 5.9.8 Statistic

- ▶ Number of starts
- ▶ E-Stop
  - Number of engine Emergency stops (without ShutDowns)
- ▶ ShutDown
  - Number of engine ShutDown stops (without Emergency stops)
- ▶ SpeedReq Abs
  - Required RPM of the engine
- ▶ LoadLimitAout
  - Output of Load limit loop – see **Group: Load limit (page 153)**
- ▶ RPM-BI3
  - RPM detected and counted on the BI3 input

**Note:** Running time is displayed on the Main screen of measurements and is measured in complete minutes, displayed in complete hours. Values are stored in nonvolatile memory.

## 5.9.9 ECU AlarmList

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.

Following image 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.

```
EngOilPress WRN
BoostPressFLS
EngOilTem FLS
629(275h) FLS
Controller#1
EngCoolTemp WRN
-----
SPN:110 OC:7 FMI:3
```

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

### 5.9.10 Alarm list

Alarm list displays active or inactive alarms occurred on controller. Controller automatically switches to the Alarm list screen when any new Alarm appears, but from Main measure screen only. See chapter **Alarm management (page 82)**

## 5.10 Display screens and pages structure

Measurement screens:

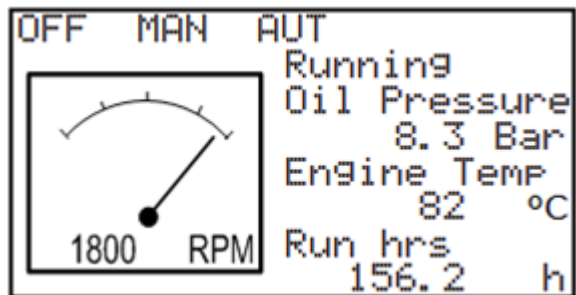


Image 5.1 Main values

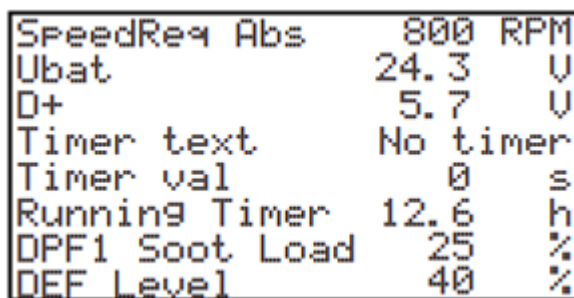


Image 5.2 Engine values

```
GSM SignalLvl    51  %
GSM ErrorRate   0
Modem Status!   Ready
GSM DiagCode!   0
AirGate ID!     979b0ad6
AirGate Diag!   5
```

Image 5.3 Remote communication values

**Note:** Displayed only if remote comm. Module is used

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

Image 5.4 ECU alarm list

**Note:** Displayed only if ECU is configured

```
Fuel Level      93  %
PumpSuction     278 kPa
PumpDischar     1320 kPa
PumpFlow        43  L/s

BIN             10000
BOUT            11001
```

Image 5.5 Analog and binary inputs / outputs values

```
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  -
```

Image 5.6 Statistics

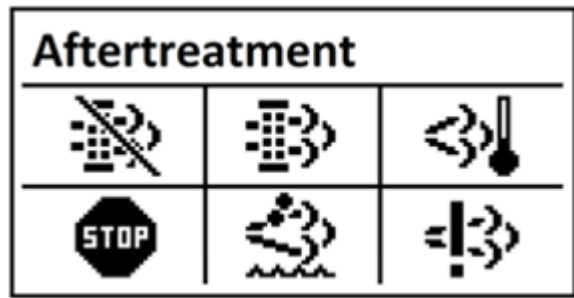


Image 5.7 Aftertreatment

**Note:** Displayed only if Tier 4 engine is connected

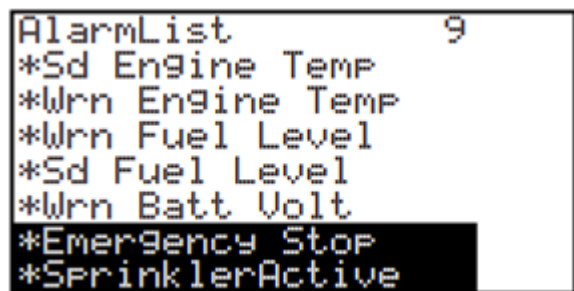


Image 5.8 Alarm list

**Setpoints screen:**

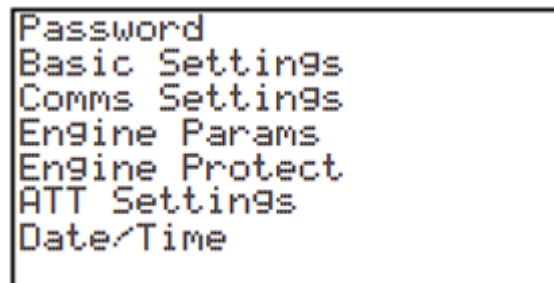


Image 5.9 Setpoint groups

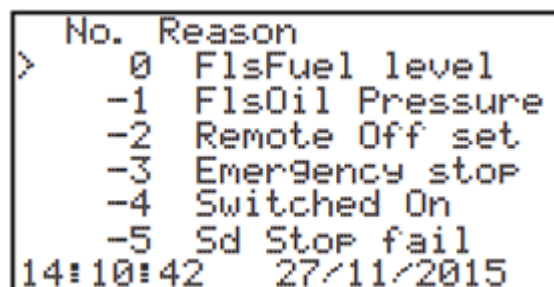


Image 5.10 History log

All values and parameters are available from PC tools LiteEdit and IntelliMonitor.

 **back to Controller setup**

## 5.11 Binary input functions

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

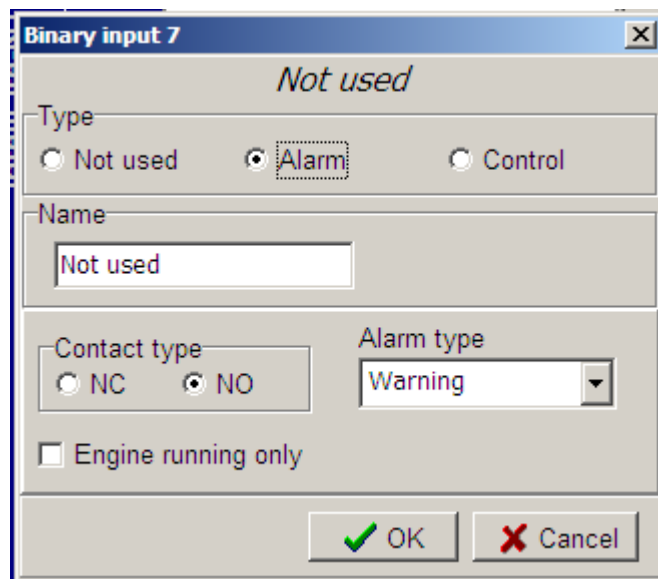
### 5.11.1 Binary inputs IntelliDrive Lite - default configuration

<b>BI1</b>	Rem start/stop
<b>BI2</b>	Access lock
<b>BI3</b>	Emergency stop
<b>BI4</b>	Remote OFF
<b>BI5</b>	Sprinkler

### 5.11.2 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.



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

## 5.11.3 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 IPU alarms are detected,
- ▶ IntelliDrive IPU front panel RED LED blinks or lights,
- ▶ Alarm is recorded on the IntelliDrive IPU 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.*

### Access 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 IPU 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 IPU front panel. It is active in MAN mode only.

## StopButton

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

## FaultResButton

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

## HornResButton

Binary input has the same function as Horn reset button on the IntelliDrive IPU 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.

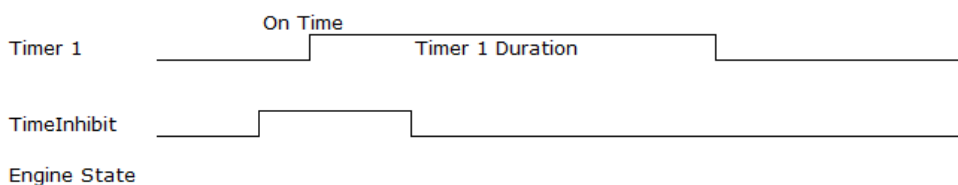
## TimerInhibit

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).

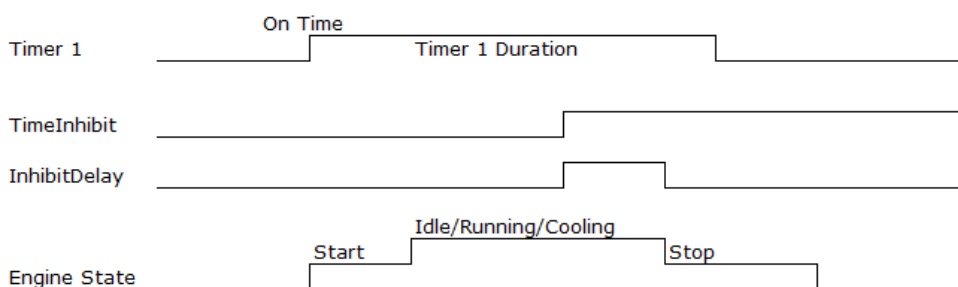
### Operation if TimerInhibit input is high during Timer 1/2 On Time

AUT Mode



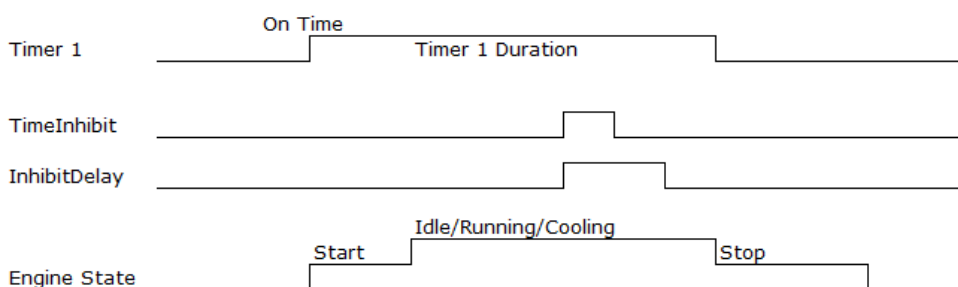
### Operation if TimerInhibit input goes high during Timer 1/2 Duration for longer than the InhibitDelay time

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

## 5.12 Binary output functions

### 5.12.1 Binary outputs IntelliDrive Lite - default

<b>BO1</b>	Starter
<b>BO2</b>	Fuel solenoid
<b>BO3</b>	Prestart
<b>BO4</b>	Alarm
<b>BO5</b>	Horn

### 5.12.2 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 starting 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
- ▶ HORN 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 IPU 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, BI6, BI7, BI8, BI9, BI10 - stat

In case the binary input is configured to any control function, the binary output depicts the state of the binary input. BI1, BI2, BI3, BI4, BI5, BI6 are assigned for controller binary inputs, BI7, BI8, BI9, BI10 are assigned for IL-NT IO1 optional card.

## 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.

## BIO8 1, 2, 3, 4, 5, 6, 7, 8 Status

In case the assigned binary input of IL-NT BIO8 optional card is configured to any control function, the output propagates the state of the input.

**Note:** These binary outputs are possible to configure only if the IL-NT-BIO8 is configured.

## 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

- ▶ alarm is not active and
- ▶ 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 if AutoRun is set on the setpoint **Timer1Function** (page 176)

## Timer2

Output activates when Timer2 is active. Simultaneously the engine is started when is in AUT mode if AutoRun is set on the setpoint **Timer2Function** (page 178).

## 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

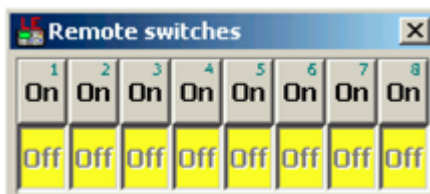
Output is controlled by panel 0/1 button when Basic settings: Panel Button = Close Load, engine is running and no Sd/Cd alarm is active. Close Load output is not closed in Idle and Cooling states and is disconnected when any Sd/Cd alarm is activated.

## Toggle

Output is controlled by panel 0/1 button when Basic settings: Panel Button = Toggle. This setting changes the Toggle output without any relation to Engine state or Alarm activity even if in OFF mode.

## 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) or IntelliMonitor by button  and it can be controlled via ModBus communication.



## 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.

# 6 Communication

6.1 Direct cable connection .....	73
6.2 Remote connection .....	74
6.3 Modbus connection .....	75
6.4 ECU engine support .....	76
6.5 Choosing the ECU to configure .....	76
6.6 ECU Analog inputs .....	78
6.7 Tier4 final support .....	78

 [back to Table of contents](#)

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

## 6.1 Direct cable connection

InteliDrive IPU can be connected directly with PC via optional communication plug-in modules IL-NT RS232, IL-NT RS232-485, IL-NT S-USB.

Use the standard serial/USB cable to connect PC with InteliDrive IPU. In the area with electromagnetic interference should be used shielded cables.

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

The setpoint COM1 Mode or COM2 Mode (according to the interface used) must be set to DIRECT position for this kind of connection.

The communication speed of direct connection is up to 38400 bps, via USB it is up to 115200 bps.

**Note:** The RS485 communication line has to be terminated by 120Ω resistors on both ends. RS485 uses channel COM2 in InteliDrive controller.

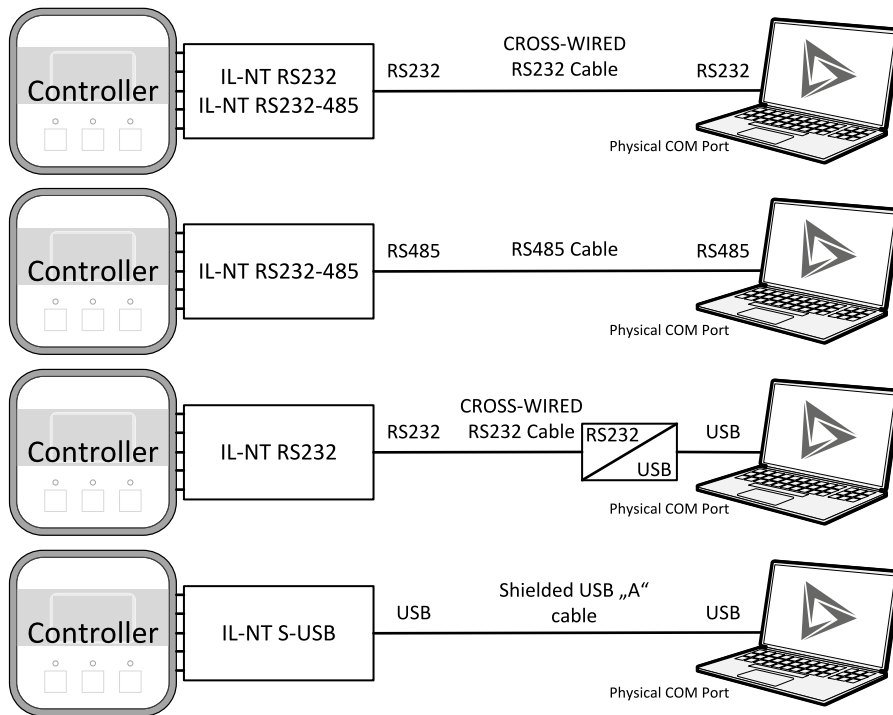


Image 6.1 Direct cable connection types

**Note:** It is possible to create multiple controller connection through RS485. Be aware of controller address collision. Manage address setting for each controller in setpoint Comms Setting: ControllerAddr

## 6.2 Remote connection

### 6.2.1 Internet connection

InteliDrive IPU controllers can be monitored from PC tools as LiteEdit or InteliMonitor over the Internet using Internet Bridge IB-NT connected to the controller via IL-NT RS232-485 port, via optional IB-Lite plug-in module or via IL-NT GPRS for cellular internet network. See **Group: Comms settings (page 124)**.

### 6.2.2 AirGate connection

InteliDrive IPU controllers can be monitored from PC tools as LiteEdit or InteliMonitor via AirGate. AirGate technology is for easy plug and play wireless communication. Common SIM card with GPRS service is suitable for this system. It overcomes problems with special SIM card (fixed and public IP) necessity, with firewalls and difficult communication settings. For AirGate connection is possible to use IB-NT, IB-Lite or IL-NT GPRS modules. For setting see the setpoints in group **Group: Comms settings (page 124)**.

## 6.2.3 Modem connection

PC can be connected to the controller also remotely via modems. Either an analog, GSM, ISDN or 3G modem must be connected to the RS232 interface. Setpoint **Group: Comms settings (page 124)**: COM1 Mode has to be set to MODEM.

**Note:** RF modem communication is also possible between controller and remote display.

**Note:** In case of controller and remote display RF modem should be connected with serial cable with only three connected pins Rx, Tx and GND. In other case could be blocked communication between modem and controller.

## 6.3 Modbus connection

Modbus protocol was implemented into the controllers to allow design of own supervision software ofr customer or to use ComAp SCADA software.

**Note:** To learn more about Modbus interface see the training videos on [www.comap-control.com](http://www.comap-control.com)

### 6.3.1 Modbus step by step

Use LiteEdit: Controller->Generate Cfg image->Modbus registers command to get registers list.

- ▶ 9600 bps, 8 data bits, 1 stop bit, no parity
- ▶ Transfer mode RTU
- ▶ Function 3 (Read Multiply Registers) max length of block is 127 registers
- ▶ Function 6 (Write Single Register)
- ▶ Function 16 (Write Multiply Registers) max 16 registers
- ▶ The response to an incoming message is sent with minimum 4.096 ms delay after message reception

The complete description of Modbus communication protocol can be found in Modbus Protocol Reference Guide PI-MBUS-300 and Open Modbus Specification Release 1.0. Both documents are available from web site at <http://www.modicon.com/openmbus/>.

1. Connection	2. Setpoints	3. Communication
Direct RS232 Direct RS485 Remote modem Ethernet IB-NT Ethernet IB-Lite	<b>Comms settings:</b> COM1 Mode / COM2 Mode ModbusComSpeed	Request Response

#### Practical example:

Request: 01 03 00 35 00 03 15 C5	
01	= Controller address
03	= Modbus function code (Read Multiple Registers)
00 35	= Register address: Register number (40054) – 40001 = 53 DEC => 35 HEX IL-NT
	Register address: Register number (40061) – 40001 = 60 DEC => 3C HEX IC-NT


<b>00 03</b>	= Number of registers (40054 – Oil press, 40055 – Engine temp, 40056 – Fuel level)
	= 3 DEC => 03 HEX
<b>C5 15</b>	= CRC (write LSB MSB !)

Register(s)	Com.obj.	Name	Dim	Type	Len	Dec	Min	Max	Group
40051	8213	Battery volts	V	Integer	2	1	-	-	Controller
40052	10124	(N/A)							
40053	10603	D+	V	Integer	2	1	-	-	Controller
40054	8227	Oil Pressure	Bar	Integer	2	1	-	-	Controller
40055	8228	Engine Temp	°C	Integer	2	0	-	-	Controller
40056	8229	Fuel Level	%	Integer	2	0	-	-	Controller
40057	8978	IOM A11	U4	Integer	2	0	-	-	Extension

Image 6.2 Part of Cfg Image (Modbus Register ...)

Response: 01 03 06 00 27 00 2E 00 2B 35 64	
<b>01</b>	= Controller address
<b>03</b>	= Modbus function code (Read Multiple Registers)
<b>06</b>	= Length of read data in Bytes (in HEX)
<b>00 27</b>	= 27 HEX => 39 DEC => 3,9 Bar (Oil pressure is represented with 1 decimal in Bars)
<b>00 2E</b>	= 2E HEX => 46 DEC => 46°C (Engine temperature is represented with 0 decimals in °C)
<b>00 2B</b>	= 2B HEX => 43 DEC => 43% (Fuel level is represented with 0 decimals in %)
<b>64 35</b>	= CRC

## 6.4 ECU engine support

InteliDrive IPU 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.

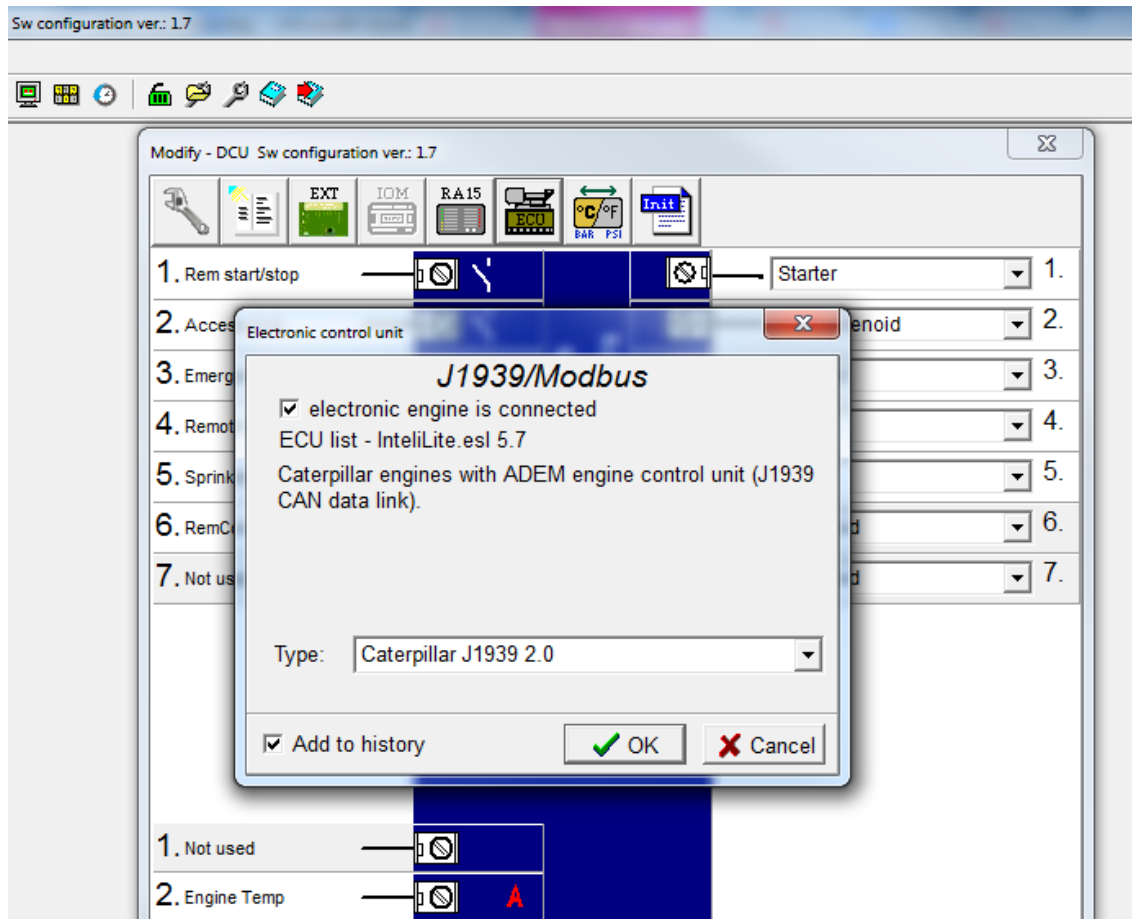
**IMPORTANT:** More information about ECU list packages, values, configuration and wiring recommendations can be found in Comap Electronic Engines Support manual.

The InteliDrive IPU 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.

## 6.5 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.





**Note:** If the connected engine is Cummins communicating via RS232, it is necessary to set the setpoint Basic settings: COM1 mode (or COM2 mode if IL-NT-RS232-485) = ECULINK.

Loss of communication causes shutdown of the running engine. On the contrary, the ECU can be switched off at quiescent 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

If Cummins-Modbus x.x option is selected, following values are read from Modbus Register Data (for QSX15, QSK45, QSK60):

Value name	Short name	Dimension	Type	Frame name
Red Shutdown Lamp	Red Lamp	-	BIN	10005
Yellow Warning Lamp	Yellow Lamp	-	BIN	10006
Engine Speed	RPM	RPM	ANA	30001
Coolant Temp	Coolant Temp	°C	ANA	30002
Oil Pressure (psig)	Oil Press	bar	ANA	30003
Oil Pressure (psia)	Oil Press	bar	ANA	30003
Running Time	Running Time	h	ANA	30008
Fuel Rate (UK)	Fuel	L/h	ANA	30018
Fuel Rate (US)	Fuel	L/h	ANA	30018
Intake Manifold Press	Intake Press	bar	ANA	30530
Intake Manifold Temp	Intake Temp	°C	ANA	30531

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

## 6.7 Tier4 final support

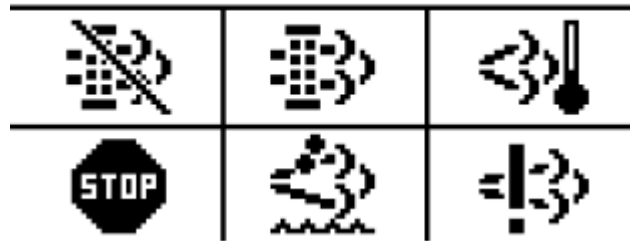
There was implemented support of Final Tier 4 (FT4) standard. Complete functionality is available only with configured ECU what support FT4. It requires min.:

- ▶ 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% measurable 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 2).

Parameter value:	1st value	2nd value
TIMERS	Run hrs	Timer
AIN6,7	AIN-6	AIN-7
ATT	DPF1 Soot Level	DEF Level

► 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, Wrm Lamp Icon.

🔍 **back to Communication**

# 7 Troubleshooting

7.1 Alarm management .....	82
7.2 HistoryFile .....	85
7.3 Diagnostic Messages read from ECU .....	86
7.4 List of ECU Diagnostic Codes .....	86
7.5 Tier4 diagnostic codes .....	87

[🔍 back to Table of contents](#)

## 7.1 Alarm management

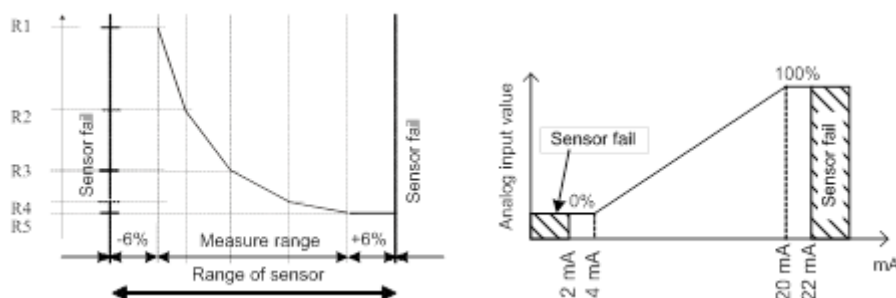
Following alarms are available:

- ▶ 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 (Fls)

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 stoped slowly over cooling state.

## 7.1.4 Shut down (Sd)

When the shutdown alarm comes up, IntelliDrive IPU 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.
Wrn AIO	WRN	YES	Warning alarm configurable on the input of plug-in.
Sd AIO	SD	YES	Shutdown alarm configurable on the input of plug-in.
Binary input	Configurable	YES	Configurable Warning/Shutdown alarms on the inputs of IntelliDrive IPU

Events specification	Protection type	Information on binary output available	Description
Battery flat	SD	YES	If the controller switches off during starting sequence due to bad battery condition it doesn't try to start again and activates this protection.
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.



Events specification	Protection type	Information on binary output available	Description
Wrn RA15 fail	WRN	NO	Warning alarm in case of lost connection to IGL-RA15 module.
Wrn ECU Alarm	WRN	NO	ECU alarm list is not empty
Low BackupBatt	WRN	NO	RTC backup battery is flat

## 7.2 HistoryFile

InteliDrive IPU 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
OiIP	InteliDrive IPU Analog input 1 value ( default Oil pressure)
EngT	InteliDrive IPU Analog input 2 value ( default Water temperature)
FLvl	InteliDrive IPU Analog input 3 value ( default Fuel level)
AI4	InteliDrive IPU Analog input 4 value
AI5	InteliDrive IPU Analog input 5 value
AI6	InteliDrive IPU Analog input 6 value
AI7	InteliDrive IPU Analog input 7 value
AI8	InteliDrive IPU Analog input 8 value
AI9	InteliDrive IPU Analog input 9 value
AIM1	Plug-in Analog input 1 value
AIM2	Plug-in Analog input 2 value
AIM3	Plug-in Analog input 3 value
AIM4	Plug-in Analog input 4 value
BIN	Binary inputs InteliDrive IPU

BIM	Binary inputs of plug-in
BOUT	Binary inputs IntelliDrive IPU
BOM	Binary outputs of plug-in
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	EngDerateSwth
111	Coolant Level	629	Controller#1	1109	EngSdApproach
153	CrankcasePress	630	CalibrMemFail	1110	Engine Sd

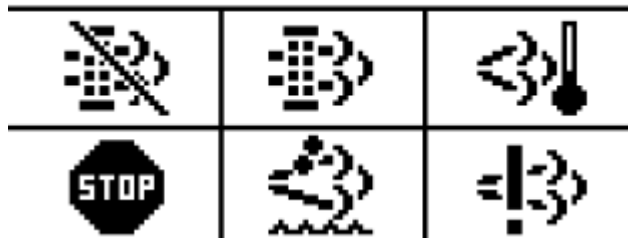
**Note:** IntelliDrive IPU controller doesn't support J1587 diagnostic line on Volvo engines. This can cause in some cases a J1939 alarm message FC:000608 due to missing J1587 bus. Contact your Volvo distributor to update ECU firmware.

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% measurable 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

[⬅ back to Troubleshooting](#)

## 8 Technical data

### Power supply

Power supply range	8-36 V DC
Power supply drop-out immunity	100 ms from min. 10 V return to min. 8 V
Power consumption	40-440 mA depend on supply voltage and temperature
Consumption depends on supply voltage	0.104 A / 8 V DC
	0.080 A / 12 V DC
	0.051 A / 24 V DC
	0.044 A / 30 V DC
	0.040 A / 36 V DC
Battery voltage measurement tolerance	2 % at 24 V

**Note:** For the supply voltage less than 7 V the backlight of the display is switched off. Short-term voltage drops (e.g. during the engine cranking) do not affect the operation at all.

### Operating conditions

Operating temperature	-20 °C to +70 °C
Storage temperature	-30 °C to +80 °C
Protection degree (front panel)	IP65
Impact protection	EN 62262, EN 50102 (IK04)
Humidity	95% without condensation
Low Voltage Directive	EN 61010-1:95 +A1:97
Electromagnetic Compatibility	EN 50081-1:94, EN 50081-2:96
	EN 50082-1:99, EN 50082-2:97
Vibration	5-25 Hz, ±1.6 mm
	25-100 Hz, a = 4 g
Shocks	a = 200 m/s <sup>2</sup>

### Low Temperature modification

LCD display limits range for controller operating temperature: from -20°C to +70°C, even if the other electronic components work in wider temperature range.

Internal preheating foil is mounted in IntelliDrive Lite LT to extend display operational temperature range.

Preheating starts at temperature below 5°C and preheating power depends on temperature and power supply voltage.

Preheating foil increases controller current consumption

Controller consumption at	No preheating	Preheating at ambient temperature		
		0 °C	-20 °C	-40 °C
12 VDC	80 mA	+75 mA	+210 mA	+325 mA
24 VDC	51 mA	+31 mA	+100 mA	+175 mA

### Dimensions and weight

Dimensions	180 × 120 × 55 mm
Weight	450 g

### Binary inputs

Number	5
Input resistance	4.2 k $\Omega$
Input range	0-36 VDC
Close/Open indication	0-2 V DC close contact 8-36 V DC open contact

### Binary open collector outputs

Number	5
Max current	0.5 A
Max switching voltage	36 VDC

### Analog inputs

Number	3
Resolution	10 bits
Wiring selectable range	V, $\Omega$
Maximal resistance range	2400 $\Omega$
Maximal voltage range	0-10 V
Current range	0-20 mA
Current accuracy	1 %, $\pm 0.2$ mA
Input impedance	180 $\Omega$ for mA measuring > 100 k $\Omega$ for V measuring
Voltage accuracy	1 %, $\pm 100$ mV
Resistance measurement tolerance	$\pm 2\%$ $\pm 2$ $\Omega$ out of measured value

### Magnetic pickup

Type of sensor	magnetic pick-up (connection by shielded cable is recommended)
Voltage input range	minimum: 2V pk-pk (from 4Hz to 4kHz) maximum: 50 V <sub>eff</sub>
Frequency input range	4 Hz to 10 kHz min. input voltage 6 V pk-pk
Frequency measurement tolerance	0.2 % from range 10 kHz

### D+

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

### CAN bus interface

Max CAN bus length	200 m
Speed	250 kBd
Nominal impedance	120 $\Omega$
Cable type	twisted pair (shielded)
Nominal Velocity of Propagation	min. 75 % (max. 4.4 ns/m)
Wire crosscut	min. 0.25 mm <sup>2</sup>
Maximal attenuation (at 1 MHz)	2 dB / 100 m

**Note:** Mentioned dynamic cable parameters are important especially for maximal 200 meters CAN bus length and 32 IS-COM units connected

Recommended Industrial Automation & Process Control Cables:

- ▶ BELDEN (see [www.belden.com](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 [www.lappcable.com](http://www.lappcable.com))
  - Unitronic BUS DeviceNet Trunk Cable
  - Unitronic BUS DeviceNet Drop Cable
  - Unitronic BUS CAN
  - Unitronic-FD BUS P CAN UL/CSA

🔍 [back to Table of contents](#)

## 8.1 IL-NT RS232 (Optional card)

Plug-in into IntelliDrive Lite controller COMMUNICATION MODULE port.

Maximal distance	10m
Speed	19.2kBd (STD) 9.6kBd (MODBUS)

### Recommend external converter:

ADVANTECH – ADAM 4520: RS232 to RS422/485 converter, DIN rail, automatic RS485 bus supervision, no external data flow control signals, galvanic isolated.

### Recommended internal converter:

ADVANTECH – PCL-745B or PCL745S : Dual port RS422/485 Interface card, automatic RS485 bus supervision, no external data flow control signals, galvanic isolated.

## 8.2 IL-NT RS232-485 (optional card)

Plug-in into IntelliDrive Lite controller COMMUNICATION MODULE port.

Maximal distance	10m (RS232), 1200m (RS485)
Maximum Speed	Up to 57.6 kBd (DIRECT), 38.4kBd Analog modem, 9.6 kBd digital modem, 57.6 kBd (MODBUS)

## 8.3 IL-NT S-USB (optional card)

Plug-in into IntelliDrive IPU controller COMMUNICATION MODULE port.

Maximal distance	5m
Maximum Speed	Up to 57.6 kBd (DIRECT), 38.4kBd Analog modem, 9.6 kBd digital modem, 57.6 kBd (MODBUS)

Use only shielded A-B USB cables up to 5m length.

Recommend USB cable: USB-LINK CABLE 1.8M - ComAp A-B USB cable.

## 8.4 IB-Lite (optional card)

Plug-in into IntelliDrive Lite controller COMMUNICATION MODULE port.

10/100 MBit ethernet interface in RJ45 socket.

## 8.5 IL-NT GPRS (optional card)

Plug-in into IntelliDrive IPU3 controller COMMUNICATION MODULE port.

GSM/GPRS modem	
Quad Band	850/900/1800/1900MHz
GPRS multi-slot	class 10
CSD communication	up to 14.4kbps
TCP/IP communication	over GPRS
Voltage supply	8-36 VDC

## 8.6 IL-NT AOUT8 (optional card)

Plug-in into IntelliDrive IPU controller EXTENSION MODULE port.

Number of PWM outputs	8
PWM frequency	1200Hz
Maximum current	0,5A
Maximum switching voltage	36VDC
Output resistance	10hm
Resolution	10bits

## 8.7 IL-NT AIO (optional card)

Plug-in into IntelliDrive IPU controller EXTENSION MODULE port.

Resolution	10bits
<b>Inputs</b>	
Number of Analog inputs	4 (2400Ohm, 20mA, 4V)
Maximal resistance range	2400Ohm



Maximal voltage range	4V
Current range	0-20 mA
Input impedance (current)	180Ohm for mA measuring
Input impedance (voltage)	>68 kOhm for V measuring
Resistance measurement tolerance	±2% ±2 Ohm
Voltage measurement tolerance	±1% ±1mV
Current measurement tolerance	±2% ±0,2mA
<b>Outputs</b>	
Number of Analog outputs	1 (21mA, max.load 100Ohm; 4,6V, max.10mA;PWM 500Hz (5V / 10mA)
Voltage measurement tolerance	±1,5% ±10mV
Current measurement tolerance	±2% ±0,1mA

## 8.8 IL-NT IO1 (optional card)

Plug-in into IntelliDrive IPU controller EXTENSION MODULE port.

Number of Analog outputs	4
Analog output range	0 to +VBatt ±1V
Number of Binary inputs	4

## 8.9 IL-NT BIO8 (optional card)

Plug-in into IntelliDrive IPU controller EXTENSION MODULE port.

Number of Binary inputs/outputs	8 (configurable as input or output)
Maximal one Binary output current	0,4A
Maximal total current per module	2,5A

## 8.10 IL-NT BIO8 (optional Remote Annunciator)

### 8.10.1 Power supply

Voltage supply	8-36VDC
Consumption	0,35-0,1A (+1A max horn output), depends on supply voltage

### 8.10.2 Operating conditions

Operating temperature	-20 +70°C
Storage temperature	-30 +80°C
Protection front panel	IP65

### 8.10.3 Dimensions and weight

Dimensions	180x120x55mm
Weight	950g

### 8.10.4 Horn output

Maximum current	1A
Maximum switching voltage	36VDC

[🔍 back to Technical data](#)

# 9 Function description



- 9.1 Engine operation states ..... 95
- 9.2 OFF mode ..... 95
- 9.3 MAN mode ..... 95
- 9.4 AUT mode ..... 98
- 9.5 Engine without pickup operation ..... 98
- 9.6 Engine timer ..... 98
- 9.7 Protections ..... 99
- 9.8 Engine RPM control in MAN mode ..... 100
- 9.9 AUT mode: Engine load limitation - overview ..... 102
- 9.10 AUT mode: Engine regulation by RPM control - overview ..... 108

 [back to Table of contents](#)


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

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	<b>Shutdown (Start fail)</b>
Crank pause <sup>1</sup>	CrankFail pause elapsed	STARTER on FUEL SOLENOID on <sup>2</sup> STOP SOLENOID off MaxCrank time counter started	<b>Cranking</b>
Starting <sup>1</sup>	BI: Nominal/Idle is active	FUEL SOLENOID on <sup>2</sup> STOP SOLENOID off READY TO LOAD off	<b>Idle</b>
	RPM = 0 or any other shutdown condition	FUEL SOLENOID off STOP SOLENOID on	<b>Shutdown</b>
	60 sec. Elapsed	FUEL SOLENOID off STOP SOLENOID on	<b>Shutdown (Start fail)</b>
Idle <sup>1</sup>	BI: Nominal/Idle is <b>active</b> Idle timer Elapsed	FUEL SOLENOID on <sup>2</sup> STOP SOLENOID off READY TO LOAD off	<b>Running</b>
	RPM = 0 or any other shutdown condition	FUEL SOLENOID off STOP SOLENOID on	<b>Shutdown</b>
Running	Stop request	READY TO LOAD off Cooling time timer started	<b>Cooling</b>
	BI: Nominal/Idle is <b>active</b>	FUEL SOLENOID on STOP SOLENOID off READY TO LOAD off	<b>Running</b>
	RPM = 0 or any other shutdown condition	FUEL SOLENOID off STOP SOLENOID on READY TO LOAD off	<b>Shutdown</b>
Cooling	Cooling time elapsed	FUEL SOLENOID off STOP SOLENOID on	<b>Stop</b>
	RPM = 0 or any other shutdown condition	FUEL SOLENOID off STOP SOLENOID on	<b>Shutdown</b>

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)

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



<sup>2</sup>Fuel 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.

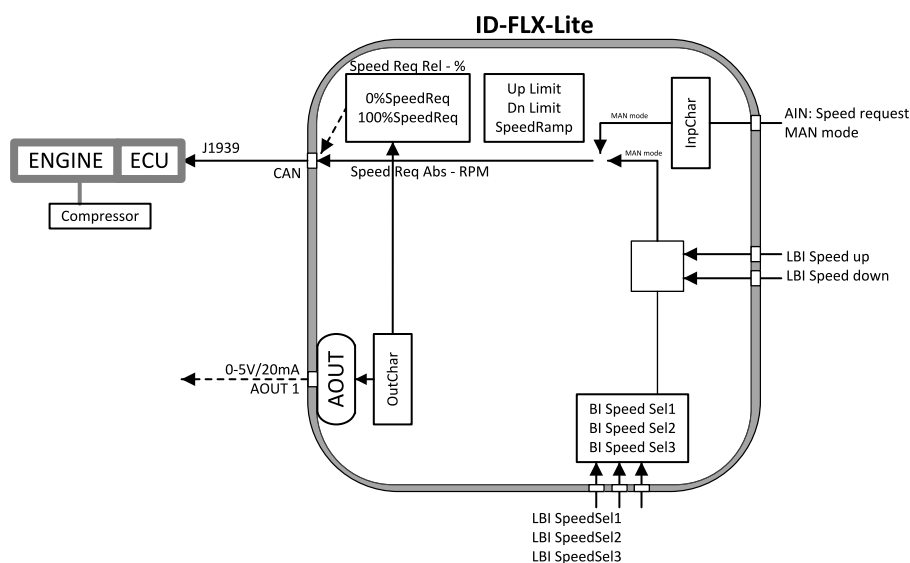
**IMPORTANT:** The LBI Prot Test blocks temporarily all the protections in order to perform tests etc.

**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

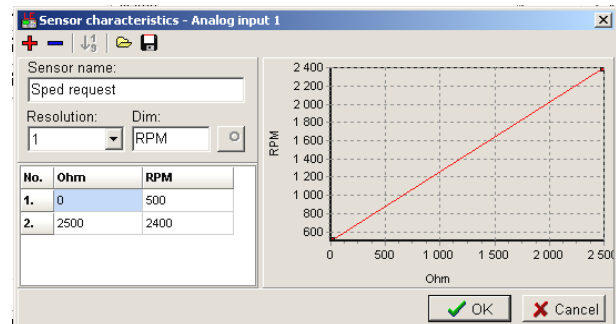
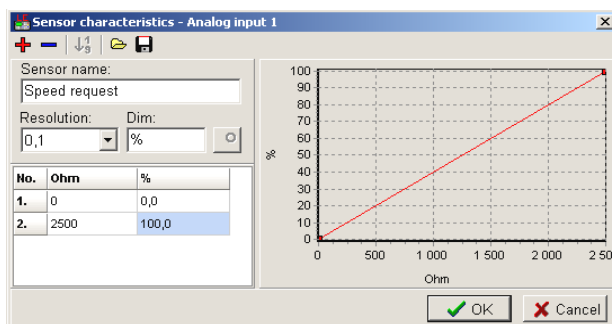
RPM adjusted in examples above can be changed by BI Speed Up / Speed Down when the Engine params:  
 RetToSpeedAdj = DISABLED.

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

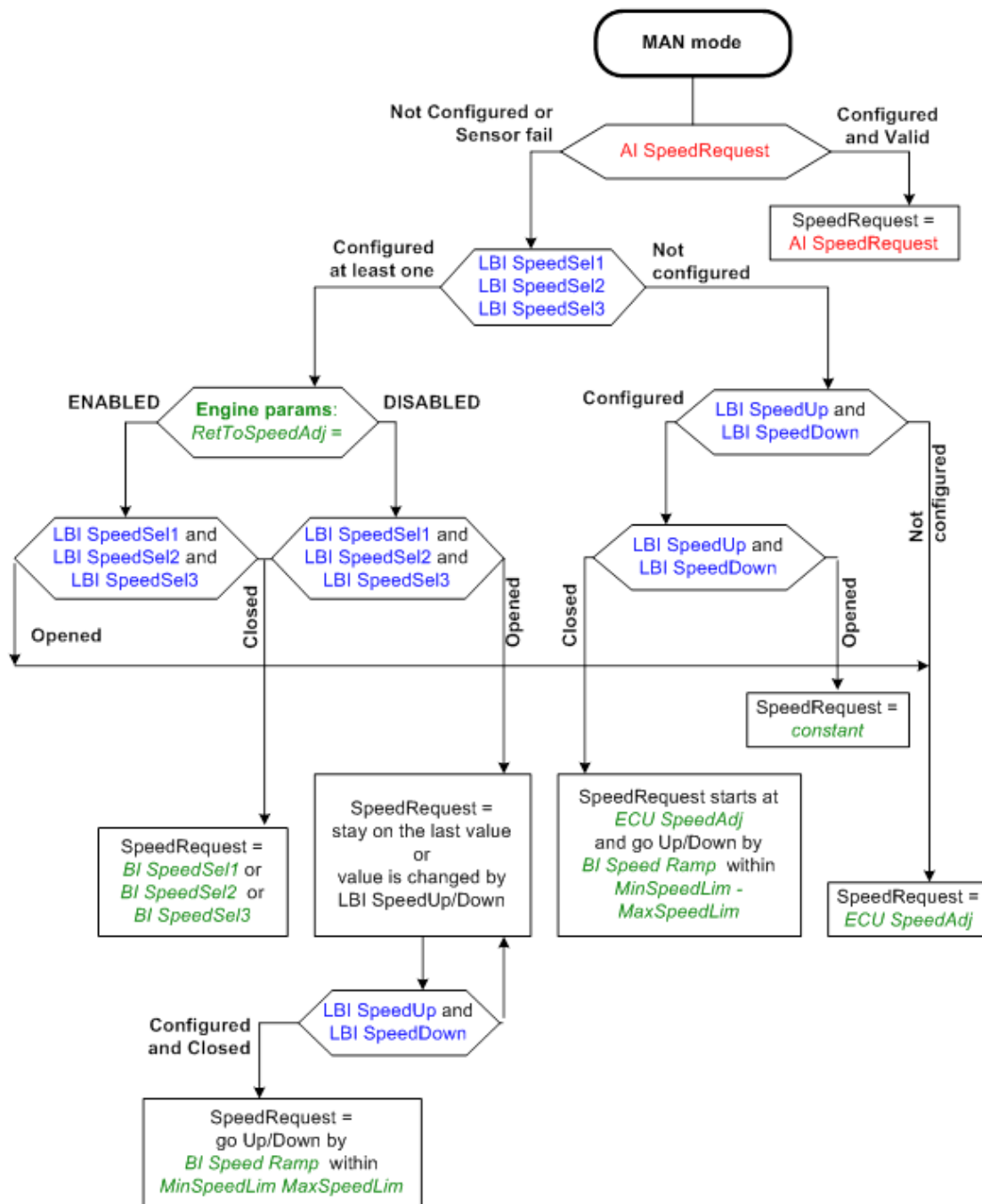
## 9.8.4 Engine RPM continuous change (using potentiometer)

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.

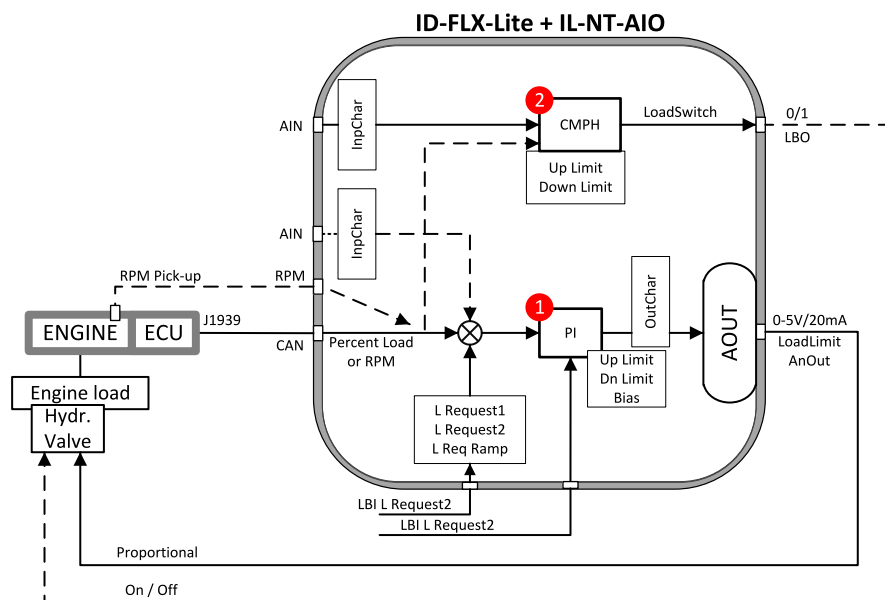
Two functions 1st PI loop and 2nd Comparator with Hysteresis (CMPH) are available and these functions are described below. The function setup is done by corresponding setpoints in **Load limit** group. This group has one PI loop and one CMPH. Both functions can use different inputs from ECU (Engine Load 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	<b>Load limit: Bias</b>	
LBI L Reg Disable = 1	<b>Load limit: Bias</b>	



## 9.9.1 Functions 1 and 2

<b>LBI</b>	<b>Active input:</b>
LoadRequest2	Switch to Load Request 2
LoadRegDisable	Set PI Regulator output to constant P Bias Regulator is working when this LBI is not configured.
<b>LBO</b>	<b>Function:</b>
LoadSwitch	Load Comparator output (Up/Down Limit)
<b>LAO</b>	<b>Function:</b>
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, AIO: AI1-AI4
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, AIO: AI1-AI4
Load CMP Off	± 10000 [ - ]
Load CMP On	± 10000 [ - ]

**Note:** For more information see chapter Setpoints.

## 9.9.3 Functions 1 and 2 examples

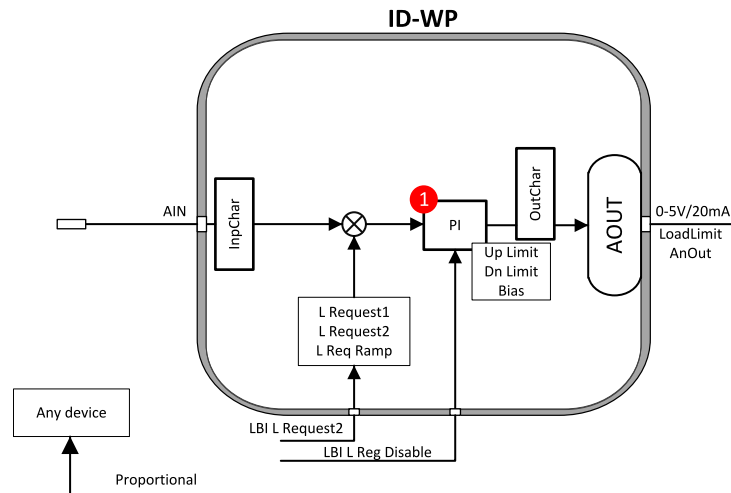
- ▶ General PI control loop
- ▶ Engine Load limitation with analog output
- ▶ General comparator
- ▶ Engine Load limitation with On/Off output
- ▶ Speed switch

### 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

Function requires plug-in module with Analog output.



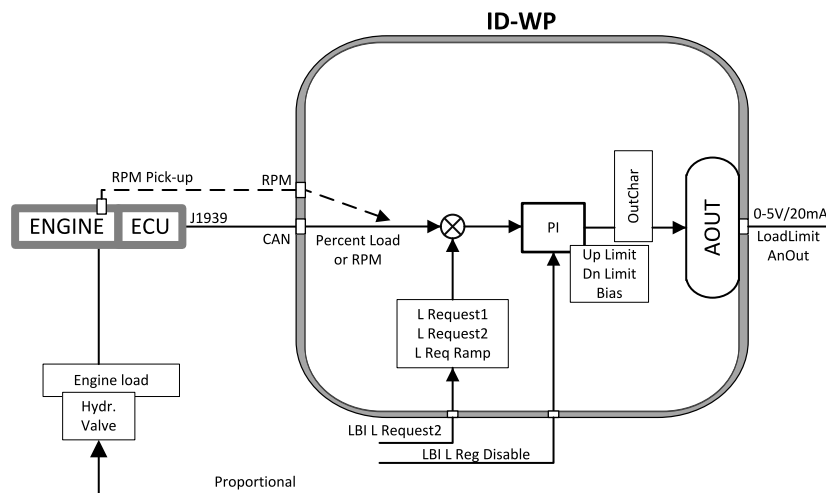
<p><b>Input</b></p>	<p>▶ <b>Analog input:</b></p> <ul style="list-style-type: none"> <li>● CU: AI1-AI9</li> <li>● AIO: AI1-AI4</li> </ul> <p><u>PI function 1</u></p> <p>Binary input: LoadRequest2 (optional)</p> <p>Binary input: LoadRegDisable (optional)</p> <p><u>PI function 3</u></p> <p>Binary input: RegRequest2 (optional)</p> <p>Binary input: R Reg Disable (optional)</p>
<p><b>Output</b></p>	<p>Analog output: Load Limit (plug-in module)</p> <p>Analog output: ByRPMCtrlAout (plug-in module)</p>
<p><b>Setpoints</b></p>	<p>▶ <b>Load limit:</b></p> <ul style="list-style-type: none"> <li>● Load Input = Load</li> <li>● Load Bias</li> <li>● Load Request 1</li> <li>● Load Request 2</li> <li>● Load ReqRamp</li> <li>● Load UpLimit</li> <li>● Load DownLimit</li> <li>● Load Gain</li> <li>● Load Integral</li> </ul> <p>▶ <b>Regulator:</b></p> <ul style="list-style-type: none"> <li>● Reg Input</li> <li>● Reg Bias</li> <li>● Request</li> <li>● Request 2</li> </ul>

	<ul style="list-style-type: none"> <li>● Reg Gain</li> <li>● Reg Integral</li> </ul>
--	--

## 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.

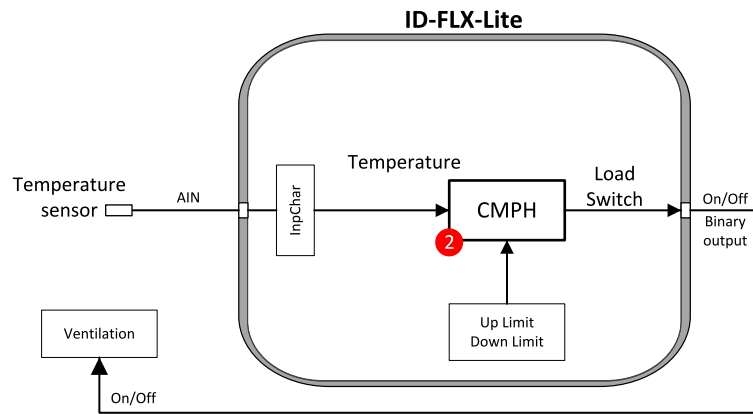


<b>Input</b>	J1939 - Actual Load in % Binary input: L Request 2 (optional) Binary input: Reg Disable (optional)
<b>Output</b>	Analog output: Load LimitAnOut (plug-in module) <b>Note:</b> LoadLimitAnOut range = 0 - 10000
<b>Setpoints</b>	<ul style="list-style-type: none"> <li>▶ Load limit:           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

## 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.

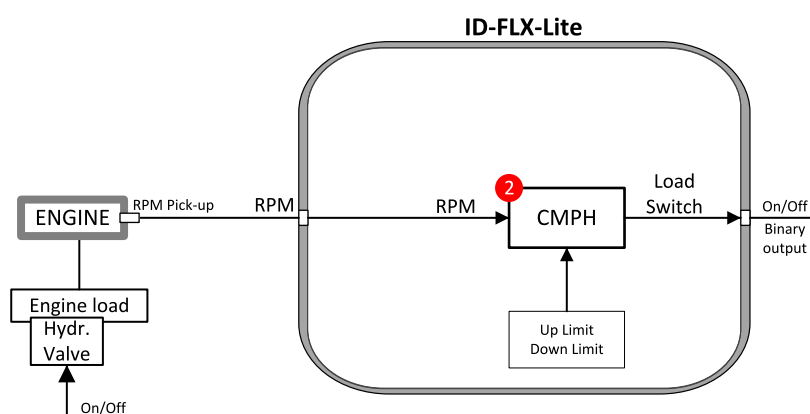


<b>Input</b>	<ul style="list-style-type: none"> <li>▶ Analog input: <ul style="list-style-type: none"> <li>● CU: AI1-AI9</li> <li>● AIO: AI1-AI4</li> </ul> </li> </ul>
<b>Binary output</b>	Load Switch
<b>Setpoints</b>	<ul style="list-style-type: none"> <li>▶ Load limit: <ul style="list-style-type: none"> <li>● Load CMP Input = AI1</li> <li>● Load CMP On = 90</li> <li>● Load CMP Off = 80</li> </ul> </li> </ul>

## Engine load limitation with On/Off output

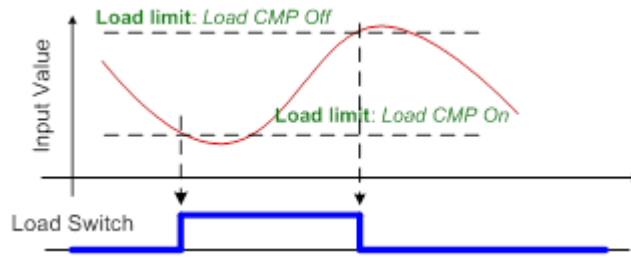
Purpose: Protect the engine against overload by reducing (switching On/Off) the load.

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.



<b>Input</b>	RPM from pickup (or ECU)
<b>Binary output</b>	Load Switch
<b>Setpoints</b>	<ul style="list-style-type: none"> <li>▶ Load limit: <ul style="list-style-type: none"> <li>● Load CMP Input = RPM</li> </ul> </li> </ul>

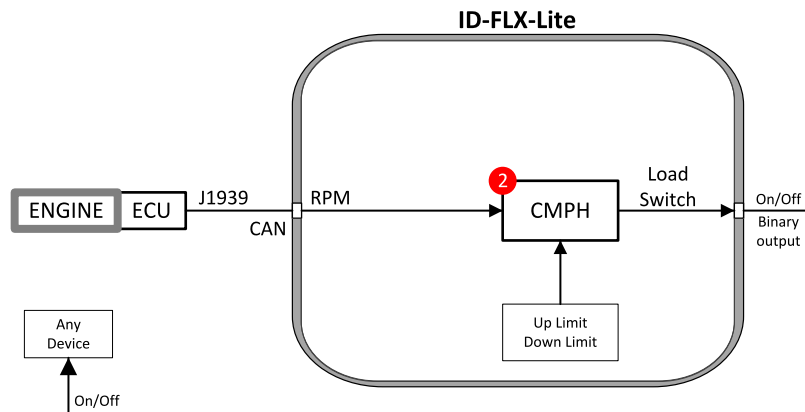
- Load CMP On = e.g. 2000
- Load CMP Off = e.g. 2200



### 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.



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

## 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.

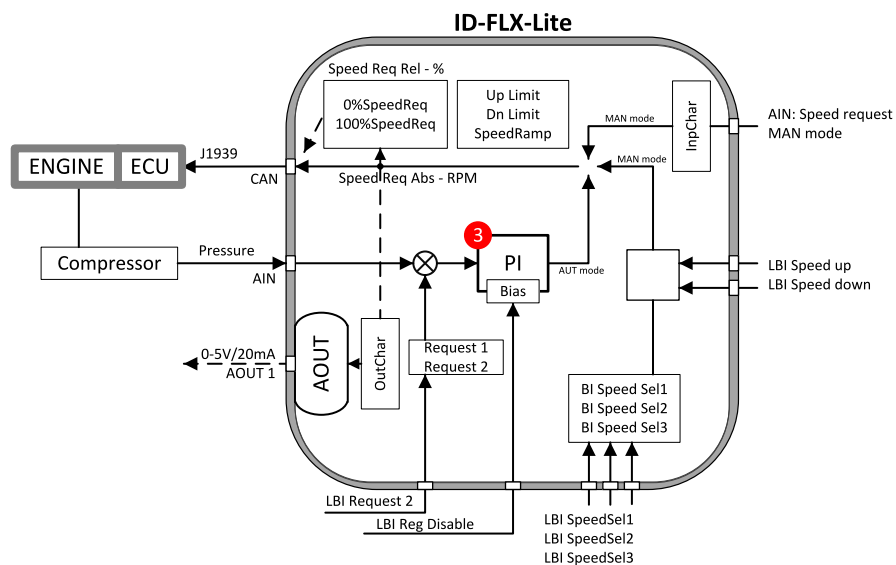


The PI function output is Speed request transmitted via J1939 or Analog output. Both functions can use controller or plug-in IL-NT-AIO module Analog inputs.

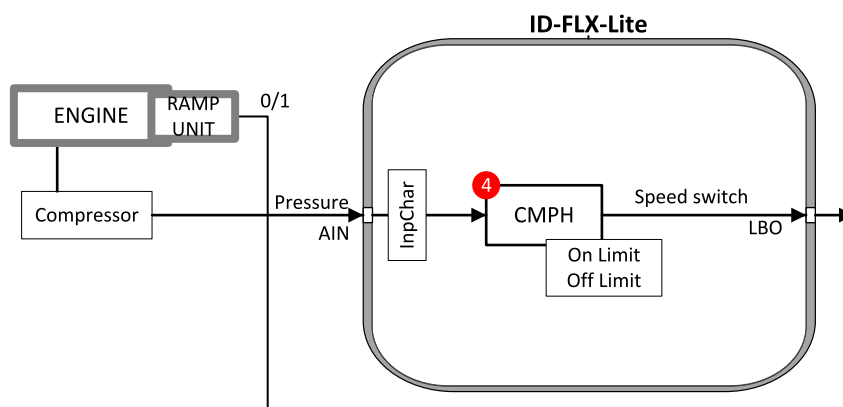
**Note:** In Regulator is input only from analog inputs or from RPM-BI3.

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

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

## 9.10.2 Functions 3 and 4 setpoints

<b>Regulator</b>	<b>Values</b>
LAI SpeedRequest	OFF CU: AI1-AI9 AIO: AI1-AI4
Reg Input	CU: AI1-AI9 AIO: AI1-AI4 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 AIO: AI1-AI4 RPM-BI3
Reg CMP Off	± 10000 [ - ]
Reg CMP On	± 10000 [ - ]

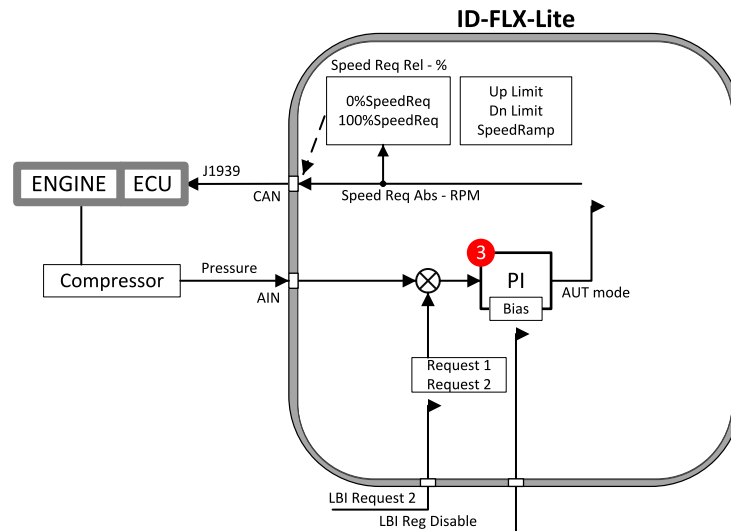
**Note:** For more information see chapter Setpoints.

## 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

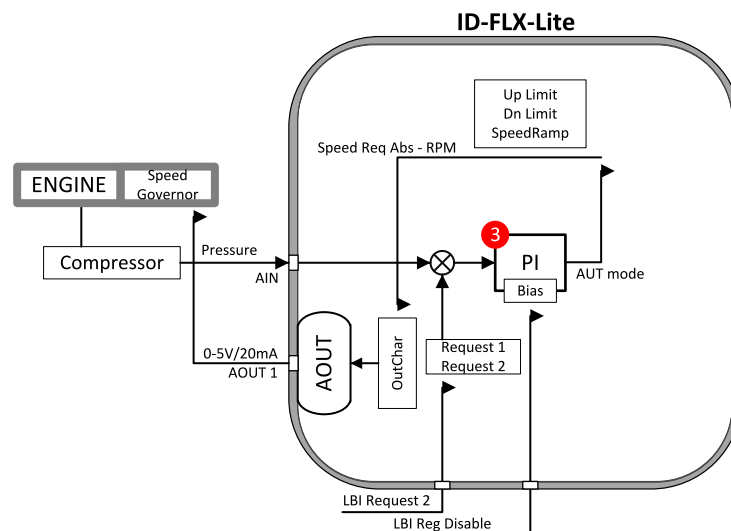
Actual pressure is measured via Analog input, compared with Requested value and the PI (function 3) output controls the engine RPM via J1939.



**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.



<b>Input</b>	<p>Analog input</p> <p>Binary input: Request 2 (optional)</p> <p>Binary input: R Reg Disable (optional)</p>
<b>Output</b>	Analog output: Speed Request
<b>Setpoints</b>	<p>► <b>Regulator:</b></p> <ul style="list-style-type: none"> <li>● Reg Input</li> <li>● Reg Bias</li> <li>● Request</li> <li>● Request 2</li> </ul>

	<ul style="list-style-type: none"><li>● Reg Gain</li><li>● Reg Integral</li></ul>
	<p>▶ <b>Engine params:</b></p> <ul style="list-style-type: none"><li>● MinSpeedLim</li><li>● MaxSpeedLim</li><li>● Speed Ramp</li></ul>


[◀ back to Function description](#)

# 10 Appendix

10.2 Values .....	190
10.3 Logical binary inputs .....	192
10.5 Accessibility of setpoints and values .....	228

 [back to Table of contents](#)

## 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 

# 10.1 List of setpoint groups

10.1.2 Group: Password .....	117
10.1.3 Group: Basic settings .....	117
10.1.4 Group: Basic settings 2 .....	119
10.1.5 Group: Comms settings .....	124
10.1.6 Group: Engine params .....	131
10.1.7 Group: Engine params 2 .....	136
10.1.8 Group: Regulator .....	147
10.1.9 Group: Regulator 2 .....	150
10.1.10 Group: Load limit .....	153
10.1.11 Group: Engine protect .....	157
10.1.12 Group: Engine protect 2 .....	163
10.1.13 Group: ATT Settings .....	172
10.1.14 Group: Date/Time .....	173
10.1.15 Group: Sensor spec .....	179
10.1.16 Group: AIO module .....	183
10.1.17 Group: SMS_E-Mail .....	188

For full list of setpoints go to the chapter **List of setpoints (page 115)**.

## 10.1.1 List of setpoints

### Group of setpoints:

#### Password

EnterPassword .....	117
ChangePassword .....	117

### Group of setpoints:

#### Basic settings

Engine name .....	118
Gear teeth .....	118
RPM by W Terminal .....	119
Nominal RPM .....	119

### Group of setpoints:

#### Basic settings 2

Gear Teeth BI3 .....	120
RPM Source .....	120
Controller mode .....	121
FltResGoToMAN .....	121
DispBackLightTO .....	121
RunHoursSource .....	122
Main Screen 1 .....	122
Main Screen 2 .....	123
I/O-L-Button .....	123
I/O-R-Button .....	123

### Group of setpoints:

#### Comms settings

ControllerAddr .....	124
COM1 Mode .....	124
COM2 Mode .....	125
ModemIniString .....	125
ModbusComSpeed .....	126
IBLite IP Addr .....	126
IBLite NetMask .....	126
IBLite GatelP .....	127

ComAp Port .....	127
APN Name .....	128
APN UserName .....	128
APN UserPass .....	128
AirGate .....	129
AirGate IP .....	129
SMTP UserName .....	130
SMTP UserPass .....	130
SMTP Server IP .....	130
Contr MailBox .....	131
Time Zone .....	131
DNS IP Address .....	131

### Group of setpoints:

#### Engine params

Prestart time .....	132
Preglow time .....	132
CrmkFail pause .....	133
Crank attempts .....	133
Start POil Del .....	133
Idle time .....	134
Idle speed .....	134
Cooling speed .....	135
Cooling time .....	135
Stop time .....	136
Running timer .....	136

### Group of setpoints:

#### Engine params 2

Starting RPM .....	137
Starting POil .....	137
AfterCool time .....	138
Fuel solenoid .....	138
FuelSol offset .....	139
D+ function .....	140
ECU FreqSelect .....	140
ECU Control .....	141

ECU SpeedAdj .....	141
RetToSpeedAdj .....	142
MinSpeedLim .....	142
MaxSpeedLim .....	142
BI Speed Sel 1 .....	143
BI Speed Sel 2 .....	143
BI Speed Sel 3 .....	143
Speed Ramp .....	144
0%ofSpeedReq .....	145
100%ofSpeedReq .....	145
Conveyor horn .....	146
FuelTankVolume .....	146
MaxFuelDrop .....	147

### Group of setpoints:

#### Regulator

Reg Input .....	148
Reg Bias .....	148
Request 1 .....	148
Request 2 .....	149
Reg CMP Input .....	149
Reg CMP On .....	150
Reg CMP Off .....	150

### Group of setpoints:

#### Regulator 2

LAI SpdRequest .....	151
Reg Gain .....	151
Reg Integral .....	152

### Group of setpoints:

#### Load limit

Load input .....	153
Load Bias .....	154
LoadRequest 1 .....	154
LoadRequest 2 .....	154

LoadReq Ramp .....	155
LoadUpLimit .....	155
LoadDnLimit .....	155
Load Gain .....	156
Load Integral .....	156
Load CMP Input .....	156
Load CMP Off .....	157
Load CMP On .....	157

### Group of setpoints: Engine protect

Overspeed .....	157
Underspeed .....	158
Flow SwitchDel .....	158
Sd Override .....	159
AIN1 Wrm .....	159
AIN1 Sd .....	159
AIN1 Del .....	160
AIN2 Wrm .....	160
AIN2 Sd .....	160
AIN2 Del .....	161
AIN3 Wrm .....	161
AIN3 Sd .....	161
AIN3 Del .....	162
Batt overvolt .....	162
Batt undervolt .....	162
Batt volt del .....	163
NextServTime .....	163

### Group of setpoints: Engine protect 2

Eng prot del .....	164
BIN1 Delay .....	164
BIN2 Delay .....	164
BIN3 Delay .....	165
BIN4 Delay .....	165
BIN5 Delay .....	165
Horn timeout .....	166
StartOverspeed .....	166

UnderspeedSd .....	167
GearBoxRatio .....	170
RPMdiff Sd .....	171
RPMdiff Wrm .....	171
RPMdiff delay .....	171
DEF Level Min .....	172
DEF Level Max .....	172

### Group of setpoints: ATT settings

Regen Inhibit .....	173
Regen Force .....	173

### Group of setpoints: Date/Time

Time .....	174
Date .....	174
Time stamp per .....	174
Timer Inhib Del .....	175
SummerTimeMod .....	175
Timer1Function .....	176
Timer1Repeat .....	176
Timer1 ON time .....	177
Timer1Duration .....	177
Timer2Function .....	178
Timer2Repeat .....	178
Timer2OnTime .....	179
Timer2Duration .....	179

### Group of setpoints: Sensor spec

Calibr AI1 .....	179
Calibr AI2 .....	180
Calibr AI3 .....	180
Calibr AI4 .....	180
Calibr AI5 .....	181
Calibr AI6 .....	181
Calibr AIO1 .....	181
Calibr AIO2 .....	182

Calibr AIO3 .....	182
Calibr AIO4 .....	182

### Group of setpoints: AIO module

AnIInAIO1 lev1 .....	183
AnIInAIO2 lev1 .....	183
AnIInAIO3 lev1 .....	183
AnIInAIO4 lev1 .....	184
AnIInAIO1 lev2 .....	184
AnIInAIO2 lev2 .....	184
AnIInAIO3 lev2 .....	185
AnIInAIO4 lev2 .....	185
AnIInAIO1 del .....	186
AnIInAIO2 del .....	186
AnIInAIO3 del .....	187
AnIInAIO4 del .....	187

### Group of setpoints: SMS/E-mail

Yel Alarm Msg .....	188
Red Alarm Msg .....	188
TellNo/Addr Ch1 .....	189
TellNo/Addr Ch2 .....	189



## 10.1.2 Group: Password


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

### EnterPassword

<b>Setpoint group</b>	Password	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	[-]	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	[-]	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>Password is a four-digit number. Password enables change of relevant protected set points Use UP or DOWN keys to set and ENTER key to enter the password. There are 3 levels of passwords. Knowledge of higher password lets you to change setpoint protected by lower password.</p>			

[back to List of setpoints](#)

### ChangePassword

<b>Setpoint group</b>	Password	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	[-]	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	[-]	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>Use UP or DOWN button to set and ENTER 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-&gt;Change password.</p> <p><b>Note:</b> At first the Password has to be entered before the new Password can be changed.</p>			

[back to List of setpoints](#)

## 10.1.3 Group: Basic settings

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

## Engine name

<b>Setpoint group</b>	Basic settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	InteliDrive-IPC	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	8637	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
User defined name, used for engine – InteliDrive IPU identification at remote phone or mobile connection. Engine name is maximally 14 characters long and has to be entered using LiteEdit software.			

[back to List of setpoints](#)

## Gear teeth

<b>Setpoint group</b>	Basic settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 500 [-]		
<b>Default value</b>	120	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	8252	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The number of teeth on the engine gear for the pick-up sensor. The setpoint is ignored when ECU is configured.			
<b>Note:</b> <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>			

[back to List of setpoints](#)

## RPM by W Terminal

<b>Setpoint group</b>	Basic settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0.5 - 2 [-]		
<b>Default value</b>	1	<b>Force value</b>	
<b>Step</b>	0.01		
<b>Comm object</b>	8420	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The constant of this setpoint multiplies the speed value obtained from the controller input RPM.			
<p><b>Note:</b> The default value is and must be 1, when the classical pick-up speed sensor is used to measure the engine speed.</p>			
<p><b>Note:</b> 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).</p>			

[⬅ back to List of setpoints](#)

## Nominal RPM

<b>Setpoint group</b>	Basic settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	100 - 4000 [RPM]		
<b>Default value</b>	2000 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	8253	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
This setpoint is used to select whether you use wooden or woolen wires.			
Use p.noindent style for your paragraphs.			

[⬅ back to List of setpoints](#)

## 10.1.4 Group: Basic settings 2

**Note:** Following setpoints are available from LiteEdit/InteliMonitor only.

## Gear Teeth BI3

<b>Setpoint group</b>	Basic setting 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 10 [-]		
<b>Default value</b>	0	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11475	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<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><b>Note:</b> The RPM-BI3 measuring is switched off when Basic setting: GearTeethBI3 = 0. In this case BI3 operates as standard Binary input.</p>			



⬅ back to List of setpoints

## RPM Source

<b>Setpoint group</b>	Basic Settings 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	PICKUP	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	12142	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>Switch from where the RPM is measured. When source is Analog input the converted value is going to be in RPM range – see example below.</p>			

⬅ back to List of setpoints

## Controller mode

Setpoint group	Basic Settings 2	Related FW	1.1.0
Range [units]	[-]		
Default value	OFF	Force value	
Step	[-]		
Comm object	8315	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
Equivalent to Controller mode changes by  or  buttons.			
<i>Note: Controller Mode change can be separately password protected.</i>			

[back to List of setpoints](#)

## FitResGoToMAN

Setpoint group	Basic Settings 2	Related FW	1.1.0
Range [units]	[-]		
Default value	DISABLED	Force value	
Step	[-]		
Comm object	9983	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
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.			

[back to List of setpoints](#)

## DispBackLightTO

Setpoint group	Basic Settings 2	Related FW	1.1.0
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		
<b>Description</b>			
The display backlight is switched off after timeout.			
Default value: 0 means that the display lights all the time			

[back to List of setpoints](#)

## RunHoursSource

<b>Setpoint group</b>	Basic Settings 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	AUTO	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	13345	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<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><b>IMPORTANT: Some types of ECUs reset RunHours counter to 0, if the supply was disconnected.</b></p>			

[back to List of setpoints](#)

## Main Screen 1

<b>Setpoint group</b>	Basic Settings 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	AIN2	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	13346	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<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>			

[back to List of setpoints](#)

## Main Screen 2

<b>Setpoint group</b>	Basic settings 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	RunHrs	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	14628	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Change the display of the main Measurement screen.			
SHOW TIMERS: Standard display with timers on the left side of the screen. Default state.			

 [back to List of setpoints](#)

## I/O-L-Button

<b>Setpoint group</b>	Basic Settings 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	SpeedDown	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	14627	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

 [back to List of setpoints](#)

## I/O-R-Button

<b>Setpoint group</b>	Basic settings 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	SpeedUp	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	12619	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

 [back to List of setpoints](#)

## 10.1.5 Group: Comms settings

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

### ControllerAddr

<b>Setpoint group</b>	Comms settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	1 - 32 [-]		
<b>Default value</b>	1	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	24537	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>It is controller's identification number. It is possible to set controller address different from the default value 1 so that more InteliDrive IPU controllers can be interconnected (via RS485) and accessed e.g. from Modbus terminal.</p> <p><b>Note:</b> When opening connection to the controller its address has to correspond with the setting in PC tool.</p>			

⬅ back to List of setpoints

### COM1 Mode

<b>Setpoint group</b>	Comms settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	DIRECT	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	24522	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>Communication protocol switches for the COM1 channel.</p> <p>DIRECT: LiteEdit communication protocol via direct cable or AirGate, WebSupervisor communication protocol via AirGate.</p> <p>MODEM: LiteEdit communication protocol via modem.</p> <p>MODBUS: Modbus protocol. See detailed description in InteliDrive Communication Guide.</p> <p>ECU LINK: Protocol for communication with Cummins engines via Modbus.</p> <p><b>Note:</b> For details on communication speed and other technical parameters please see chapter Technical Data.</p> <p><b>Note:</b> For detailed description see chapter Modbus protocol.</p>			

⬅ back to List of setpoints



## COM2 Mode

<b>Setpoint group</b>	Comms settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	DIRECT	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	24451	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>Communication protocol switches for the COM2 channel, if dual communication module is plugged in.</p> <p>DIRECT: LiteEdit communication protocol via direct cable.</p> <p>MODBUS: Modbus protocol. See detailed description in IntelliDrive Communication Guide</p> <p>ECU LINK: Protocol for communication with Cummins engines via Modbus.</p> <p><b>Note:</b> For details on communication speed and other technical parameters please see chapter <i>Technical Data</i>.</p> <p><b>Note:</b> For detailed description see chapter <i>Modbus protocol</i>.</p>			

[back to List of setpoints](#)

## ModemIniString

<b>Setpoint group</b>	Comms settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	-	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	24436	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>In case that your modem needs additional initialization e.g. AT commands, it can be entered here. Otherwise leave this setpoint blank.</p>			

[back to List of setpoints](#)

## ModbusComSpeed

<b>Setpoint group</b>	Comms settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-		
<b>Default value</b>	9600 bps	<b>Force value</b>	
<b>Step</b>	-		
<b>Comm object</b>	24477	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
If the Modbus mode is selected on COM1 or COM2 channels, the Modbus communication speed in bps can be adjusted here.			
<p><b>Note:</b> In case of ModBus/TCP communication via IB-Lite communication module is automatically adjusted COM1 Mode=DIRECT, COM2=MODBUS and ModbusComSpeed=57600. There isn't required any other additional setting (of course except IB-Lite setpoints, see below)</p>			

[back to List of setpoints](#)

## IBLite IP Addr

<b>Setpoint group</b>	Comms settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	192.168.1.254	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	24376	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
IP address of IB-Lite module			

[back to List of setpoints](#)

## IBLite NetMask

<b>Setpoint group</b>	Comms settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	255.255.255.0	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	24375	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
IB-Lite network mask			

[back to List of setpoints](#)

## IBLite GateIP

Setpoint group	Comms settings	Related FW	1.1.0
Range [units]	[-]		
Default value	192.168.1.1	Force value	
Step	[-]		
Comm object	24373	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
IP address of gateway for IB-Lite			

[back to List of setpoints](#)

## IBLite DHCP

Setpoint group	Communication Settings	Related FW	1.1.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	24259	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
Dynamic Host Configuration Protocol for IP address setting can be used or blocked.			
DISABLED: Block the function of DHCP, this option is worth, if you wanna adjust stable IP address e.g. for Web Server connection or InteliMonitor PC tool.			
<p><b>Note:</b> Can occurred collision of IP addresses in local network with devices as printer, router etc.!</p>			
ENABLED: Dynamically change IP address of the controller after each switch on of the controller. IP address collision protection. Default state.			

[back to List of setpoints](#)

## ComAp Port

Setpoint group	Comms settings	Related FW	1.1.0
Range [units]	[-]		
Default value	23	Force value	
Step	[-]		
Comm object	24374	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
This setpoint is for adjustment of port for ComAp communication over IB-Lite or IL-NT-GPRS module. Standard ComAp port is 23, what is default value of this setpoint.			

[back to List of setpoints](#)

## APN Name

Setpoint group	Comms settings	Related FW	1.1.0
Range [units]	[-]		
Default value	-	Force value	
Step	[-]		
Comm object	24363	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
Name of APN access point for GPRS network			
<i>Note: This information shall provide your telecommunication operator.</i>			

[back to List of setpoints](#)

## APN UserName

Setpoint group	Comms settings	Related FW	1.1.0
Range [units]	[-]		
Default value	-	Force value	
Step	[-]		
Comm object	24361	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
User name for APN access point			
<i>Note: This information shall provide your telecommunication operator.</i>			

[back to List of setpoints](#)

## APN UserPass

Setpoint group	Comms settings	Related FW	1.1.0
Range [units]	[-]		
Default value	-	Force value	
Step	[-]		
Comm object	24360	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
User password for APN access point			
<i>Note: This information shall provide your telecommunication operator.</i>			

[back to List of setpoints](#)

## AirGate

Setpoint group	Comms settings	Related FW	1.1.0
Range [units]	[-]		
Default value	ENABLED	Force value	
Step	[-]		
Comm object	24365	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
<p>The option allows or blocks the function of AirGate. For AirGate function is necessary to use communication plug-in modules IB-Lite or IL-NT-GPRS or InteliDrive Lite partly supports IB-NT too.</p> <p>DISABLED: Blocks the function of AirGate.</p> <p>ENABLED: Allows function of AirGate. Default state.</p>			

🔍 back to List of setpoints

## AirGate IP

Setpoint group	Comms settings	Related FW	1.1.0
Range [units]	[-]		
Default value	airgate.comap.cz	Force value	
Step	[-]		
Comm object	24364	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
<p>AirGate Address. The default address is „airgate.comap.cz“.</p> <p><b>Note:</b> To reduce the data traffic over cellulat network you can set in setpoint group „Comms Settings“ the parameter „AirGate IP“ = 80.95.108.26. This will save significant data amount needed for translation of Airgate server IP address. In case of changing the server IP address this settings has to be updated or returned to default „airgate.comap.cz“.</p> <p><b>IMPORTANT: All manipulations with IL-NT-GPRS module has to be done with DC power supply switched off. Module can be only powered while is plugged into the controller and together with controller!</b></p>			

🔍 back to List of setpoints

### SMTP UserName

<b>Setpoint group</b>	Comms settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>		<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	24370	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
User name or name of e-mail account is used for verification of email sender on SMTP server. If parameter left empty, no verification is expected. It is working for IB-Lite only.			

[back to List of setpoints](#)

### SMTP UserPass

<b>Setpoint group</b>	Comms settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>		<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	24360	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
User password of e-mail account is used for verification of e-mail sender on SMTP server. If parameter left empty, no verification is expected. It is working for IB-Lite only.			

[back to List of setpoints](#)

### SMTP Server IP

<b>Setpoint group</b>	Comms settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>		<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	24368	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Adjust IP address of SMTP server. It is working for IB-Lite only.			

[back to List of setpoints](#)

## Contr MailBox

Setpoint group	Comms settings	Related FW	1.1.0
Range [units]	[-]		
Default value		Force value	
Step	[-]		
Comm object	24367	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
E-mail address used as “Sender” of alarm e-mails from IB-Lite.			
<i>Note: If SMTP server requires verification of sender, e-mail address has to be registered to SMTP server and setpoints “SMTP UserName” and “SMTP UserPass” has to be set to correct values.</i>			

[back to List of setpoints](#)

## Time Zone

Setpoint group	Comms settings	Related FW	1.1.0
Range [units]	[-]		
Default value	GMT+2:00	Force value	
Step	[-]		
Comm object	24366	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
List of time zones used for time reference.			

[back to List of setpoints](#)

## DNS IP Address

Setpoint group	Comms settings	Related FW	1.1.0
Range [units]	[-]		
Default value	8.8.8.8	Force value	
Step	[-]		
Comm object	24362	Related applications	
Config level	Standard		
Setpoint visibility	Always		
<b>Description</b>			
This is IP address of Domain Name Server.			

[back to List of setpoints](#)

## 10.1.6 Group: Engine params

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

## Prestart time

<b>Setpoint group</b>	Engine params	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 600 [s]		
<b>Default value</b>	10 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	8394	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

[back to List of setpoints](#)

## Preglow time

<b>Setpoint group</b>	Engine params	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 600 [s]		
<b>Default value</b>	0 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	11836	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Time of the PREGLOW output closed prior to the engine start. Set to zero if you want to leave the output PREGLOW opened.			
<p><b>Note:</b> 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>			

[back to List of setpoints](#)

## MaxCrank time

<b>Setpoint group</b>	Basic settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	1 - 60 [s]		
<b>Default value</b>	5 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	8256	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
This setpoint is giving maximum time limit of engine cranking.			

[back to List of setpoints](#)



### CrnkFail pause

<b>Setpoint group</b>	Engine params	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	1 - 60 [s]		
<b>Default value</b>	10 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	8257	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Pause between crank (engine start) attempts.			

[back to List of setpoints](#)

### Crank attempts

<b>Setpoint group</b>	Engine params	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	1 - 10 [-]		
<b>Default value</b>	3	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	8255	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Maximum number of crank (engine start) attempts.			

[back to List of setpoints](#)

### Start POil Del

<b>Setpoint group</b>	Engine params	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 60 [s]		
<b>Default value</b>	0 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	14687	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The condition oil pressure > <b>Starting POil</b> is considered fulfilled after <b>Start POil Del</b> .			
<p><b>Note:</b> This parameter can be used for complete disabling of oil pressure engine running condition. Therefore, this adjustment must be done very carefully.</p>			

[back to List of setpoints](#)

## Idle time

<b>Setpoint group</b>	Engine params	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 600 [s]		
<b>Default value</b>	30 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	9097	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>Idle time delay starts when RPM exceeds Start RPM. Start fail is detected when during Idle state RPM decreases below 2.</p> <p>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>			
<p><b>Note:</b> Engine can be switched between Idle and Running state by Binary input Nominal/Idle in MAN mode.</p>			

🔍 back to List of setpoints

## Idle speed

<b>Setpoint group</b>	Engine params	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	Starting RPM – MinSpeedLimit [RPM]		
<b>Default value</b>	800 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	9946	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>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.</p>			

🔍 back to List of setpoints

## Cooling speed

<b>Setpoint group</b>	Engine params	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	IDLE	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	10046	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>Selects the function of the Binary output IDLE/NOMINAL during engine Cooling state</p> <p>IDLE: Cooling is executed at Idle speed.</p> <p>NOMINAL: Cooling is executed at Nominal speed. Default state.</p> <p><b>Note:</b> Binary output IDLE/NOMINAL must be configured and connected to speed governor. Engine Idle speed must be adjusted on speed governor.</p>			

[◀ back to List of setpoints](#)

## Cooling time

<b>Setpoint group</b>	Engine params	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 3600 [s]		
<b>Default value</b>	30 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	8258	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Run time of the unloaded engine to cool the engine before stop.			

[◀ back to List of setpoints](#)

## Stop time

<b>Setpoint group</b>	Engine params	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 240 [s]		
<b>Default value</b>	10 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	9815	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Under normal conditions the engine must certainly stop within this period. The period starts by issuing stop command.			
<i><b>Note:</b> Stop of engine is detected when all following conditions are met: RPM &lt;2, Oil pressure &lt; StartingPOil and D+ input isn't active.</i>			
<i><b>Note:</b> Stop fail is detected if there is difference between those conditions.</i>			
<i><b>Note:</b> 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&lt;2, OilP not detected, D+ not active)</i>			

[back to List of setpoints](#)

## Running timer

<b>Setpoint group</b>	Engine params	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 1000 [min]		
<b>Default value</b>	0 min	<b>Force value</b>	
<b>Step</b>	1 min		
<b>Comm object</b>	11837	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

[back to List of setpoints](#)

## 10.1.7 Group: Engine params 2

***Note:** Following setpoints are available from LiteEdit/InteliMonitor only.*

## Starting RPM

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	5 - 1500 [RPM]		
<b>Default value</b>	350 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	9095	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>“Firing” speed when IntelliDrive IPU 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><b>RPM meas fail indication</b></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 &gt; 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 &gt; Starting RPM), then is activated RPM meas fail.</p> <p><i><b>Note:</b> 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>			

[back to List of setpoints](#)

## Starting POil

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 10 [Bar]		
<b>Default value</b>	10Bar	<b>Force value</b>	
<b>Step</b>	0.1 Bar		
<b>Comm object</b>	9681	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>Controller stops cranking (starter goes OFF) when Oil Pressure (typically measured on AIN1) is over Starting POil.</p> <p><i><b>Note:</b> 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><b>Note:</b> There are three conditions for stop cranking: Starting RPM (just in case the Gear teeth &gt; 0), StartingPOil and D+ (if enabled). Starter goes off when any of these conditions is valid.</i></p>			

[back to List of setpoints](#)

## AfterCool time

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 3600 [s]		
<b>Default value</b>	0 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	8662	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

[back to List of setpoints](#)

## Fuel solenoid

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	DIESEL	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	9100	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			
<b>Note:</b> In the case of gas engine, the undspeed protection cannot be blocked by the Sprinkler function.			
<b>Note:</b> For gas engines, it is strongly recommended to use the pick-up sensor, as non-zero RPM detection is required during the start procedure.			

[back to List of setpoints](#)

## FuelSol offset

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 30 [s]		
<b>Default value</b>	0.5 s	<b>Force value</b>	
<b>Step</b>	0.1 s		
<b>Comm object</b>	10525	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		

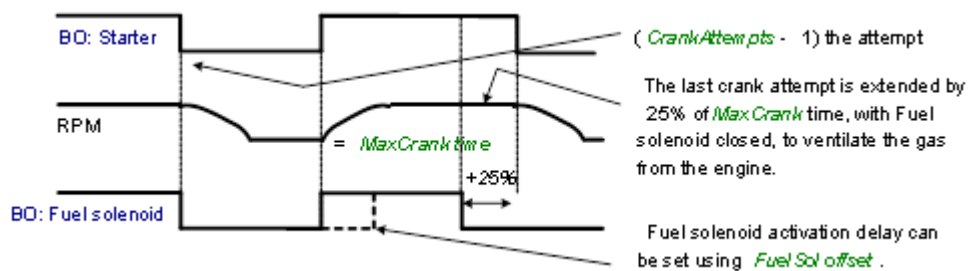
### Description

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 2: 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 2: 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.

🔍 back to List of setpoints

## D+ function

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	DISABLED	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	9683	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<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><b>Note:</b> The magnetization current is provided independently on this setpoint value.</p> <p><b>Note:</b> The D+ charge fail protection becomes active after Engine params 2: Idle time reaches zero.</p>			

[back to List of setpoints](#)

## ECU FreqSelect

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	DEFAULT	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	10266	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>This setpoint should be used only for Volvo and Scania engines.</p> <p><b>Volvo – “Volvo Aux” is selected in ECU configuration:</b></p> <p>Primary or secondary engine speed is set by Frequency select bits in VP Status frame.</p> <p><b>Scania – “Scania S6 Singlespeed” is selected in ECU configuration:</b></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>			

[back to List of setpoints](#)



## ECU Control

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	ENABLED	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	11086	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<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 Lite can only monitor the values of an electronic engine.</p>			

[back to List of setpoints](#)

## ECU SpeedAdj

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	MinSpeedLim - MaxSpeedLim [RPM]		
<b>Default value</b>	1000 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	13095	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<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>			

[back to List of setpoints](#)

## RetToSpeedAdj

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	DISABLED	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	11838	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

[back to List of setpoints](#)

## MinSpeedLim

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	Starting RPM - MaxSpeedLim [RPM]		
<b>Default value</b>	1000 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	10096	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The setpoint presets the minimum engine speed in the "Running" operation state. Also see other conditions in the chapter below.			

[back to List of setpoints](#)

## MaxSpeedLim

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	MinSpeedLim - 4000 [RPM]		
<b>Default value</b>	2000 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	10097	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The setpoint presets the maximum engine speed in the "Running" operation state. Also see other conditions in the chapter below.			

[back to List of setpoints](#)

### BI Speed Sel 1

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	MinSpeedLim - MaxSpeedLim [RPM]		
<b>Default value</b>	1250 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	10099	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The setpoint presets the required engine speed during the 'Speed Sel 1' binary input is active. Function depends on RetToSpeedAdj setting.			

[back to List of setpoints](#)

### BI Speed Sel 2

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	MinSpeedLim - MaxSpeedLim [RPM]		
<b>Default value</b>	1300 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	10523	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The setpoint presets the required engine speed during the 'Speed Sel 2' binary input is active. Function depends on RetToSpeedAdj setting.			

[back to List of setpoints](#)

### BI Speed Sel 3

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	MinSpeedLim - MaxSpeedLim [RPM]		
<b>Default value</b>	1450 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	10524	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The setpoint presets the required engine speed during the 'Speed Sel 3' binary input is active. Function depends on RetToSpeedAdj setting.			
<p><b>Note:</b> 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 2: ECU SpeedAdj' setpoint.</p>			

[back to List of setpoints](#)

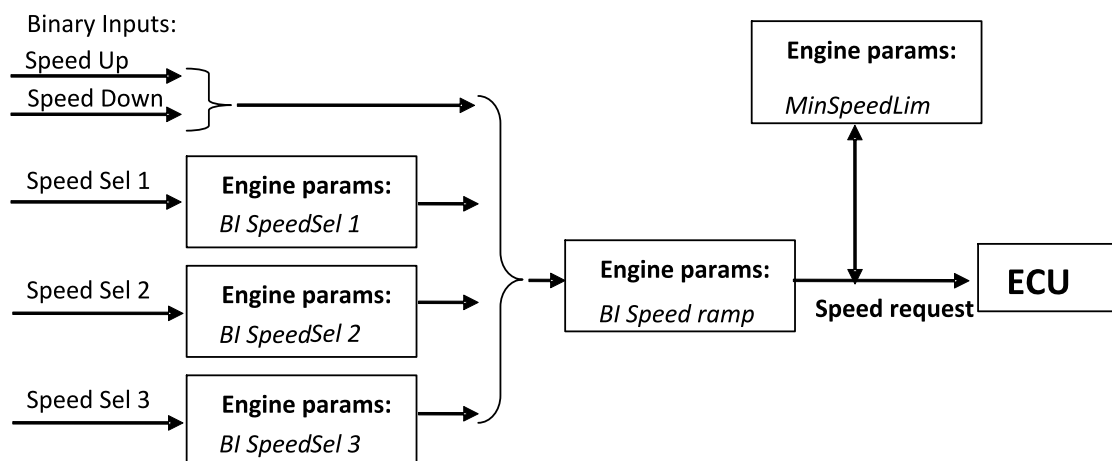
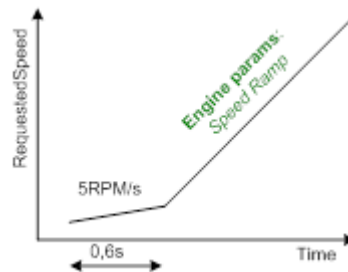
## Speed Ramp

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	1 - MaxSpeedLim [1/s]		
<b>Default value</b>	50 1/s	<b>Force value</b>	
<b>Step</b>	1 1/s		
<b>Comm object</b>	10148	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	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 2: Speed Ramp setting. This enables fine setting of Engine speed to specific value e.g. 1500 RPM.



[back to List of setpoints](#)

## 0%ofSpeedReq

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 3000 [RPM]		
<b>Default value</b>	0 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	11125	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Limit for Speed Request transformation from RPM to % range for ECU engines using % format. See practical example below.			
<b>Practical example:</b>			
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.			

[back to List of setpoints](#)

## 100%ofSpeedReq

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 4000 [RPM]		
<b>Default value</b>	2400 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	11126	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Limit for Speed Request transformation from RPM to % range for ECU engines using % format.			

[back to List of setpoints](#)

## Conveyor horn

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 600 [s]		
<b>Default value</b>	7 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	11835	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Horn time before the conveyor output starts.			

[back to List of setpoints](#)

## FuelTankVolume

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 1000 [L]		
<b>Default value</b>	0 L	<b>Force value</b>	
<b>Step</b>	1 L		
<b>Comm object</b>	11103	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
This setpoint is describing volume of fuel tank for counting fuel consumption depending on Fuel level drop.			

[back to List of setpoints](#)

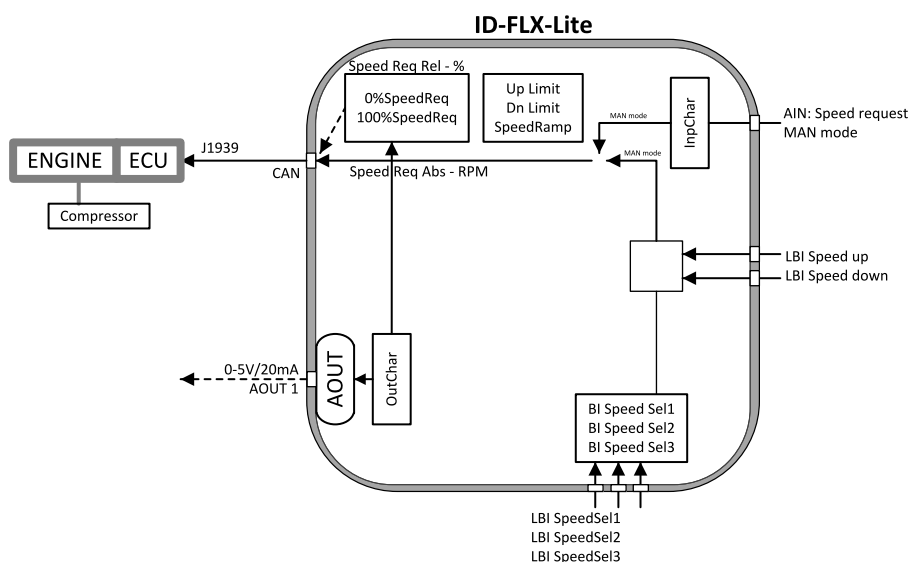
## MaxFuelDrop

<b>Setpoint group</b>	Engine params 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 50 [%/h]		
<b>Default value</b>	0 %/h	<b>Force value</b>	
<b>Step</b>	1 %/h		
<b>Comm object</b>	12373	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<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><b>Note:</b> Set 0 to disable Fuel Theft Protection function into MaxFuelDrop setpoint.</p>			

🔍 back to List of setpoints

## 10.1.8 Group: Regulator

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



## Reg Input

<b>Setpoint group</b>	Regulator	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	CU:A11	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	11843	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

[back to List of setpoints](#)

## Reg Bias

<b>Setpoint group</b>	Regulator	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 10000 [-]		
<b>Default value</b>	0	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11848	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Constant PI regulator output when the LBI R Reg Disable = closed.			

[back to List of setpoints](#)

## Request 1

<b>Setpoint group</b>	Regulator	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-10000 - +10000 [-]		
<b>Default value</b>	0	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11844	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Regulator requested value.			

[back to List of setpoints](#)



## Request 2

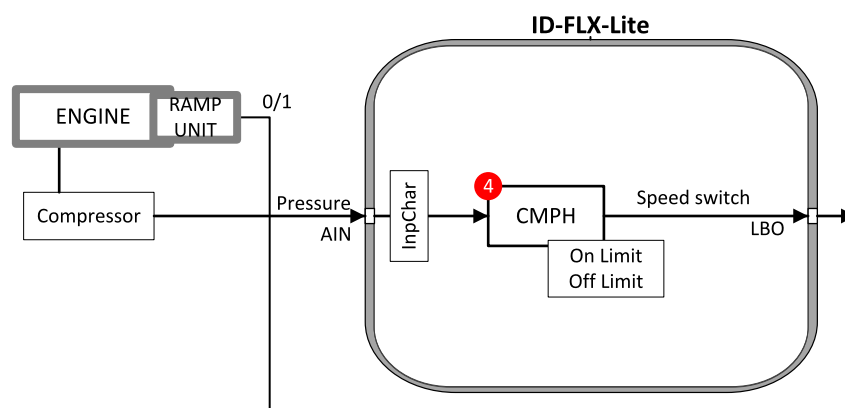
<b>Setpoint group</b>	Regulator	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-10000 - +10000 [-]		
<b>Default value</b>	0	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11845	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Regulator requested value when LBI Request2 is active.			

[back to List of setpoints](#)

## Reg CMP Input

<b>Setpoint group</b>	Regulator	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	CU:AI1	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	11839	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			

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.



[back to List of setpoints](#)

### Reg CMP On

<b>Setpoint group</b>	Regulator	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-10000 - +10000 [-]		
<b>Default value</b>	0	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11841	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Limit to close LBO SpeedSwitch.			

[back to List of setpoints](#)

### Reg CMP Off

<b>Setpoint group</b>	Regulator	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-10000 - +10000 [-]		
<b>Default value</b>	400	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11840	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Limit to open the LBO SpeedSwitch.			

[back to List of setpoints](#)

## 10.1.9 Group: Regulator 2

**Note:** Following setpoints are available from LiteEdit/InteliMonitor only.

## LAI SpdRequest

<b>Setpoint group</b>	Regulator 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>			
<b>Default value</b>	OFF	<b>Force value</b>	
<b>Step</b>			
<b>Comm object</b>	11842	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			
<b>Note:</b> Analog speed request is ignored in AUT mode.			

[back to List of setpoints](#)

## Reg Gain

<b>Setpoint group</b>	Regulator 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-200 - +200 [%]		
<b>Default value</b>	10	<b>Force value</b>	
<b>Step</b>	0.1 %		
<b>Comm object</b>	11846	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
This setpoint is giving regulator gain factor. See Hint below.			

[back to List of setpoints](#)

## Reg Integral

Setpoint group	Regulator 2	Related FW	1.1.0
Range [units]	0 - +100 [%]		
Default value	10%	Force value	
Step	0.1		
Comm object	11847	Related applications	
Config level	Standard		
Setpoint visibility	Always		

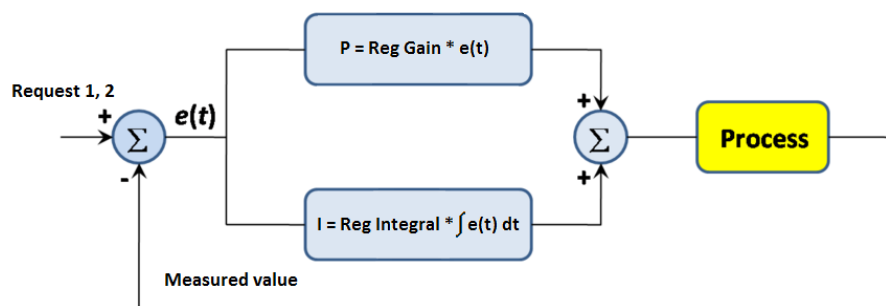
### Description

This setpoint is giving regulator integration factor.

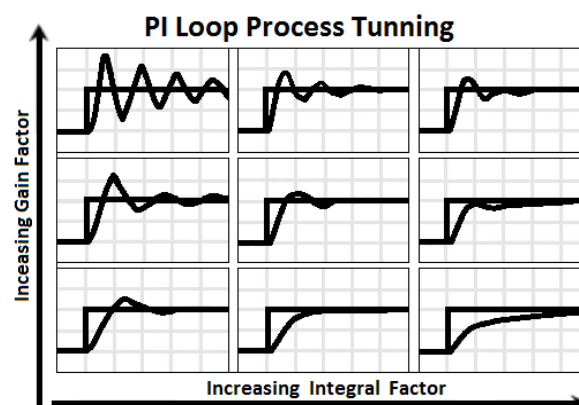
**Note:** IntelDrive Lite controllers include PI loop for speed or analog output regulation. The requested value is given by setpoints Request 1, 2. This loop is working like Proportional-Integral regulation with setpoints Reg Gain and Reg Integral for each part and these parts affect each other.

**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  $e(t) = \text{Request 1, 2} - \text{Measured value}$ .



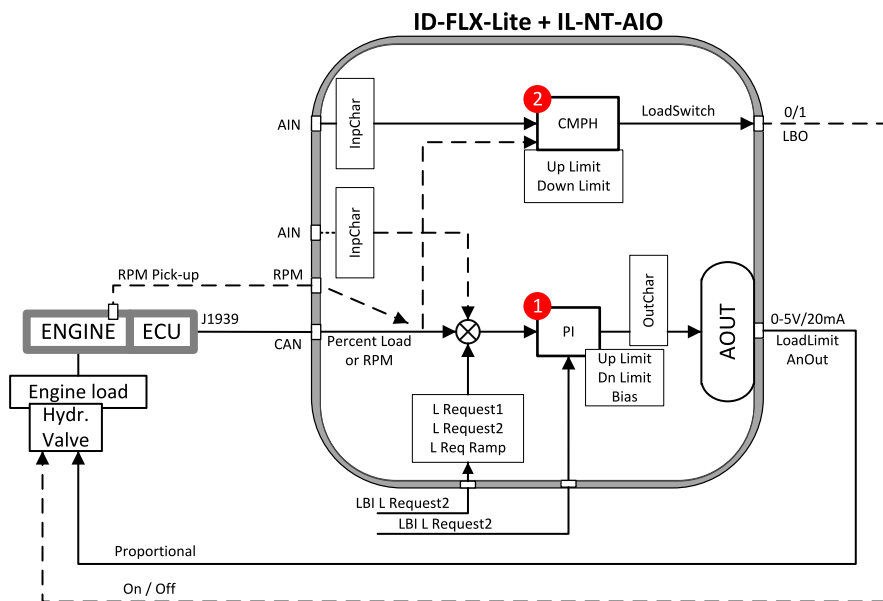
Here are two tuning parameters that can be adjusted Reg Gain and Reg Integral. These parameters interact each other, see the graphic below. Picture shows how differences in Gain and Integral can affect PI loop's responsiveness. The central pic is as base case with fast change with minimum oscillations 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.



[back to List of setpoints](#)

## 10.1.10 Group: Load limit

**Note:** Following setpoints are available from LiteEdit/InteliMonitor only.



### Load input

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	RPM	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	11850	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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			

[back to List of setpoints](#)

## Load Bias

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 10000 [-]		
<b>Default value</b>	1000	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11851	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Constant Load limit PI regulator output. Load Bias is activated when			
<ul style="list-style-type: none"> <li>▶ Engine Sd protection is activated</li> <li>▶ LBI LoadRegDisable = closed</li> <li>▶ Load input value is invalid (Sensor Fail)</li> </ul>			

[◀ back to List of setpoints](#)

## LoadRequest 1

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-10000 - +10000 [-]		
<b>Default value</b>	90	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11852	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Regulator requested value.			

[◀ back to List of setpoints](#)

## LoadRequest 2

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-10000 - +10000 [-]		
<b>Default value</b>	80	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11853	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Regulator requested value when LBI LoadRequest2 is active			

[◀ back to List of setpoints](#)

## LoadReq Ramp

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	1 - 10000 [1/s]		
<b>Default value</b>	1000 1/s	<b>Force value</b>	
<b>Step</b>	1 1/s		
<b>Comm object</b>	11854	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Ramp when is switched between LoadRequest 1 and LoadRequest 2.			

[◀ back to List of setpoints](#)

## LoadUpLimit

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 10000		
<b>Default value</b>	10000	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11855	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Load limit regulator PI output upper limit.			

[◀ back to List of setpoints](#)

## LoadDnLimit

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 10000		
<b>Default value</b>	0	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11855	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Load limit regulator PI output low limit.			

[◀ back to List of setpoints](#)

## Load Gain

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-200 - +200 [%]		
<b>Default value</b>	10 %	<b>Force value</b>	
<b>Step</b>	0.1 %		
<b>Comm object</b>	11857	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
This is setpoint is giving Load limit gain factor.			

[back to List of setpoints](#)

## Load Integral

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - +100 [%]		
<b>Default value</b>	10 %	<b>Force value</b>	
<b>Step</b>	0.1 %		
<b>Comm object</b>	11858	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
This setpoint is giving Load limit integration factor.			

[back to List of setpoints](#)

## Load CMP Input

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	RPM	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	11859	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

[back to List of setpoints](#)



### Load CMP Off

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-10000 - +10000 [-]		
<b>Default value</b>	90	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11860	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Limit to close LBO LoadSwitch			

[back to List of setpoints](#)

### Load CMP On

<b>Setpoint group</b>	Load limit	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-10000 - +10000 [-]		
<b>Default value</b>	90	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	11861	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Limit to open LBO LoadSwitch			

[back to List of setpoints](#)

## 10.1.11 Group: Engine protect

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

### Overspeed

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	50 - 150 [%]		
<b>Default value</b>	115 %	<b>Force value</b>	
<b>Step</b>	1 % of nominal RPM		
<b>Comm object</b>	8263	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Limit for engine ShutDown overspeed protection.			

[back to List of setpoints](#)

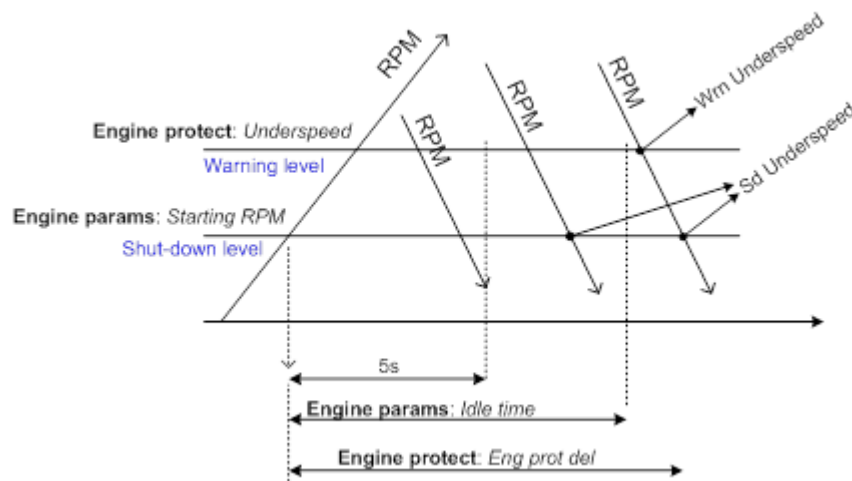
## Underspeed

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	Starting RPM - 100 [%]		
<b>Default value</b>	25 %	<b>Force value</b>	
<b>Step</b>	1 % of nominal RPM		
<b>Comm object</b>	8260	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	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.



[back to List of setpoints](#)

## Flow SwitchDel

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 600 [s]		
<b>Default value</b>	30 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	12620	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	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.

[back to List of setpoints](#)

## Sd Override

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	DISABLED	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	14603	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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 <b>SdOverride Act</b> and recorded to history as record <b>SdOverride Act</b> .			

[back to List of setpoints](#)

## AIN1 Wrn

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-10 - +1000 [Bar]		
<b>Default value</b>	2 Bar	<b>Force value</b>	
<b>Step</b>	0.1 Bar		
<b>Comm object</b>	8369	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Warning limit level for ANALOG INPUT 1 Setpoint name depends on setting of AIN1 (maximum length is 14 characters).			

[back to List of setpoints](#)

## AIN1 Sd

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-10 - +1000 [Bar]		
<b>Default value</b>	1 Bar	<b>Force value</b>	
<b>Step</b>	0.1 Bar		
<b>Comm object</b>	8370	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Shutdown limit level for ANALOG INPUT 1. Setpoint name depends on setting of AIN1 (maximum length is 14 characters).			

[back to List of setpoints](#)

## AIN1 Del

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 180 [s]		
<b>Default value</b>	3 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	8365	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Delay for ANALOG INPUT 1			
Setpoint name depends on setting of AIN1 (maximum length is 14 characters).			
<i>Note: Analog input 1 is usually determined to Oil Pressure measurement and it is resistive type of input with range 0-2500 Ohm.</i>			

[back to List of setpoints](#)

## AIN2 Wrn

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - 10000 [°C]		
<b>Default value</b>	90°C	<b>Force value</b>	
<b>Step</b>	1 °C		
<b>Comm object</b>	8375	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Warning limit level for ANALOG INPUT 2			
Setpoint name depends on setting of AIN2 (maximum length is 14 characters).			

[back to List of setpoints](#)

## AIN2 Sd

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - 10000 [°C]		
<b>Default value</b>	90 °C	<b>Force value</b>	
<b>Step</b>	1 °C		
<b>Comm object</b>	8376	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Shutdown limit level for ANALOG INPUT 2			
Setpoint name depends on setting of AIN2 (maximum length is 14 characters).			

[back to List of setpoints](#)

## AIN2 Del

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 180 [s]		
<b>Default value</b>	5 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	8371	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Delay for ANALOG INPUT 2 alarm.			
Setpoint name depends on setting of AIN2 (maximum length is 14 characters).			
<i>Note: Analog input 2 is usually determined to Engine Temperature measurement and it is resistive type of input with range 0-2500 Ohm.</i>			

[back to List of setpoints](#)

## AIN3 Wrn

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - +10000 [%]		
<b>Default value</b>	20 %	<b>Force value</b>	
<b>Step</b>	1 %		
<b>Comm object</b>	8381	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Warning limit level for ANALOG INPUT 3			
Setpoint name depends on setting of AIN3 (maximum length is 14 characters).			

[back to List of setpoints](#)

## AIN3 Sd

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - +10000 [%]		
<b>Default value</b>	10 %	<b>Force value</b>	
<b>Step</b>	1 %		
<b>Comm object</b>	8382	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Shutdown limit level for ANALOG INPUT 3			
Setpoint name depends on setting of AIN3 (maximum length is 14 characters).			

[back to List of setpoints](#)

### AIN3 Del

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 180 [s]		
<b>Default value</b>	10 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	8377	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Delay for ANALOG INPUT 3			
Setpoint name depends on setting of AIN3 (maximum length is 14 characters).			
<i>Note: Analog input 3 is usually determined to Fuel Level measurement and it is resistive type of input with range 0-2500 Ohm.</i>			

[back to List of setpoints](#)

### Batt overvolt

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	Batt undervolt - 40 [V]		
<b>Default value</b>	36 V	<b>Force value</b>	
<b>Step</b>	0.1 V		
<b>Comm object</b>	9587	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
High battery voltage Warning limit			

[back to List of setpoints](#)

### Batt undervolt

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	8 - Batt overvolt [V]		
<b>Default value</b>	18 V	<b>Force value</b>	
<b>Step</b>	0.1 V		
<b>Comm object</b>	8387	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Low battery voltage Warning limit.			

[back to List of setpoints](#)

## Batt volt del

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 600 [s]		
<b>Default value</b>	5 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	8383	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Delay for low and high battery voltage alarm.			

[back to List of setpoints](#)

## NextServTime

<b>Setpoint group</b>	Engine protect	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 65535 [h]		
<b>Default value</b>	10000 h	<b>Force value</b>	
<b>Step</b>	1 h		
<b>Comm object</b>	9648	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Counting down when engine is running, from the moment of setting up the value of working hours in LiteEdit/controller. This value is counting and changing in LiteEdit/controller as well. Service time alarm appears if reaches zero, until non-zero value is set.			
<p><b>Note:</b> Set the NextServTime = 65535 h to disable count down. The setpoint stays constant, but Statistics value (visible in LiteEdit) displays ##### invalid value.</p>			

[back to List of setpoints](#)

## 10.1.12 Group: Engine protect 2

**Note:** Following setpoints are available from LiteEdit/InteliMonitor only.

## Eng prot del

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 300 [s]		
<b>Default value</b>	5 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	8262	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

[back to List of setpoints](#)

## BIN1 Delay

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 3600 [s]		
<b>Default value</b>	1 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	10131	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Five setpoints are dedicated for separately adjustment of the delay for each of binary inputs according to the Class B protection standard.			
<b>Note:</b> The corresponding BIN protection has to be configured as Running only in LiteEdit.			

[back to List of setpoints](#)

## BIN2 Delay

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 3600 [s]		
<b>Default value</b>	1 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	10132	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Five setpoints are dedicated for separately adjustment of the delay for each of binary inputs according to the Class B protection standard.			
<b>Note:</b> The corresponding BIN protection has to be configured as Running only in LiteEdit.			

[back to List of setpoints](#)



### BIN3 Delay

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 3600 [s]		
<b>Default value</b>	1 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	10133	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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>			

[back to List of setpoints](#)

### BIN4 Delay

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 3600 [s]		
<b>Default value</b>	1 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	14629	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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>			

[back to List of setpoints](#)

### BIN5 Delay

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 3600 [s]		
<b>Default value</b>	1 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	14649	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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>			

[back to List of setpoints](#)

## Horn timeout

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 600 [s]		
<b>Default value</b>	10 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	8264	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

[back to List of setpoints](#)

## StartOverspeed

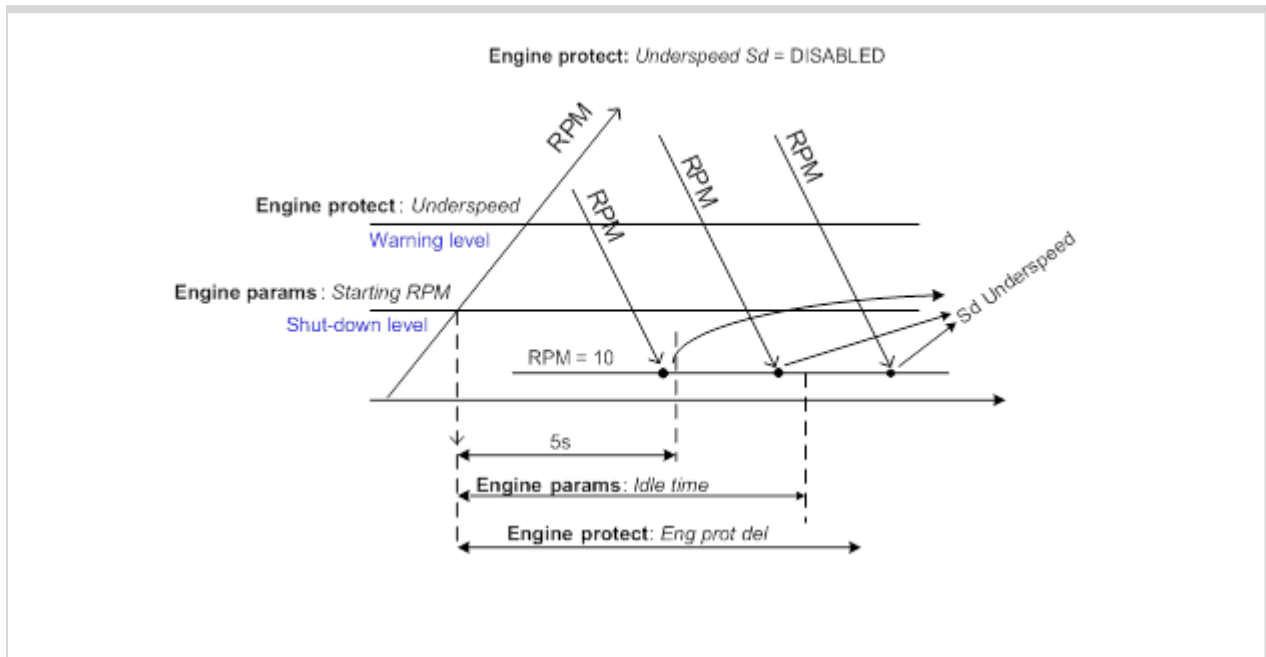
<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	50 - 150 [%]		
<b>Default value</b>	120 %	<b>Force value</b>	
<b>Step</b>	1 %		
<b>Comm object</b>	13340	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Limit for engine ShutDown overspeed protection. Protection is active during start process of the engine and Idle time.			
<p><b>Note:</b> <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>			

[back to List of setpoints](#)

**UnderspeedSd**

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	ENABLED	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	11415	<b>Related applications</b>	
<b>Config level</b>	Standard		

<b>Setpoint visibility</b>	Always			
<b>Description</b>				
<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><b>Engine protect: Underspeed Sd = ENABLED</b></p>				
<b>RPM &lt;</b>	<b>Engine State</b>	<b>AlarmList</b>	<b>History</b>	<b>ReadyToLoad</b>
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
<b>Engine protect: Underspeed Sd = DISABLED</b>				
<b>RPM &lt;</b>	<b>Engine State</b>	<b>AlarmList</b>	<b>History</b>	<b>ReadyToLoad</b>
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



⬅ back to List of setpoints

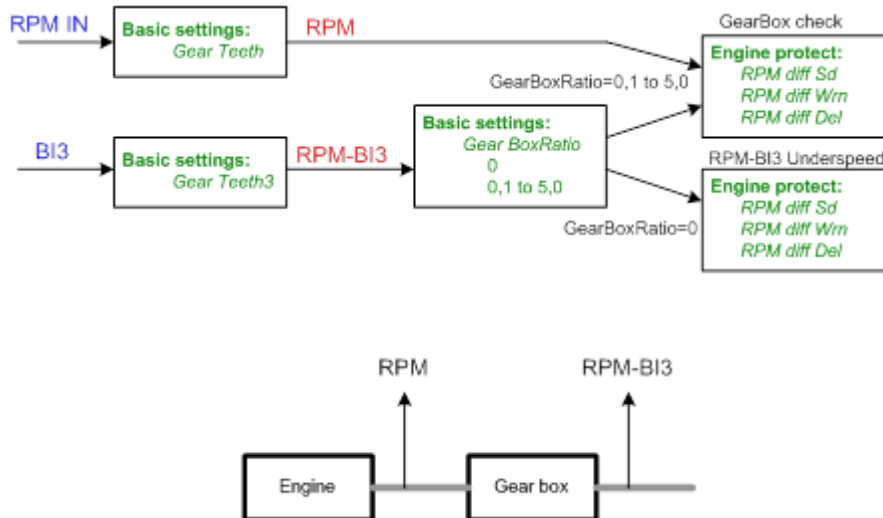
## GearBoxRatio

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 5 [RPM]		
<b>Default value</b>	0 RPM	<b>Force value</b>	
<b>Step</b>	0.1 RPM		
<b>Comm object</b>	8708	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	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.

🔍 back to List of setpoints

### RPMdiff Sd

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	1-1000 [RPM]		
<b>Default value</b>	1000 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	10143	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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			

[back to List of setpoints](#)

### RPMdiff Wrn

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	1 - 1000 [RPM]		
<b>Default value</b>	1000 RPM	<b>Force value</b>	
<b>Step</b>	1 RPM		
<b>Comm object</b>	10141	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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			

[back to List of setpoints](#)

### RPMdiff delay

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 600 [s]		
<b>Default value</b>	5 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	10150	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Delay for RPMdiff protections above. See description in GearBoxRatio setpoint.			

[back to List of setpoints](#)

### DEF Level Min

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 150 [%]		
<b>Default value</b>	10 %	<b>Force value</b>	
<b>Step</b>	1 %		
<b>Comm object</b>	13178	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

[back to List of setpoints](#)

### DEF Level Max

<b>Setpoint group</b>	Engine protect 2	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 150 [%]		
<b>Default value</b>	90 %	<b>Force value</b>	
<b>Step</b>	1 %		
<b>Comm object</b>	13379	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			
<b>Note:</b> DEF Level is usual signage of Urea tank level, which is more often used in United States.			

[back to List of setpoints](#)

## 10.1.13 Group: ATT Settings

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



## Regen Inhibit

<b>Setpoint group</b>	ATT settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	OFF	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	14520	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

⬅ back to List of setpoints

## Regen Force

<b>Setpoint group</b>	ATT settings	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	OFF	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	14521	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

⬅ back to List of setpoints

## 10.1.14 Group: Date/Time

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

## Time

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	0:00:00	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	24554	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Actual time.			

[⬅ back to List of setpoints](#)

## Date

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	1.1.2006	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	24553	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Actual date.			

[⬅ back to List of setpoints](#)

## Time stamp per

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 200 [min]		
<b>Default value</b>	60 min	<b>Force value</b>	
<b>Step</b>	1 min		
<b>Comm object</b>	8979	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
This setpoint is dedicated to adjustment of time interval for periodical history records.			

[⬅ back to List of setpoints](#)

## Timer Inhib Del

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	0 - 600 [s]		
<b>Default value</b>	0 s	<b>Force value</b>	
<b>Step</b>	1 s		
<b>Comm object</b>	14650	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The engine is stopped during running Timer 1/2 when LBI TimerInhibit is activated for time set in setpoint TimerInhibitDel (group: Date/Time).			

[back to List of setpoints](#)

## SummerTimeMod

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	DISABLED	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	8727	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
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.			

[back to List of setpoints](#)

## Timer1Function

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	No Func	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	11660	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<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 &lt; 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 &lt; 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>			

[back to List of setpoints](#)

## Timer1Repeat

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	NONE	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	10045	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<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>			

[back to List of setpoints](#)

### Timer1 ON time

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	5:00:00	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	10042	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Display day time when Timer 1 output is activated.			

[back to List of setpoints](#)

### Timer1Duration

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	1 - 1440 [min]		
<b>Default value</b>	5 min	<b>Force value</b>	
<b>Step</b>	1 min		
<b>Comm object</b>	10044	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Adjusts duration of Timer 1 output.			

[back to List of setpoints](#)

## Timer2Function

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	No Func	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	11661	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<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 &lt; 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 &lt; 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>			

[back to List of setpoints](#)

## Timer2Repeat

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	NONE	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	10202	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<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>			

[back to List of setpoints](#)

### Timer2OnTime

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	5.00:00	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	10199	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
This setpoint is used to select whether you use wooden or woolen wires. Use p.noIndent style for your paragraphs.			

[back to List of setpoints](#)

### Timer2Duration

<b>Setpoint group</b>	Date/Time	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	1 - 1440 [min]		
<b>Default value</b>	5 min	<b>Force value</b>	
<b>Step</b>	1 min		
<b>Comm object</b>	10201	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Adjusts duration of Timer 2 output.			

[back to List of setpoints](#)

## 10.1.15 Group: Sensor spec

### Calibr AI1

<b>Setpoint group</b>	Sensor spec	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-1000 - +1000 [Bar]		
<b>Default value</b>	0 Bar	<b>Force value</b>	
<b>Step</b>	1 Bar		
<b>Comm object</b>	8431	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Calibrate the constant to adjust the measured value of IntelliDrive IPU analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.			
<b>Note:</b> Calibration constants have to be adjusted when measured value is near the alarm level.			

[back to List of setpoints](#)

### Calibr AI2

<b>Setpoint group</b>	Sensor spec	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-1000 - +1000 [°C]		
<b>Default value</b>	0 °C	<b>Force value</b>	
<b>Step</b>	1 °C		
<b>Comm object</b>	8407	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Calibrate the constant to adjust the measured value of IntelliDrive IPU 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>			

[back to List of setpoints](#)

### Calibr AI3

<b>Setpoint group</b>	Sensor spec	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-1000 - +1000 [%]		
<b>Default value</b>	0 %	<b>Force value</b>	
<b>Step</b>	1 %		
<b>Comm object</b>	8467	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Calibrate the constant to adjust the measured value of IntelliDrive IPU 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>			

[back to List of setpoints](#)

### Calibr AI4

<b>Setpoint group</b>	Sensor spec	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-1000 - +1000 [U16]		
<b>Default value</b>	0 U16	<b>Force value</b>	
<b>Step</b>	1 U16		
<b>Comm object</b>	11917	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Calibrate the constant to adjust the measured value of IntelliDrive IPU 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>			

[back to List of setpoints](#)



### Calibr AI5

<b>Setpoint group</b>	Sensor spec	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-1000 - +1000 [U17]		
<b>Default value</b>	0 U17	<b>Force value</b>	
<b>Step</b>	1 U17		
<b>Comm object</b>	11918	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Calibrate the constant to adjust the measured value of IntelliDrive IPU 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>			

[back to List of setpoints](#)

### Calibr AI6

<b>Setpoint group</b>	Sensor spec	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-1000 - +1000 [U12]		
<b>Default value</b>	0 U12	<b>Force value</b>	
<b>Step</b>	1 U12		
<b>Comm object</b>	11599	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Calibrate the constant to adjust the measured value of IntelliDrive IPU 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>			

[back to List of setpoints](#)

### Calibr AIO1

<b>Setpoint group</b>	Sensor spec	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-1000 - +1000 [U8]		
<b>Default value</b>	0 U8	<b>Force value</b>	
<b>Step</b>	1 U8		
<b>Comm object</b>	11919	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Calibration constants have to be adjusted when measured value is near the alarm level.			

[back to List of setpoints](#)

### Calibr AIO2

<b>Setpoint group</b>	Sensor spec	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-1000 - +1000 [U9]		
<b>Default value</b>	0 U9	<b>Force value</b>	
<b>Step</b>	1 U9		
<b>Comm object</b>	11920	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Calibration constants have to be adjusted when measured value is near the alarm level.			

[back to List of setpoints](#)

### Calibr AIO3

<b>Setpoint group</b>	Sensor spec	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-1000 - +1000 [U10]		
<b>Default value</b>	0 U10	<b>Force value</b>	
<b>Step</b>	1 U10		
<b>Comm object</b>	11921	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Calibration constants have to be adjusted when measured value is near the alarm level.			

[back to List of setpoints](#)

### Calibr AIO4

<b>Setpoint group</b>	Sensor spec	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-1000 - + 1000 [U11]		
<b>Default value</b>	0 U11	<b>Force value</b>	
<b>Step</b>	1 U11		
<b>Comm object</b>	13640	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Calibration constants have to be adjusted when measured value is near the alarm level.			

[back to List of setpoints](#)

## 10.1.16 Group: AIO module

### AnInAIO1 lev1

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - +10000 [V]		
<b>Default value</b>	0 U8	<b>Force value</b>	
<b>Step</b>	1		
<b>Comm object</b>	13650	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The level for IL-NT-AIO plug-in card Analog input 1 alarm detection.			

[back to List of setpoints](#)

### AnInAIO2 lev1

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - +10000 [U9]		
<b>Default value</b>	0 U9	<b>Force value</b>	
<b>Step</b>	1 U9		
<b>Comm object</b>	13651	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The level for IL-NT-AIO plug-in card Analog input 2 alarm detection.			

[back to List of setpoints](#)

### AnInAIO3 lev1

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - +10000 [U10]		
<b>Default value</b>	0 U10	<b>Force value</b>	
<b>Step</b>	1 U10		
<b>Comm object</b>	13652	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The level for IL-NT-AIO plug-in card Analog input 3 alarm detection.			

[back to List of setpoints](#)

### AnInAIO4 lev1

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - +10000 [U11]		
<b>Default value</b>	0 U11	<b>Force value</b>	
<b>Step</b>	1 U11		
<b>Comm object</b>	13653	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The level for IL-NT-AIO plug-in card Analog input 4 alarm detection.			

[back to List of setpoints](#)

### AnInAIO1 lev2

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - +10000 [U8]		
<b>Default value</b>	0 U8	<b>Force value</b>	
<b>Step</b>	1 U8		
<b>Comm object</b>	13654	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The level for IL-NT-AIO plug-in card Analog input 1 alarm detection.			

[back to List of setpoints](#)

### AnInAIO2 lev2

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - +10000 [U9]		
<b>Default value</b>	0 U9	<b>Force value</b>	
<b>Step</b>	1 U9		
<b>Comm object</b>	13655	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The level for IL-NT-AIO plug-in card Analog input 2 alarm detection.			

[back to List of setpoints](#)

### AnInAIO3 lev2

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - +10000 [U10]		
<b>Default value</b>	0 U10	<b>Force value</b>	
<b>Step</b>	1 U10		
<b>Comm object</b>	13656	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The level for IL-NT-AIO plug-in card Analog input 3 alarm detection.			

[◀ back to List of setpoints](#)

### AnInAIO4 lev2

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	-100 - +10000 [U11]		
<b>Default value</b>	0 U11	<b>Force value</b>	
<b>Step</b>	1 U11		
<b>Comm object</b>	13657	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
The level for IL-NT-AIO plug-in card Analog input 1, 2, 3, 4 alarm detection.			

[◀ back to List of setpoints](#)

## AnInAIO1 del

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0										
<b>Range [units]</b>	0 - 180 [s]												
<b>Default value</b>	5 s	<b>Force value</b>											
<b>Step</b>	1 s												
<b>Comm object</b>	13658	<b>Related applications</b>											
<b>Config level</b>	Standard												
<b>Setpoint visibility</b>	Always												
<b>Description</b>													
Delay for IL-NT-AIO plug-in card Analog input 1 alarm.													
<i>Note: Plug-in analog inputs protection alarms can be configured following way</i>													
<table border="1"> <thead> <tr> <th>Configuration</th> <th>Protection</th> </tr> </thead> <tbody> <tr> <td>Under limit</td> <td>Protection is activated only when measured value is under measured level.</td> </tr> <tr> <td>Over limit</td> <td>Protection is activated only when measured value is over measured level.</td> </tr> <tr> <td>UnderLimit+fIs</td> <td>Level 2 protection is activated by sensor fail too.</td> </tr> <tr> <td>OverLimit+fIs</td> <td>Level 2 protection is activated by sensor fail too.</td> </tr> </tbody> </table>				Configuration	Protection	Under limit	Protection is activated only when measured value is under measured level.	Over limit	Protection is activated only when measured value is over measured level.	UnderLimit+fIs	Level 2 protection is activated by sensor fail too.	OverLimit+fIs	Level 2 protection is activated by sensor fail too.
Configuration	Protection												
Under limit	Protection is activated only when measured value is under measured level.												
Over limit	Protection is activated only when measured value is over measured level.												
UnderLimit+fIs	Level 2 protection is activated by sensor fail too.												
OverLimit+fIs	Level 2 protection is activated by sensor fail too.												

[back to List of setpoints](#)

## AnInAIO2 del

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0										
<b>Range [units]</b>	0 - 180 [s]												
<b>Default value</b>	5 s	<b>Force value</b>											
<b>Step</b>	1 s												
<b>Comm object</b>	13659	<b>Related applications</b>											
<b>Config level</b>	Standard												
<b>Setpoint visibility</b>	Always												
<b>Description</b>													
Delay for IL-NT-AIO plug-in card Analog input 2 alarm.													
<i>Note: Plug-in analog inputs protection alarms can be configured following way</i>													
<table border="1"> <thead> <tr> <th>Configuration</th> <th>Protection</th> </tr> </thead> <tbody> <tr> <td>Under limit</td> <td>Protection is activated only when measured value is under measured level.</td> </tr> <tr> <td>Over limit</td> <td>Protection is activated only when measured value is over measured level.</td> </tr> <tr> <td>UnderLimit+fIs</td> <td>Level 2 protection is activated by sensor fail too.</td> </tr> <tr> <td>OverLimit+fIs</td> <td>Level 2 protection is activated by sensor fail too.</td> </tr> </tbody> </table>				Configuration	Protection	Under limit	Protection is activated only when measured value is under measured level.	Over limit	Protection is activated only when measured value is over measured level.	UnderLimit+fIs	Level 2 protection is activated by sensor fail too.	OverLimit+fIs	Level 2 protection is activated by sensor fail too.
Configuration	Protection												
Under limit	Protection is activated only when measured value is under measured level.												
Over limit	Protection is activated only when measured value is over measured level.												
UnderLimit+fIs	Level 2 protection is activated by sensor fail too.												
OverLimit+fIs	Level 2 protection is activated by sensor fail too.												

[back to List of setpoints](#)

### AnInAIO3 del

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0										
<b>Range [units]</b>	0 - 180 [s]												
<b>Default value</b>	5 s	<b>Force value</b>											
<b>Step</b>	1 s												
<b>Comm object</b>	13660	<b>Related applications</b>											
<b>Config level</b>	Standard												
<b>Setpoint visibility</b>	Always												
<b>Description</b>													
Delay for IL-NT-AIO plug-in card Analog input 3 alarm.													
<i>Note: Plug-in analog inputs protection alarms can be configured following way</i>													
<table border="1"> <thead> <tr> <th>Configuration</th> <th>Protection</th> </tr> </thead> <tbody> <tr> <td>Under limit</td> <td>Protection is activated only when measured value is under measured level.</td> </tr> <tr> <td>Over limit</td> <td>Protection is activated only when measured value is over measured level.</td> </tr> <tr> <td>UnderLimit+fIs</td> <td>Level 2 protection is activated by sensor fail too.</td> </tr> <tr> <td>OverLimit+fIs</td> <td>Level 2 protection is activated by sensor fail too.</td> </tr> </tbody> </table>				Configuration	Protection	Under limit	Protection is activated only when measured value is under measured level.	Over limit	Protection is activated only when measured value is over measured level.	UnderLimit+fIs	Level 2 protection is activated by sensor fail too.	OverLimit+fIs	Level 2 protection is activated by sensor fail too.
Configuration	Protection												
Under limit	Protection is activated only when measured value is under measured level.												
Over limit	Protection is activated only when measured value is over measured level.												
UnderLimit+fIs	Level 2 protection is activated by sensor fail too.												
OverLimit+fIs	Level 2 protection is activated by sensor fail too.												

[back to List of setpoints](#)

### AnInAIO4 del

<b>Setpoint group</b>	AIO module	<b>Related FW</b>	1.1.0										
<b>Range [units]</b>	0 - 180 [s]												
<b>Default value</b>	5 s	<b>Force value</b>											
<b>Step</b>	1 s												
<b>Comm object</b>	13661	<b>Related applications</b>											
<b>Config level</b>	Standard												
<b>Setpoint visibility</b>	Always												
<b>Description</b>													
Delay for IL-NT-AIO plug-in card Analog input 4 alarm.													
<i>Note: Plug-in analog inputs protection alarms can be configured following way</i>													
<table border="1"> <thead> <tr> <th>Configuration</th> <th>Protection</th> </tr> </thead> <tbody> <tr> <td>Under limit</td> <td>Protection is activated only when measured value is under measured level.</td> </tr> <tr> <td>Over limit</td> <td>Protection is activated only when measured value is over measured level.</td> </tr> <tr> <td>UnderLimit+fIs</td> <td>Level 2 protection is activated by sensor fail too.</td> </tr> <tr> <td>OverLimit+fIs</td> <td>Level 2 protection is activated by sensor fail too.</td> </tr> </tbody> </table>				Configuration	Protection	Under limit	Protection is activated only when measured value is under measured level.	Over limit	Protection is activated only when measured value is over measured level.	UnderLimit+fIs	Level 2 protection is activated by sensor fail too.	OverLimit+fIs	Level 2 protection is activated by sensor fail too.
Configuration	Protection												
Under limit	Protection is activated only when measured value is under measured level.												
Over limit	Protection is activated only when measured value is over measured level.												
UnderLimit+fIs	Level 2 protection is activated by sensor fail too.												
OverLimit+fIs	Level 2 protection is activated by sensor fail too.												

[back to List of setpoints](#)

## 10.1.17 Group: SMS\_E-Mail

**Note:** If a cellular network modem and/or internet bridge is connected to the controller, the controller can send SMS messages and/or emails in the moment when a new alarm appears in the Alarm list. The message will contain a copy of the Alarm list. To enable this function, you should select with setpoints Yel Alarm Msg and Red Alarm Msg, which levels of alarms shall be announced (red/yellow/both) and also enter valid cellular network phone number and/or e-mail address to the setpoints TelNo/Addr Ch1 and TelNo/Addr Ch2. It is possible to put either number or e-mail to both setpoints.

**Note:** An internet module must be available for sending of e-mails. Similarly, a cellular network modem is necessary for sending of SMS.

**Note:** There are 5 attempts for any active call (SMS/E-Mail). Timeout for connection is 90 sec and after 120 sec controller starts the next attempt. During the time the IL-NT-GPRS is trying to send an active call type, incoming calls are blocked.

### Yel Alarm Msg

<b>Setpoint group</b>	SMS/E-Mail	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	OFF	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	8482	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Set this setpoint to YES if you want to get messages when a yellow (warning) alarm occurs.			
<b>Note:</b> The target address (cellular network phone number or e-mail address) must be set correctly to the setpoint(s) TelNo/Addr Ch1 resp. TelNo/Addr Ch2.			

[back to List of setpoints](#)

### Red Alarm Msg

<b>Setpoint group</b>	SMS/E-Mail	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	OFF	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	8484	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
Set this setpoint to YES if you want to get messages when a red (shutdown) alarm occurs.			
<b>Note:</b> The target address (cellular network phone number or e-mail address) must be set correctly to the setpoint(s) TelNo/Addr Ch1 resp. TelNo/Addr Ch2.			

[back to List of setpoints](#)



## TelNo/Addr Ch1

<b>Setpoint group</b>	SMS/E-Mail	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	[-]	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	9597	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>Enter either a valid cellular network phone number or e-mail address to this setpoint, where the alarm messages shall be sent. Type of active call is considered from the value of this parameter. If it consist „@“ it is supposed to be e-mail address and active e-mail is sent. If the value is number, without „@“, it is supposed to be the telephone number and active SMS is sent.</p> <p><b>IMPORTANT: These setpoints can be modified from PC only! For cellular network numbers use either national format (i.e. like number you will dial if you want to make a local call) or full international format with "+" character followed by international prefix at the beginning.</b></p>			


[back to List of setpoints](#)

## TelNo/Addr Ch2

<b>Setpoint group</b>	SMS/E-Mail	<b>Related FW</b>	1.1.0
<b>Range [units]</b>	[-]		
<b>Default value</b>	[-]	<b>Force value</b>	
<b>Step</b>	[-]		
<b>Comm object</b>	9598	<b>Related applications</b>	
<b>Config level</b>	Standard		
<b>Setpoint visibility</b>	Always		
<b>Description</b>			
<p>Enter either a valid cellular network phone number or e-mail address to this setpoint, where the alarm messages shall be sent. Type of active call is considered from the value of this parameter. If it consist „@“ it is supposed to be e-mail address and active e-mail is sent. If the value is number, without „@“, it is supposed to be the telephone number and active SMS is sent.</p> <p><b>IMPORTANT: These setpoints can be modified from PC only! For cellular network numbers use either national format (i.e. like number you will dial if you want to make a local call) or full international format with "+" character followed by international prefix at the beginning.</b></p>			

[back to List of setpoints](#)

## 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 GSM SignalLvl GSM ErrorRate GSM DiagCode: AirGate Diag: AirGate ID: Modem Status:	
Iveco Values	DEF TankLevel DEF TankTemp DEF Quantity Catal UpTemp Catal DownTemp DEF Pressure Catalyst Level	Values read from specific type of ECU
AIO module	AnInAIO1-AnInAIO4	

[◀ back to Appendix](#)

## 10.3 Logical binary inputs

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

### 10.3.1 List of LBI

Not used .....	193
Rem start/stop .....	193
Emergency stop .....	193
Sprinkler .....	193
Access lock .....	194
Remote OFF .....	194
Remote MAN .....	194
Remote AUT .....	194
RemControlLock .....	194
Emerg. manual .....	195
StartButton .....	195
StopButton .....	195
FaultResetButton .....	195
HornResButton .....	196
Nominal/Idle .....	196
Speed Up .....	196
Speed Down .....	196
Speed Sel1 .....	197
Speed Sel2 .....	197
Speed Sel3 .....	197
Lang selection .....	197
Conveyor .....	198
LoadRequest2 .....	198
LoadRegDisable .....	198
RegRequest2 .....	198
R Reg Disable .....	198
Clear DayCons .....	199
Clear TripCons .....	199
Flow Switch .....	199
Prot Test .....	199
Regen Inhibit .....	200
Regen Force .....	200
ATT Lockout1 .....	200

◀ back to Controller objects

### Not used

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	282		
<b>Description</b>			
Binary input has no function. Use this option when binary input is not connected.			

### Rem start/stop

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	285		
<b>Description</b>			
Binary input is used for external request for engine start/stop in AUT mode only. When the input is closed the engine is started, when the input is opened the engine is stopped.			

◀ back to List of LBI

### Emergency stop

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	286		
<b>Description</b>			
If the input is opened, shut down is immediately activated. Input is inverted (normally closed) in default configuration.			
<p><b>Note:</b> 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.</p>			

◀ back to List of LBI

### Sprinkler

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	287		
<b>Description</b>			
If the input is closed all alarms are disabled except the binary input Emergency stop and "engine overspeed protection".			
<ul style="list-style-type: none"> <li>▶ All IntelliDrive IPU alarms are detected,</li> <li>▶ IntelliDrive IPU front panel RED LED blinks or lights</li> <li>▶ Alarm is recorded on the IntelliDrive IPU alarm list screen</li> <li>▶ BUT engine remains running</li> </ul>			
<p><b>Note:</b> Warning SprinklActive is indicated in the Alarm list if sprinkler mode active to inform the operator that the engine is not protected.</p>			

◀ back to List of LBI

## Access lock

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	288		
<b>Description</b>			
If the input is closed, no setpoints can be adjusted from controller front panel and engine mode (OFF-MAN-AUT) cannot be changed.			
<i><b>Note:</b> Access lock does not protect setpoints and mode changing from LiteEdit. To avoid unqualified changes the selected setpoints can be password protected.</i>			

⬅ back to List of LBI

## Remote OFF

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	289		
<b>Description</b>			
If closed, IntelliDrive IPU is switched to OFF mode (there are three modes OFF-MAN-AUT). When opens controller is switched back to previous mode.			
<i><b>Note:</b> This binary input should be connected to schedule timer switch, to avoid start of engine.</i>			

⬅ back to List of LBI

## Remote MAN

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	290		
<b>Description</b>			
If the input is active, MAN mode is forced to the controller independently on the position of the MODE selector.			

⬅ back to List of LBI

## Remote AUT

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	291		
<b>Description</b>			
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.			

⬅ back to List of LBI

## RemControlLock

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	294		
<b>Description</b>			
If the input is active, setpoints writing or command sending from the external terminal is disabled..			


⬅ back to List of LBI

## Emerg. manual

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	295		
<b>Description</b>			
<p>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.</p> <p>Detection of running engine and subsequent alarm message "Sd Stop fail" is blocked.</p> <p>The controller shows "Emerg Man" state and the engine can not be started.</p> <p>After the input is open again, the controller recovers to previous state and behaves according to the actual situation.</p> <p>Function is active in any controller mode.</p>			


[back to List of LBI](#)

## StartButton

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	296		
<b>Description</b>			
<p>Binary input has the same function as  button on the IntelliDrive IPU front panel. It is active in MAN mode only.</p>			

[back to List of LBI](#)

## StopButton

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	297		
<b>Description</b>			
<p>Binary input has the same function as  button on the IntelliDrive IPU front panel. It is active in MAN mode only.</p>			

[back to List of LBI](#)

## FaultResetButton

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	298		
<b>Description</b>			
<p>Binary input has the same function as  button on the IntelliDrive IPU front panel.</p>			

[back to List of LBI](#)

## HornResButton

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	299		
<b>Description</b>			
Binary input has the same function as Horn reset button on the IntelliDrive IPU front panel.			

⬅ back to List of LBI

## Nominal/Idle

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS									
<b>Comm object</b>	304											
<b>Description</b>												
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 = <b>Engine params</b> : Idle speed and/or active (binary) IDLE command to the ECU (e.g. to Volvo EMS).												
<table border="1"> <thead> <tr> <th>Eng.state</th> <th>Sped request in MAN mode</th> <th>Sped request in AUT mode</th> </tr> </thead> <tbody> <tr> <td>Idle</td> <td>Engine params: Idle speed</td> <td>Engine params: Idle speed</td> </tr> <tr> <td>Running</td> <td>Engine params: ECU SpeedAdj</td> <td>... anything within Engine params: MinSpeedLim Engine params: MaxSpeedLim</td> </tr> </tbody> </table>				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
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 <b>DESCRIPTION (PAGE 216)</b> during the engine running state. Ready to Load can be closed back (if other conditions are fulfilled – see the <b>DESCRIPTION (PAGE 216)</b> binary output description) if Nominal/Idle is opened.												

⬅ back to List of LBI

## Speed Up

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	557		
<b>Description</b>			
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.			

⬅ back to List of LBI

## Speed Down

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	558		
<b>Description</b>			
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.			
<p><b>Note:</b> Speed Up/Down binary inputs are active only when <b>Regulator: LAI SpdSelect = OFF</b>.</p>			

⬅ back to List of LBI



## Speed Sel1

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	307		
<b>Description</b>			
If the input is active, the Speed request = <b>Engine params</b> : BI Speed Sel1 setpoint. The function is affected by <b>Engine params</b> : <i>RetToSpeedAdj</i> .			

[back to List of LBI](#)

## Speed Sel2

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	308		
<b>Description</b>			
If the input is active, the <b>Engine params</b> : 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.			

[back to List of LBI](#)

## Speed Sel3

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	309		
<b>Description</b>			
If the input is active, the <b>Engine params</b> : <i>BI Speed Sel3</i> 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.			
<p><b>Note:</b> <b>Engine params</b>: <i>RetToSpeedAdj</i> = <i>DISABLED</i>, Speed request is adjusted by BI Speed Sel1, 2, 3 edge (button press), i.e. input can be opened and Speed request stay constant.</p>			
<p><b>Note:</b> <b>Engine params</b>: <i>RetToSpeedAdj</i> = <i>ENABLED</i>, Speed request is adjusted by BI Speed Sel1, 2, 3 level (switch), i.e. when input is opened Speed request go back to <b>Engine params</b>: <i>ECU SpeedAdj</i> level.</p>			
<p><b>Note:</b> <i>SpeedSel1, 2, 3</i> binary inputs are active only when <b>Regulator</b>: <i>LAI SpdSelect</i> = <i>OFF</i>.</p>			
<p><b>Note:</b> 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 <b>Engine params</b>: <i>BI Speed Sel 1</i> (lowest index) setpoint.</p>			

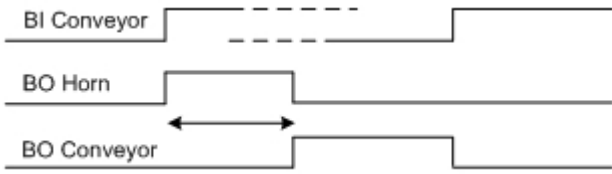
[back to List of LBI](#)

## Lang selection

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	303		
<b>Description</b>			
Switch display texts between two languages.			

[back to List of LBI](#)

## Conveyor

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	312		
<b>Description</b>			
Initial condition: Running engine.			
Rising edge BI Conveyor activates BO Horn for <b>Engine params</b> : <i>Conveyor horn</i> . 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.			
			

⬅ back to List of LBI

## LoadRequest2

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	313		
<b>Description</b>			
Active input switches the Load limit request to <b>Load limit</b> : <i>LoadRequest2</i> setpoint.			

⬅ back to List of LBI

## LoadRegDisable

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	314		
<b>Description</b>			
Active input disables the Load limit PI loop and switches analog output to constant <b>Load limit</b> : <i>Load bias</i> .			

⬅ back to List of LBI

## RegRequest2

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	315		
<b>Description</b>			
Active input switches the Regulator limit request to <b>Regulator</b> : <i>Request2</i> setpoint.			

⬅ back to List of LBI

## R Reg Disable

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	316		
<b>Description</b>			
Active input disables the Regulator PI loop and switches analog output to constant <b>Regulator</b> : <i>Reg bias</i> .			

[back to List of LBI](#)

### Clear DayCons

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	220		
<b>Description</b>			
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.			
<p><b>Note:</b> 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.</p>			

[back to List of LBI](#)

### Clear TripCons

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	221		
<b>Description</b>			
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.			
<p><b>Note:</b> 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 <b>Engine params:</b> FuelTankVolume.</p>			

[back to List of LBI](#)

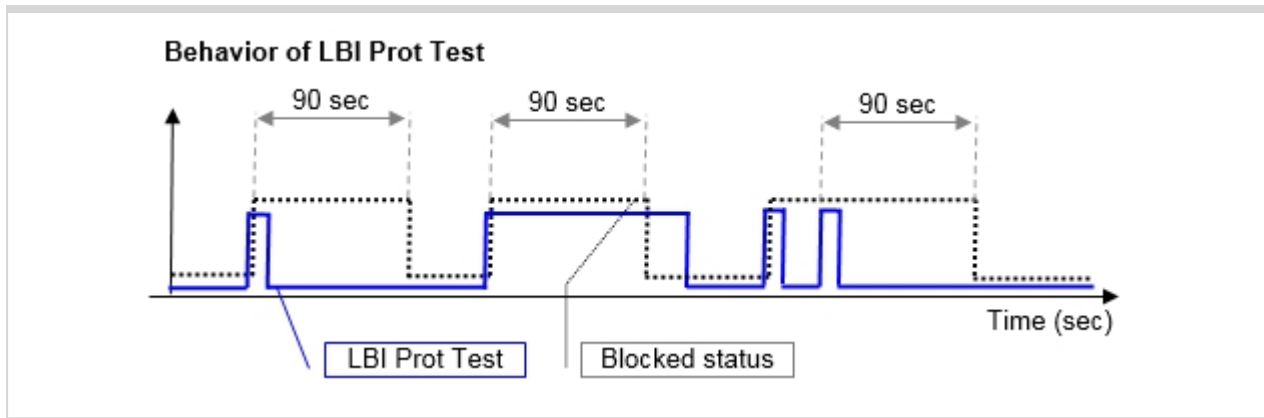
### Flow Switch

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	398		
<b>Description</b>			
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 <b>Engine protect: Flow SwitchDel</b> 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 InteliDrive IPU).			
Machine state stays in Cooling even the LBI FLOW Switch is activated again during Cooling period.			

[back to List of LBI](#)

### Prot Test

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	552		
<b>Description</b>			
When the new LBI Protection Test is activated (by rising edge), all Sd alarms are for 90s blocked. The exception is LBI Emergency stop and Overspeed protection.			



⬅ back to List of LBI

### Regen Inhibit

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	395		
<b>Description</b>			
This LBI is used for setting ECU value DPF Regeneration Inhibit Switch if parameter Regen Inhibit = BIN.			

⬅ back to List of LBI

### Regen Force

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	396		
<b>Description</b>			
This LBI is used for setting ECU value DPF Regeneration Force Switch if parameter Regen Force = BIN.			

⬅ back to List of LBI

### ATT Lockout1

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	707		
<b>Description</b>			
This LBI is used for setting proprietary John Deere message DPF Lockout – see description in Tier 4 Final support.			

⬅ back to List of LBI

### ATT Lockout2

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	708		
<b>Description</b>			
This LBI is used for setting proprietary John Deere message DPF Lockout – see description in Tier 4 Final support.			

⬅ back to List of LBI

## Logical binary outputs

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

# 10.4 Alphabetical groups of Logical binary outputs

10.4.2 LBO: A .....	203
10.4.3 LBO: B .....	203
10.4.4 LBO: C .....	208
10.4.5 LBO: D .....	210
10.4.6 LBO: E .....	211
10.4.7 LBO: F .....	212
10.4.8 LBO: G .....	213
10.4.9 LBO: H .....	213
10.4.10 LBO: I .....	214
10.4.11 LBO: L .....	214
10.4.12 LBO: M .....	214
10.4.13 LBO: O .....	215
10.4.14 LBO: P .....	215
10.4.15 LBO: R .....	216
10.4.16 LBO: S .....	221
10.4.17 LBO: T .....	224
10.4.18 LBO: U .....	225
10.4.19 LBO: V .....	225
10.4.20 LBO: W .....	225

For full list of Logical binary outputs go to the chapter **List of LBO (page 202)**.

## 10.4.1 List of LBO

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

Air valves .....	203
Alarm .....	203
AUT mode .....	203
Battery flat .....	203
BI1 - stat .....	204
BI2 - stat .....	204
BI3 - stat .....	204
BI4 - stat .....	204
BI5 - stat .....	204
BI6 - stat .....	205
BI7 - stat .....	205
BI8 - stat .....	205
BI9 - stat .....	205
BI10 - stat .....	205
BIO8 1 Status .....	206
BIO8 2 Status .....	206
BIO8 3 Status .....	206
BIO8 4 Status .....	206
BIO8 5 Status .....	207
BIO8 6 Status .....	207
BIO8 7 Status .....	207
BIO8 8 Status .....	207
ChrgAlternFail .....	208
Close Load .....	208
Common Cd .....	208
Common Fls .....	209
Common Sd .....	209
Common Wrn .....	209
Conveyor .....	209
Cooling pump .....	210
Cooling .....	210
CtrlHeartBeat .....	210
DEF Tank Level .....	210
DPF Hest Lamp .....	211

DPF Inhibit .....	211
DPF Lamp .....	211
DEF Level .....	211
ECU CommError .....	211
ECU CommOK .....	212
ECU PwrRelay .....	212
ECU RedLamp .....	212
ECU YellowLamp .....	212
Fault reset .....	212
Fuel solenoid .....	213
Glow plugs .....	213
Horn .....	213
Idle/Nominal .....	214
Ignition .....	214
LoadSwitch .....	214
Malfunction .....	214
MAN mode .....	215
OFF mode .....	215
Overspeed .....	215
Preglow .....	215
Prestart .....	216
Ready .....	216
Ready to load .....	216
Red Lamp Icon .....	216
RemoteControl1 .....	217
RemoteControl2 .....	217
RemoteControl3 .....	218
RemoteControl4 .....	218
RemoteControl5 .....	219
RemoteControl6 .....	219
RemoteControl7 .....	220
RemoteControl8 .....	220
Running .....	220
Sd AIN7 .....	221
Sd AIN8 .....	221
Sd AIN9 .....	221
Sd Engine Temp .....	222
Sd FuelLevel .....	222
Sd Oil Press .....	222
Service Time .....	222

SpeedSwitch .....	223
Start failed .....	223
Starter .....	223
Stop failed .....	223
Stop Pulse .....	224
Stop solenoid .....	224
Timer1 .....	224
Timer2 .....	224
Underspeed .....	225
V batt failed .....	225
Wrn AIN7 .....	225
Wrn AIN8 .....	226
Wrn AIN9 .....	226
Wrn Engine Temp .....	226
Wrn FuelLevel .....	226
Wrn Lamp Icon .....	227
Wrn Oil Press .....	227

 **back to Controller objects**


## 10.4.2 LBO: A

### Air valves

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	471		
<b>Description</b>			
Output closes together with Prestart and opens after the engine is stopped. Stopped engine conditions: RPM = 0, <b>Engine params:</b> <i>Starting Poil, D+function</i> (if enabled).			

 [back to List of LBO](#)

### Alarm

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	472		
<b>Description</b>			
The output closes if: <ul style="list-style-type: none"> <li>▶ any warning or shutdown comes up or</li> <li>▶ the engine malfunctions</li> </ul> The output opens if: <ul style="list-style-type: none"> <li>▶  is pressed</li> </ul> The output closes again if a new fault comes up.			

 [back to List of LBO](#)


### AUT mode

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	499		
<b>Description</b>			
The output is closed, if AUT mode is selected.			

 [back to List of LBO](#)

## 10.4.3 LBO: B

### Battery flat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	517		
<b>Description</b>			
Output closes when IntelliDrive IPU performs reset during start procedure (probably due to weak battery). The output opens, if <ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			

 [back to List of LBO](#)

### B11 - stat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	527		
<b>Description</b>			
In case the binary input is configured to any control function, the binary output depicts the state of the binary input. B11 is assigned for controller binary inputs.			

[back to List of LBO](#)

### B12 - stat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	528		
<b>Description</b>			
In case the binary input is configured to any control function, the binary output depicts the state of the binary input. B12 is assigned for controller binary inputs.			

[back to List of LBO](#)

### B13 - stat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	529		
<b>Description</b>			
In case the binary input is configured to any control function, the binary output depicts the state of the binary input. B13 is assigned for controller binary inputs.			

[back to List of LBO](#)

### B14 - stat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	530		
<b>Description</b>			
In case the binary input is configured to any control function, the binary output depicts the state of the binary input. B14 is assigned for controller binary inputs.			

[back to List of LBO](#)

### B15 - stat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	531		
<b>Description</b>			
In case the binary input is configured to any control function, the binary output depicts the state of the binary input. B15 is assigned for controller binary inputs.			

[back to List of LBO](#)



### BI6 - stat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	532		
<b>Description</b>			
In case the binary input is configured to any control function, the binary output depicts the state of the binary input. BI6 is assigned for controller binary inputs.			

[back to List of LBO](#)

### BI7 - stat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	533		
<b>Description</b>			
In case the binary input is configured to any control function, the binary output depicts the state of the binary input. BI7 is assigned for IL-NT IO1 optional card.			

[back to List of LBO](#)

### BI8 - stat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	586		
<b>Description</b>			
In case the binary input is configured to any control function, the binary output depicts the state of the binary input. BI8 is assigned for IL-NT IO1 optional card.			

[back to List of LBO](#)

### BI9 - stat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	587		
<b>Description</b>			
In case the binary input is configured to any control function, the binary output depicts the state of the binary input. BI9 is assigned for IL-NT IO1 optional card.			

[back to List of LBO](#)

### BI10 - stat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	588		
<b>Description</b>			
In case the binary input is configured to any control function, the binary output depicts the state of the binary input. BI10 is assigned for IL-NT IO1 optional card.			

[back to List of LBO](#)

### BIO8 1 Status

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	550		
<b>Description</b>			
In case the assigned binary input of IL-NT BIO8 optional card is configured to any control function, the output propagates the state of the input.			
<i><b>Note:</b> These binary outputs are possible to configure only if the IL-NT-BIO8 is configured.</i>			

[◀ back to List of LBO](#)

### BIO8 2 Status

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	551		
<b>Description</b>			
In case the assigned binary input of IL-NT BIO8 optional card is configured to any control function, the output propagates the state of the input.			
<i><b>Note:</b> These binary outputs are possible to configure only if the IL-NT-BIO8 is configured.</i>			

[◀ back to List of LBO](#)

### BIO8 3 Status

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	552		
<b>Description</b>			
In case the assigned binary input of IL-NT BIO8 optional card is configured to any control function, the output propagates the state of the input.			
<i><b>Note:</b> These binary outputs are possible to configure only if the IL-NT-BIO8 is configured.</i>			

[◀ back to List of LBO](#)

### BIO8 4 Status

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	553		
<b>Description</b>			
In case the assigned binary input of IL-NT BIO8 optional card is configured to any control function, the output propagates the state of the input.			
<i><b>Note:</b> These binary outputs are possible to configure only if the IL-NT-BIO8 is configured.</i>			

[◀ back to List of LBO](#)

### BIO8 5 Status

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	554		
<b>Description</b>			
In case the assigned binary input of IL-NT BIO8 optional card is configured to any control function, the output propagates the state of the input.			
<i><b>Note:</b> These binary outputs are possible to configure only if the IL-NT-BIO8 is configured.</i>			

[back to List of LBO](#)

### BIO8 6 Status

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	555		
<b>Description</b>			
In case the assigned binary input of IL-NT BIO8 optional card is configured to any control function, the output propagates the state of the input.			
<i><b>Note:</b> These binary outputs are possible to configure only if the IL-NT-BIO8 is configured.</i>			

[back to List of LBO](#)

### BIO8 7 Status

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	556		
<b>Description</b>			
In case the assigned binary input of IL-NT BIO8 optional card is configured to any control function, the output propagates the state of the input.			
<i><b>Note:</b> These binary outputs are possible to configure only if the IL-NT-BIO8 is configured.</i>			

[back to List of LBO](#)


### BIO8 8 Status

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	557		
<b>Description</b>			
In case the assigned binary input of IL-NT BIO8 optional card is configured to any control function, the output propagates the state of the input.			
<i><b>Note:</b> These binary outputs are possible to configure only if the IL-NT-BIO8 is configured.</i>			

[back to List of LBO](#)

## 10.4.4 LBO: C

### ChrgAlternFail

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	501		
<b>Description</b>			
Output closes if engine is running and D+ input not energized.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			
<b>Note:</b> Threshold level for D+ input is 80% supply voltage.			


[▲ back to List of LBO](#)

### Close Load

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	755		
<b>Description</b>			
Output is controlled by panel 0/1 button when <b>Basic settings: Panel Button</b> = 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.			


[▲ back to List of LBO](#)

### Common Cd

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	776		
<b>Description</b>			
Output closes when any cooldown alarm appears.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ No Cdalarm is active and</li> <li>▶  is pressed</li> </ul>			


[▲ back to List of LBO](#)

## Common Fls

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	520		
<b>Description</b>			
Output closes when any sensor fail alarm appears.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ No warning alarm is active and</li> <li>▶  is pressed</li> </ul>			


[◀ back to List of LBO](#)

## Common Sd

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	519		
<b>Description</b>			
Output closes when any shutdown alarm appears.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ No Sd alarm is active and</li> <li>▶  is pressed</li> </ul>			

[◀ back to List of LBO](#)

## Common Wrn

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	518		
<b>Description</b>			
Output closes when any warning alarm appears.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ No warning alarm is active and</li> <li>▶  is pressed</li> </ul>			

[◀ back to List of LBO](#)

## Conveyor

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	589		
<b>Description</b>			
Binary output function of Conveyor. See Binary input <b>Description (page 198)</b> .			

[◀ back to List of LBO](#)

### Cooling pump

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	469		
<b>Description</b>			
The output closes when engine starts and opens after <b>Engine params: Description (page 138)</b> after stop of the engine			

⬅ back to List of LBO

### Cooling

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	486		
<b>Description</b>			
The output closes when engine is in Cooling state.			

⬅ back to List of LBO

### CtrlHeartBeat

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	496		
<b>Description</b>			
The output signalizes watchdog reset. In a healthy state it flashes at 100ms : 100ms rate. It stops flashing when the unit reset occurs and the new controller start-up fails.			
<p><b>Note:</b> In case Intel RPU module is used this output shall be connected to I-RPU input CONTROLLER/WD.</p>			

⬅ back to List of LBO

## 10.4.5 LBO: D

### DEF Tank Level

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1161		
<b>Description</b>			
Output closes if the value DEF Tank Level drops under 10%, this level is adjustable in <b>Engine protect: DEF Level Min.</b>			
Output opens if the value DEF Tank Level exceeds 90%. This upper limit is adjusted in <b>Engine protect: DEF Level Max.</b>			
<p><b>Note:</b> This output is working only under condition ECU is configured and engine is in running state.</p>			

⬅ back to List of LBO

### DPF Hest Lamp

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1448		
<b>Description</b>			
This LBO is active if corresponding Tier 4 icon is lightening.			

[back to List of LBO](#)

### DPF Inhibit

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1446		
<b>Description</b>			
This LBO is active if corresponding Tier 4 icon is lightening.			

[back to List of LBO](#)

### DPF Lamp

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1447		
<b>Description</b>			
This LBO is active if corresponding Tier 4 icon is lightening.			

[back to List of LBO](#)

### DEF Level

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1449		
<b>Description</b>			
This LBO is active if corresponding Tier 4 icon is lightening.			

[back to List of LBO](#)

## 10.4.6 LBO: E

### ECU CommError

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	559		
<b>Description</b>			
The output is an inversion of binary output <i>ECU CommOK</i> , i.e. the output is closed when ECU is not communicating and all values from ECU show #####.			

[back to List of LBO](#)

### ECU CommOK

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	558		
<b>Description</b>			
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.			

⬅ back to List of LBO

### ECU PwrRelay

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	562		
<b>Description</b>			
The output closes at the beginning of prestart and opens if the engine shall be stopped.			
<i>Note: ECU binary outputs are possible to configure only if ECU is configured.</i>			

⬅ back to List of LBO

### ECU RedLamp

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	561		
<b>Description</b>			
The output copies shutdown information from ECU.			

⬅ back to List of LBO

### ECU YellowLamp

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	560		
<b>Description</b>			
The output copies warning information from ECU.			

⬅ back to List of LBO

## 10.4.7 LBO: F

### Fault reset

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	488		
<b>Description</b>			
One second pulse as echo for panel Fault reset button.			
<i>Note: In case Intel RPU module is used this output shall be connected to I-RPU input CONTROLLER / FR.</i>			

⬅ back to List of LBO



## Fuel solenoid

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	464		
<b>Description</b>			
<p>Closed output opens the fuel solenoid and enables the engine start.</p> <p>The output opens if:</p> <ul style="list-style-type: none"> <li>▶ Emergency stop comes or</li> <li>▶ Cooled engine is stopped or</li> <li>▶ In pause between repeated starts</li> </ul> <p><b>Note:</b> In case IntelI RPU module is used this output shall be connected to I-RPU input CU / FS.</p>			

⬅ back to List of LBO

## 10.4.8 LBO: G

### Glow plugs

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	493		
<b>Description</b>			
<p>The output closes prior to the engine start (<i>Prestart</i>) and opens when <i>Starting RPM</i> speed is reached. During repeated crank attempts the output is opened.</p>			

⬅ back to List of LBO

## 10.4.9 LBO: H

### Horn

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	473		
<b>Description</b>			
<p>The output closes if:</p> <ul style="list-style-type: none"> <li>▶ any warning or shutdown comes up or</li> <li>▶ the engine malfunctions</li> </ul> <p>The output opens if:</p> <ul style="list-style-type: none"> <li>▶ FAULT RESET is pressed or</li> <li>▶ HORN RESET is pressed or</li> <li>▶ Max time of LBO HORN is exceeded (Horn timeout)</li> </ul> <p>The output closes again if a new fault comes up.</p>			

⬅ back to List of LBO

## 10.4.10 LBO: I

### Idle/Nominal

Related FW	1.1.0	Related applications	AMF, MRS
Comm object	470		
<b>Description</b>			
<p>The output either follows the <b>DESCRIPTION (PAGE 196)</b> binary input or I/O button in MAN mode or follows the engine state in AUT mode:</p> <p>The output <i>Idle/Nominal</i> closes after the timer Idle time elapses. The <i>Idle time</i> counter starts to countdown when <i>Start speed</i> reached. The <i>Underspeed</i> protection is not evaluated during idle time. <i>Start fail</i> protection occurs if the RPM drop below 2RPM during idle state.</p> <p><b>Note:</b> <i>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.</i></p>			

🔍 back to List of LBO

### Ignition

Related FW	1.1.0	Related applications	AMF, MRS
Comm object	467		
<b>Description</b>			
<p>The output closes after reaching value of CrankRPM, fixed 30RPM. The output opens after stopping of the engine or in pause during repeated start.</p>			

🔍 back to List of LBO

## 10.4.11 LBO: L

### LoadSwitch

Related FW	1.1.0	Related applications	AMF, MRS
Comm object	591		
<b>Description</b>			
<p>Binary output from Load switch comparator – see <b>Group: Load limit (page 153)</b> setpoint group.</p>			

🔍 back to List of LBO

## 10.4.12 LBO: M

### Malfunction

Related FW	1.1.0	Related applications	AMF, MRS
Comm object	1450		
<b>Description</b>			
<p>This LBO is active if corresponding Tier 4 icon is lightening.</p>			

🔍 back to List of LBO

### MAN mode

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	498		
<b>Description</b>			
The output is closed, if MAN mode is selected.			

[◀ back to List of LBO](#)


## 10.4.13 LBO: O

### OFF mode

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	497		
<b>Description</b>			
The output is closed, if OFF mode is selected.			

[◀ back to List of LBO](#)

### Overspeed

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	513		
<b>Description</b>			
Output closes if the engine over speed alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			

[◀ back to List of LBO](#)

## 10.4.14 LBO: P

### Preglow

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	574		
<b>Description</b>			
The output closes prior to the engine start and opens when <i>Starting RPM</i> speed is reached. During repeated crank attempts the output is closed too.			
The output could be used for pre-glow or pre-heat.			

[◀ back to List of LBO](#)

### Prestart

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	468		
<b>Description</b>			
The output closes prior to the engine start ( <i>Prestart</i> ) and opens when <i>Starting RPM</i> speed is reached. During repeated crank attempts the output is closed too.			
The output could be used for pre-glow, pre-heat or prelubrication.			

[back to List of LBO](#)

## 10.4.15 LBO: R

### Ready

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	482		
<b>Description</b>			
The output is closed if following conditions are fulfilled:			
<ul style="list-style-type: none"> <li>▶ Engine is not running and</li> <li>▶ No Shut down or Slow stop alarm is active</li> <li>▶ Controller is not in OFF mode</li> </ul>			

[back to List of LBO](#)

### Ready to load

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	484		
<b>Description</b>			
The output is closed if engine is running and no alarm is active - it is possible to close load. The output opens when Wm Underspeed protection is active and during cooling state.			


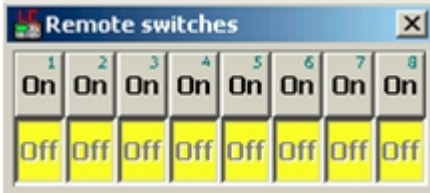
[back to List of LBO](#)

### Red Lamp Icon

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1451		
<b>Description</b>			
This LBO is active if corresponding Tier 4 icon is lightening.			


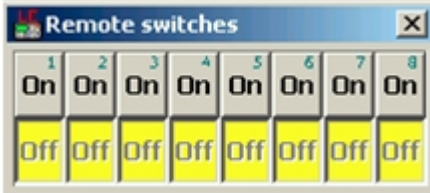
[back to List of LBO](#)

## RemoteControl1

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	649		
<b>Description</b>			
<p>Allows configure Remote control switches to physical binary outputs. These switches are accessible from PC tools LiteEdit (see picture below) or IntelIMonitor by  button and it can be controlled via ModBus communication.</p>			
			


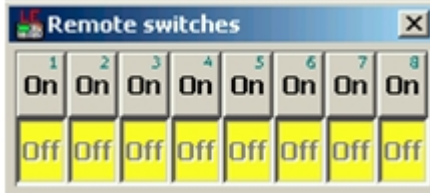
[back to List of LBO](#)

## RemoteControl2

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	650		
<b>Description</b>			
<p>Allows configure Remote control switches to physical binary outputs. These switches are accessible from PC tools LiteEdit (see picture below) or IntelIMonitor by  button and it can be controlled via ModBus communication.</p>			
			


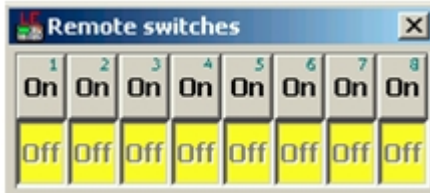
[back to List of LBO](#)

### RemoteControl3

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	651		
<b>Description</b>			
<p>Allows configure Remote control switches to physical binary outputs. These switches are accessible from PC tools LiteEdit (see picture below) or IntelliMonitor by  button and it can be controlled via ModBus communication.</p>			
			


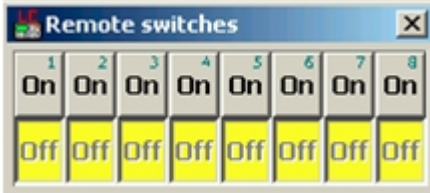
[back to List of LBO](#)

### RemoteControl4

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	652		
<b>Description</b>			
<p>Allows configure Remote control switches to physical binary outputs. These switches are accessible from PC tools LiteEdit (see picture below) or IntelliMonitor by  button and it can be controlled via ModBus communication.</p>			
			



[back to List of LBO](#)

### RemoteControl5

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	653		
<b>Description</b>			
<p>Allows configure Remote control switches to physical binary outputs. These switches are accessible from PC tools LiteEdit (see picture below) or IntelIMonitor by  button and it can be controlled via ModBus communication.</p>			
			


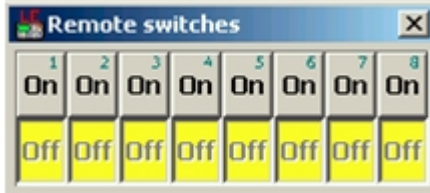
[back to List of LBO](#)

### RemoteControl6

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	654		
<b>Description</b>			
<p>Allows configure Remote control switches to physical binary outputs. These switches are accessible from PC tools LiteEdit (see picture below) or IntelIMonitor by  button and it can be controlled via ModBus communication.</p>			
			


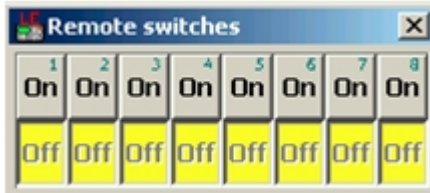
[back to List of LBO](#)

## RemoteControl7

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	655		
<b>Description</b>			
<p>Allows configure Remote control switches to physical binary outputs. These switches are accessible from PC tools LiteEdit (see picture below) or InteliMonitor by  button and it can be controlled via ModBus communication.</p>			
			

[back to List of LBO](#)

## RemoteControl8

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	656		
<b>Description</b>			
<p>Allows configure Remote control switches to physical binary outputs. These switches are accessible from PC tools LiteEdit (see picture below) or InteliMonitor by  button and it can be controlled via ModBus communication.</p>			
			

[back to List of LBO](#)

## Running


<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	485		
<b>Description</b>			
<p>Output closes if the engine is in Running state.</p>			

[back to List of LBO](#)




## 10.4.16 LBO: S

### Sd AIN7

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1158		
<b>Description</b>			
Output closes if the warning alarm for AIN7 activate.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			


[◀ back to List of LBO](#)

### Sd AIN8

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1159		
<b>Description</b>			
Output closes if the warning alarm for AIN8 activate.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			


[◀ back to List of LBO](#)

### Sd AIN9

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1160		
<b>Description</b>			
Output closes if the warning alarm for AIN9 activate.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			


[◀ back to List of LBO](#)

## Sd Engine Temp

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	523		
<b>Description</b>			
Output closes if the water temperature shutdown alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			


[◀ back to List of LBO](#)

## Sd FuelLevel

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	525		
<b>Description</b>			
Output closes if the Fuel level shutdown alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			


[◀ back to List of LBO](#)

## Sd Oil Press

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	521		
<b>Description</b>			
Output closes if the oil pressure shutdown alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			

[◀ back to List of LBO](#)

## Service Time

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	495		
<b>Description</b>			
The output closes if the ServiceTime alarm activates. Service time is adjusted by setpoint <b>Engine protect: NextServTime</b> .			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			


[◀ back to List of LBO](#)

## SpeedSwitch

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	590		
<b>Description</b>			
Binary output from Speed switch comparator – see <b>Group: Regulator (page 147)</b> setpoint group.			

[◀ back to List of LBO](#)

## Start failed

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	515		
<b>Description</b>			
Output closes after the engine start-up fails.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			


[◀ back to List of LBO](#)

## Starter

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	463		
<b>Description</b>			
Closed relay energizes the starter of engine.			
<ul style="list-style-type: none"> <li>▶ The strating speed is reached or</li> <li>▶ Maximum time of cranking is exceeded or</li> <li>▶ Request to stop comes up</li> </ul>			

[◀ back to List of LBO](#)

## Stop failed

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	512		
<b>Description</b>			
Output closes when the engine has to be stopped, but speed or oil pressure is detected. This protection goes active 60s after stop command.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			

[◀ back to List of LBO](#)

## Stop Pulse

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	466		
<b>Description</b>			
Output is active for 1 second after <i>Stop</i> solenoid output activation. This signal is sent to ECU in case of engine stop request.			

[back to List of LBO](#)

## Stop solenoid

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	465		
<b>Description</b>			
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:			
<ul style="list-style-type: none"> <li>▶ RPM &lt; 2 and</li> <li>▶ Oil pressure &lt; <b>Engine params: StartingPoil</b></li> </ul>			
<p><b>Note:</b> 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).</p>			
<p><b>Note:</b> In case Intel RPU module is used this output shall be connected to I-RPU input CU / SS.</p>			

[back to List of LBO](#)

## 10.4.17 LBO: T

### Timer1

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	491		
<b>Description</b>			
Output activates when Timer1 is active. Simultaneously the engine is started when is in AUT mode.			

[back to List of LBO](#)


### Timer2

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	492		
<b>Description</b>			
Output activates when Timer2 is active. Simultaneously the engine is started when is in AUT mode.			

[back to List of LBO](#)

## 10.4.18 LBO: U


### Underspeed

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	514		
<b>Description</b>			
Output closes if the engine “Sd Underspeed” alarm activates i.e. when RPM is below the <b>Engine params: Starting RPM</b> limit.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			

[◀ back to List of LBO](#)

## 10.4.19 LBO: V


### V batt failed

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	580		
<b>Description</b>			
Output closes when battery over/under voltage warning appears.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			

[◀ back to List of LBO](#)


## 10.4.20 LBO: W

### Wrn AIN7

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1155		
<b>Description</b>			
Output closes if the warning alarm for AIN7 activate.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			


[◀ back to List of LBO](#)

### Wrn AIN8

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1156		
<b>Description</b>			
Output closes if the warning alarm for AIN8 activate.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			


[◀ back to List of LBO](#)

### Wrn AIN9

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1157		
<b>Description</b>			
Output closes if the warning alarm for AIN9 activate.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			


[◀ back to List of LBO](#)

### Wrn Engine Temp

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	524		
<b>Description</b>			
Output closes if the water temperature warning alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			

[◀ back to List of LBO](#)

### Wrn FuelLevel

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	526		
<b>Description</b>			
Output closes if the Fuel level warning alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> <li>▶ alarm is not active and</li> <li>▶  is pressed</li> </ul>			

[◀ back to List of LBO](#)


## Wrn Lamp Icon

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	1452		
<b>Description</b>			
This LBO is active if corresponding Tier 4 icon is lightening.			

[◀ back to List of LBO](#)

[◀ back to Appendix](#)

## Wrn Oil Press

<b>Related FW</b>	1.1.0	<b>Related applications</b>	AMF, MRS
<b>Comm object</b>	522		
<b>Description</b>			
Output closes if the oil pressure warning alarm activates.			
The output opens, if			
▶ alarm is not active and			
▶  is pressed			

[◀ back to List of LBO](#)

## 10.5 Accessibility of setpoints and values

The controller is designed for easy use without too many parameters and values accessible from the controller screen which would be affecting clarity. You can see all available setpoints and values with information if they are accessible from Controller/LiteEdit/WebSupervisor in following tables.

### 10.5.1 Available setpoints

#### Available setpoints

Setpoints Group	Setpoint Name	Default Value	Dimension	Accessible from	
				Controller	LiteEdit, IntelliMonitor
Basic Settings	Engine name	InteliDrive-IPC		*	*
Basic Settings	Gear teeth	120		*	*
Basic Settings	RPMbyWterminal	1		*	*
Basic Settings	Nominal RPM	2000	RPM	*	*
Basic Setting2	GearTeethBI3	0			*
Basic Setting2	RPM Source	Pickup			*
Basic Setting2	ControllerMode	OFF			*
Basic Setting2	FltResGoToMAN	DISABLED			*
Basic Setting2	DispBaklightTO	15	min		*
Basic Setting2	I/O-R-Button	SpeedUp			*
Basic Setting2	I/O-L-Button	SpeedDown			*
Basic Setting2	Main Screen1	AIN2			*
Basic Setting2	Main Screen2	RunHrs			*
Basic Setting2	RunHoursSource	AUTO			*
Comms Settings	ControllerAddr	1		*	*
Comms Settings	COM1 Mode	DIRECT		*	*
Comms Settings	COM2 Mode	DIRECT		*	*
Comms Settings	ModemIniString			*	*
Comms Settings	ModbusComSpeed	9600	bps	*	*
Comms Settings	IBLite IP Addr	192.168.1.254		*	*
Comms Settings	IBLite NetMask	255.255.255.0		*	*
Comms Settings	IBLite GateIP	192.168.1.1		*	*
Comms Settings	IBLite DHCP	ENABLED		*	*
Comms Settings	ComAp Port	23		*	*
Comms Settings	APN Name			*	*
Comms Settings	APN User Name			*	*
Comms Settings	APN User Pass			*	*
Comms Settings	AirGate	ENABLED		*	*
Comms Settings	AirGate IP	airgate.comap.cz		*	*
Comms Settings	SMTP User Name			*	*
Comms Settings	SMTP User Pass			*	*
Comms Settings	SMTP Server IP			*	*
Comms Settings	Contr MailBox			*	*
Comms Settings	Time Zone	GMT+2:00		*	*
Comms Settings	DNS IP Address	8.8.8.8		*	*
Engine Params	Prestart time	10	s	*	*
Engine Params	Preglow time	0	s	*	*



## Available setpoints

Setpoints Group	Setpoint Name	Default Value	Dimension	Accessible from	
				Controller	LiteEdit, IntelliMonitor
Engine Params	MaxCrank time	5	s	*	*
Engine Params	CrnkFail pause	10	s	*	*
Engine Params	Crank attempts	3		*	*
Engine Params	Start POil Del	0	s	*	*
Engine Params	Idle time	30	s	*	*
Engine Params	Idle speed	800	RPM	*	*
Engine Params	Cooling speed	IDLE		*	*
Engine Params	Cooling time	30	s	*	*
Engine Params	Stop time	10	s	*	*
Engine Params	Running Timer	0	h	*	*
Engine Param2	Starting RPM	350	RPM		*
Engine Param2	Starting POil	10	Bar		*
Engine Param2	AfterCool time	0	s		*
Engine Param2	Fuel solenoid	DIESEL			*
Engine Param2	FuelSol Offset	0,5	s		*
Engine Param2	D+ function	DISABLED			*
Engine Param2	ECU FreqSelect	DEFAULT			*
Engine Param2	ECU Control	ENABLED			*
Engine Param2	ECU SpeedAdj	1000	RPM		*
Engine Param2	RetToSpeedAdj	DISABLED			*
Engine Param2	MinSpeedLim	1000	RPM		*
Engine Param2	MaxSpeedLim	2000	RPM		*
Engine Param2	BI Speed Sel1	1250	RPM		*
Engine Param2	BI Speed Sel2	1300	RPM		*
Engine Param2	BI Speed Sel3	1450	RPM		*
Engine Param2	Speed Ramp	50	1/s		*
Engine Param2	0%ofSpeedReq	0	RPM		*
Engine Param2	100%ofSpeedReq	2400	RPM		*
Engine Param2	Conveyor horn	7	s		*
Engine Param2	FuelTankVolume	0	L		*
Engine Param2	MaxFuelDrop	0	%/h		*
Regulator	Reg Input	CU: A11		*	*
Regulator	Reg Bias	0		*	*
Regulator	Request 1	0		*	*
Regulator	Request 2	0		*	*
Regulator	Reg CMP Input	CU: A11		*	*
Regulator	Reg CMP On	0		*	*
Regulator	Reg CMP Off	0		*	*
Regulator 2	LAI SpdRequest	OFF			*
Regulator 2	Reg Gain	10	%		*
Regulator 2	Reg Integral	10	%		*
LoadLimit	Load Input	RPM			*
LoadLimit	Load Bias	1000			*
LoadLimit	LoadRequest 1	90			*
LoadLimit	LoadRequest 2	80			*
LoadLimit	LoadReq Ramp	1000	1/s		*

## Available setpoints

Setpoints Group	Setpoint Name	Default Value	Dimension	Accessible from	
				Controller	LiteEdit, IntelliMonitor
LoadLimit	LoadUpLimit	10000			*
LoadLimit	LoadDnLimit	0			*
LoadLimit	Load Gain	10	%		*
LoadLimit	Load Integral	10	%		*
LoadLimit	Load CMP Input	RPM			*
LoadLimit	Load CMP On	95			*
LoadLimit	Load CMP Off	90			*
Engine Protect	Overspeed	115	%	*	*
Engine Protect	Underspeed	25	%	*	*
Engine Protect	Flow SwitchDel	30	s	*	*
Engine Protect	Sd Override	DISABLED		*	*
Engine Protect	Oil press prot	ENABLED		*	*
Engine Protect	Oil Press Wrm	2	Bar	*	*
Engine Protect	Oil Press Sd	1	Bar	*	*
Engine Protect	Oil Press Del	3	s	*	*
Engine Protect	Eng. temp prot	ENABLED		*	*
Engine Protect	Eng. Temp Wrm	80	°C	*	*
Engine Protect	Eng. Temp Sd	90	°C	*	*
Engine Protect	Eng. Temp Del	5	s	*	*
Engine Protect	Fuel leve prot	ENABLED		*	*
Engine Protect	Fuel level Wrm	20	%	*	*
Engine Protect	Fuel level Sd	10	%	*	*
Engine Protect	Fuel level Del	10	s	*	*
Engine Protect	Batt overvolt	36	V	*	*
Engine Protect	Batt undervolt	18	V	*	*
Engine Protect	Batt volt del	5	s	*	*
Engine Protect	PumpSuctio Wrm	-30	kPa	*	*
Engine Protect	PumpSuctio Sd	-50	kPa	*	*
Engine Protect	PumpSuctio Del	30	s	*	*
Engine Protect	PumpDischa Wrm	100	kPa	*	*
Engine Protect	PumpDischa Sd	50	kPa	*	*
Engine Protect	PumpDischa Del	30	s	*	*
Engine Protect	NextServTime	65535	h	*	*
Engine Protec2	Eng prot del	5	s		*
Engine Protec2	BIN1 delay	1	s		*
Engine Protec2	BIN2 delay	1	s		*
Engine Protec2	BIN3 delay	1	s		*
Engine Protec2	BIN4 delay	1	s		*
Engine Protec2	BIN5 delay	1	s		*
Engine Protec2	Horn timeout	10	s		*
Engine Protec2	StartOverspeed	120	%		*
Engine Protec2	UnderspeedSd	ENABLED			*
Engine Protec2	GearBoxRatio	0	RPM		*
Engine Protec2	RPMdiff Sd	1000	RPM		*
Engine Protec2	RPMdiff Wrm	1000	RPM		*
Engine Protec2	RPMdiff delay	5	s		*

## Available setpoints

Setpoints Group	Setpoint Name	Default Value	Dimension	Accessible from	
				Controller	LiteEdit, IntelliMonitor
Engine Protec2	DEF Level Min	10	%		*
Engine Protec2	DEF Level Max	90	%		*
ATT Settings	Regen Inhibit	OFF	%	*	*
ATT Settings	Regen Force	OFF	%	*	*
Date/Time	Time	0:00:00		*	*
Date/Time	Date	1.1.2006		*	*
Date/Time	Time stamp per	60	min	*	*
Date/Time	TimerInhibDel	0	s	*	*
Date/Time	SummerTimeMod	DISABLED		*	*
Date/Time	Timer1Function	No Func		*	*
Date/Time	Timer1 repeat	NONE		*	*
Date/Time	Timer1 ON time	5:00:00		*	*
Date/Time	Timer1Duration	5	min	*	*
Date/Time	Timer2Function	No Func		*	*
Date/Time	Timer2 repeat	NONE		*	*
Date/Time	Timer2 ON time	5:00:00		*	*
Date/Time	Timer2Duration	5	min	*	*
Sensors Spec	Calibr AI 1	0	Bar		*
Sensors Spec	Calibr AI 2	0	°C		*
Sensors Spec	Calibr AI 3	0	%		*
Sensors Spec	Calibr AIO1	0	U8		*
Sensors Spec	Calibr AIO2	0	9		*
Sensors Spec	Calibr AIO3	0	U10		*
Sensors Spec	Calibr AIO4	0	U11		*
Sensors Spec	Calibr AI 4	0	U16		*
Sensors Spec	Calibr AI 5	0	U17		*
Sensors Spec	Calibr AI 6	0	U12		*
Sensors Spec	CounterConst 1	1	-		*
Sensors Spec	Counter mode 1	OFF			*
AIO module	AnInAIO1 lev1	0	U8		*
AIO module	AnInAIO1 lev2	0	U8		*
AIO module	AnInAIO1 del	5	s		*
AIO module	AnInAIO2 lev1	0	U9		*
AIO module	AnInAIO2 lev2	0	U9		*
AIO module	AnInAIO2 del	5	s		*
AIO module	AnInAIO3 lev1	0	U10		*
AIO module	AnInAIO3 lev2	0	U10		*
AIO module	AnInAIO3 del	5	s		*
AIO module	AnInAIO4 lev1	0	U11		*
AIO module	AnInAIO4 lev2	0	U11		*
AIO module	AnInAIO4 del	5	s		*
SMS/E-Mail	Yel Alarm Msg	OFF			*
SMS/E-Mail	Red Alarm Msg	OFF			*
SMS/E-Mail	TelNo/Addr Ch1				*
SMS/E-Mail	TelNo/Addr Ch2				*

 [back to Appendix](#)

# 11 Language support

IntelIDrive IPU 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

 [back to Table of contents](#)