InteliDrive

InteliDrive Lite

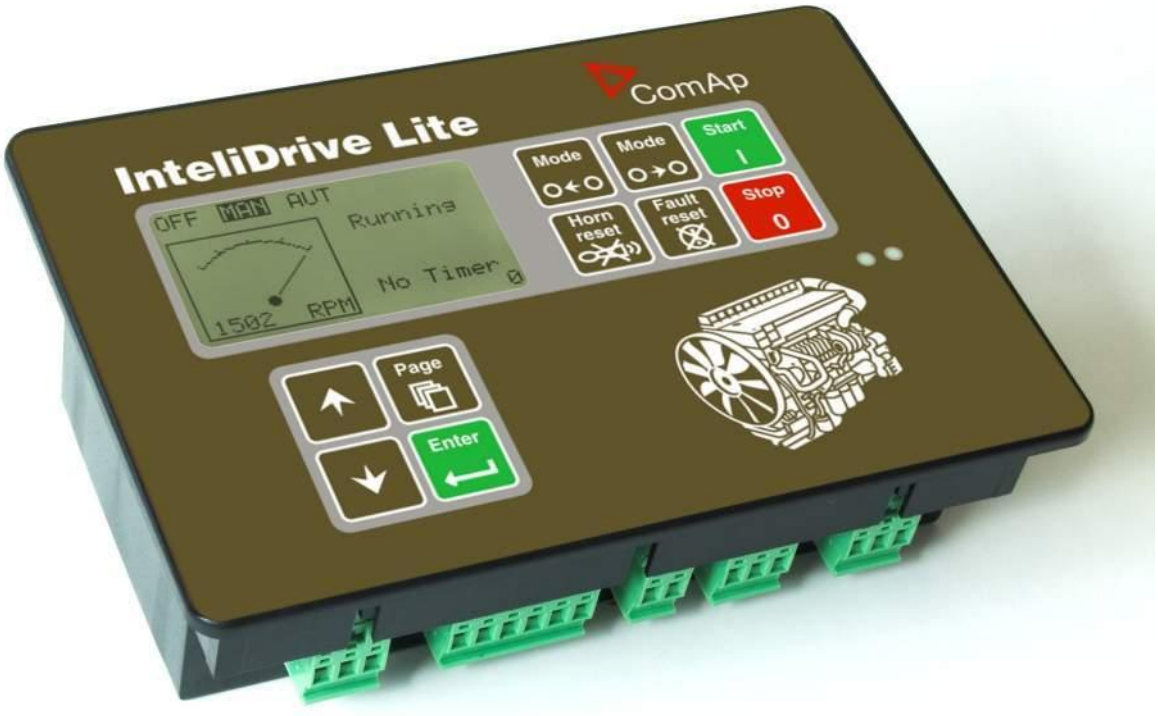
Modular Engine Controller

Compact Controller for Single Engines

ID-Lite

SW version 2.0, January 2011

USER GUIDE



ComAp, spol. s r.o.
Kundratka 2359/17, 180 00 Praha 8,
Czech Republic
Tel: +420 2 66316661,
Fax: +420 2 66316647
E-mail: info@comap.cz,
www.comap.cz

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Table of Contents

General guidelines

What describes this manual?

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

This manual is dedicated for

Operators of engines.
Engine control panel builders.
For everybody who is concerned with installation, operation and maintenance of the engine applications.

!! Warnings !!

Remote control

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

Because of large variety of InteliDrive-Lite parameters settings, it is not possible to describe any combination. Some of InteliDrive-Lite functions are subject of changes depend on SW version. The data in this manual only describes the product and are not warranty of performance or characteristic.

Text

PAGE	(Capital letters in the frame) buttons on the front panel
Break Return	(Italic) set points
Engine protections	(Bold) Set point group
REMOTE START/STOP	(Capital letters) binary inputs and outputs

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.

Note:
SW and HW must be compatible (e.g. ID-Lite firmware and ID-Lite HW) otherwise the function will be disabled. If wrong software is downloaded the message HARDWARE INCOMPATIBLE appears on controller screen. In this case use Boot load (jumper) programming – close Boot jumper and follow instructions in LiteEdit, download correct software.

General description

Description of the controller system (with all options)

InteliDrive-Lite is a comprehensive controller for single engines with extended support of electronic engines and extension 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.
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.

Controller supports WebSupervisor system. This system enables gen-set and drive fleet and assets management as well as pure monitoring. Visit www.comap.cz for more details about WebSupervisor.

Software package

ID-Lite-2.0 is distributed as ID-Lite-2.0.iwe package. It is compatible with the LiteEdit-4.5 (or - 4.5.1) PC software – use installation package LiteEdit 4.5 r1 Installation Suite from ComAp web.

Reduced screen archive

Two default archives are available in ID-Lite-2.0

Default configuration			Display mode	
ID-Lite-2.0.AIL	**ID-Lite-s-2.0.AIL**		**User**	**Engineer**
Home Analog inputs Binary inputs Binary outputs Statistics (ECU Analog values) (ECU Alarm list) Alarm list	Home Analog inputs (ECU Analog values) (ECU Alarm list) Alarm list		Measuring only	Measuring Setpoints History

No setpoints, No history screens are visible when User interface = User (use Enter+Page, Enter, Enter).

Hints:
No plug-in module can be configured in "ID-Lite-s-2.0.AIL " reduced screen version of ail archive.

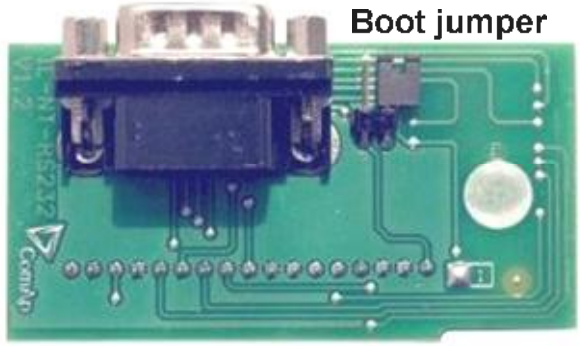
What is in the package?

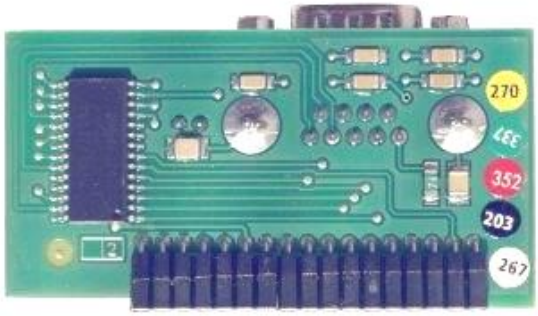
Accessories	Description	Optional / Obligatory
ID-Lite	InteliDrive-Lite central unit	Obligatory
Communication plug-in		
IL-NT RS232	RS232 communication card	Optional plug-in
IL-NT 232/485	Combined communication card	
IL-NT S-USB	USB communication card	Optional plug-in
IB-Lite	Ethernet/Internet interface	Optional plug-in
IL-NT-GPRS	GSM/GPRS modem	Optional plug-in
Extension plug-in		
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
External modules		
IL-NT RD	Remote display	Optional external for DCU
IGL-RA15	Remote annunciator	Optional external for DCU

IL-NT RS232 communication module

IL-NT RS232 is optional plug-in card to enable InteliDrive-Lite for RS232 communication. This is required for computer or Modbus connection. Card insert into expansion “Communication module” slot back on the controller.

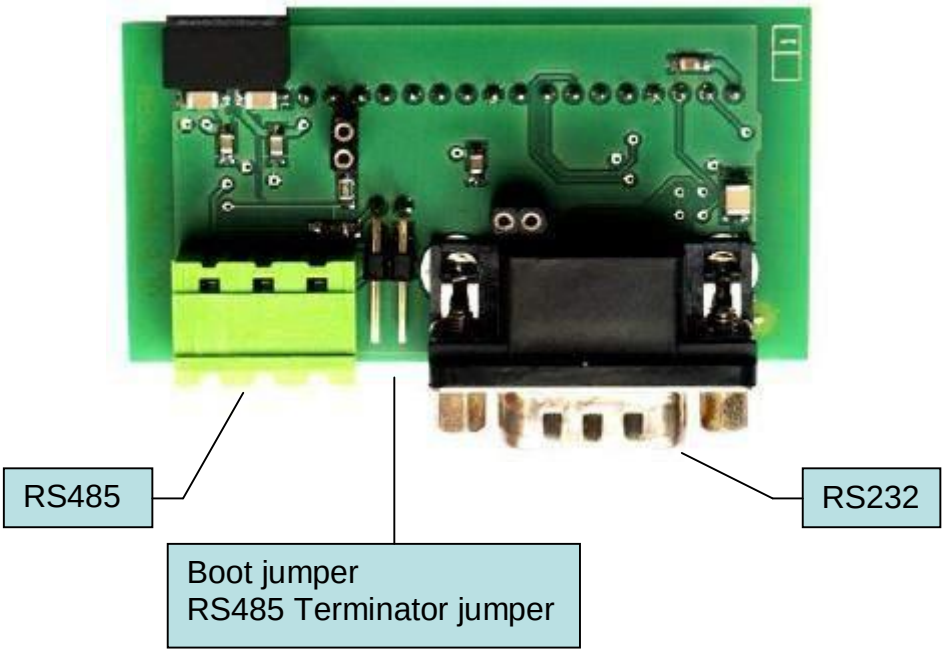




IL-NT RS232-485 communication module

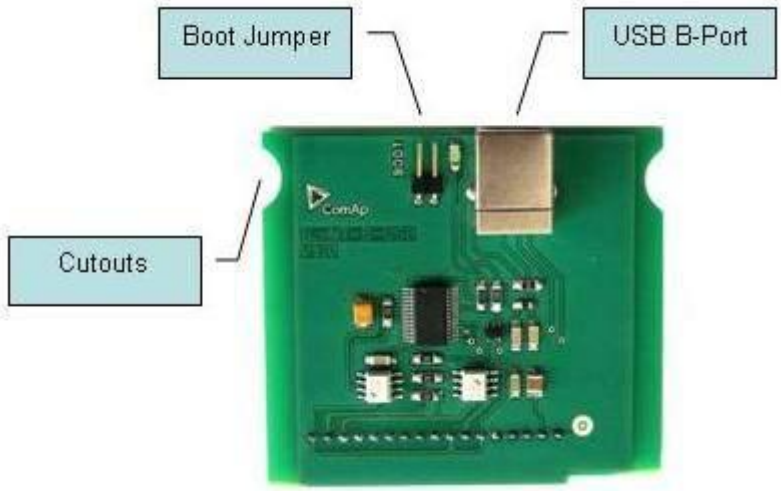
IL-NT RS232-485 is optional plug-in RS232 and RS485 communication interface. This is required for computer or Modbus connection. The IL-NT RS232-485 is a dual port module with RS232 and RS485 interfaces at independent COM channels. The RS232 is connected to COM1 and RS485 to COM2.

To insert the module, please follow the instructions for IL-NT RS232 module, procedure is analogous. 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.



IL-NT S-USB communication module

IL-NT S-USB is optional plug-in card to enable InteliLite^{NT} communication via USB port. This is required for computer or Modbus connecting. Card inserts into expansion slot back on the controller. To insert the module, please follow the instructions for IL-NT RS232 module, procedure is analogous. You must open the cover first (use screwdriver to open) and then insert the module into slot. Once you have inserted it, part of the module will remain over plastic box. It is supposed to be used as a service tool. When you need to remove it, grab module in cutouts and pull it up manually.



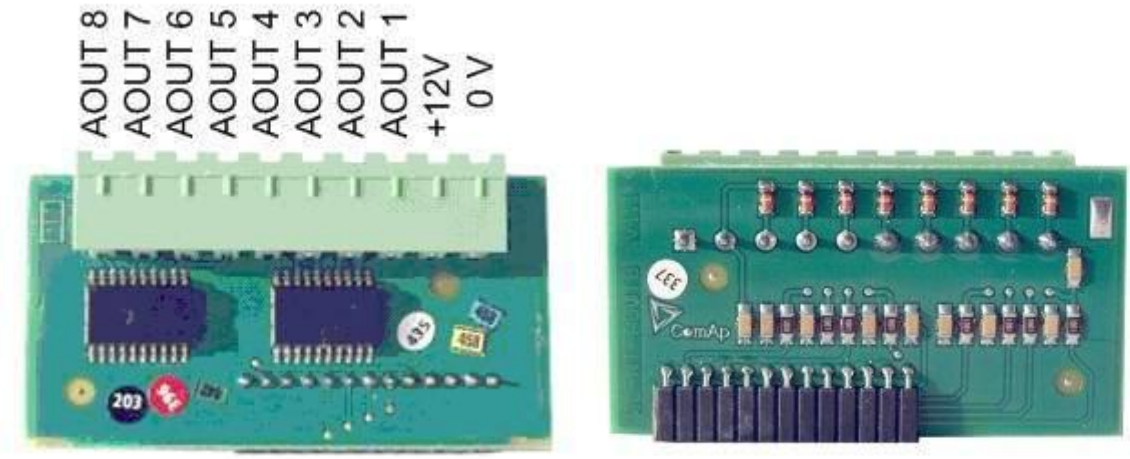
Hint:

Use the shielded USB A-B cable with this module! Recommended is ComAp cable – Order code: "USB-LINK CABLE 1.8M".

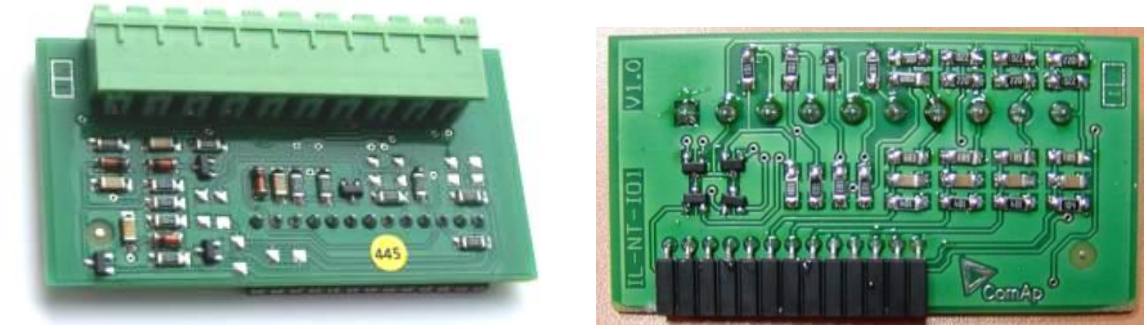
IL-NT AOUT8 – 8 gauge driver module

IL-NT AOUT8 is optional plug-in card. Through this card controller can drive up to 8 VDO style industrial/automotive gauges. Gauge type and value are configured in LiteEdit (3.0 or higher) software.

Any analog value from controller may be shown in that way. All outputs operate as pwm signal at 1200Hz.



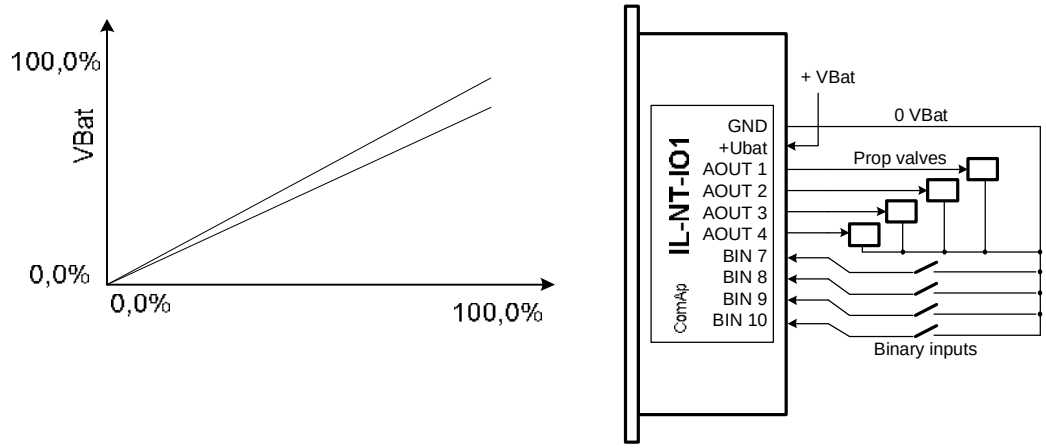
IL-NT IO1 – extension I/O module



Module structure and wiring is on the drawing below.
The GND terminal is internally wired with battery minus power supply terminal. The +VBat has to be wired to battery plus power supply on IL-NT-DCU controller. It is possible to connect up to four Proportional valves.

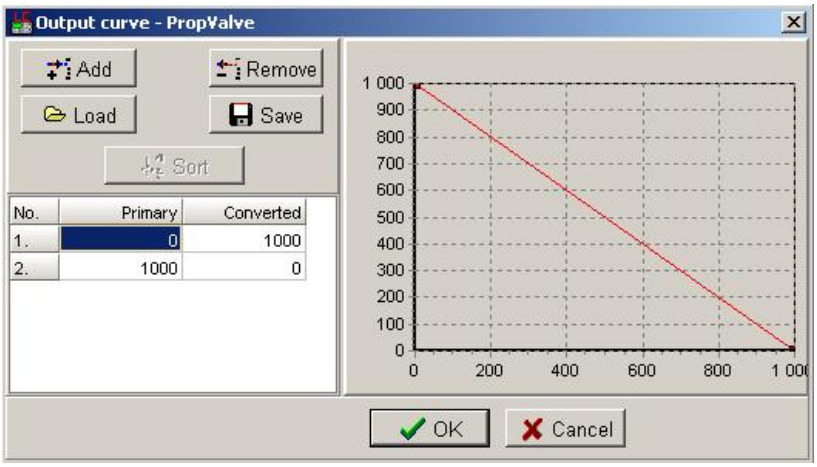
Analog output - AOUT1 to AOUT4 characteristic

Output voltage corresponds to setpoints setting (see below) – depending on engine conditions (controller binary inputs state).
There should be up to one volt lover voltage compare to adjusted % of +VBat voltage.
The Analog output short to ground connection longer than 1 sec can damage the output circuit.



Analog output characteristic

Conversion curves - Output curve – PropValve



Primary value format:
1000 = 100,0%
Converted value format:
1000 = 100,0%

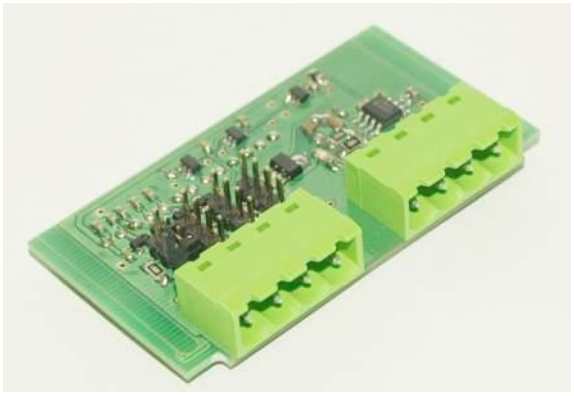
IL-NT AIO

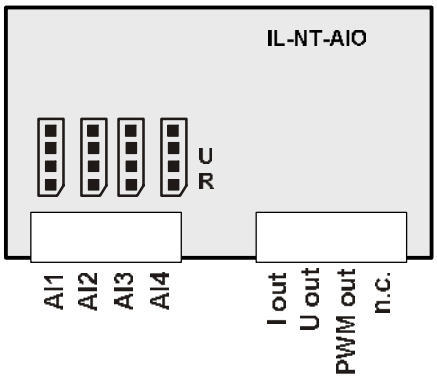
IL-NT AIO is optional plug-in card with additional four Analog inputs and one Analog output. Use LiteEdit to configure Inputs and Output.

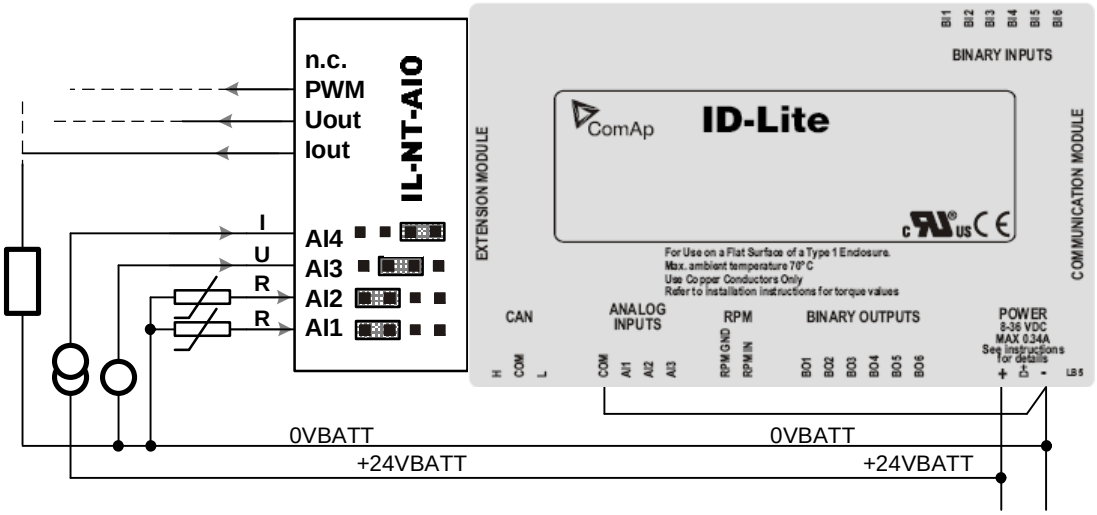
AIN1 – AIN4	2600 ohm / 20 mA / 4V		
AOUT	0 – 20 mA (max 22mA) max 100ohm load 0 – 4,5V (max 10mA) PWM 5V / 15mA / 500 Hz	I out U out PWM out	

AOUT configuration:

	0,00% PWM	100,00% PWM
Uout	0,0 V	4,6 V ± 0,1V
Iout	0,0 mA	20,6 mA ± 0,1mA





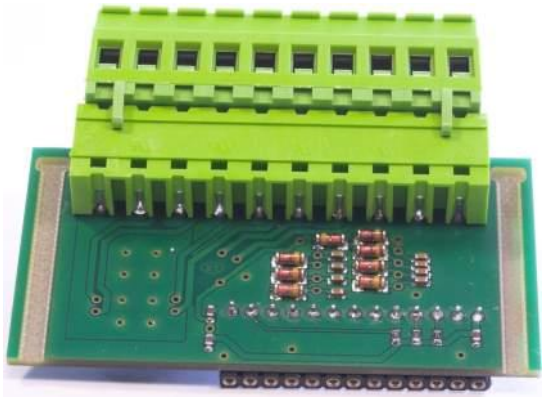


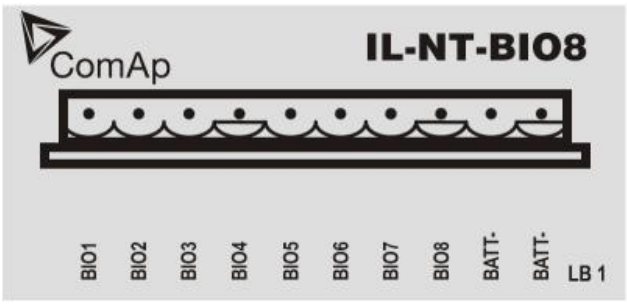
IL-NT BIO8 Binary input/output module

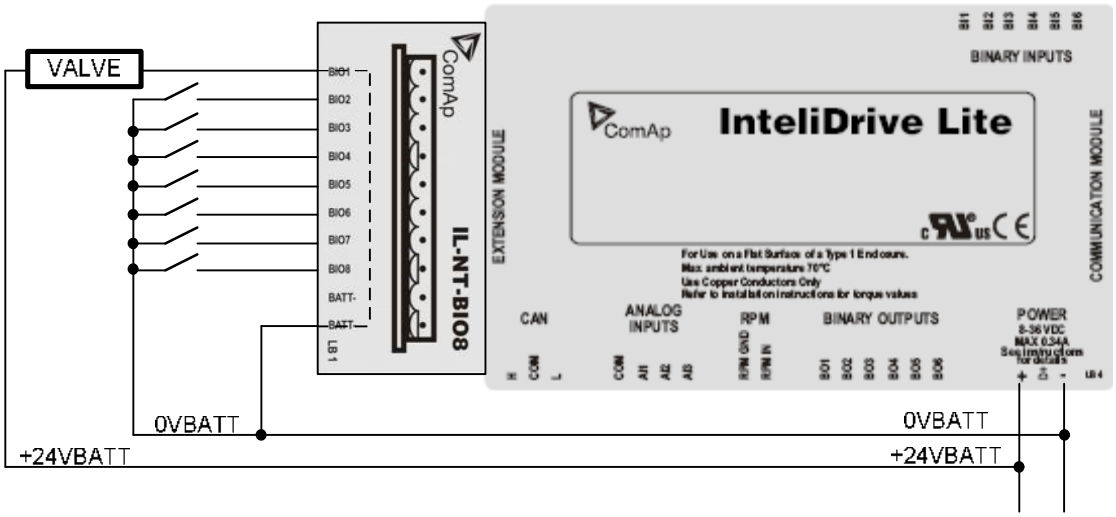
IL-NT BIO8 is optional plug-in card. Through this card controller can accommodate up to 8 binary inputs or outputs. In LiteEdit configuration is possible to easily choose if particular I/O will be binary input or output.

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.





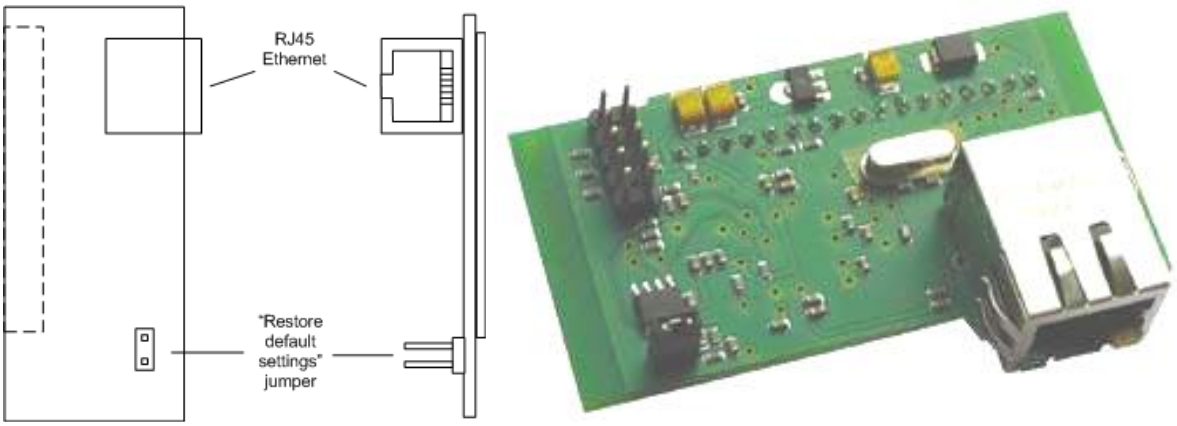


IL-NT BIO8 BATT- terminal has to be connected to 0VBAT in case at least one Binary output is configured or to both BATT- when more than four Binary outs are connected.

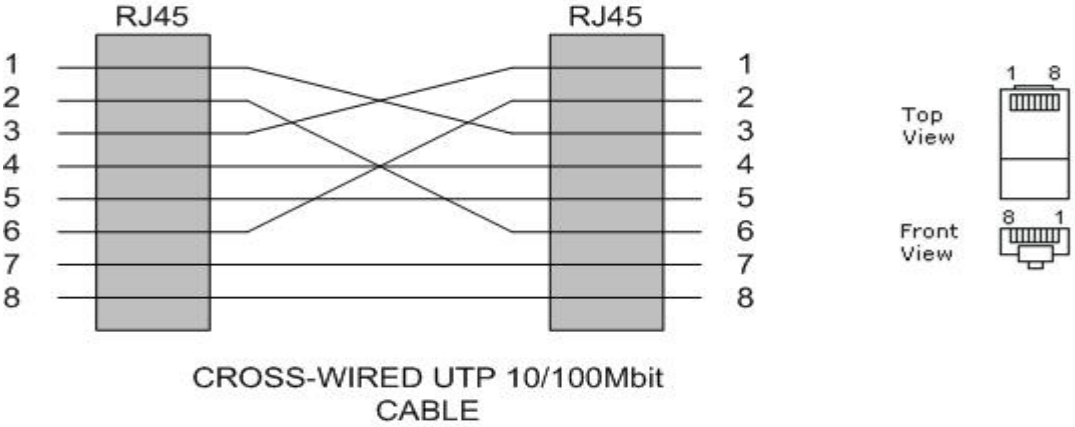
	1	2	3	4	5	6	7	8	9	10
IL-NT AOUT8	0V	+VBatt	AOUT1	AOUT2	AOUT3	AOUT4	AOUT5	AOUT6	AOUT7	AOUT8
IL-NT IO1	0V	+VBatt	AOUT1	AOUT2	AOUT3	AOUT4	BIN7	BIN8	BIN9	BIN10
IL-NT BIO8	BIO1	BIO2	BIO3	BIO4	BIO5	BIO6	BIO7	BIO8	0V	0V
IL-NT AIO	AIN1	AIN2	AIN3	AIN4	n.c.	n.c.	I out	U out	PWM out	n.c.

IB-Lite Ethernet communication plug-in card

IB-Lite is a 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 InteliMonitor through ethernet/Internet network, for sending active e-mails and for integration of the controller into a building management (Modbus/TCP protocol).
This card enables to monitor and control the drive over web browser from any location with internet access using appropriate security measures. In conjunction with AirGate server connection the card also enables to monitor the drive in WebSupervisor management system.
Card inserts into expansion slot back on the controller. To insert the module, please follow the instructions for IL-NT RS232 module, procedure is analogous.



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.



CROSS-WIRED UTP 10/100Mbit CABLE

Hint:

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

IL-NT GPRS module

This plug-in module is 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.

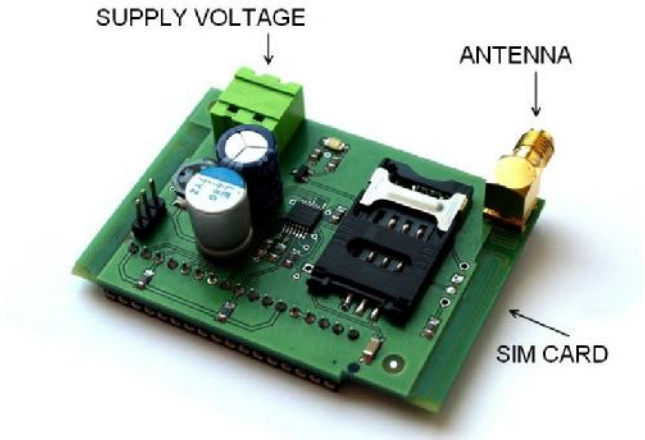
Card inserts into expansion slot back on the controller. To insert the module, please follow the instructions for IL-NT RS232 module, procedure is analogous.

Hint:

GPRS and CSD services has to be provided by your GSM/GPRS operator for successful operation.

Hint:

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!



See the IL-NT-GPRS Quick Guide how to start using IL-NT-GPRS module.

IL-NT RD Remote display

IL-NT RD is remote display for controller. Remote display provides the same control and monitoring functions as controller itself. No programming of the display is required – unit is self configurable from main controller. It is connected with controller via RS232 line. Longer distances (up to 1200m) are possible when RS232/RS485 converters are used.

Remote annunciator IGL-RA15

The remote annunciator IGL-RA15 can be connected to the ID-Lite unit via CAN bus. Any of the binary outputs can be configured (using LiteEdit (3.0 or higher) software) to each LED diode on the RA15. The module (just one) can be also enabled and configured using LiteEdit software.

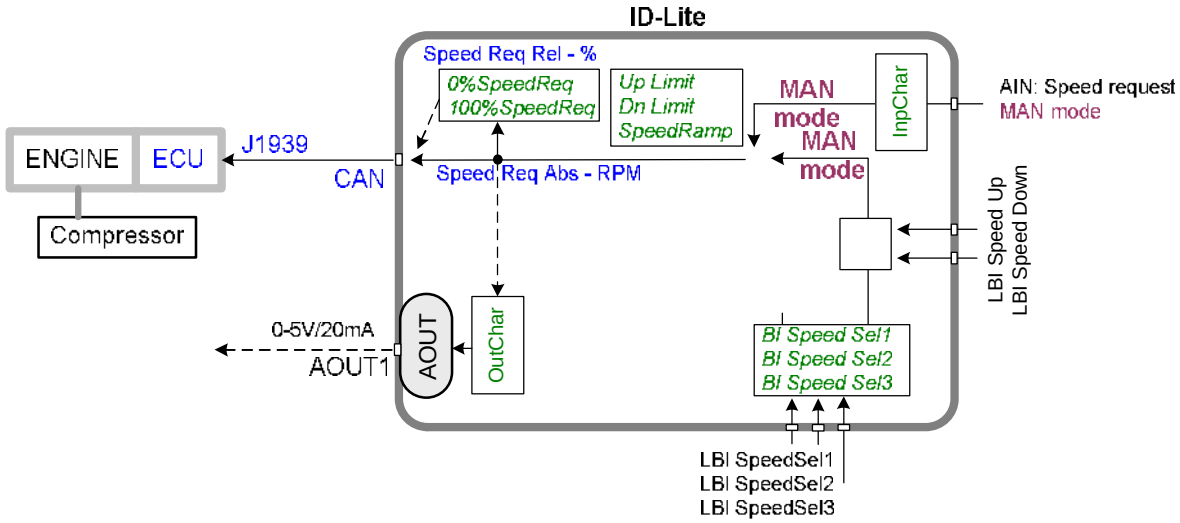
Just Warning alarm is indicated when communication to RA15 is interrupted.
See the documentation of IGL-RA15 for the technical and function description.

Function description

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 SpeedSel1, ..2, ..3.
- Ramp engine RPM Up/Down by Binary inputs BI SpeedUp and Speed Down.
- Control engine RPM by Analog input – e.g. by potentiometer.



Engine RPM Idle - Nominal switching

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

Engine RPM two/three levels switching

Continuing example above …. active Binary inputs SpeedSel1, ..2, ..3 ramps the Engine RPM to the selected setpoint level. … i.e. switched/ramped to another three levels.

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

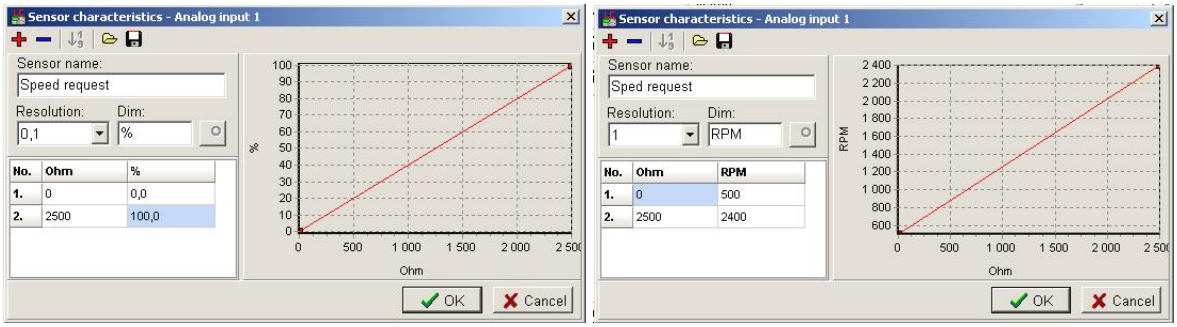
Engine RPM by Up/Down buttons settings

RPM adjusted in examples above can be changed by BI SpeedUp / SpeedDown when Engine params: RetToSpeedAdj = DISABLED.

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

Engine RPM continuous change (using potentiometer)

- Adjust **Regulator**: *LAI SpeedReq* = AI1, AI2, AI3 … to corresponding Analog input.
- Configure this Analog input – sensor characteristic in RPM or Percentage (expected pot resistance 2,5 kiloOhms in example below). **Engine params**: *Speed ramp* setpoint is active.



AUT mode: Engine load limitation – overview

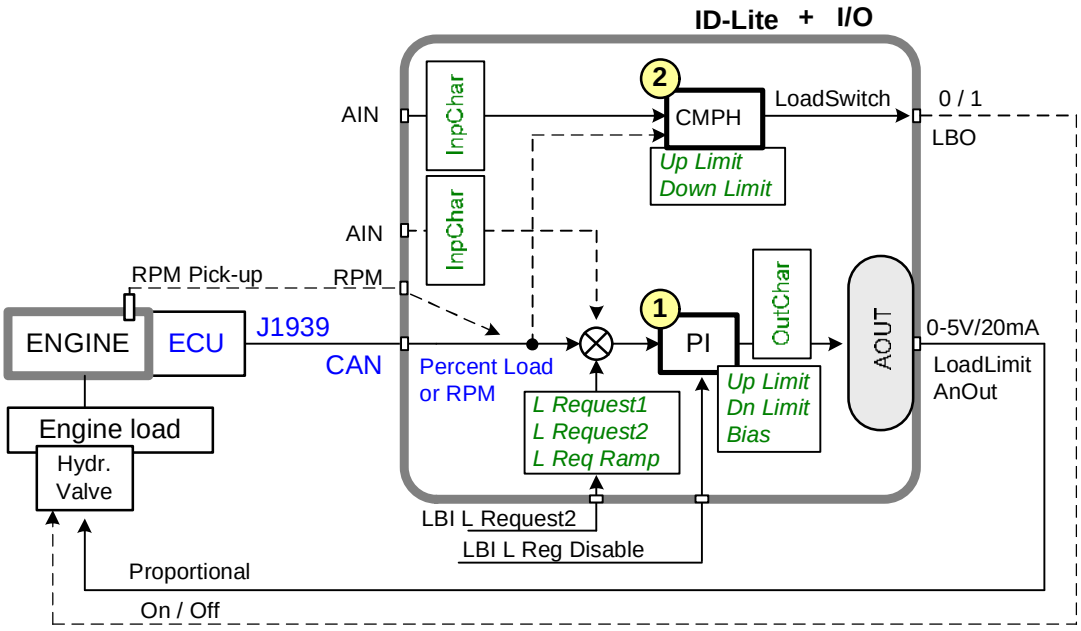
Functions below can reduce the engine load when is over adjusted limit.
Two functions 1 = PI loop and 2 = Comparator with Hysteresis (CMPH) are available in this group. The function setup is done by corresponding setpoints in **Load limit** group. Both functions can use different inputs from ECU (Engine 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.

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	Bias	
LBI L Reg Disable = 1	Bias	

Functions 1 and 2 overview



Functions 1 and 2 I/O

LBI	Active input:

LoadRequest2	Switch to *Load Request 2*
LoadRegDisable	Set 1-PI Regulator output to constant *P Bias* Regulator is working when this LBI is not configured.
LBO	Function:
LoadSwitch	Load Comparator output
LAO	
LoadLimitAOut	Analog output of Load Limitation PI control loop.

Functions 1 and 2 setpoints

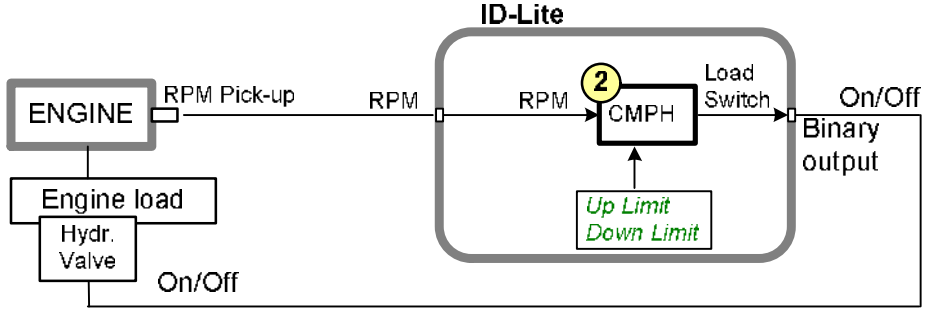
Load limit	*Load Input*	ECU: RPM, Load, CU: AI1, AI2, AI3 AIO: AI1, AI2, AI3, AI4
	Load Bias	0 - 10000 [-]
	LoadRequest 1	± 10000 [-]
	LoadRequest 2	± 10000 [-]
	LoadReq Ramp	1 - 10000 [-]
	LoadUpLimit	0 - 10000 [-]
	LoadDnLimit	0 - 10000 [-]
	Load Gain	0,0 ± 200,0%
	Load Integral	0,0% - 100,0%
	Load CMP Input	ECU:RPM, Load CU: AI1, AI2, AI3 AIO: AI1, AI2, AI3, AI4
	Load CMP Off	± 10000 [-]
	Load CMP On	± 10000 [-]

Functions 1 and 2 examples

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

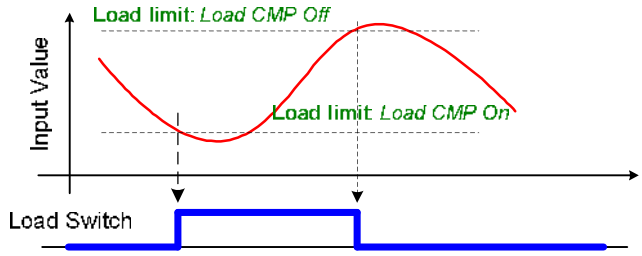
Engine load limitation with On/Off output
Purpose: Protect the engine against overload by reducing (switching On/Off) the load.

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



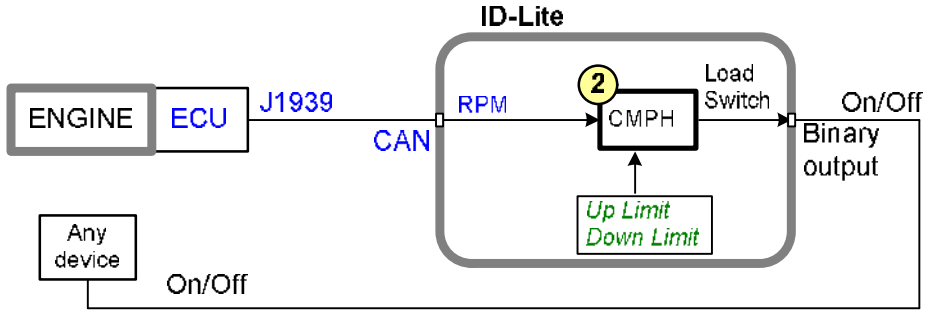
Input	RPM from pickup (or ECU)
Binary output	Load Switch
Setpoints	**Load limit**: *Load CMP Input* = RPM *Load CMP On* = e.g. 2000 *Load CMP Off* = e.g. 2200

Load comparator function



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

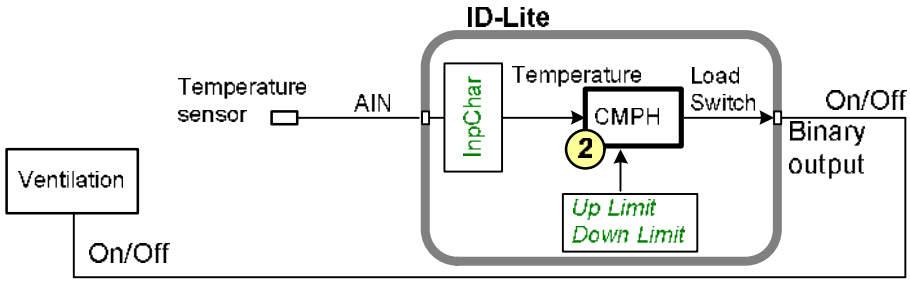
Description: Depends on setpoint settings the CMPH (Comparator with Hysteresis) activates/deactivates the Binary output Load switch that switch off some device when RPM is below adjusted limit.



Input	Analog input
Binary output	Load Switch
Setpoints	**Load limit**: *Load CMP Input* = Actual Load *Load CMP On* = 2000 *Load CMP Off* = 2200

General comparator
Purpose: Switch on/off some device depends on analog value – e.g. temperature.

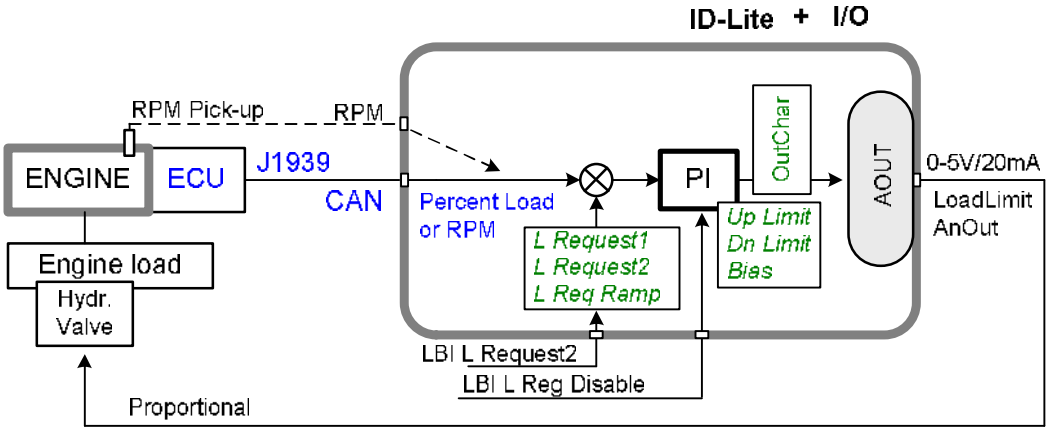
Description: The function activates/deactivates some device based e.g. on temperature.



Input	Analog input
Binary output	Load Switch
Setpoints	**Load limit**: *Load CMP Input* = AI1 *Load CMP On* = 90 *Load CMP Off* = 80

Engine load limitation with analog output
Purpose: Protect the engine against overload by reducing the load.

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

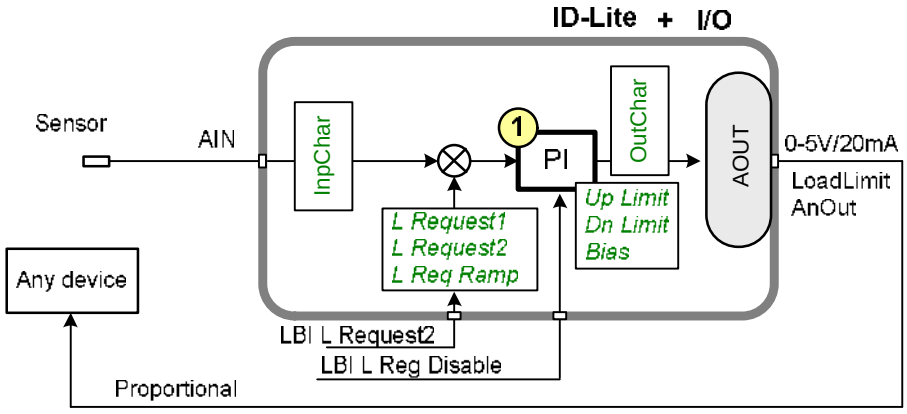


Input	J1939 – Actual Load in % Binary input: L Request 2 (optional) Binary input: Reg Disable (optional)
Output	Analog output: Load LimitAnOut (plug-in module) Note: LoadLimitAnOut range = 0 – 10000
Setpoints	**Load limit**: *Load Input* = Load *Load Bias* *Load Request* *Load Request 2* *Load ReqRamp* *Load UpLimit* *Load DownLimit* *Load Gain* *Load Integral*

Note: AnOut range = 0 – 10000

General PI control loop
Purpose: PI control of any value.

Description: 1-PI (can be used 3-PI as well) detect the difference between actual and requested value and changes the output to keep the controlled value on the limit.
Function requires plug-in module with Analog output.



Input	Analog input: CU: AI1, AI2, AI3 AIO: AI1, AI2, AI3, AI4 Function 1-PI Binary input: L Request 2 (optional) Binary input: L Reg Disable (optional) Function 3-PI Binary input: Request 2 (optional) Binary input: Reg Disable (optional)
Output	Analog output: Load Limit (plug-in module) Analog output: ByRPMCtrlAout (plug-in module)
Setpoints	**Load limit**: *Load Input* = Load *Load Bias* *Load Request 1* *Load Request 2* *Load ReqRamp* *Load UpLimit* *Load DownLimit* *Load Gain* *Load Integral*
	Regulator: *Reg Input* *Reg Bias* *Request* *Request 2* *Reg Gain* *Reg Integral*

AUT mode: … by RPM control – overview

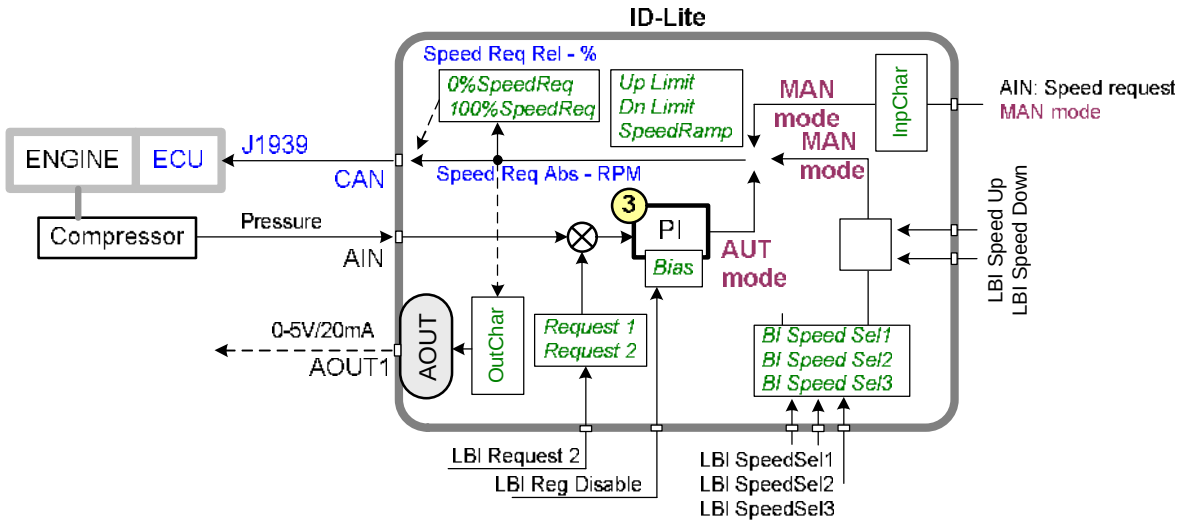
Functions below can automatically change the engine RPM to keep value measured on controller (plug-in module) Analog input (e.g. Pressure) on adjusted level.

Functions 3 = PI loop and 4 = Comparator with Hysteresis (CMPH) are available. The function setup is done by corresponding setpoints in **Regulator** group.
The 3-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.
In table below see different operation conditions.

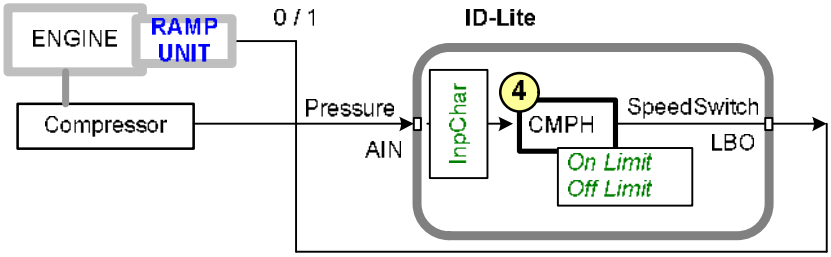
Condition	Speed request	Binary output SpeedSwitch
OFF mode	**Engine params**: *Idle speed*	=0
MAN mode	Manual	In operation
AUT mode	Automatic by PI loop	In operation
Stop = Not Running	**Engine params**: *Idle speed*	In operation
Sd protection	**Engine params**: *Idle speed*	In operation

LBI R Reg Disable = 1	**Regulator**: *Reg Bias*	In operation

Functions 3 and 4 overview



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



Functions 3 and 4 I/O

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

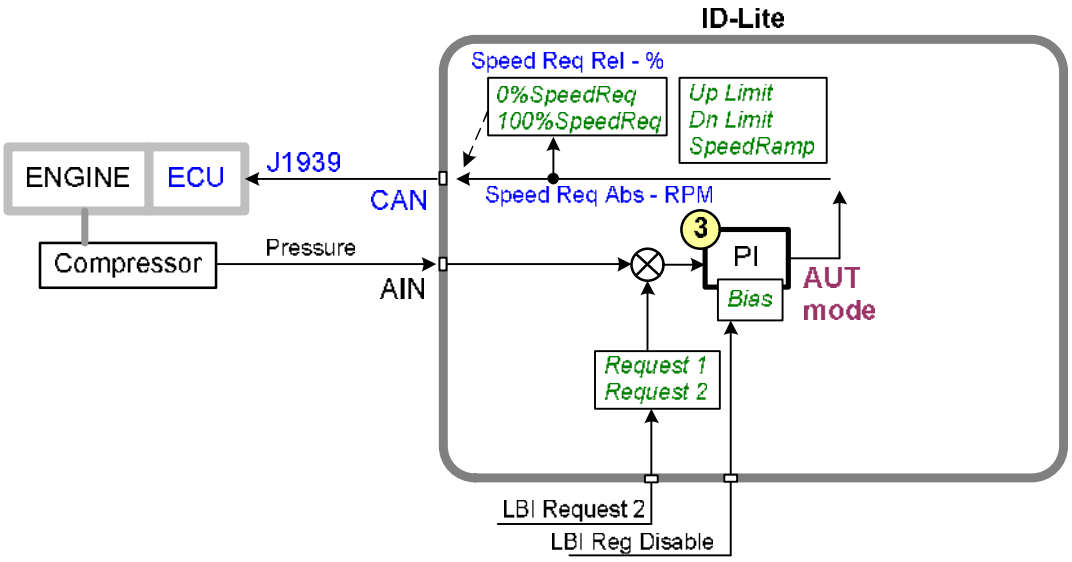
Functions 3 and 4 setpoints

Regulator	*LAI SpeedRequest*	OFF CU: AI1, AI2, AI3 AIO: AI1, AI2, AI3, AI4
	Reg Input	CU: AI1, AI2, AI3 AIO: AI1, AI2, AI3, AI4
	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, AI2, AI3 AIO: AI1, AI2, AI3, AI4
	Reg CMP Off	± 10000 [-]
	Reg CMP On	± 10000 [-]

Functions 3 and 4 examples

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

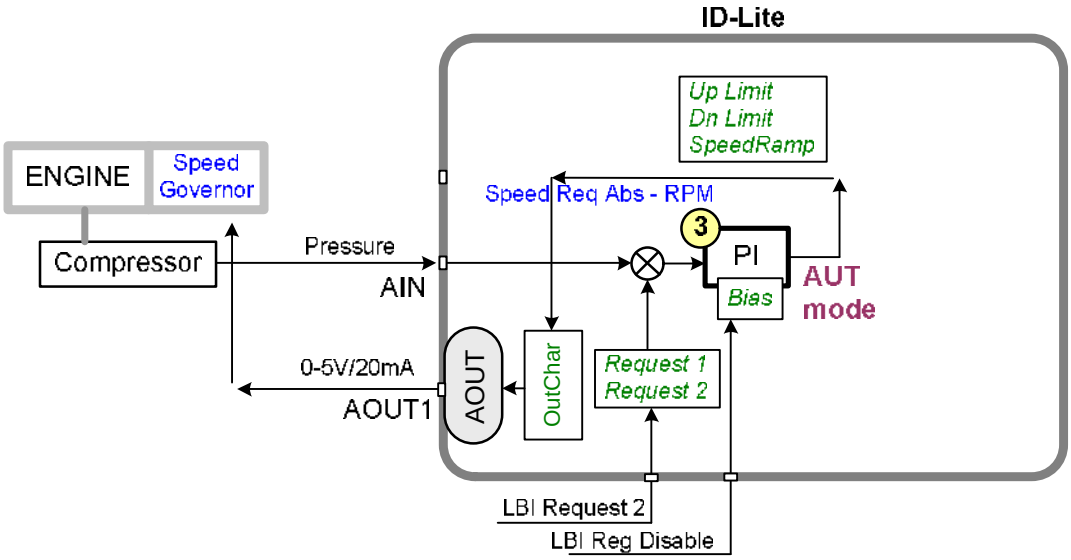
Pressure by RPM control via J1939
Actual pressure is measured via Analog input, compared with Requested value and the 3-PI output controls the engine RPM via J1939.



Input	Analog input Binary input: Request 2 (optional) Binary input: R Reg Disable (optional)
Output	Analog output: Speed Request
Setpoints	**Regulator**: *Reg Input* *Reg Bias* *Request* *Request 2* *Reg Gain* *Reg Integral*
	Engine params: *MinSpeedLim* *MaxSpeedLim* *SpeedRamp*

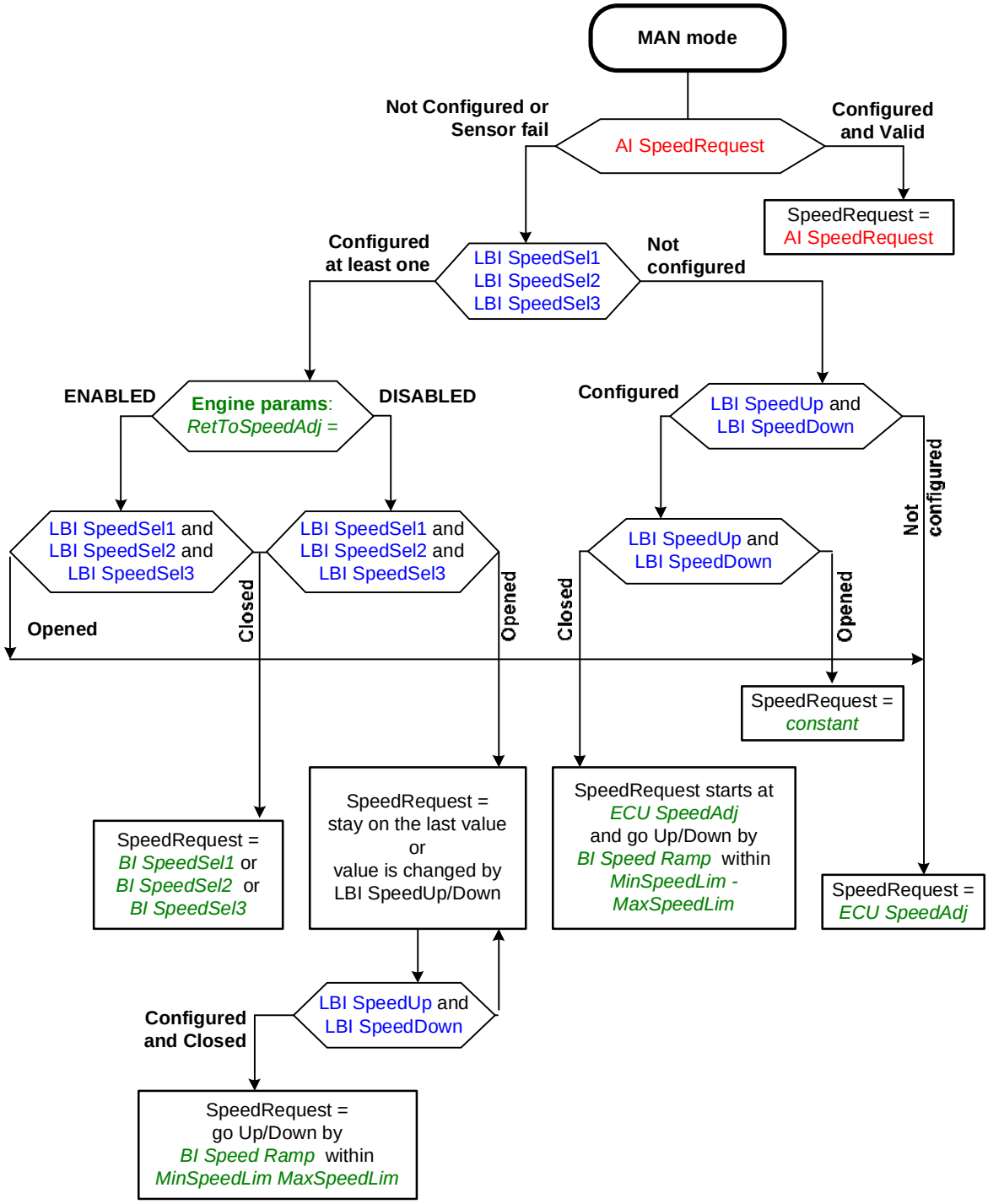
Take care if the Speed request in AUT mode is not limited by **Engine params**: *Speed ramp.*

Pressure by RPM control via Analog output
Actual pressure is measured via Analog input, compared with Requested value and the 3-PI output controls the engine RPM via Analog output.



Input	J1939 – Actual Load in % Binary input: L Request 2 (optional) Binary input: Reg Disable (optional)
Output	Analog output: Speed request
Setpoints	**Load limit**: *Load Input* = Load *Load Bias* = 5000 *Load Request* = 80 *Load Request 2* = 100 *Load ReqRamp* = 80 *Load UpLimit* = 9000 *Load DnLimit* = 1000 *Load Gain* = 50 *Load Integral* = 80 *Load Ramp* = 5000

Speed request chart



OFF mode

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

MAN mode

START – starts the engine.
STOP – stops the engine.

Hint:
The engine can run without load unlimited time.
The controller does not automatically stop the running engine in MAN mode.
The controller does not start the engine when binary input REM START/STOP is closed.

Start-stop sequence

MODE = MAN (Engine start/stop request is given by pressing buttons START and STOP)
MODE = AUT (Engine start/stop request is given by binary input REM START/STOP)
The start-up sequence can be interrupted in any time by coming stop request
Fuel solenoid is switched on with time advance of 1s fixed before starter motor is switched on.

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

AUT mode

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

Engine speed request is sourced from 3-PI function in AUT mode.

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

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* (not with AIN1 set to binary) or **Engine params**: *D+ function* = ENABLED.

Engine run timer

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.

AUT mode

Engine starts and runs all the time when the LBI Rem start/stop is closed. *Running Timer* is activated after Rem s/s is opened. 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.

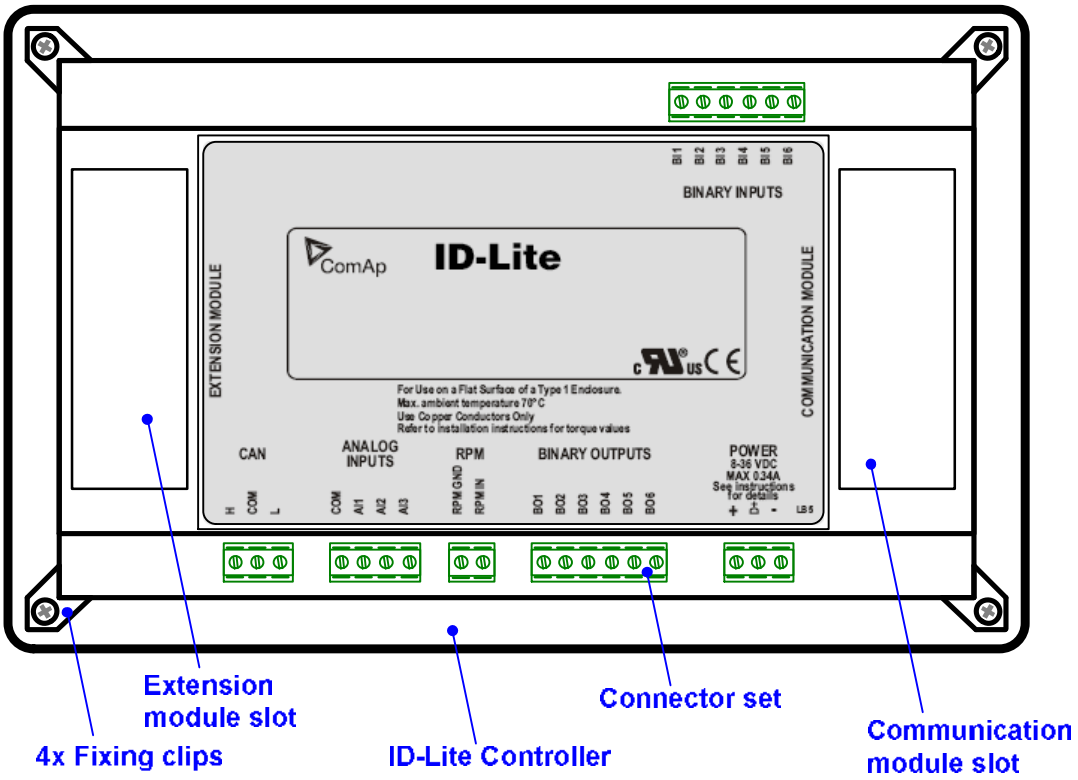
	MAN mode		**AUT mode**	
	RunTimer = 0 = disabled	**RunTimer > 0 = enabled**	**RunTimer = 0 = disabled**	**RunTimer > 0 = enabled**
Rem s/s = ON	No function		Start and Run unlimited time	
Rem s/s = OFF			Cooling	Cooling after RunTimer is over
START	Engine runs unlimited time until STOP	Engine start-runs 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			

ID-Lite Terminals

What is in the box

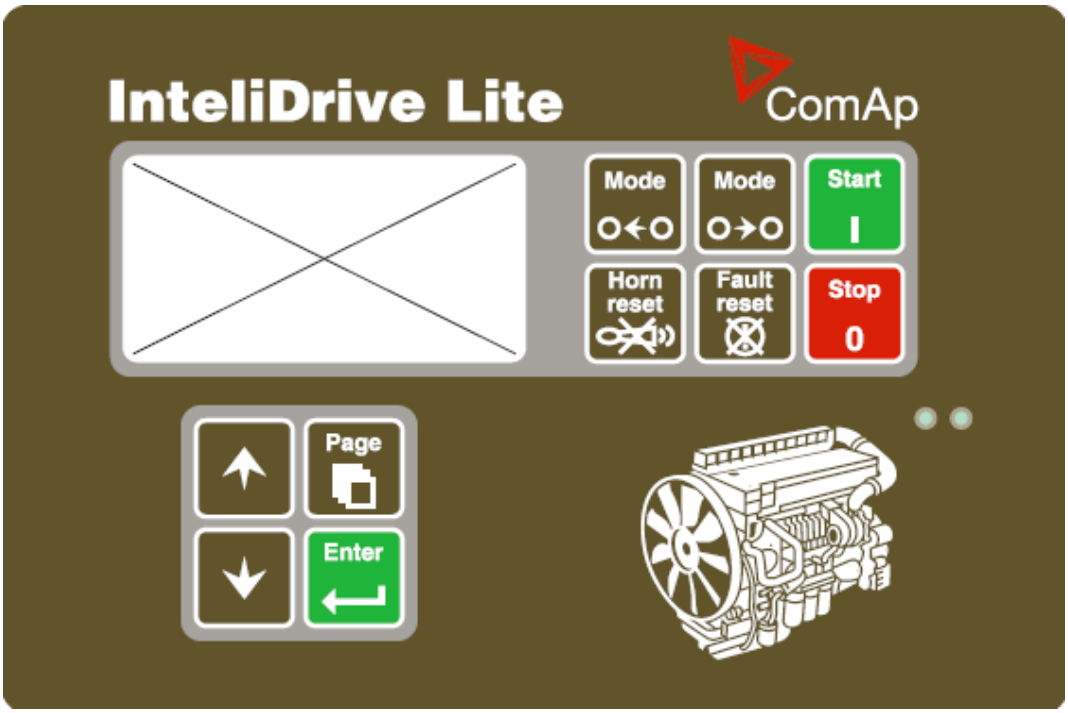
ID-Lite controller is delivered in the box as one set containing the

- ID-Lite controller programmed with default configuration
- 4x Fixing clips
- Complete connectors (female) set for controller wiring.
-

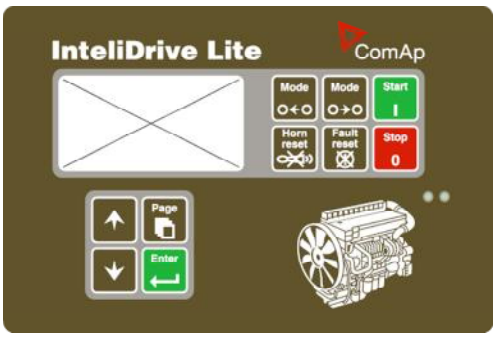


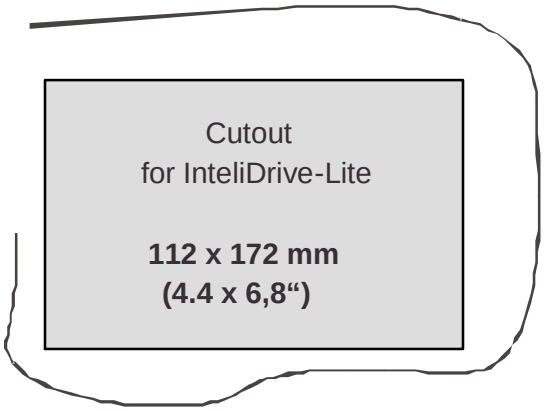
Order codes

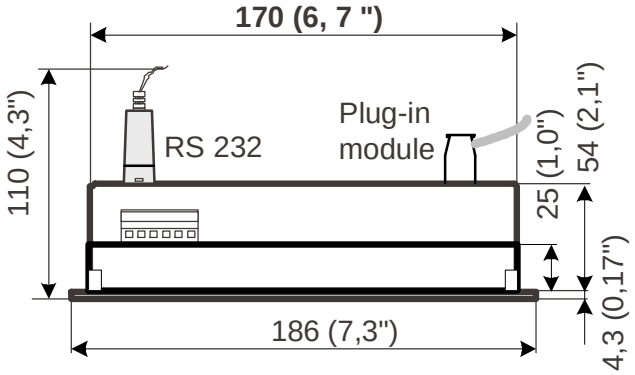
	Order code
Above described ID-Lite set in the box	ID-Lite
Separate Fixing clips (brackets)	Clamps set for ID-Lite
Separate set of (female) connectors can be ordered	TermSet IL-NT

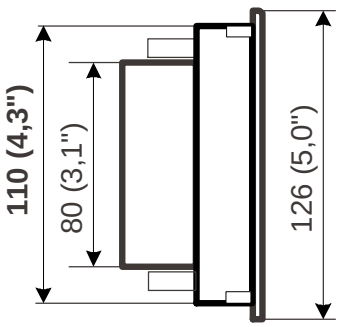

InteliDrive Lite
ComAp
Mode
Mode
Start
Horn reset
Fault reset
Stop
0
Page
Enter

Dimensions


InteliDrive Lite
ComAp
Mode
Mode
Start
Horn reset
Fault reset
Stop
0
Page
Enter


Cutout
for InteliDrive-Lite
112 x 172 mm
(4.4 x 6,8“)

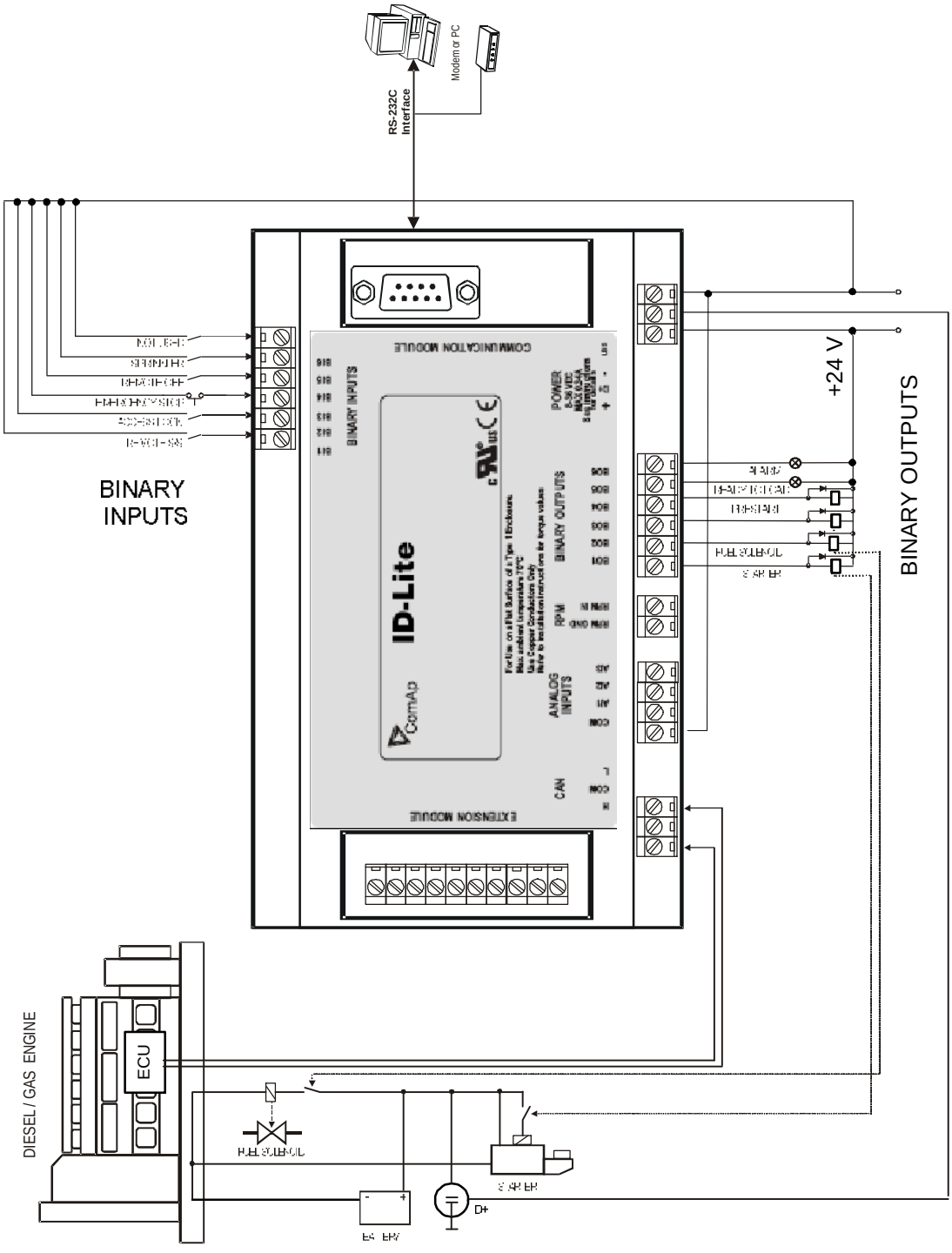

170 (6, 7 ")
110 (4,3")
RS 232
Plug-in
module
25 (1,0")
54 (2,1")
186 (7,3")
4,3 (0,17")


110 (4,3")
80 (3,1")
126 (5,0")

Recommended wiring

ID-Lite – Wiring example

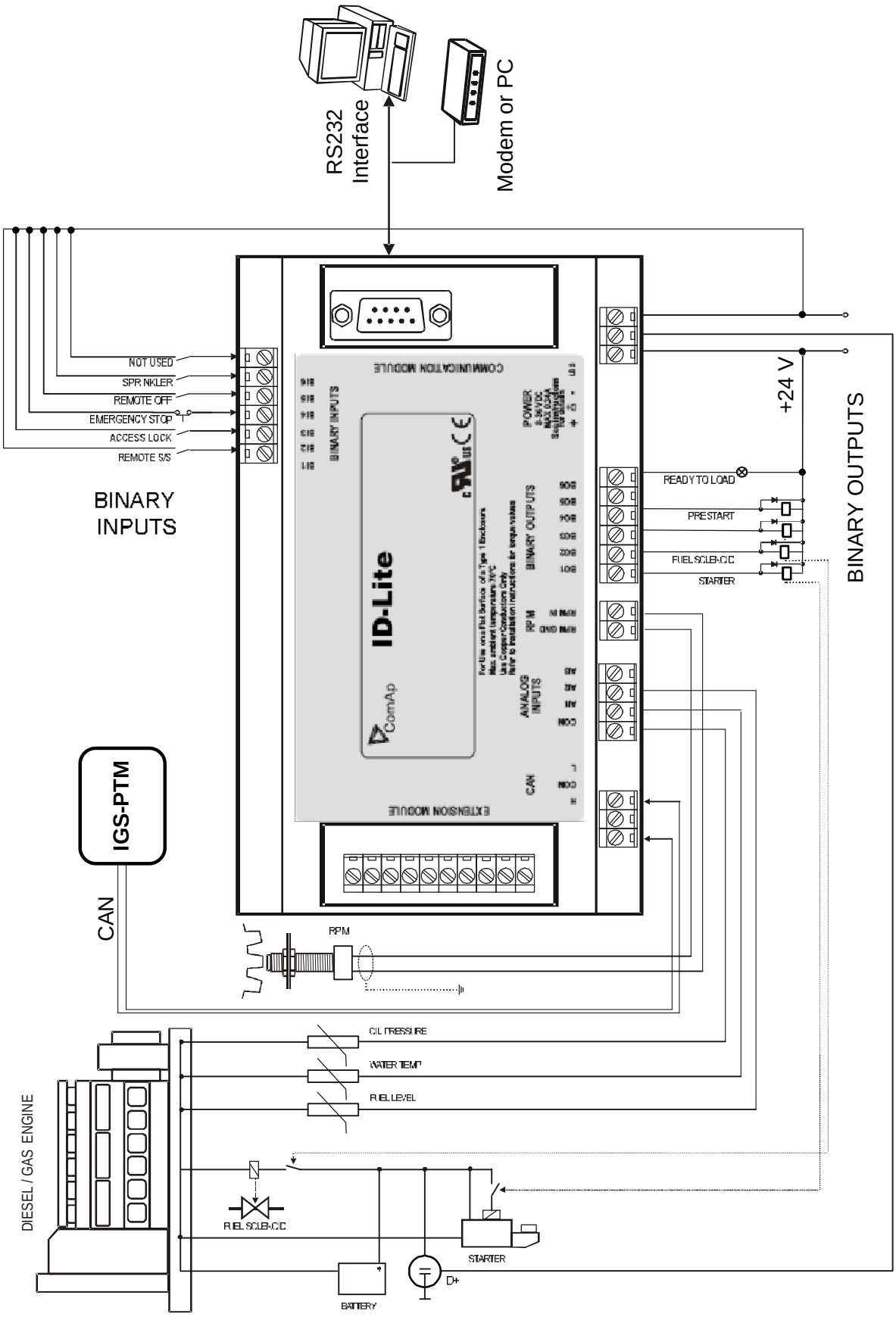
All engine data are transferred from ECU via CAN J1939 interface in example below. The extension IGL-RA15 modules can be connected to CAN bus together with ECU.



Hint:

It is possible to start Volvo and Scania engines via CAN bus. See Engines started via CAN bus.

Wiring example with separate sensors



Getting started

How to install

General

To ensure proper function:

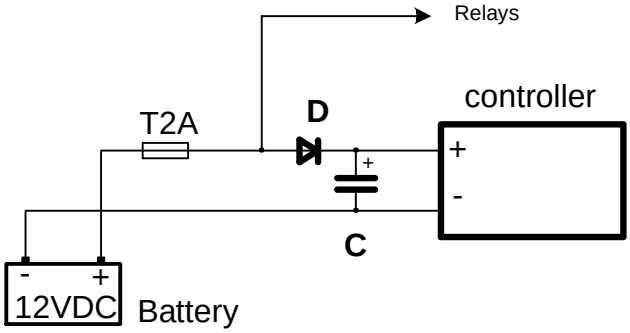
Wiring for binary inputs and analog inputs must not be run with power cables.
Analog and binary inputs should use shielded cables, especially when length >3m.

Power supply

To ensure proper function:
Use min. power supply cable of 1.5mm^2
Maximum continuous DC power supply voltage is 36VDC. Maximum allowable power supply voltage is 39VDC. The ID-Lite's power supply terminals are protected against large pulse power disturbances. When there is a potential risk of the controller being subjected to conditions outside its capabilities, an outside protection devise should be used.
Hint:
The InteliDrive-Lite controller should be grounded properly in order to protect against lighting strikes!! The maximum allowable current through the controller's negative terminal is 4A (this is dependent on binary output load).

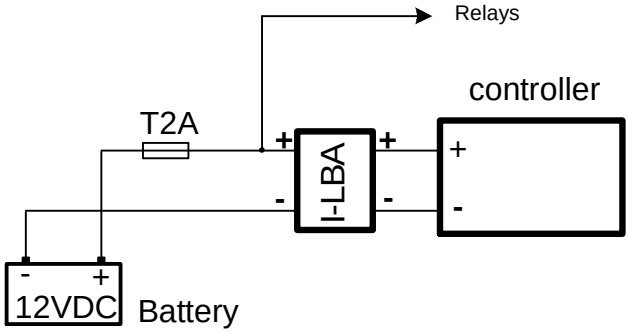
For the connections with 12VDC power supply, the InteliDrive-Lite includes internal capacitors that allow the controller to continue operation during cranking if the battery voltage dip occurs. If the voltage before dip is 12V, after 150ms the voltage recovers to 7 V, the controller continues operating. 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.

Connecting the external capacitor



The capacitor size depends on required time. It shall be approximately thousands of microFarads.
The capacitor size should be
5 000 microFarad to withstand 150ms voltage dip under following conditions:
Voltage before dip is 12V, after 150ms the voltage recovers to min. allowed voltage, i.e. 8V

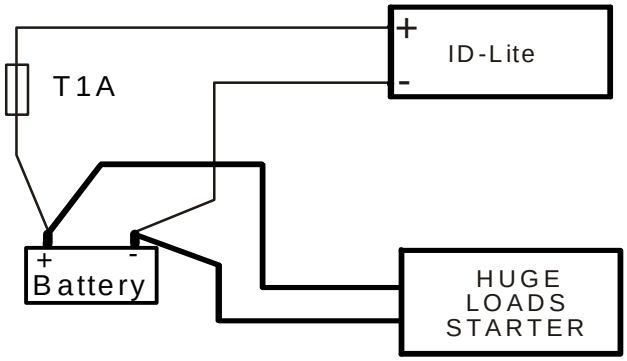
Connecting I-LBA – Low Battery Adaptor module



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

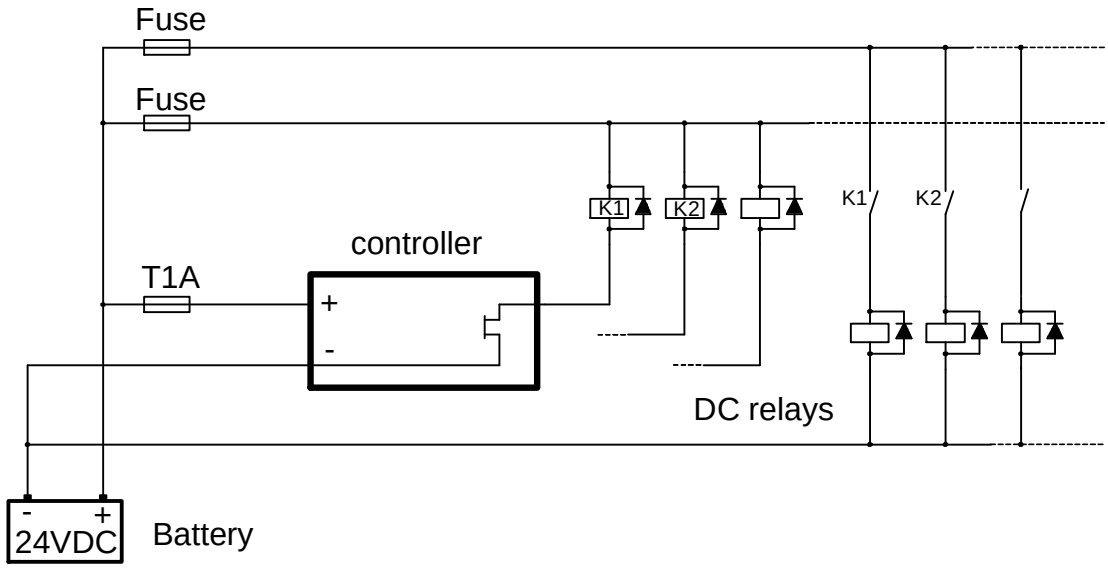
Power supply fusing

A one-amp 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.

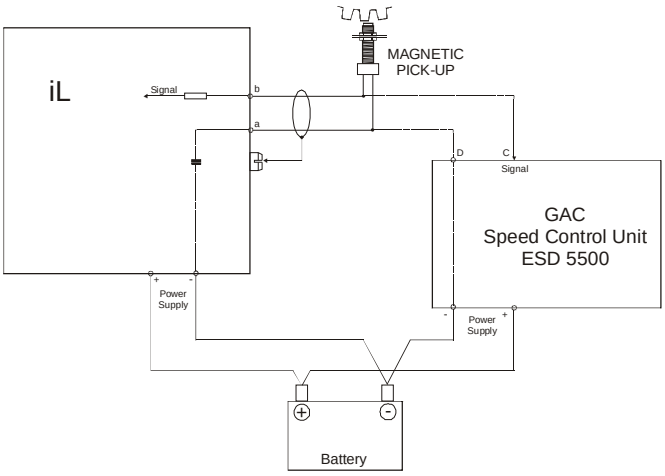


Grounding

To ensure proper function:
Use as short as possible cable to the grounding point on the switchboard
Use cable min. 2,5mm^2
The "-" terminal of the battery has to be properly grounded

Magnetic pick-up

To ensure proper function:
Use a shielded cable



Be aware of interference signal from Speed governor when one speed pick-up is used.
If engine will not start:

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

Analog inputs

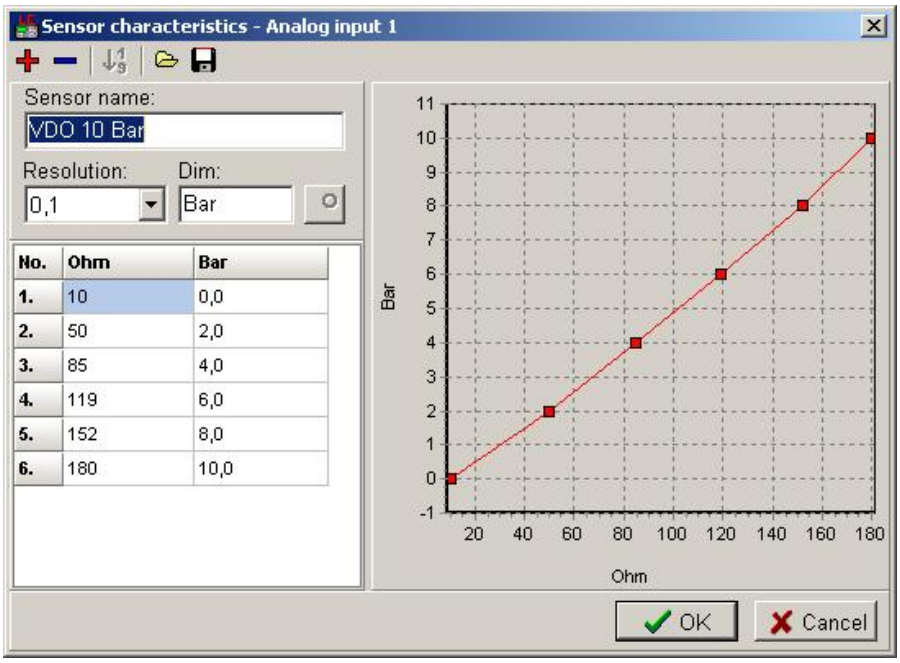
Three analog inputs are available on the ID-Lite

Configuration

Each analog input can be configured by LiteEdit software following way.

LiteEdit		Possibility
Type	Not used Alarm	Analog input isn't used
Name	… text	Up to 14 ASCII characters
Config	Analog	Analog measuring in specified range. Binary: open/close - threshold 750 Ω. Three-state: open/close - threshold 750 Ω, Failure <10 Ω or > 2400 Ω
Alarm properties	Over	Overstep. Sensor fail does not activate protection.
	Over+Fls	Overstep and Sensor fail activates protection.
	Under	Under step. Sensor fail does not activate protection.
	Under+Fls	Under step and Sensor fail activates protection.
Sensor - Points	Sensor name Resolution Dimension	… text Number of decimal points bar,%,°C, …
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 (3.0 or higher).



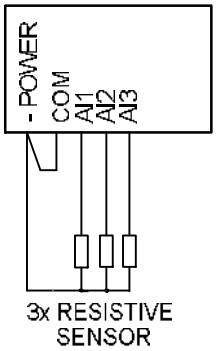
Each Analog input has separate set points for two level alarm setting. Analog input alarm levels and delay adjust in **Protection** or **Engine protection** group.

Default current sensor characteristic with external resistor 120 ohms

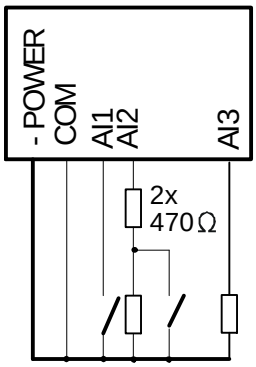
	4-20mA/100		0-20mA/100		0-20mA/-20 - 120°C
Ohm	Converted	Note 1	Note 2	Note 3	Note 4
120			0 mA	0%	-20°C
170	0	0%	4 mA	20%	8°C
200	13				22°C
230	25	25%	8 mA	40%	36°C
280	38				50°C
330	50	50%	12 mA	60%	64°C
390	63				78°C
460	75	75%	16 mA	80%	92°C
560	88				106°C
690	100	100%	20 mA	100%	120°C

Note 1 - % range for 4-20 mA input
Note 2 - range 0-20 mA
Note 3 - % range for 0-20 mA input
Note 4 - characteristic 0-20 mA / -20 - +120 °C

Connection of ID-Lite analog inputs



Standard connection of three resistive sensors to analog inputs.



Mixed connection of ID-Lite analog inputs:

AI1 – binary input
AI2 – three state input
AI3 – analog resistive input

Analog inputs are designed for resistive sensors with resistance in range of 0Ω to 2,4kΩ.
To ensure a proper function use shielded cables, especially for length over >3m.

Current output transducers

InteliDrive-Lite analog inputs are mainly designed for resistor sensors.
In special case transducers to 4-20mA output can be used for oil measuring (10.0Bar or 6.0Bar). Use predefined 4-20mA/100 or 4-20mA/60 sensors.
This method reduces the input resolution by less than 50%. Some types of transducers are not suitable for connection to ID-Lite analog inputs because of influencing by ID-Lite analog input.

As binary input

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

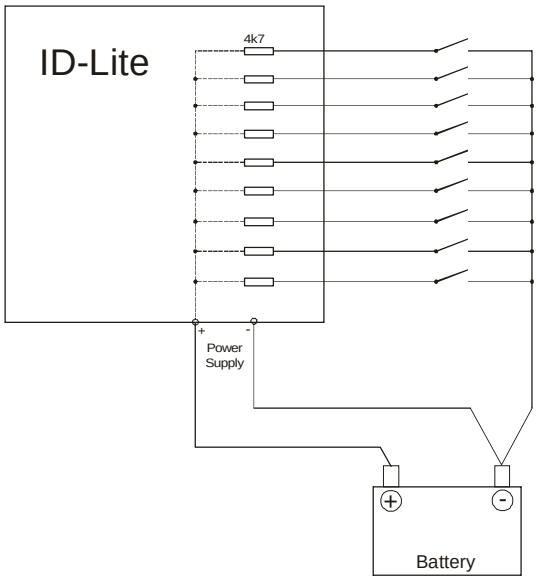
As three state input

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

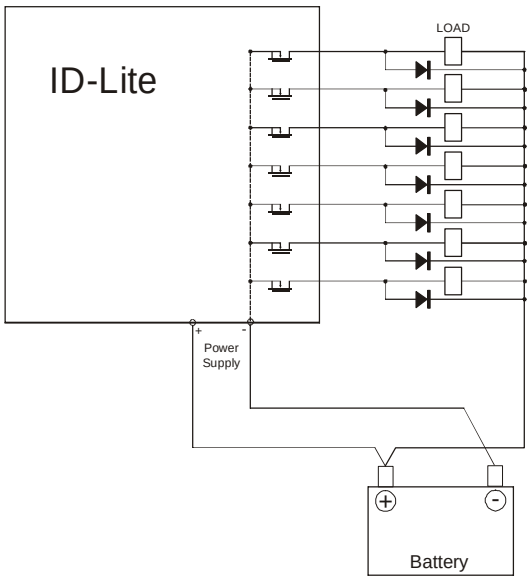
Unused analog inputs

Configure Type = Not used

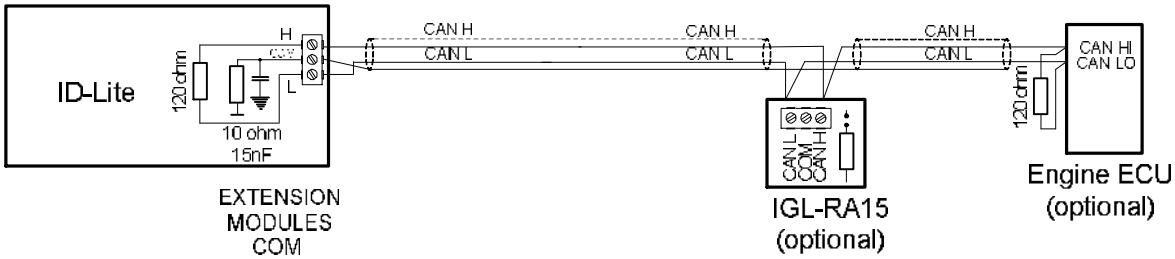
Binary inputs



Binary outputs



Extension 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 by the 120-ohm (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 connect to ID-Lite COM terminal.
ID-Lite contains internal fix 120-ohm resistor and must be located on the CAN bus end.
It is possible to connect only one IGL-RA15 to ID-Lite.

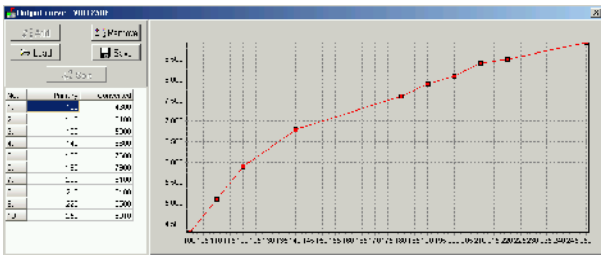
Use 

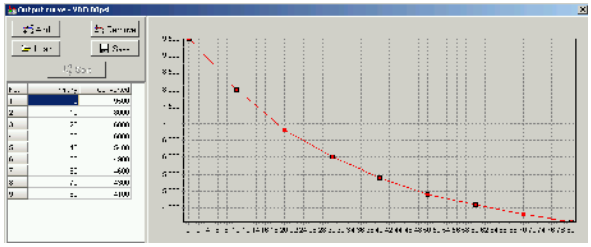
button in LiteEdit (3.0 or higher) configuration window to activate CAN (J1939) interface.

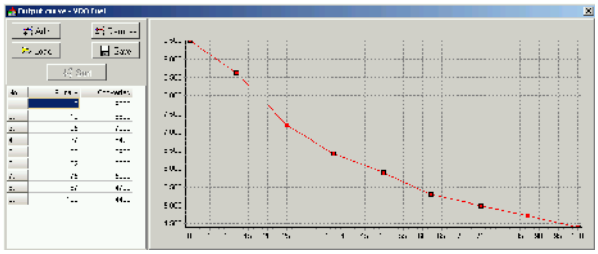
Analog outputs

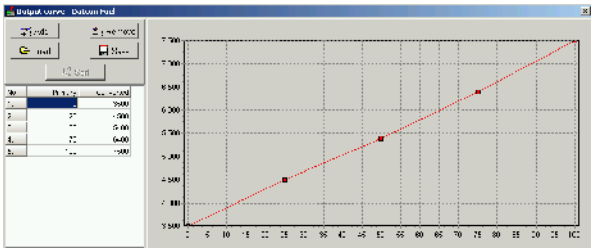
Optional plug in card IL-NT AOU8 provides eight Pulse-With-Modulation (PWM) outputs. These are intended to drive VDO style analog gauges. This is to provide visual indication of typically ECU values without installing additional sensors on the engine. PWM signal emulates sensor which would be typically mounted on the engine.
Any value from controller may be configured to the outputs. Use LiteEdit PC SW to configure corresponding sensor/gauge curve and value selection.

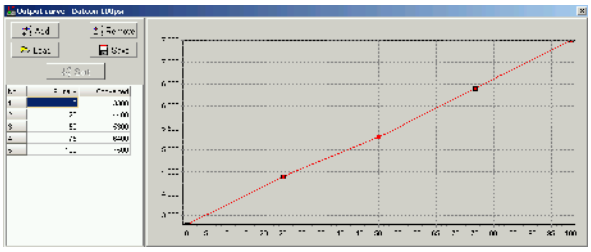
Default analog output curves

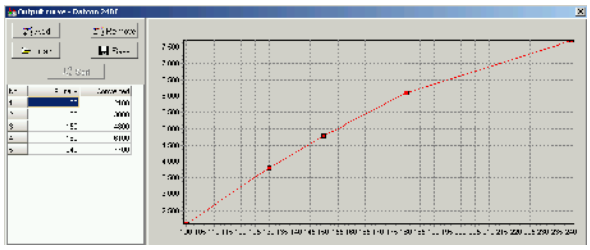


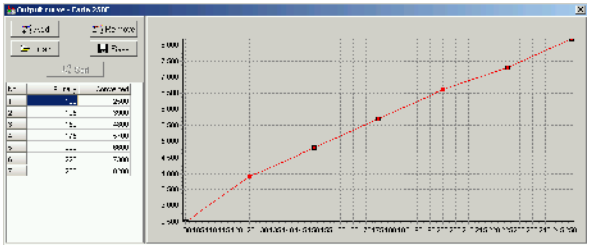


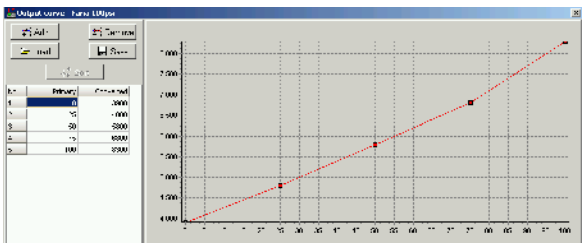


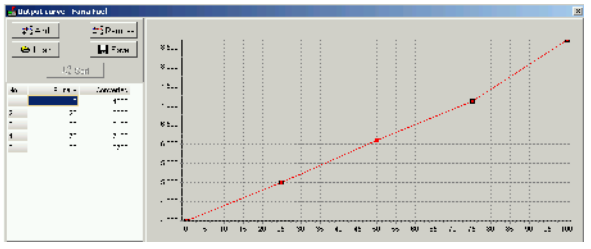




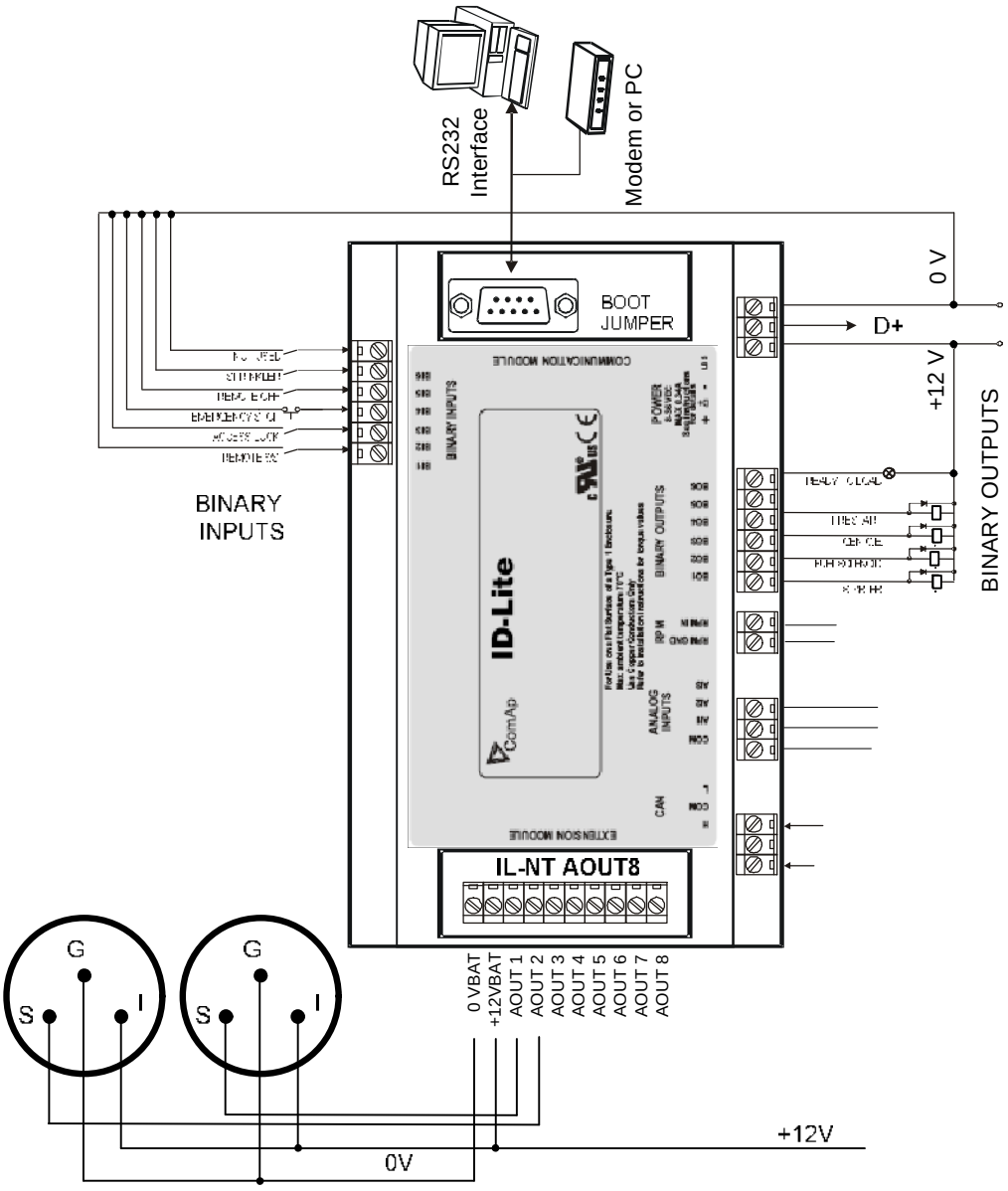




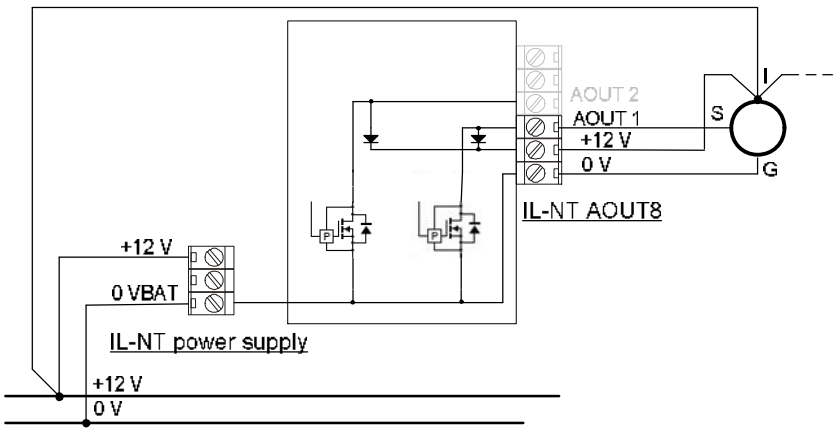




IL-NT-AOUT8 wiring example for Datcon gauges



Internal IL-NT AOUT8 wiring



ECU-controlled engine support

One ID-Lite firmware branch covers both standard and electronic controlled (monitored) engines. The appropriate engine/ECU type is selected in LiteEdit (3.0 or higher) like other peripheries. Press the 

button in LiteEdit Configuration window.

Hint:
Import latest ECU list – ECU list-4.9.iwe for up to date engine ECU specification.
Select the proper esl file in LiteEdit-Options-ESL files – typically Allspeed.esl.

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

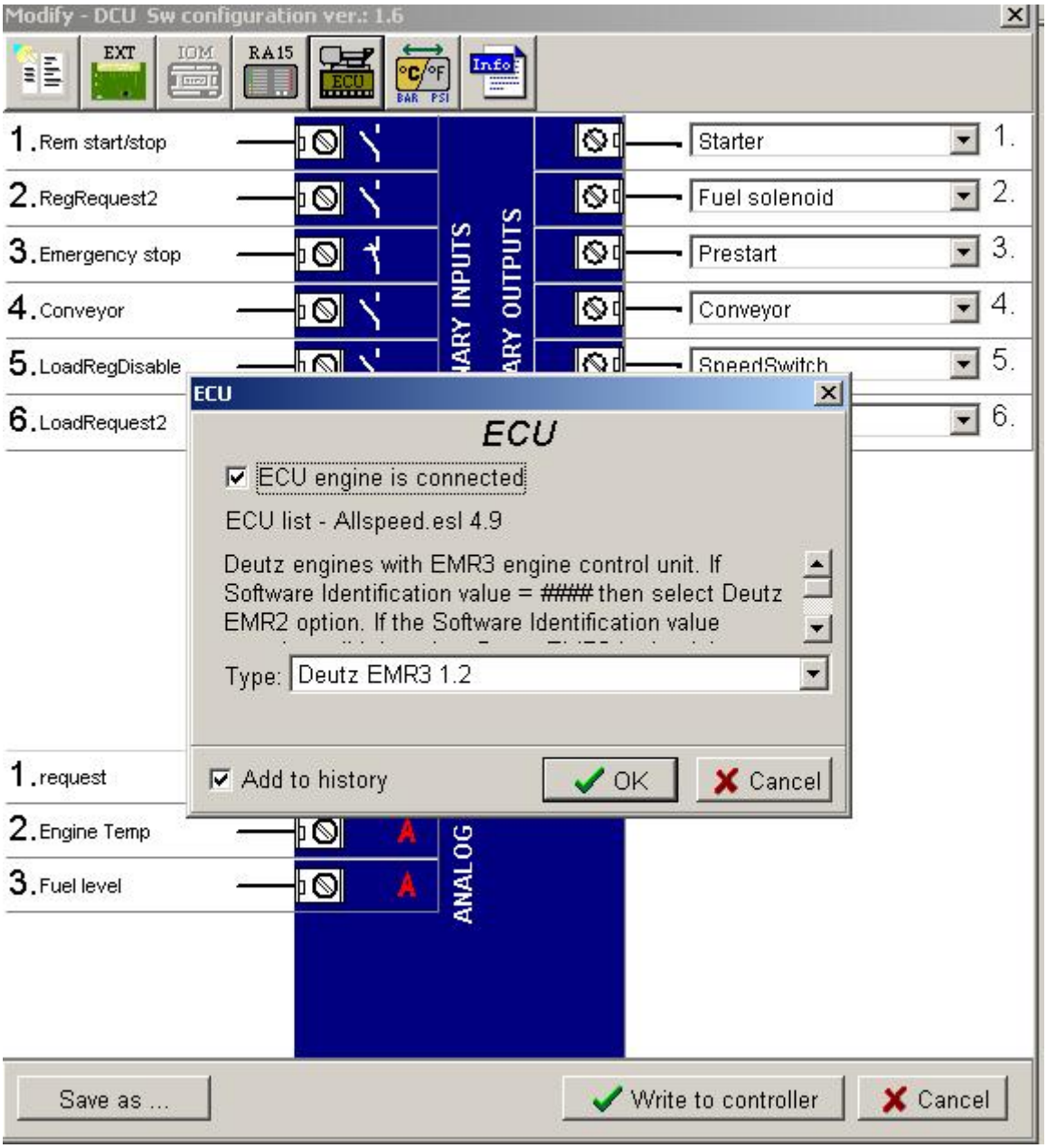
The ID-Lite controller always sends either speed request = 0 % or the IDLE command via J1939 in controller IDLE state. In the MAN mode the IDLE operation can be controlled by Nominal/Idle binary input.

Identifying configured ECU

Navigate to default screen with gauge and press buttons PAGE and ENTER at the same time. Then browse through screen by button PAGE until you find value "ESF:xx.y - (zzz)", where xx.y = ESF version number, zzz= Engine ID.

Engine ID index is in table below:

Engine ID	ESF - Electronic Engine
1	Volvo EMSI Singlespeed / EMSII
3	Scania S6 Singlespeed
4	Cummins CM570
5	Cummins MODBUS
7	John Deere
8	Deutz EMR2
9	DDC DDEC IV/V
10	Caterpillar J1939
12	Perkins ECM
14	Iveco NEF&Cursor
16	Scania S6 Singlespeed from ver.1794335
18	SISU EEM3 Gen-set
20	MTU ADEC J1939
25	Deutz EMR3
26	Cummins CM850
28	Iveco Vector
29	MAN MFR
31	VM Marine
32	VM Industrial
35	GM SECM
36	ISUZU ECM
44	E-control ECU
255	Standard J1939 engine



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 (for Volvo and Scania engines). For other engines J1939 is used for monitoring only.

Values read from ECU

Value name	Short name	Dimension	Type	Frame name
EngOil Filter Diff.Press	OilDiffPres	bar	ANA	DD
Amber Warning Lamp	AmberWrnLamp	-	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

Cummins MODBUS

When “Cummins-Modbus” 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

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.

List of ECU diagnostic codes

Faultcode	Diagnostic code	Faultcode	Diagnostic code	Faultcode	Diagnostic code
51	ThrottlePos	158	BattPotential	636	PositionSensor
91	AccelPedalPos	168	ElectricalPot	637	TimingSensor
94	FuelDelPress	172	AirInlet Temp	639	J1939 CAN Bus
97	WaterInFuelInd	174	Fuel Temperat	651	InjectorCyl#1
98	EngineOilLevel	175	EngOil Temp	652	InjectorCyl#2
100	EngOil Press	189	RatedEngSpeed	653	InjectorCyl#3
101	CrankcasePress	190	EngineSpeed	654	InjectorCyl#4
102	Boost Press	231	J1939 Datalink	655	InjectorCyl#5
105	Intake Temp	237	VIN	656	InjectorCyl#6

106	AirInletPress	515	EngDesOpSpeed	677	EngStartRelay
107	AirFiltDifPres	620	5V SupplyFail	898	RequestedSpeed
108	BarometricPres	626	PrehActuator	970	AuxEngSdSwitch
110	EngCool Temp	628	EMSProgFailure	971	EngDerateSwtch
111	Coolant Level	629	Controller#1	1109	EngSdApproach
153	CrankcasePress	630	CalibrMemFail	1110	Engine Sd

Hint:
ID-Lite 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	PDEInjctorCyl1
0x2600	SensorSupply1	0xC100	PDEInjctorCyl2
0x2700	SensorSupply2	0xC200	PDEInjctorCyl3
0x2800	ExtrAnalogInp	0xC300	PDEInjctorCyl4
0x3200	BatteryVoltage	0xC400	PDEInjctorCyl5
0x3300	CAN msg not ok	0xC500	PDEInjctorCyl6
0x3403	CAN version	0xC600	PDEInjctorCyl7
0x4300	HWWatchdog	0xC700	PDEInjctorCyl8
0x6200	FanActuator	0xE200	OverheatProt
0x6400	WasteGateAct	0xE600	CoordEmergStop
0x6600	StarterActuatr		

Analog inputs

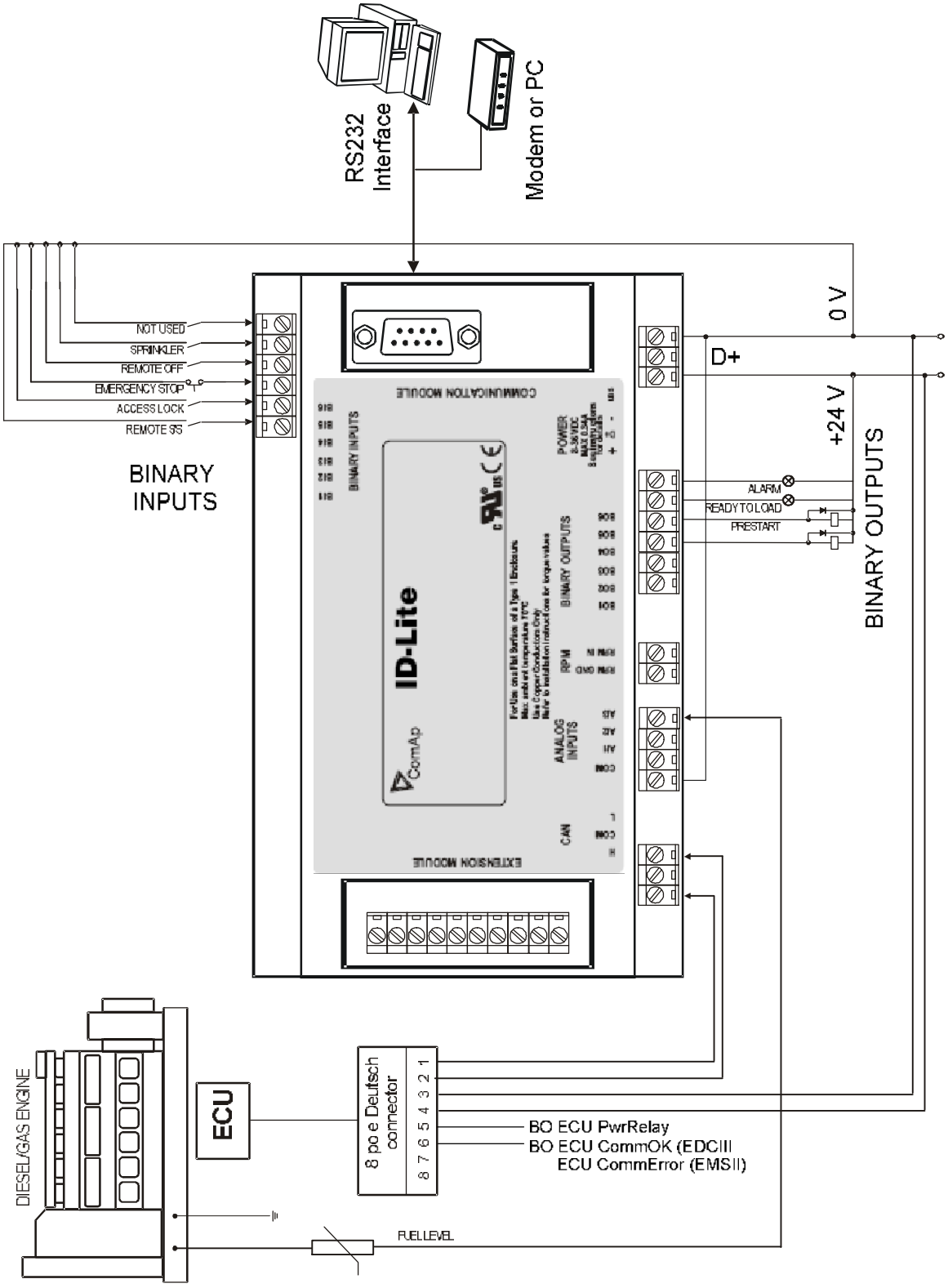
Reading of mentioned values from ECU enables to use analog inputs of the unit for other purposes, e.g. measuring, displaying and alarm activation related to various quantities. The configuration thus allows using three analog inputs on the central unit and four analog inputs on plug-in module if connected.
If the engine without ECU is controlled by ID-Lite, the first analog input is permanently configured to Oil pressure, other analog inputs remain freely configurable.

Connection description

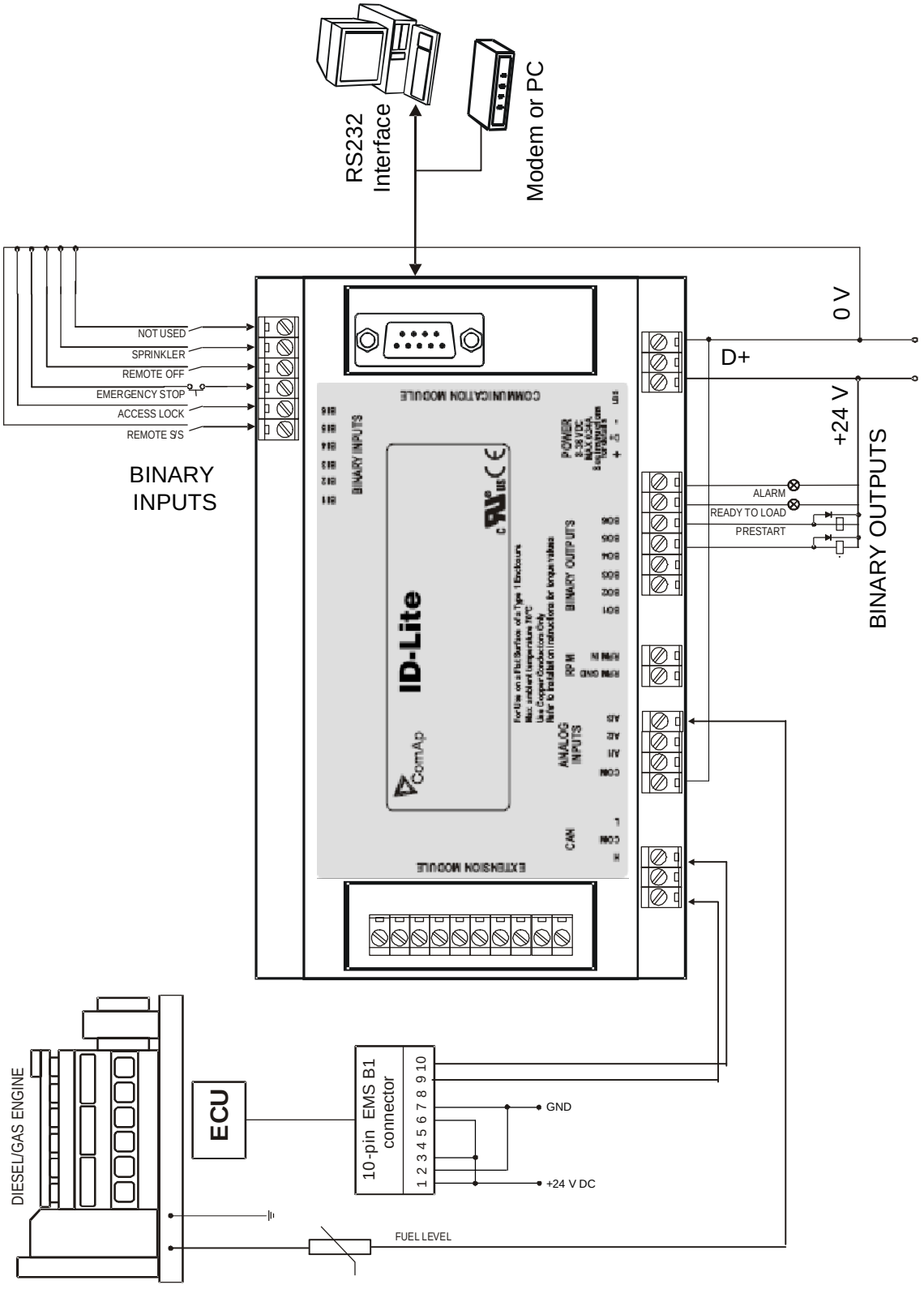
The following diagrams show how to connect the engine control unit to the ID-Lite controller:

Engines with J1939 support started via CAN bus

VOLVO PENTA engines (EMS II, EDC III units)



SCANIA S6


RS232
Interface
Modem or PC
NOT USED
SPRINKLER
REMOTE OFF
EMERGENCY STOP
ACCESS LOCK
REMOTE S'S
BINARY
INPUTS
0 V
D+
+24 V
ALARM
READY TO LOAD
PRESTART
BINARY OUTPUTS
ID-Lite
ECU
DIESEL/GAS ENGINE
10-pin EMS B1
connector
1 2 3 4 5 6 7 8 9 10
GND
+24 V DC
FUEL LEVEL

Engines not started via CAN bus

PERKINS 2800 series

ID-Lite binary output description	Perkins Customer interface connector
Start output	connects directly to engine starter solenoid
Fuel output	1,10,15,33,34 powers up ECU and enables the injectors

ID-Lite CAN description	Perkins Customer interface connector
CAN bus common	Screen for the J1939 cable.
CAN bus H	31
CAN bus L	32

JOHN DEERE

ID-Lite binary output description	John Deere 21 pin Deutsch connector
Start output	D
Fuel output	G (switched ECU power),J (ignition)

ID-Lite CAN description	John Deere 21 pin Deutsch connector
CAN bus common	Screen for the J1939 cable.
CAN bus H	V
CAN bus L	U

CUMMINS ISB/ISBE

ID-Lite binary output description	Cummins ISB OEM Harness connector B
Start output	connects directly to engine starter solenoid
Fuel output	39

ID-Lite CAN description	Cummins ISB 9 pin Deutsch connector
CAN bus common	SAE J1939 shield - screen for J1939 cable.
CAN bus H	SAE J1939 signal
CAN bus L	SAE J1939 return

Cummins engines with MODBUS communication

ID-Lite set up (available from version 2.0):

Basic settings: *RS232 mode* = CUMMINS MB

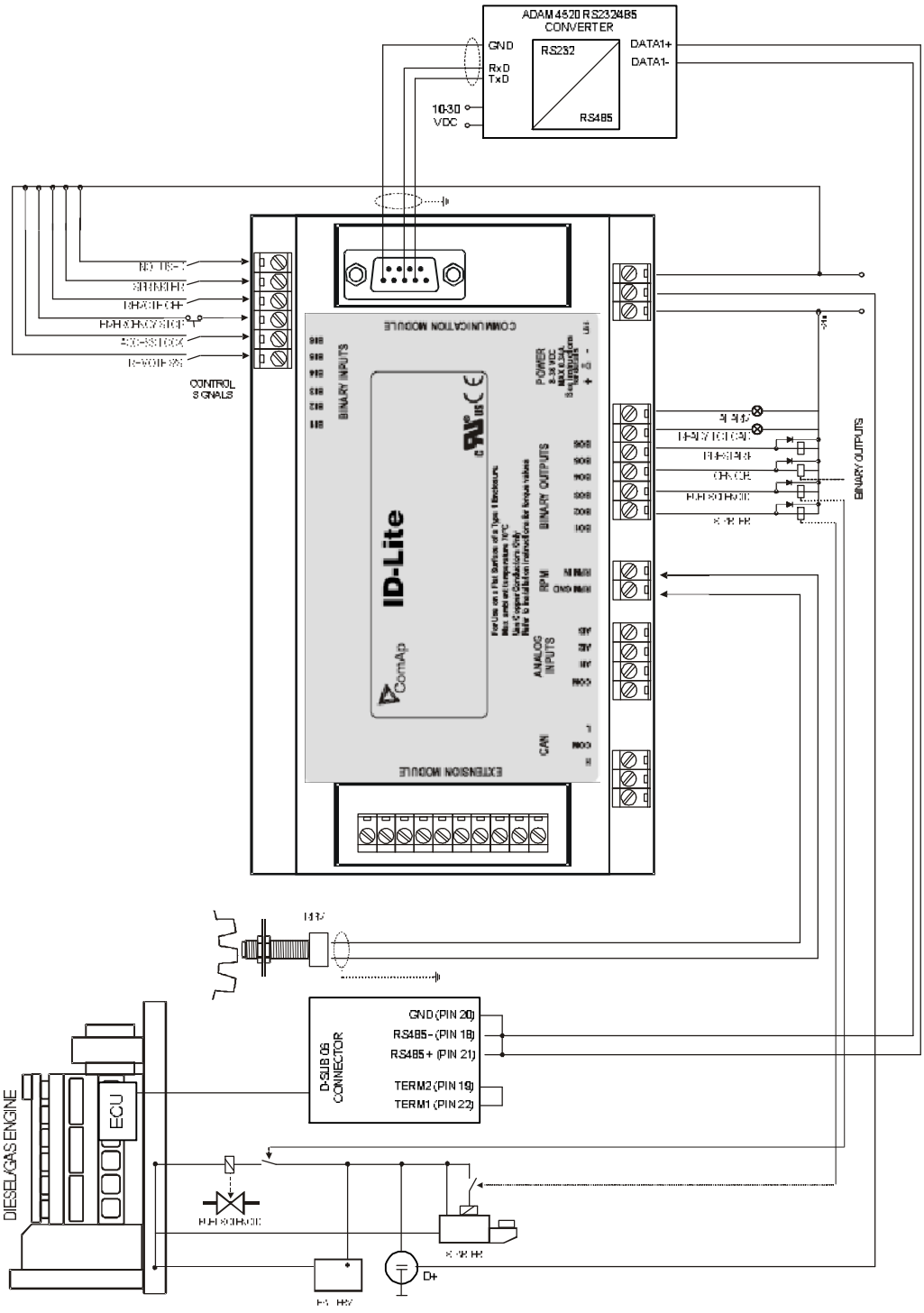
Software configuration: ECU → ECU engine is connected → Type: Cummins MODBUS

RS232/RS485 converter (see following diagram) set up:

Data format settings (SW1) 11 bits (1 start bit, 8 data bits, 2 stop bits)

Baud rate settings (SW2) 9600 bps

(more info available on http://www.advantech.com/products/Model_Detail.asp?model_id=1-D6FLH)



Inputs and outputs

Hint:
Any Binary input or output can be configured to any ID-Lite controller terminal or changed to different function by LiteEdit (3.0 or higher) software. There is fix 1 sec delay when any binary input is configured as protection.

Binary inputs ID-Lite - default

BI1 Rem start/stop

BI2 Access lock

BI3 Emergency stop

BI4 Remote OFF

BI5 Sprinkler

BI6 RemControlLock

Binary inputs – list

Not used

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

Alarm

If the input is closed (or opened) selected alarm is activated.
Binary Alarm configuration items

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

Rem start/stop

External request for engine run. AUT mode only.

Emergency stop

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

Hint:
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 ID-Lite alarms are detected,
- ID-Lite front panel RED LED blinks or lights,
- Alarm is recorded on the ID-Lite alarm list screen,
- BUT engine remains running.

Hint:
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.
Hint:
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, InteliDrive-Lite is switched to OFF mode (there are three modes OFF-MAN-AUT). When opens controller is switched back to previous mode.
Hint:
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.

Emergency 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 ID-Lite front panel. It is active in MAN mode only.

StopButton

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

FaultResButton

Binary input has the same function as Fault reset button on the ID-Lite front panel.

HornResButton

Binary input has the same function as Horn reset button on the ID-Lite front panel.

Nominal/Idle

Input works in MAN mode only switching between Idle-Running state. 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 opens.

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.

SpeedUp/Down binary inputs are active only when **Regulator**: *LAI SpdSelect* = OFF.

Speed Sel 1

If the input is active, the Speed request = **Engine params:** *BI Speed Sel 1* setpoint. The function is affected by Engine params: RetToSpeedAdj.
RetToSpeed

Speed Sel 2

If the input is active, the **Engine params:** *BI Speed Sel 2* 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 Sel 3

If the input is active, the **Engine params:** *BI Speed Sel 3* 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.
Hint:
Engine params: *RetToSpeedAdj* = DISABLED … Speed request is set by BI Speed Sel1, ..2, ..3 edge (button press). i.e. input can be opened and Speed request stay constant.

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

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

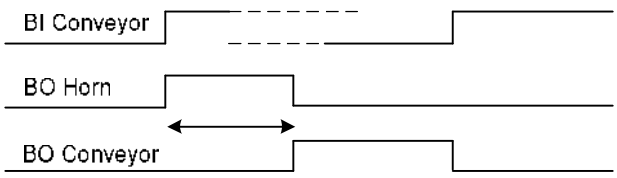
When more binary inputs are active at the same time, e.g. all binary inputs: 'Speed Sel1', 'Speed Sel2', 'Speed Sel3' then requested speed is given by **Engine params:** *BI Speed Sel 1* (lowest index) setpoint.

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 deactivates/opens the BO Conveyor. BO Conveyor is deactivated in case of Sd protection.



Load Request2

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

LoadReg Disable

Active input disables the Load limit PI loop and switches analog output to constant **Load limit**: *Load bias*.

RegRequest2

Active input switches the … by RPM loop request to **Regulator**: *Request2* setpoint.

R Reg Disable

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

Clear DayCons

Active input executes counter reset of DayCons statistical value.

Clear TripCons

Active input executes counter reset of TripCons statistical value.

Binary outputs ID-Lite - default

BO1 **Starter**

BO2 **Fuel solenoid**

BO3 **Prestart**

BO4 **Alarm**

BO5 **Horn**

BO6 **Not used**

Binary outputs - list

Not used

Output has no function.

Starter

The closed relay energizes the starter motor.
The relay opens if:

- the “firing” 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.*

Hint:
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).

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 30RPM. 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 **Engine params**: *AfterCool time* after stop of the engine.

Idle/Nominal

The output either follows the Nominal/Idle binary input 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 period. A *Start fail* protection occurs if the RPM drop below 2RPM during idle state.

Air valves

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

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

Alarm

The output closes if:

- any warning 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 HORN is exceeded (*Horn timeout*)

The output closes again if a new fault comes up.

Wrn AnImAIO1..4

Output closes if the AIO: AI1..4 warning alarm activates.
The output opens, if

- alarm is not active and
- FAULT RESET is pressed

Sd AnImAIO1..4

Output closes if the AIO: AI1..4 shutdown alarm activates.
The output opens, if

- alarm is not active and
- FAULT RESET is pressed

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.

Stop failed

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

- 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 "Wrn Underspeed" or "Sd Underspeed" alarm activates i.e. when RPM is below the **Engine Protect**: *Underspeed* or **Engine params**: *Starting RPM* limit.
The output opens, if

- "Wrn Underspeed" alarm is not active
- "Sd Underspeed" alarm is not active and
- FAULT RESET is pressed

Start failed

Output closes after the engine start-up fails.
The output opens, if

- alarm is not active and
- FAULT RESET is pressed

Battery flat

Output closes when InteliDrive-Lite 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

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.

Wrn FuelLevel

Output closes if the Fuel level warning alarm activates.

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 shut-down alarm appears.
The output opens, if

- No sd 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

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.

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

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

ServiceTime

Output closes if the ServiceTime alarm 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 PwrRelay

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

ECU YellowLamp

The output copies warning information from ECU.

ECU RedLamp

The output copies shutdown information from ECU.

CtrlHeartBeat

Output signalizes watchdog reset. In a healthy state it blinks at 500ms : 500ms rate. When watchdog reset occurs, it stops blinking.

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 #####.

BI1..10 – stat

In case the assigned binary input is configured to any control function, the output propagates the state of the input. BI1..6 are assigned for CU: BI1..6, BI7..10 are assigned for BI7..BI10 of IL-NT IO1 optional card.

BIO8 1..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.

Timer1

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

Timer2

Output activates when Timer2 is active

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.

Conveyor

Binary output of Conveyor function. See Binary input Conveyor.

LoadSwitch

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

SpeedSwitch

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

Analog inputs

Three analog inputs are designed for resistive sensors only.

It is possible to configure on each Analog input:

- Reading from ID-Lite Analog inputs or from Engine Control Unit via CAN bus (J1939)
- Sensor characteristics – from the list, or custom sensor curve
- Value dimension (e.g. psi - bars, °F - °C, % - l)
- Number of decimal points (0, 1, 2, …).

Warning and shut-down limits are adjusted in **Engine protect** group.
The analog inputs are configurable. Use LiteEdit (3.0 or higher) software to modify configuration.
Default configuration is:

Oil press

Oil pressure analog input. Default VDO sensor in range 0 to 10.0 bars.

Water temp

Water temperature analog input. Default VDO sensor in range 0 to 100 °C.

Fuel level

Fuel level analog input. Default VDO sensor 0-180R = 0-100%

Hint:
For further information about analog inputs' configuration see Analog inputs.

CAN J1939 interface

Following values can be received from Engine Control Unit via CAN bus instead of measuring on ID-Lite terminals when J1939 interface is enabled.

Value	Value is received from	
	J1939 enabled	J1939 disabled
RPM	ECU	ID-Lite – RPM terminals
Oil pressure	ECU or ID-Lite AI1	ID-Lite AI1 terminals
Water temperature	ECU or ID-Lite AI2	ID-Lite AI2 terminals
Fuel level	ECU or ID-Lite AI3	ID-Lite AI3 terminals
ECU State	ECU	
Fuel rate	ECU	
Manifold temp	ECU	
Boost pressure	ECU	
PercLoadAtCS	ECU	

Use LiteEdit 3.0 to enable/disable J1939 interface and to configure ID-Lite analog inputs.
Hint:
RPM reading is automatically switched to pickup measuring (depends on **Basic setting**: *Gear teeth* value) if J1939 fails.

Other available analog inputs

Use IL-NT-AIO with additional 4 analog inputs.

Setpoints

Password

EnterPassword

Password is a four-digit number. Password enables change of relevant protected set points Use ⇧ or ⇩ 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.

ChangePassword

Use ⇧ or ⇩ keys to set and ENTER key to change the password.
Hint:
At first the Password has to be entered before the new Password can be changed.

Basic settings

Engine name

User defined name, used for engine – ID-Lite identification at remote phone or mobile connection. *Engine name* is max 14 characters long and have to be entered using LiteEdit (3.0 or higher) software.

Gear teeth [-]

Number of teeth on the engine gear for the pick-up sensor. The setpoint is ignored when ECU is configured.
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.
Step: 1
Range: 0 – 500

Nominal RPM [RPM]

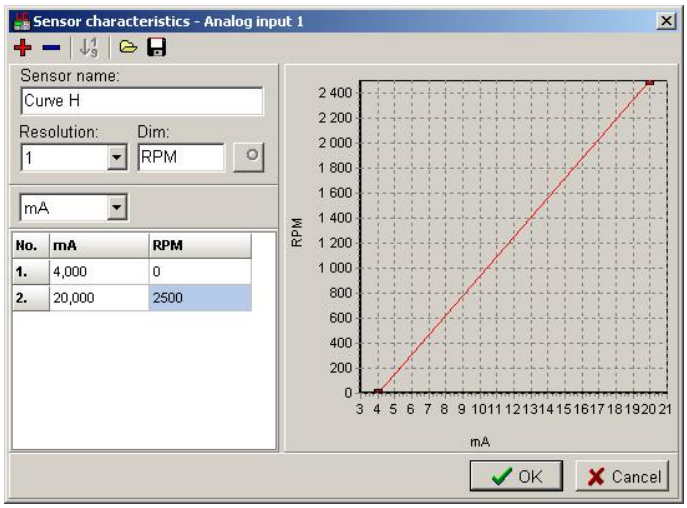
Nominal engine speed, base for overspeed protection and scale on RPM gauges.
Step: 1RPM
Range: 100 – 4000 RPM

GearTeethBI3 [-]

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 1 Hz and =### over 50 Hz.
Configure BI Type = Not used and change the name according the function for RPM-BI3 measuring.
Hint:
The RPM-BI3 measuring is switched off when **Basic setting**: *GearTeethBI3* = 0. In this case BI3 operates as standard Binary input.
Step: 1
Range: 0 – 10

RPM source [PICKUP, AIO-AIN1, AIO-AIN2, AIO-AIN3, AIO-AIN4]

Switch from where the RPM is measured. When source is Analog input the converted value Is to be in RPM range – see example below.



ControllerMode [OFF, MAN, AUT]

Equivalent to Controller mode changes by MODE→ or ←MODE buttons.

Hint:

Controller Mode change can be separately password protected.

FltResGoToMAN [ENABLED, DISABLED]

DISABLED: Controller stays in AUT mode after Fault reset .
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.

DispBaklightTO [min]

Timeout after which the display backlight is switched off.
Step: 1 min
Range: 0 – 60 min
Default value: 0 … means that the display lights all the time

Comms Settings

Contr. addr (1 .. 32) [-]

Controller identification number. It is possible to set controller address different from the default value (1) so that more ID-Lite controllers can be interconnected (via RS485) and accessed e.g. from Modbus terminal.

Hint:

When opening connection to the controller it's address has to correspond with the setting in PC tool. From LiteEdit it is only possible to connect to controllers with address 1.

COM1 Mode [DIRECT/MODEM/MODBUS/ECU LINK]

Communication protocol switch for the COM1 channel.
DIRECT: LiteEdit communication protocol via direct cable or AirGate, WebSupervisor communication protocol via AirGate.
MODEM: LiteEdit communication protocol via modem.
MODBUS: Modbus protocol. See detailed description in InteliCommunication guide.
ECU LINK: Protocol for communication with Cummins engines via Modbus.

Hint:

For details on communication speed and other technical parameters please see chapter Technical Data.
For detail description see chapter Modbus protocol.

COM2 Mode [DIRECT/MODBUS/ECU LINK]

Communication protocol switch for the COM2 channel, if dual communication module is plugged in.
DIRECT: LiteEdit communication protocol via direct cable.
MODBUS: Modbus protocol. See detailed description in InteliCommunication guide.
ECU LINK: Protocol for communication with Cummins engines via Modbus.

Hint:
For details on communication speed and other technical parameters please see chapter Technical Data.
For detail description of communication possibilities see actual Inteli Communication Guide xxx.pdf - chapter Modbus protocol and others.

ModemIniString

If your modem needs some additional initialization AT commands (i.e. because of national telephony network differences), it can be entered here. Otherwise leave this setpoint blank.

ModbusComSpeed [9600,19200, 38400, 57600]

If the Modbus mode is selected on COM1 or COM2 channels, the Modbus communication speed in *bps* can be adjusted here.

IBLite IP Addr

IP address of IB-Lite module

IBLite NetMask

IB-Lite network mask

IBLite GateIP

IP address of gateway for IB-Lite

ComAp Port

Port for ComAp communication over IB-Lite or IL-NT-GPRS module

APN Name

Name of APN access point for GPRS network.
Hint:
This information shall provide the your GSM/GPRS operator.

APN UserName

User name for APN access point.
Hint:
This information shall provide the your GSM/GPRS operator.

APN UserPass

User password for APN access point.
Hint:
This information shall provide the your GSM/GPRS operator.

AirGate IP

IP address of AirGate server.

SMTP UserName

User name or name of e-mail account for verification of email sender on SMTP server. If parameter left empty, no verification is expected. Works for IB-Lite only.

SMTP UserPass

User password of e-mail account for verification of e-mail sender on SMTP server. If parameter left empty, no verification is expected. Works for IB-Lite only.

SMTP Server IP

IP address of SMTP server. Works for IB-Lite only.

Contr MailBox

E-mail address used as “Sender” of alarm e-mails from IB-Lite.
Hint:
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.

Time Zone

List of time zones used for time reference.

DNS IP Address

IP address of Domain Name Server.

Engine params

Starting RPM [RPM]

“Firing” speed when ID-Lite controller stops cranking (starter goes OFF).
Sd Underspeed protection is activated when RPM drops back below the *Starting RPM* for more than 5 second the engine starting procedure.

Limit is ignored when Gear teeth = 0 i.e. in engine operation without speed pickup (running state is indicated from D+ or Starting POil.
Step: 1 RPM
Range: 5 – 1500 RPM

RPM meas fail indication
When during "Cranking state" ... i.e. Starter (or J1939 Start command) is activated
then one running condition was detected (D+ was activated or (POil > Starting POil) condition was filled) - i.e. Starter was switched off based on it
and
within time of minimum of (fix 5s and Cranking time) do not appear RPM > Starting RPM --- then is activate RPM meas fail.

Starting POil [Bar]

Controller stops cranking (starter goes OFF) when Oil Pressure (typically measured on AIN1) is over *Starting POil*.
Step: 0,1 Bar
Range: 0,0 – 10,0 Bar
Hint:
There are three conditions for stop cranking: Starting RPM (just in case the Gear teeth > 0), StartingPOil and D+ (when enabled). Starter goes off when any of these conditions is valid.

Prestart time [s]

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 PRE-START opened.
Step: 1s
Range: 0 – 600 s

Preglow time [s]

Time of the PREGLOW output closed prior to the engine start. Set to zero if you want to leave the output PREGLOW opened.

Function with shorter period (*Prestart time* or *Preglow time*) starts later to finish both in the same time – when *Starting RPM* speed is reached.

Step: 1s
Range: 0 – 600 s

MaxCrank time [s]

Maximum time limit of engine cranking.
Step: 1s
Range: 1 – 60 s

CrnkFail pause [s]

Pause between crank (engine start) attempts.
Step: 1s
Range: 5 – 60 s

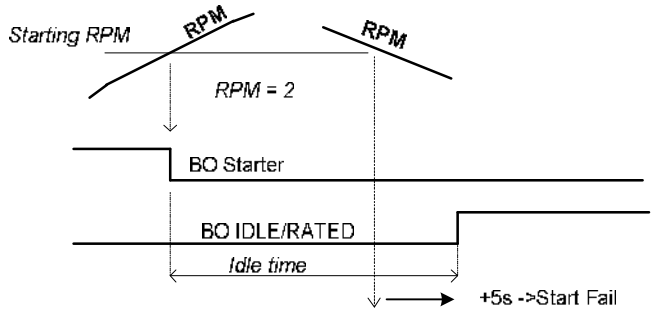
Crank attemps [-]

Max number of crank (engine start) attempts.
Step: 1
Range: 1 – 10

Idle time [s]

Idle time delay starts when RPM exceeds *Start RPM*. Start fail is detected when during Idle state RPM decreases below 2.
During the *Idle time* timer running the binary output IDLE/NOMINAL is opened, when it elapses the IDLE/NOMINAL output closes. Binary output IDLE/NOMINAL opens during Cooling period again.
Engine can be switched between Idle and Running state by Binary input Nominal/Idle in MAN mode.

Step: 1 s
Range: 0 – 600 s



Idle speed [RPM]

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 shut-down.
Step: 1RPM
Range: *Starting RPM – MinSpeedLimit*

Cooling speed [NOMINAL, IDLE]

Selects the function of the Binary output IDLE/NOMINAL during engine Cooling state.
NOMINAL : Cooling is executed at Nominal speed.
IDLE: Cooling is executed at Idle speed.
Hint:

Binary output IDLE/NOMINAL must be configured and connected to speed governor. Engine Idle speed must be adjusted on speed governor.

Cooling time [s]

Runtime of the unloaded engine to cool the engine before stop.
Step: 1s
Range: 0 – 3600 s

AfterCool time [s]

Runtime of engine after cooling pump. Binary output *Cooling pump* is closed when the engine starts and opens *AfterCool time* delayed after engine stops.
Step: 1s
Range: 0 – 3600s

Stop time [s]

Under normal conditions the engine must certainly stop within this period. The period starts by issuing stop command.
Step: 1s
Range: 0 – 240 s
Hint:
Stop of engine is detected when all following conditions are met: RPM <2, Oil pressure < *StartingPOil* and D+ input isn't active.
Stop fail is detected when there is difference between those conditions.

Fuel solenoid [DIESEL / GAS]

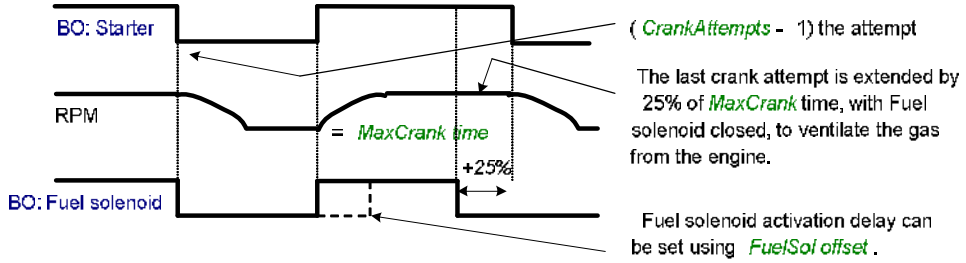
Setpoint setting determines behavior of the Binary output FUEL SOLENOID.
DIESEL: Output closes 1 sec before Binary output STARTER.
The output opens if Emergency stop comes or Cooled engine is stopped and in pause between repeated starts.
GAS: In this mode of operation the output closes to open the gas 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.
Hint:
In the case of gas engine, the underspeed protection cannot be blocked by the Sprinkler function.
For gas engines, it is strongly recommended to use the pick-up sensor, as non-zero RPM detection is required during the start procedure.

FuelSol offset [s]

This setpoint adjusts the Fuel solenoid output activation in relation to Starter output when *Fuel solenoid* = GAS. Setpoint's values mean that fuel valve is opened after the Starter. *FuelSol offset* has effect for both *Fuel solenoid* = DIESEL or GAS.
Step: 0,1 s
Range: 0,0 – 30,0 s

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

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 IGS-NT. This function is valid only when **Engine params**: *Fuel solenoid* = GAS:



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 = (fix) 30 RPM. The output opens after stopping of the engine or during crank fail pauses among crank attempts.

D+ function [ENABLED, CHRGFAIL, DISABLED]

ENABLED: The D+ terminal is used for both functions – "running engine" detection and charge fail detection.
CHRGFAIL: The D+ terminal is used for charge fail detection only.
DISABLED: The D+ terminal is not used.
Hint:
The magnetization current is provided independently on this setpoint value.
The D+ charge fail protection becomes active after **Engine params**: *Idle time* reaches zero.

ECU FreqSelect [PRIMARY, SECONDARY, DEFAULT]

Volvo – "Volvo Aux" is selected in ECU configuration:
Primary or secondary engine speed is set by *Frequency select* bits in **VP Status** frame.
Scania – "Scania S6 Singlespeed" is selected in ECU configuration:
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.

ECU Control [ENABLED, STARTSTOP, DISABLED]

The setpoint enables adjustment of the electronic engine control by following settings:
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
STARTSTOP – there is a limited control of an electronic engine reduced to both Start request and Stop request. The Speed request is blocked.
DISABLED – a control of an electronic engine is fully blocked and the ID-Lite can only monitor the values of an electronic engine.
Default: ENABLED

ECU SpeedAdj [RPM]

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.
Speed request in % range is calculated using the setpoints *0%ofSpeedReq* and *100%ofSpeedReq.*
Step: 1RPM
Range: *MinSpeedLim – MaxSpeedLim*

RetToSpeedAdj [ENABLED, DISABLED]

Selection between LBI Speed selection1, ..2, ..3 behavior.

DISABLED: Speed request is set by LBI Speed selection1, ..2, ..3 (see corresponding 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.
ENABLED: Speed request goes to *ECU SpeedAdj* when the LBI Speed selection1, ..2, ..3 is opened. Speed request can be changed by Binary inputs Speed Up and Speed Down when LBI Speed selection 1, ..2, ..3 is closed.

MinSpeedLim [RPM]

The setpoint presets the minimum engine speed in the "Running" operation mode. Also see other conditions in the chapter below.
Step: 1 RPM
Default: 1200 RPM
Range: *Starting RPM – MaxSpeedLim*

MaxSpeedLim [RPM]

The setpoint presets the maximum engine speed in the "Running" operation mode. Also see other conditions in the chapter below.
Step: 1 RPM
Default: 2700 RPM
Range: *MinSpeedLim* – 4000 RPM

BI Speed Sel 1 [RPM]

The setpoint presets the required engine speed during the 'Speed Sel 1' binary input is active. Function depends on RetToSpeedAdj setting.
Step: 1 RPM
Default: 1250 RPM
Range: *MinSpeedLim – MaxSpeedLim*

BI Speed Sel 2 [RPM]

The setpoint presets the required engine speed during the 'Speed Sel 2' binary input is active. Function depends on RetToSpeedAdj setting.
Step: 1 RPM
Default: 1300 RPM
Range: *MinSpeedLim – MaxSpeedLim*

BI Speed Sel 3 [RPM]

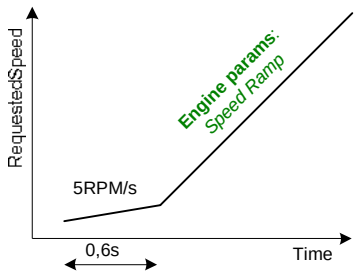
The setpoint presets the required engine speed during the 'Speed Sel 3' binary input is active. Function depends on RetToSpeedAdj setting.
Step: 1 RPM
Default: 1450 RPM
Range: *MinSpeedLim – MaxSpeedLim*

Hint:
When none of the binary inputs: 'Speed Sel 1', 'Speed Sel 2' and 'Speed Sel 3', 'Speed Up' and 'Speed Down' has not been configured then engine speed is given by the '**Engine params:** *ECU SpeedAdj*' setpoint.

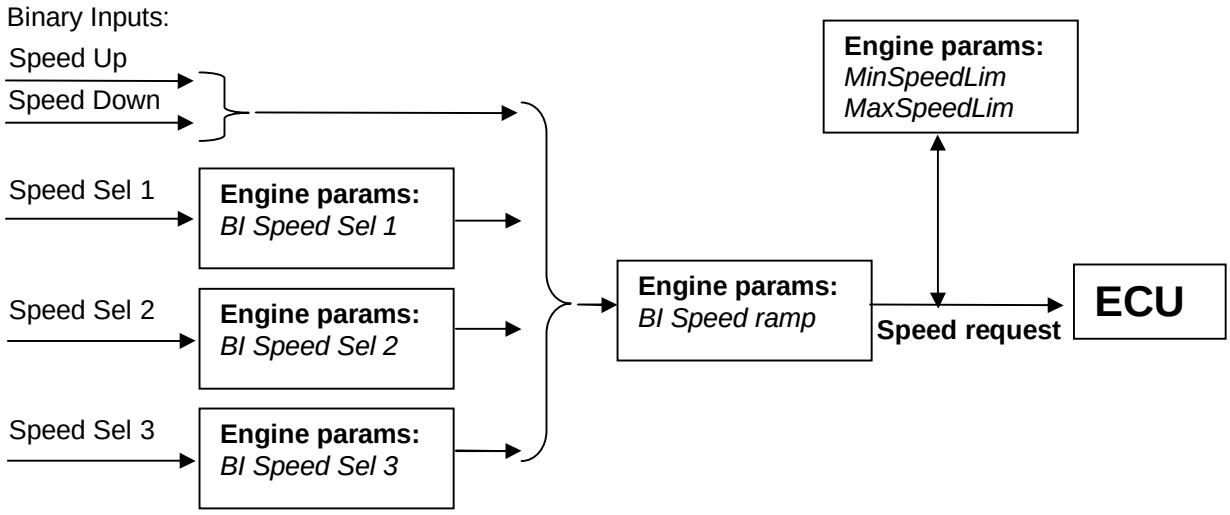
BI Speed Ramp [RPM/s]

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

The Binary inputs SpeedUp and SpeedDown ramp function is for the 0,6 sec constant 5RPM/s not depend on Engine params: SpeedRamp setting. This enables fine setting of Engine speed to specific like 1500 RPM value.



Step: 1 RPM/s
Default: 100 RPM
Range: *MaxSpeedLim*



0%ofSpeedReq [RPM]

Limit for Speed Request transformation from RPM to % range for ECU engines using % format.
Step: 1 RPM
Default: 0 RPM
Range: 0 – 3000 RPM

100%ofSpeedReq [RPM]

Limit for Speed Request transformation from RPM to % range for ECU engines using % format.
Step: 1 RPM
Default: 2000 RPM
Range: 0 – 4000 RPM

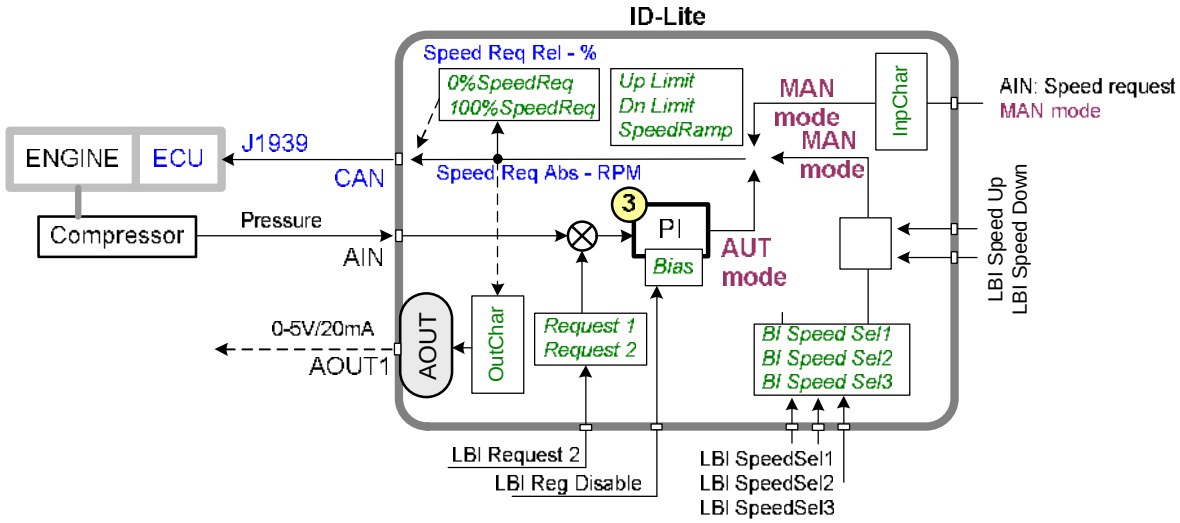
Conveyor horn [s]

Horn time before the conveyor output starts.
Step: 1 s
Default: 7 s
Range: 0 – 600 s

Running timer [min]

Automatic engine stop in MAN mode or delayed engine stop in AUT mode.
Step: 1 min
Default: 0 min
Range: 0 – 1000 min

Regulator



LAI SpdRequest [OFF, CU:AI1, CU:AI2, CU:AI3 AIO: IA1, AIO: AI2, AIO: AI3, AIO: AI4]

Selection of analog Speed request in controller MAN mode.
OFF: Speed request selection is done by binary inputs.
CU: AI1, CU: AI2, CU: AI3: AIO1 … AIO4: Speed request via analog input only. Binary inputs are ignored. Analog speed request is ignored in AUT mode.

Reg Input [CU: AI1, CU: AI2, CU: AI3, AIO: IA1, AIO: AI2, AIO: AI3, AIO: AI4, RPM-BI3]

PI loop analog input selection or from central unit (CU) or from plug-in (AIO). The Speed request (regulator output) is set to *Reg Bias* value in the case of selected analog input sensor fail.

Reg Bias [-]

Constant PI regulator output when the LBI R Reg Disable = closed.
Step: 1
Range: 0 – 10000
Default: 0

Request 1 [-]

Regulator requested value.
Step: 1
Range: -10000 – +10000
Default: 0

Request 2 [-]

Regulator requested value when LBI Request2 is active.
Step: 1
Range: -10000 – +10000
Default: 0

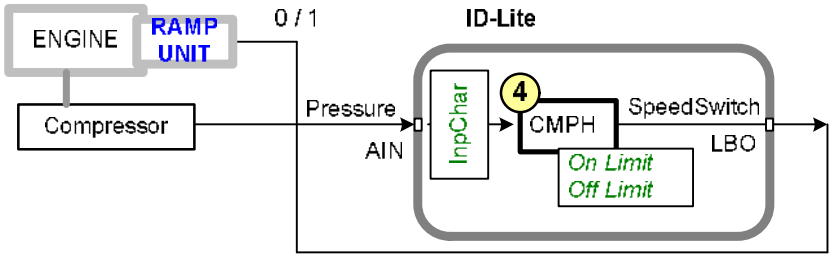
Reg Gain [%]

Regulator gain.
Step: 0,1

Range: -200,0% – +200,0%
Default: 0

Reg Integral [%]

Regulator integration factor.
Step: 0,1
Range: 0% – +100,0%
Default: 0



Reg CMP Input [CU: AI1, CU: AI2, CU: AI3, AIO: IA1, AIO: AI2, AIO: AI3, AIO: AI4, RPM-BI3]

Comparator with hysteresis analog input selection or from central unit (CU) or from plug-in (AIO).

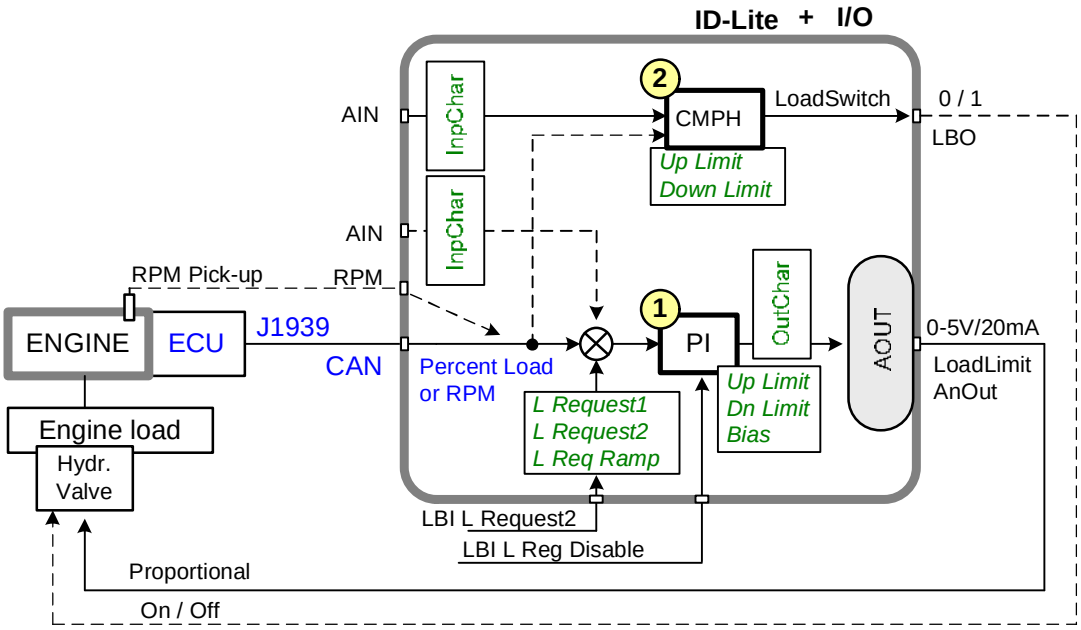
Reg CMP On [-]

Limit to close LBO SpeedSwitch
Step: 1
Range: -10000 – +10000
Default: 0

Reg CMP Off [-]

Limit to open the LBO SpeedSwitch.
Step: 1
Range: -10000 – +10000
Default: 0

Load limit



Load input [RPM, ECU:Load,

CU: IA1, CU: AI2, CU: AI3, AIO: IA1, AIO: AI2, AIO: AI3, AIO: AI4]

Load limit PI loop analog input selection or from ECU or from central unit (CU).

Load Bias [-]

Load limit constant PI regulator output. *Load Bias* is activated when

- Engine Sd protection is activated
- LBI L Reg Disable = closed
- Load input value is invalid (Sensor Fail)

Step: 1
Range: 0 – 10000
Default: 0

LoadRequest1 [-]

Regulator requested value.
Step: 1
Range: -10000 – +10000
Default: 100

Load request2 [-]

Regulator requested value.
Step: 1
Range: -10000 – +10000
Default: 80

LoadReqRamp [1/s]

Ramp when switching between LoadRequest1 and LoadRequest2.
Step: 1/s
Range: 1 – +10000/s
Default: 100

LoadUpLimit [-]

Load limit regulator PI output upper limit.

Step: 1
Range: 0 – 10000
Default: 100

LoadDnLimit [-]

Load limit regulator PI output low limit.
Step: 1
Range: 0 – 10000
Default: 9900

Load Gain [%]

Regulator gain.
Step: 0,1
Range: -200,0% – +200,0%
Default: 0

Load Integral [%]

Regulator integration factor.
Step: 0,1
Range: 0% – +100,0%
Default: 0

Load CMP Input [RPM, ECU:Load,

CU: IA1, CU: AI2, CU: AI3, AIO: IA1, AIO: AI2, AIO: AI3, AIO: AI4]

Comparator with hysteresis analog input selection or from central unit (CU) or from plug-in (AIO).

Load CMP Off

Limit to close LBO LoadSwitch
Step: 1
Range: -10000 – +10000

Load CMP On

Limit to open LBO LoadSwitch
Step: 1
Range: -10000 – +10000

Engine protect

Eng prot del [s]

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*.
Step: 1s
Range: 0 – 300 s

BIN6 delay [s]

Specific protection delay adjustable on Binary Input 6. Delay is active for Wrn or Sd protection only - not for functions like Rem Start/Stop. Protection delay is active for both Binary input NO / NC configuration. *BIN6 del* starts after *Eng prot del* when BI6 protection is configured “Running only”.
Step: 1s
Range: 0 – 300 s

Horn timeout [s]

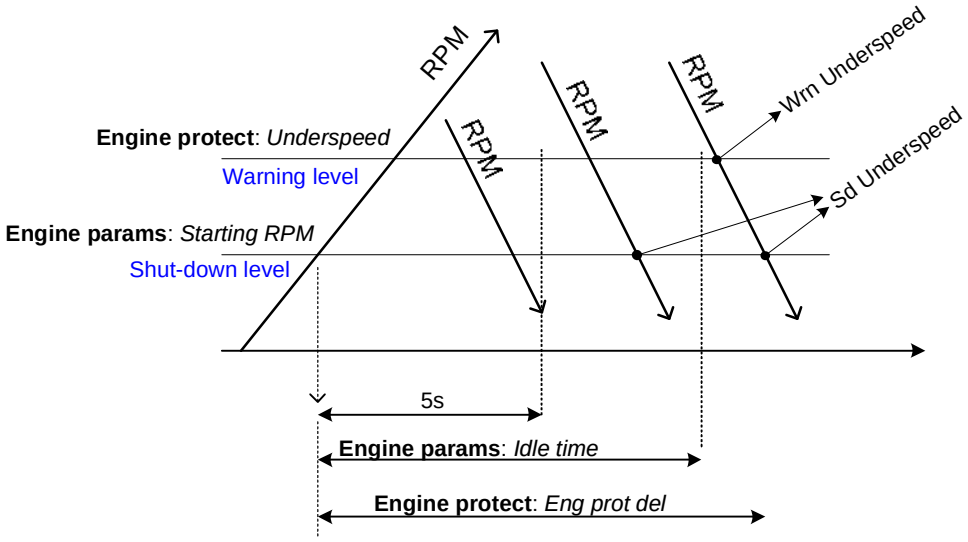
Max time limit of horn sounding. Set to zero if you want to leave the output HORN open. Horn timeout starts again from the beginning if a new alarm appears before previous Horn timeout has elapsed.
Step: 1s
Range: 0 – 600 s

Overspeed [%]

Limit for engine Sd overspeed protection.
Step: 1% of nominal RPM
Range: 50 – 150%

Underspeed [%]

The limit for Warning Underspeed protection. Active protection is indicated as "Wrn underspeed" in Alarm list. Under speed Warning protection is inactive 5 second after RPM is over **Engine params**: *Starting RPM* and during the Idle time.
The "Ready to load" output is deactivated when Wrn underspeed protection is active and needs the Fault reset for activation after RPM is over Underspeed limit.
Step: 1% of nominal RPM
Range: *Starting RPM* – 100%



UnderspeedSd [ENABLED / DISABLED]

The UnderspeedSd parameter specifies if underspeed shutdown protection limit is given by *Starting RPM* parameter (ENABLED) or set to fix level = 10RPM (DISABLED).

AnIInp1 level1 [Bar]

Warning limit level for ANALOG INPUT 1
Step: 0,1 Bar
Range: -10 – 1000 Bar

AnIInp1 level2 [Bar]

Shutdown limit level for ANALOG INPUT 1
Step: 0,1 Bar
Range: -10 – 1000 Bar

AnIInp1 del [s]

Delay for ANALOG INPUT 1
Step: 1 s

Range: 0 – 180 s

AnIInp2 level1 [ ]

Warning limit level for ANALOG INPUT 2
Step: 1 °C
Range: -100 – 10000

AnIInp2 level2 [ ]

Shutdown limit level for ANALOG INPUT 2
Step: 1 °C
Range: -100 – 10000

AnIInp2 del [s]

Delay for ANALOG INPUT 2 alarm.
Step: 1 s
Range: 0 – 180 s

AnIInp3 level1 [ ]

Warning limit level for ANALOG INPUT 3
Step: 1 %
Range: -100 – 10000

AnIInp3 level2 [ ]

Shutdown limit level for ANALOG INPUT 3
Step: 1 %
Range: -100 – 10000

AnIInp3 del [s]

Delay for ANALOG INPUT 3
Step: 1 s
Range: 0 – 180 s

Batt overvolt [V]

High battery voltage Warning limit.
Step: 0,1 V
Range: 8(Batt undervolt)– 40 V

Batt undervolt [V]

Low battery voltage Warning limit.
Step: 0,1 V
Range: 8V – 40 (Batt overvolt)

Batt volt del [s]

Delay for low and high battery voltage alarm.
Step: 1s
Range: 0 – 600 s

NextServTime [h]

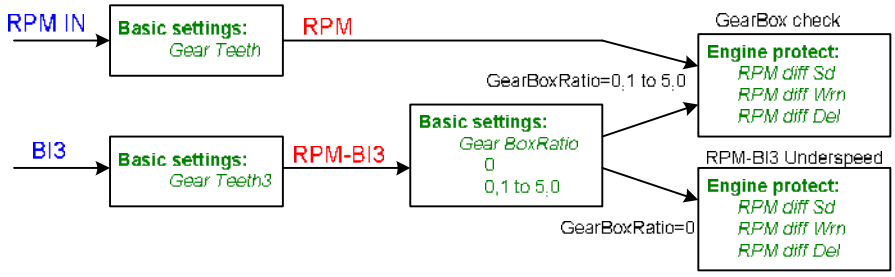
Counting down when engine running. Service time alarm appears if reaches zero.
Step: 1h
Range: 0 – 65535h

GearBoxRatio [-]

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

- Separate RPM-BI3 underspeed Wrn and Sd protection when **Engine protect**: *GearBoxRatio* = 0,0.
- Difference check between RPM and RPM3 with calculation of gear-box transmition ratio when **Engine protect**: *GearBoxRatio* > 0,0. Protection is active when engine is Ready to load.

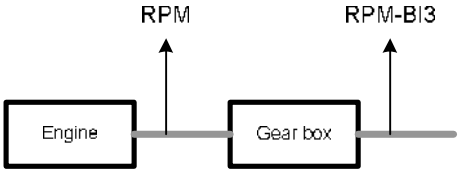
Step: 0,1
Range: 0,0 – 5,0



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

RPMdiff Sd [-]

RPM-BI3 Sd underspeed protection limit or Sd difference limit between RPM-BI3 and RPM transferred via GearBoxRatio. See description in GearBoxRatio setpoint.
Message: Sd RPMdiff
Step: 1
Range: 1 – 1000



RPMdiff Wrn [-]

RPM-BI3 Sd underspeed protection limit or Sd difference limit between RPM-BI3 and RPM transferred via GearBoxRatio. See description in GearBoxRatio setpoint.
Message: Wrn RPMdiff
Step: 1
Range: 1 – 1000

RPMdiff delay [-]

Delay for RPMdiff protections above. See description in GearBoxRatio setpoint.
Step: 1 s
Range: 0 – 600 s

Date/Time

Time stamp per [min]

Time interval for periodic history records.
Step: 1 min
Range: 0 – 200min

SummerTimeMod [DISABLED / WINTER / SUMMER / WINTER-S / SUMMER-S]

DISABLED: Automatic switching between summer and wintertime is disabled.
WINTER (SUMMER) : Automatic switching between summer and wintertime is enabled and it is set to winter (summer) season.

WINTER-S (SUMMER-S) : Modification for southern hemisphere.

Time [HHMMSS]

Actual time.

Date [DDMMYYYY]

Actual date.

Timer1Function [NoFunction, AutoRun, AutoRegCMP, AutoBatt]

NoFunction: operates just corresponding LBO Exerc Timer1 according the Timer1 setting – see *Timer1 repeat*, *Time1 ONtime*, *Timer1Duration*. Function operates in all OFF-MAN-AUT modes.

AutoRun: Engine automatically starts and stops in AUT mode according the Timer1 setting.

AutoRegCMP: start and stop engine in AUT mode according the LBO Speed switch - see **Regulator**: *Reg CMP* setpoints. The comparator function (output) works opposite when **Regulator**: *Reg CMP On* < *Reg CMP Off*. The **Date/Time**: .. *repeat*, ..*ON time*, ..*Duration* settings are not important in this case.

AutoBatt: engine starts when actual Battery voltage < **Engine protect**: *Batt undervolt* + *Batt volt del* and stays running for **Date/Time**: *Timer1 Duration*. Function operates in AUT mode.

Timer1..2 repeat [NONE/MONDAY/TUESDAY/WEDNESDAY/THURSDAY/WEDNESDAY/FRIDAY/SATURDAY/SUNDAY/MON-FRI/MON-SAT/MON-SUN/SAT-SUN]

Defines TIMER1 activation. Binary output TIMER1 is internally linked with Rem Start/Stop binary input. Refer to binary inputs for details.

NONE: Timer function is disabled
MONDAY, TUESDAY, WEDNESDAY, THURSDAY, WEDNESDAY, FRIDAY, SATURDAY, SUNDAY:
Timer is activated on daily basis.
MON-FRI, MON-SAT, SAT-SUN:
Timer is activated on selected day interval.

Timer1..2 ON time

Day time when Timer 1..2 output activates.

Timer1..2Duration

Duration of Timer 1..2 output.
Step: 1 min
Range: 1 – 1440 s

Sensor spec

Calibr AI1, AI2, AI3 […]

Calibrating constant to adjust the measured value of ID-Lite analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.
Step: 1
Range: -1000 – +1000
Hint:
Calibration constants have to be adjusted when measured value is near the alarm level.

CalibrAIO 1..4 […]

Calibrating constant to adjust the measured value of plug-in analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.
Step: 1

Range: -1000 – +1000

AIO module

AnlInAIO1..4 lev1 [ ]

The level for AIO ANALOG INPUT 1..4 alarm detection.
Step: 1
Range: -100 - +10000

AnlInAIO1..4 lev2 [ ]

The level for AIO ANALOG INPUT 1..4 alarm detection.
Step: 1
Range: -100 - +10000

AnlInAIO1..4 del [s]

Delay for AIO ANALOG INPUT 1..4 alarm.
Step: 1 s
Range: 0 - 180 s

Hint:
Plug-in analog inputs protection alarms can be configured following way

Configuration	Protection
Under	Protection is activated only when measured value is under measured level.
Over	Protection is activated only when measured value is over measured level.
Under+fls	Level 2 protection is activated by sensor fail as well.
Over+fls	Level 2 protection is activated by sensor fail as well.

SMS/E-Mail

Remote alarm messaging

If a GSM 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 GSM phone number and/or e-mail address to the setpoints TelNo/Addr Ch1 and TelNo/Addr Ch2. It is possible to put either a GSM number or e-mail to both setpoints.

NOTE:
An internet module must be available for sending of e-mails. Similarly, a GSM modem is necessary for sending of SMS.

Hint:
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 is trying to send an active call type, incoming calls are blocked.

Yel Alarm Msg [OFF / ON]

Set this setpoint to YES if you want to get messages when a **yellow** (warning) alarm occurs.

Hint
The target address (GSM phone number or e-mail address) must be set correctly to the setpoint(s) TelNo/*Addr Ch1* resp. TelNo/*Addr Ch2*.

Red Alarm Msg [OFF / ON]

Set this setpoint to YES if you want to get messages when a **red** (shutdown) alarm occurs.

Hint

The target address (GSM phone number or e-mail address) must be set correctly to the setpoint(s) TelNo/*Addr Ch1* resp. TelNo/*Addr Ch2*.

TelNo/Addr Ch1, 2

Enter either a valid GSM 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.

Hint:

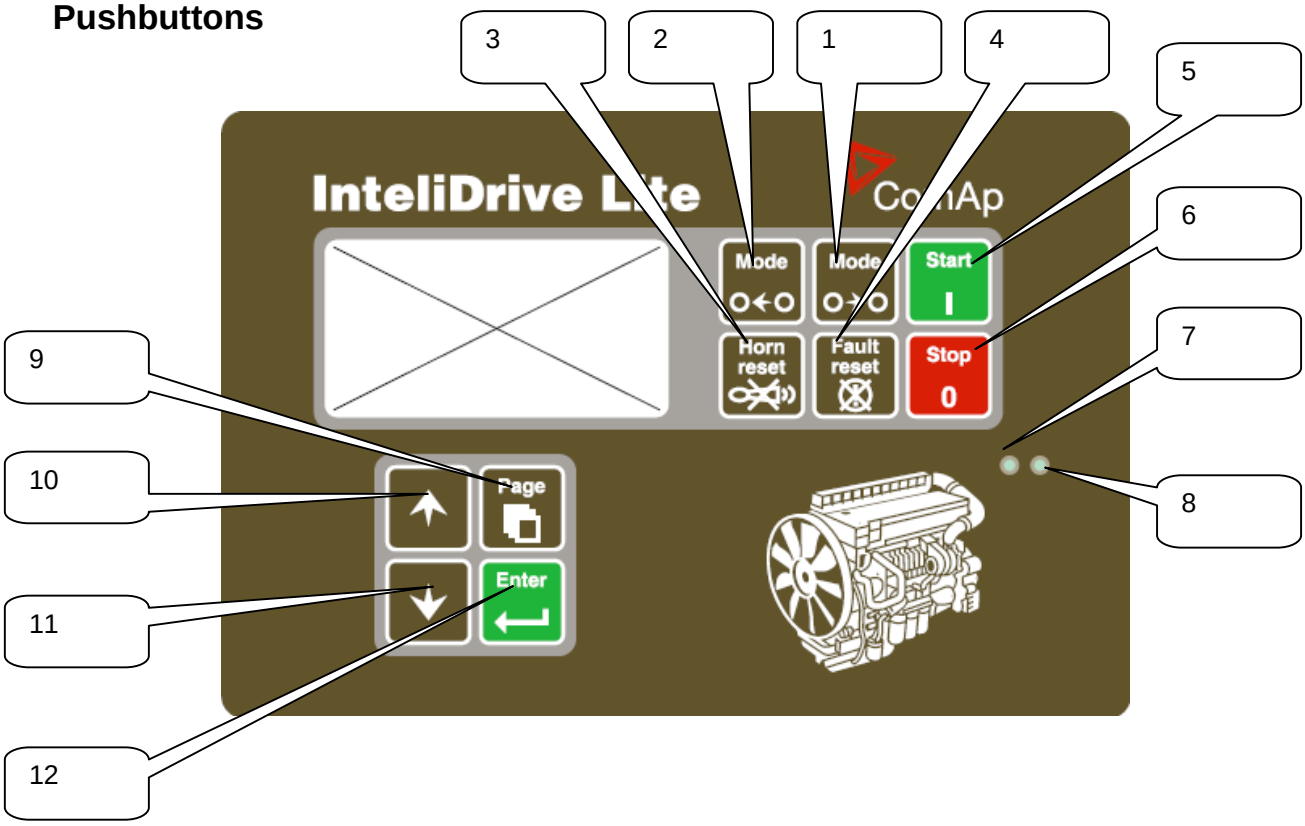
For GSM numbers use either national format (i.e. like number you will dial if you want to make a local call) or full international format with "+" character followed by international prefix in the begin.

This setpoint can be modified from PC only!

Operator interface

Pushbuttons and LEDs

Pushbuttons



1. MODE→ Cyclic forward selection the engine operation mode (OFF -> MAN -> AUT)
2. ←MODE Cyclic backward selection the engine operation mode (AUT -> MAN ->OFF)
3. HORN RESET Deactivates the HORN
4. FAULT RESET Acknowledges faults and alarms
5. START Start of the engine
6. STOP Stop of the engine
7. GREEN LED Engine running
8. RED LED Engine fail
9. PAGE Cyclic selection of the display mode(MEASUREMENT->ADJUSTEMENT)
10. ⇑ Select the set point, select the screen or increase set point value
11. ⇓ Select the set point, select the screen or decrease set point value
12. ENTER Confirm set point value

Serial number, Password decode and Diagnostic data are available on User interface screen

Init screens

Customer Logo screen

This is a first screen which is dedicated for information provided by customers such as contact numbers, service technician contact and customer message for end users of gen-set. Configuration of this screen is only done by LiteEdit PC software.

Firmware Init screen

This screen contains information about type of controller, controller manufacturer ComAp, uploaded firmware branch, used application and version of firmware. There is also information about currently configured electronic engine, respectively used ESF file.

Details on recognition of configured electronic engine are in chapter Identifying configured ECU.

Language screen

ID-Lite controller offers configurable language support. On this screen is possible to switch between languages configured in controller.
Other way to change language is by binary input Lang Selection.

User Interface screen

ID-Lite controller since ID-LITE-1.6 SW 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 settings of controller, reviewing the history, measurement and alarms. This mode is default.

Display menus: User and Engineer

There are 3 display menus available: MEASUREMENT and ADJUSTMENT and HISTORY in Engineer menu and just MEASUREMENT in User menu.
Each menu consists of several screens. Press repeatedly PAGE button to select requested menu.

Switching between User and Engineer menus

Hold ENTER and then press PAGE to activate info screen and the panel LED test. Within 10second press PAGE to switch to Language selection screen and the second time PAGE to switch to User interface selection.

How to select the engine mode ?

Use MODE→ or ←MODE to select requested engine operation mode
(OFF – MAN – AUT)

How to view measured data?

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

How to view and edit set points?

1. Use repeatedly PAGE button to select the ADJUSTMENT menu.
2. Use ⇑ or ⇓ to select requested set points group.
3. Press ENTER to confirm.
4. Use ⇑ or ⇓ to select requested set point.
5. Set points marked **"*"** are password protected.
6. Press ENTER to edit.
7. Use ⇑ or ⇓ to modify the set point. When ⇑ or ⇓ is pressed for 2 sec, auto repeat function is activated.
8. Press ENTER to confirm or PAGE to leave without change.
9. Press PAGE to leave selected set points group.

How to change the display contrast?

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

Hint:

Only in MEASUREMENT menu.

How to check the serial number and software revision?

Hold ENTER and then press PAGE. This activates the panel LED test. On the display you can see (for 10 seconds) ID-Lite INFO screen containing:

1) *Controller name* (see **Basic setting** group)
2) ID-Lite serial number (8 character number)
3) SW version: the first is the firmware version number;
   the second is configuration table number.
4) Application: DCU
5) Branch: Standard

Hint:

Only in MEASUREMENT menu.

How to change language?

Hold ENTER and then press PAGE to get to Serial number and software revision screen. Then press PAGE to enter Language selection screen. Use ⇑ or ⇓ to select desired langue and press ENTER to confirm selection.

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:

	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 FAULT RESET 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.

Hint:

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

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 signalized in the standard alarm list and by exclamation mark on the main measure screen.
Control from the front panel:

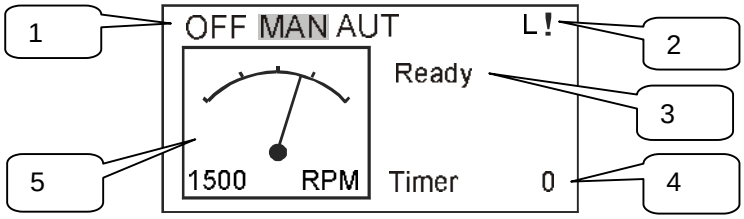
↑↓	One screen up/down
Enter	Cursor move within the ECU alarm list
Enter + Fault reset	ECU fault code reset

How to list History records ?

1. Use repeatedly PAGE button to select the History menu.
2. Use ⇑ or ⇓ to select requested History line – see Reason, Date and Time.
3. Press ENTER to go-on line to right – see recorded values.
4. Use repeatedly PAGE button to go back to Measurement screen.

MEASUREMENT screens description

Main measure screen



1. Operation mode of the engine
2. Indication: **R**=Remote access, **L**=Access lock, **!** =active Alarm
3. Status of the engine
4. Timer - events counting time (e.g. prestart, cooling, etc.)
5. Engine RPM

ID-Lite Analog inputs screen

Oil pressure	(AI1 bargraph with protection limits indication)
Water temperature	(AI2 bargraph with protection limits indication)
Fuel level	(AI3 bargraph with protection limits indication)
Battery voltage	(power supply bargraph with protection limits indication)

AnInAIO Analog inputs screen

AnInAIO1	(AI1 bargraph with protection limits indication)
AnInAIO2	(AI2 bargraph with protection limits indication)
AnInAIO3	(AI3 bargraph with protection limits indication)
AnInAIO3	(AI3 bargraph with protection limits indication)

Hint:

This screen is shown/hidden depending on whether the plug-in is configured or not.
Extension module screens are invisible in ID-Lite-s-2.0.ail configuration file.

ID-Lite Binary inputs

BI1 to BI6

Invisible in ID-Lite-s-2.0.ail configuration file.

ID-Lite Binary outputs

BO1 to BO6

Invisible in ID-Lite-s-2.0.ail configuration file.

ECU State

ECU YellowLamp
ECU RedLamp
WaitToStart

Hint:

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

ECU Values

Oil pressure	Bar or psi	
Water temp	°C or °F	
PercLoadAtCS	%	(Percentual load at current speed.)
Boost pressure	Bar or psi	
ManifoldTemp	°C or °F	
Fuel rate	L/h or gph	

Hint:

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

Statistic

Run hours
Number of starts
E-Stop Number of engine Emergency stops (without Shut-downs)
ShutDown Number of engine Shut down stops (without Emergency stops)

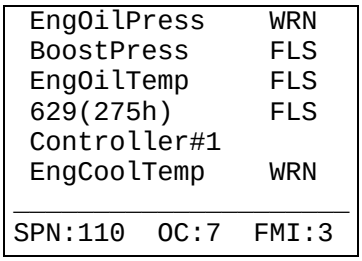
NextServTime

Hint:
Invisible in ID-Lite-s-2.0.ail configuration file.
Running time is measured in complete minutes, displayed in complete hours. Values are stored in nonvolatile memory.

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.



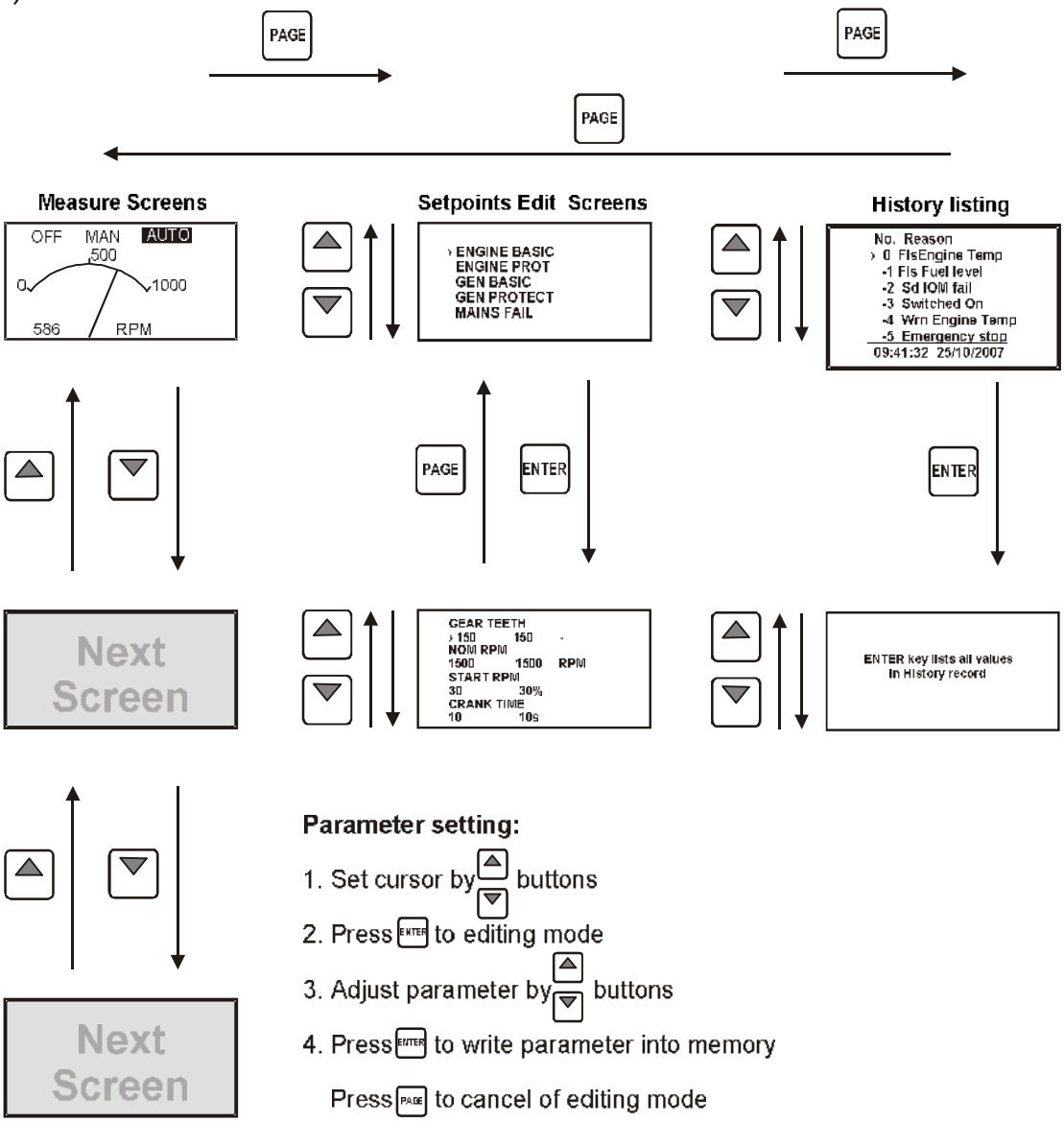
Hint:
For FMI = 0 and 1, WRN is displayed. For other FMI codes, FLS is displayed.

Alarm list

Displays active or inactive alarms configured on ID-Lite Binary or analog outputs.
ID-Lite controller automatically switches to the Alarm list screen when any new Alarm appears, but from Main measure screen only.

Chart guide to menus and pushbutton's operation

Chart is valid for User interface: Engineer
User screen allows just Measure screens view.
No setpoints, No history screens are visible when User interface = User (use Enter+Page, Enter, Enter).



ID-Lite-s-2.0.ail configuration file has reduced screen structure.

Default configuration			Display mode	
ID-Lite-2.0.AIL	**ID-Lite-s-2.0.AIL**		**User**	**Engineer**
Home Analog inputs Binary inputs Binary outputs Statistics (ECU Analog values) (ECU Alarm list) Alarm list	Home Analog inputs (ECU Analog values) (ECU Alarm list) Alarm list		Measuring only	Measuring Setpoints History

Alarm management

Following alarms are available:

- Sensor fail
- Warning
- Shut down

Sensor fail (FLS)

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

Warning (WRN)

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

Possible warnings:

See List of possible events

Shut down (SD)

When the shut-down alarm comes up, ID-Lite opens outputs 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.

Hint:

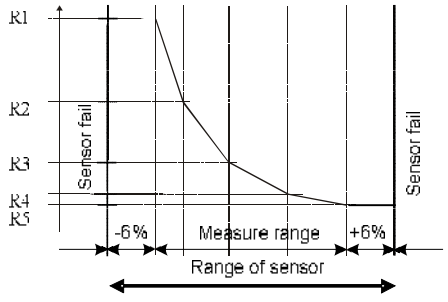
Engine running only alarms are activated **Engine protect**: *Eng prot del* after the engine RPM > **Engine params**: *Starting RPM* during the engine starting procedure.

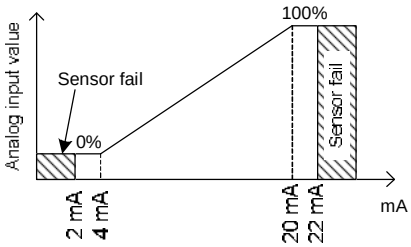
Possible shut-down alarms:

See List of possible events

Sensor fail detection

Sensor fail Fls is detected when measured value is 6 percent out of range. Controller screen displays in this case string #### instead measured value.





Engine operation states

Engine state machine

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 speed is reached and the *Idle timer* is running
Running	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

List of possible alarms

Events specification	Protection type	Information on binary output available (See list of Binary outputs)	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.
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 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 ID-Lite.
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.
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,

Events specification	Protection type	Information on binary output available (See list of Binary outputs)	Description
			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*.
Underspeed	WRN	YES	The protection is active if RPM goes below the limit adjusted by *Underspeed* setpoint.
EmergencyStop	SD	NO	If the input *Emergency stop* is opened shutdown is immediately activated.
PickupFault	SD	NO	Failure of magnetic pick-up sensor for speed measurement.
Stop fail	SD	YES	Engine stop failed.
WrnServiceTime	WRN	NO	The period for servicing is set by the *NextServTime* setpoint. The protection comes active if the running hours of the engine reach this value.
ChrgAlternFail	WRN	YES	Failure of alternator for charging the battery.
SprinklActive	WRN	NO	The protection is active if the output *Sprinkler* is closed.
Wrn 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

History file

InteliDrive-Lite stores a record of each important event into the history file. The history file seats 117 records. When the history file is full, the oldest records are removed.

Hint:

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

Record structure

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
UBat	Battery voltage
OilP	ID-Lite Analog input 1 value (default Oil pressure)
EngT	ID-Lite Analog input 2 value (default Water temperature)
FLvl	ID-Lite Analog input 3 value (default Fuel level)
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 ID-Lite
BIM	Binary inputs of plug-in
BOUT	Binary inputs ID-Lite
BOM	Binary outputs of plug-in
FC	ECU alarm Failure Code
FMI	ECU alarm Failure Mode Identifier

The ECU values are not recorded to history.

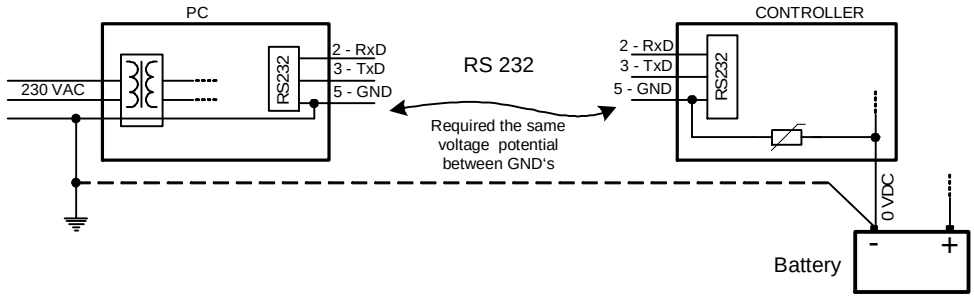
Remote control and data logging

ID-Lite-2.0 is distributed as ID-Lite-2.0.iwe package. It is compatible with the LiteEdit-4.5 (or - 4.5.1) PC software – use installation package LiteEdit 4.5 r1 Installation Suite from ComAp web.

Direct connection to the PC

ID-Lite can be connected directly with PC via optional IL-NT RS232 interface.
Use the standard serial cable to connect PC with ID-Lite.

Hint:
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).



RS232, USB or RS485 interface can be used for direct cable connection to a PC. The setpoint *COM1 Mode* or *COM2 Mode* (according to the interface used) must be set to DIRECT position for this kind of connection.

SMS commands

Examples

Value reading	#1:0 r8276	#1 … controller address 0 … access code r8276 … read value number 8276
… response	#Gen-set name: 100	
Setpoint setting	#1:0 p1234,r8276,w8276 110,r8276	#1 … controller address 0 … access code p1234 … password r8276 … read value of 8276 w8276 110 … write 110 to 8276 r8276 … read value of 8276
… response	#Gen-set name:ok,100,ok,110	
Engine control	#1:0 p1234,c1	#1 … controller address 0 … access code p1234 … password c1 … engine start (c2=stop)
… response	#Gen-set name:ok	Command was accepted

More details see in InteliCommunicationGuide – chapter SMS Message Control.

PC software - LiteEdit

On the PC (for direct, modem, Internet or AirGate connection) has to be installed the ComAp's software package LiteEdit. (based on Windows 95 or newer platform)
LiteEdit enables:

- read the quantities
- adjust all set points
- control the engine
- configure the controller
- select software configuration
- modify alarm inputs and outputs
- modify password, commands protections
- direct, modem or Internet communication
- language translator

Language translator

Default archive contains English and Chinese languages. To change default Chinese (Unicode) to any Latin language use Remove and Add buttons in LiteEdit – Translator-Language window.

Language support

ID-LITE firmware version 1.6 and above supports following language code pages:

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

Since ID-Lite-1.9 the Greece character set is supported as well.

Modbus protocol

Select the ID-Lite serial ports function in the **Basic settings**: *COM1 mode* or *COM2 mode* = MODEM.
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/ .

Details of Modbus implementation and Modbus command examples see in InteliCommunicationGuide-x-y.pdf – chapter Modbus protocol description.

Hint:
Download the actual controller Modbus registers list from controller or from (ail) archive - use "Controller-Generate Cfg image" command from LiteEdit software.

Remote communication

Note:
Refer to InteliCommunication guide for all additional information.

Internet connection

ID-Lite controllers can be monitored from LiteEdit over the Internet via internal IB-Lite plug-in module.

AirGate connection

ID-Lite controllers can be monitored from LiteEdit or WebSupervisor system via AirGate. AirGate technology is for easy plug'n'play communication over Internet. GPRS and IB-Lite plug-in cards are suitable for this system. It overcomes problems with fixed and public IP address necessity, with firewalls and difficult communication settings.

Recommended ISDN modem

- Askey TAS-200E
- ASUScom TA-220ST
- Develo Microlink ISDN i

Recommended GSM modem

- Siemens M20, TC35, TC35i, ES75, MC39
- Wavecom M1200/WMOD2
- Wavecom - Maestro 20, dual 900/1800MHz.
- Wavecom – Fastrack M1306B, dual 900/1800 MHz (Fastrack M1206B is NOT recommended)
- FALCOM A2D, dual 900/1800MHz.

GSM Modem setup

Prior to start work with GSM modem run following program for GSM proper setup.
Program writes all the necessary AT commands to configure the GSM modem properly for use with ID-Lite.
This program runs independent on LiteEdit:

- Start MS Windows-Start-Program files - LiteEdit –Gm_setup.exe.
- Select COM port
- Select iG-CU (=IS-CU) or iG-MU unit
- Press Setup button
- Follow commands in GSM Modem Setup window

Typical real baud rate for GSM data communication is 80 to 90 Bps.

Hint:
It is strongly recommended to use the same type of modem on the both sides (ID-Lite and PC) of connection.

Mobile SIM card setting

- Adjust SIM card in GSM modem following way:
- enable data connection (when required)
- no PIN code

Technical data

Power supply

Voltage supply	8-36V DC
Consumption	40-430mA depend on supply voltage and temperature
Consumption depends on supply voltage	0,104A at 8VDC 0,080A at 12VDC 0,051A at 24VDC 0,044A at 30VDC 0,040A at 36VDC
Allowed supply voltage drop-out:	100ms from min. 10V return to min. 8V
Battery voltage measurement tolerance	2 % at 24V

Hint:

For the supply voltage less than 7V 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 ID-Lite	-20..+70°C
Operating temperature ID-Lite LT#	-40..+70°C
Storage temperature	-30..+80°C
Protection front panel	IP65
Humidity	95% without condensation
Standard conformity	
Low Voltage Directive	EN 61010-1:95 +A1:97
Electromagnetic Compatibility	EN 50081-1:94, EN 50081-2:96 EN 50082-1:99, EN 50082-2:97
Vibration	5 - 25 Hz, ±1,6mm 25 - 100 Hz, a = 4 g
Shocks	a = 200 m/s^2

Low Temperature modification

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

Internal preheating foil is mounted in InteliDrive-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.

Technical data

	ID-Lite Standard	Order code:ID-Lite-xxxxx LT
Operating temperature	-20 °C..+70°C	-40 °C..+70°C
Storage temperature	-30 °C..+80°C	-30 °C..+80°C

Preheating foil increases controller current consumption

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

InteliDrive-Lite LT works immediately after switch on at -30 °C and display becomes visible after a few minutes.

Dimensions and weight

Dimensions	180x120x55mm
Weight	450g

Binary inputs and outputs

Binary inputs

Number of inputs	6
Input resistance	4,2 kΩ
Input range	0-36 VDC
Switching voltage level for close contact indication	0-2 V
Max voltage level for open contact indication	8-36 V

Binary open collector outputs

Number of outputs	6
Maximum current	0,5 A
Maximum switching voltage	36 VDC

Analog inputs

Not electrically separated	
Number of inputs	3
Resolution	10 bits
Jumper selectable range	V, Ohm (default), mA
Maximal resistance range	2500 Ω
Maximal voltage range	2.5 V
Current range	0 – 20 mA
Input impedance	180 Ω for mA measuring
Input impedance	> 100 kΩ for V measuring
Resistance measurement tolerance	± 2 % ± 2 Ω out of measured value

Speed pick-up input

Type of sensor	magnetic pick-up (connection by shielded cable is recommended)
Minimum input voltage	2 Vpk-pk (from 4 Hz to 4 kHz)
Maximum input voltage	50 Veff
Minimum measured frequency	4 Hz
Maximum measured frequency	10 kHz (min. input voltage 6Vpk-pk)
Frequency measurement tolerance	0,2 %

D+ function

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

CAN bus interface

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

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

Nominal Velocity of Propagation	min. 75% (max. 4,4 ns/m)
Wire crosscut	min.0,25 mm^2
Maximal attenuation (at 1 MHz)	2 dB / 100m

Recommended Industrial Automation & Process Control Cables:
BELDEN (see http://www.belden.com):

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

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

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

IL-NT RS232 (optional card)

Plug-in into ID-Lite controller COMMUNICATIN 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

IL-NT RS232-485 (optional card)

Plug-in into ID-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)

IL-NT S-USB (optional card)

Plug-in into ID-Lite 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.

IB-Lite (optional card)

Plug-in into ID-Lite controller EXTENSION MODULE port.

10/100 Mbit ethernet interface in RJ45 socket

IL-NT GPRS (optional card)

Plug-in into ID-Lite controller EXTENSION MODULE port.

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

IL-NT AOUT8 (optional card)

Plug-in into ID-Lite controller EXTENSION MODULE port.

Number of PWM outputs	8
PWM frequency	1200Hz
Maximum current	0.5 A
Maximum switching voltage	36 VDC
Output resistance	1Ω
Resolution	10 bits

IL-NT AIO (optional card)

Plug-in into ID-Lite controller EXTENSION MODULE port.

Number of Analog inputs:	4 (2400 Ohm, 20mA, 4V)
Number of Analog outputs:	1 (21mA, max.load 100 Ohm; 4,6V, max.10mA; PWM 500Hz (5V / 10mA)
Resolution:	10 bits

Inputs:

Maximal resistance range:	2400 Ohm
Maximal voltage range:	4 V
Current range:	0-20 mA
Input impedance (current):	180 Ohm 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

Outputs:

Voltage measurement tolerance:	± 1,5% +- 10mV
Current measurement tolerance:	± 2% +- 0,1mA

IL-NT BIO8 (optional card)

Plug-in into ID-Lite controller EXTENSION MODULE port.

Number of Binary Inputs/Outputs:	8 (configurable as Input or Output)
Max. one Binary output current:	0,4A

Max total current per module:	2,5A

IL-NT IO1 (optional card)

Plug-in into ID-Lite controller EXTENSION MODULE port.

Number of Analog outputs:	4
Analog output range:	0 to +VBatt ±1V
Number of binary inputs:	4 (equal to ID-Lite CU)

IGL-RA15 (optional Remote Annunciator)

Power supply

Voltage supply	8-36V DC
Consumption	0,35-0,1A (+1A max horn output) Depend on supply voltage

Operating conditions

Operating temperature	-20..+70°C
Storage temperature	-40..+80°C
Protection front panel	IP65

Dimensions and weight

Dimensions	180x120x55mm
Weight	950g

Horn output

Maximum current	1 A
Maximum switching voltage	36 VDC