Compact Controller for Industrial and Marine Applications

InteliDrive DCU

Expandable engine controller

with electronic engines support

Industrial Applications: SS and AS
Marine Applications: AUX, EME, CMB and PRP

January 2013 version r2

Operator guide

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Abbreviations

aid	Archive file extension for InteliDrive controller
AIN	Controller or extension module Analog input
Alarm	General term for any active engine protection Warning, Shutdown, … etc.
Alarm list	Controller or PC DriveMonitor screen with list of active and unaccepted alarms detected from ID controller.
AS	Controller All Speed mode
ECU Alarm list	Controller or PC DriveMonitor screen with list of active and unaccepted alarms detected from engine ECU.
AOUT	Controller Analog OUTput or outputs group.
Archive	Usually aid file that contains all controller data: configuration, setpoints setting and history records.
AUX	Controller application (archive, operational mode) for Auxiliary engines.
BI	Controller binary input.
BIN	Controller binary inputs group.
BO	Controller binary output.
BOUT	Controller binary outputs group.
CAN	Control Area Network – serial data link.
Cd	Cool down protection, cooling period is included before engine stops.
CMB	Controller Combined mode.
D+	Controller function for battery charging function check and/or engine running indication.
DC	DriveConfig, PC software for InteliDrive configuration.
DM	DriveMonitor, PC software for InteliDrive monitoring.
DriveConfig	PC software for InteliDrive configuration.
DriveMonitor	PC software for InteliDrive monitoring.
ECU	Engine Electronic (injection) Control Unit.
ECU alarm	Alarm detected in engine electronic control unit that is received via J1939.
EME	InteliDrive Emergency operational mode.
EMS I.	Electronic Management System – version I.
EMS II.	Electronic Management System – version II.
Fls	Controller sensor fail alarm.
FMI	Failure Mode Identifier.
GSM modem	Modem for Global System of Mobile communication
History	List of alarms and operational states with Reason, Date and Time and adjustable values set that is stored in controller, can be listed from the screen or DriveMonitor.
HRB	Controller Harbor mode.
I-CB	Inteli - Communication bridge = controller interface for other electronic engines like MTU, CAT etc.. that are not supported yet.
ID	InteliDrive controller.
ID-COM	InteliDrive communication module with interface to J1939, J1587 and to other controllers.
ID-DCU	InteliDrive – DieselControlUnit.
ID-MCU	InteliDrive – Industrial Controller Unit with Volvo Penta front panel modification.
ID-RPU	InteliDrive – Redundancy Protection Unit = ID backup unit for Over speed and Emergency stop protection in Marine applications.
ID-SCM	InteliDrive - Speed Control Module = interface unit for InteliDrive Industrial.
IG-IB	InteliGen – Internet Bridge = controller interface for internet communication.
IGL-RA15	Remote Anunciator = external 15 LED indication panel (three colors, configurable).
IG-MU	InteliGen – Modem Unit = controller interface for multiple engines application – one point communication with group or one point modem connection.
IGS-PTM	Controller extension module with 8 binary inputs and outputs and 4 analog inputs.
I-RB	Inteli Relay board = interface board with 16 free contact relays.

I-RB16	Inteli Relay board = interface board with 16 free contact relays.
I-RD	Inteli Remote Display (Remote Panel) = the same panel like on controller, all data received via CAN2 bus.
I-RD-CAN	Inteli Remote Display (Remote Panel) = the same panel like on controller, all data received via CAN2 bus.
I-RP	Inteli Remote Display (Remote Panel) = the same panel like on controller, all data received via CAN2 bus.
IS-AIN8	InteliSys – Analog input module = extension module with 8 analog inputs.
IS-BIN16/8	InteliSys – Binary input/output module = extension module with 16 binary inputs and 8 binary outputs.
J1587	The J1587 bus is mainly used for redundant signals; system diagnosis and software download on after market tools.
J1587/J1708	See J1587
J1939	The J1939 bus in mainly used for engine controls and engine monitoring.
KWP2000	Scania Communication protocol.
LOC	Controller Local mode
mhx	Extension for controller firmware (Motorola HeX file).
MID	Message Identification Assignments.
OFF	Controller mode when power supply is switched on, but all binary outputs and start commands are disabled = engine start is blocked.
PID	Parameter Identification Assignments.
PPID	Proprietary Parameter Identification Assignments.
PRP	Controller application (archive, operational mode) for Propeller engines.
RPM	Engine Revolution Per Minute – engine speed.
PCB	Printed Circuit Board
PSID	Proprietary Parameter Identification Assignments.
RS232	Standard serial data line for PC or Modem connection (controller programming or monitoring).
Sd	Shut down protection.
SID	Subsystem Identification Assignments.
SPN	Suspect Parameter Number
SS	Controller Single Speed mode
Wrn	Warning protection.

Conformity declaration

CE

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

!!! CAUTION !!!

Always properly connect grounding terminals!

Adjust set points

All parameters are preadjusted to their typical values. But the set points in the "**Basic settings**" settings group **!!must!!** be adjusted before the first startup of the gen-set.

!!! WRONG ADJUSTMENT OF BASIC PARAMETERS CAN DESTROY THE ENGINE !!!

The following instructions are for qualified personnel only.
To avoid personal injury do not perform any action not specified in the User guides for ID-DCU Marine or ID-DCU Industrial !!!

WARNING – VERY IMPORTANT !!!

Be aware that the binary outputs can change state during and after software reprogramming. Before the controller is used again ensure that the proper configuration and setpoint settings are set in the controller.

Disconnect the Binary outputs Starter and Fuel or press EMERGENCY STOP button to avoid unexpected automatic start of genset during any work or maintenance on the engine or switchboard.

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.

General description

This guide provides general information on how to operate the InteliDrive controller. More detailed information is available in the User guides for ID-DCU Marine or ID-DCU Industrial.

InteliDrive ID-DCU Industrial and ID-DCU Marine engine controllers controls, monitors and protects the engine in single or variable speed operational modes (ID-DCU-Industrial) and propeller, emergency, auxiliary and harbor modes (ID-DCU-Marine). The controllers can communicate with Engine Management System via the CAN serial line using standard J1939 or another (KWP2000) communication protocol.

InteliDrive controllers are equipped with a powerful graphic display with icons, symbols and bar-graphs and panel buttons for intuitive operation.

InteliDrive ID-DCU-Marine central unit together with ID-RPU provides redundant engine control. Switches itself to the backup mode in the case of controller failure, protects engine using its own Shut down and Emergency stop inputs and Fuel, Stop outputs. Monitors power supply, switches to the secondary power and measures also the secondary RPM.

Engine functions

- Engine sequencing and control (start/stop, warm-up and cool-down, pre-lubrication etc.)
- Different operational modes – single or variable speed (ID-DCU-Industrial) and emergency, auxiliary, harbor or propulsion (ID-DCU-Marine)
- Engine monitoring and protections (2 or more level analog inputs protection, adjustable delays)
- Speed measurement from magnetic pick-up or from ECU (+ redundant channel – ID-DCU-Marine only)
- Running hours meter, number of starts counter
- Configurable 14 Binary inputs and Outputs and 8 Analog inputs
- Setpoints are adjustable via InteliDrive panel or via PC software
- 3 level password protection
- On screen Alarm and ECU Alarm indication
- Event and time driven engine history for back tracing
- Two or more languages selectable in controller

Communication

- RS232 / Modbus RTU
- Analog or GSM modem
- Engines with Engine Electronic Control Unit: J1939, J1587, KWP2000
- Extension units for more I/O and Remote Display panel

Physical

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

Available modules

- ID–RPU Redundant Protection Unit (at ID-DCU-Marine only)
- ID-SCM Speed control module (at ID-DCU-Industrial only)
- IS-AIN8 Extension module with 8 analog inputs
- IS-BIN16/8 Extension module with 16 binary inputs and 8 binary outputs
- IGS-PTM Extension module with 4 analog inputs and 8/8 binary in/outputs
- IGL-RA15 Extension module with 15 indicating LED

Manuals

To download manuals according to the specific controller:

1. Open http://www.comap.cz/ in your browser. To access manuals on ComAp website, please, register in ComAp club
2. Where to find documentation on web

Products / Engine controllers / InteliDrive-DCU (Marine) / Downloads / Manuals

Types of Documents on Web page

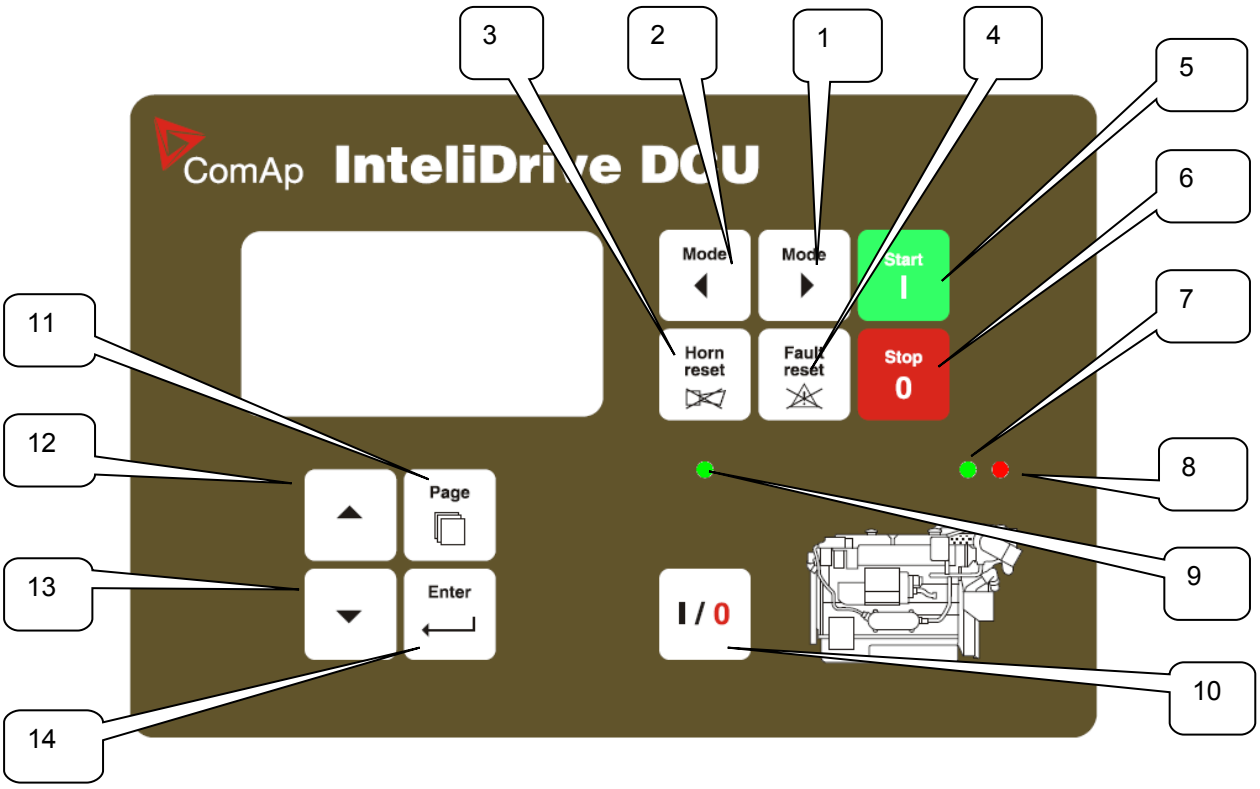
All the documents are intended for everybody who is concerned with the installation, operation and maintenance of an engine application.

- **Data Sheets** describe basic technical specification and purpose of various types of controllers.
- **Getting Started Guide** will help you to answer some basic questions that typically occur during the first contact with engine controller.
- **User guide** is Installation, Application and Reference guide in one book.
- **Communication Guides** describe communication interface among controller(s) and superior system. From this manual you can get information on all available types of communication.

- **ComAp Electronic Engines Support** describes all supported ECU, wiring and functionality.

Operator Interface

Pushbuttons and LEDs



Pushbuttons and LED's:

1.	MODE ►	Cycle forward through engine operation modes OFF -> RUN (AUX, EME, HRB and PRP in case of Marine version).
2.	MODE ◄	Cycle backward through engine operation modes OFF <- RUN (AUX, EME, HRB and PRP in case of Marine version).
3.	HORN RESET	Deactivates the HORN.
4.	FAULT RESET	Acknowledges faults and alarms.
5.	START	Starts the engine in SS or AS mode.
6.	STOP	Stops the engine in SS or AS mode (hold time =1 sec).
7.		GREEN = Engine running.
8.		Flashing RED = Not acknowledged (new) alarm present in Alarm List. Stable RED = Acknowledged alarm present in Alarm List.
9.		GREEN = On/Off output is active.
10.	On/Off	Button for Close load or Clutch Binary output control.
11.	PAGE	Cycles through the display screens MEASUREMENT -> ADJUSTEMENT ->HISTORY.
12.	▲	Select the set point, select the screen or increase set point value.
13.	▼	Select the set point, select the screen or decrease set point value.
14.	ENTER	Confirm set point value.

How to select engine mode?

Use MODE ► or MODE ◄ to select requested engine operation mode.

Hint:
Switching to OFF mode is blocked on running engine.

Display menus

There are 4 display menus available: MEASUREMENT, External measurement, ADJUSTMENT and HISTORY.
Each menu consists of several screens. Pressing the PAGE button repeatedly will scroll the user through the menu screens.

How to view measured data?

Pressing the PAGE button repeatedly will scroll the user through the menu screens. Select the MEASUREMENT screen. Use ▲ or ▼ to select the screen with requested data.

How to view and edit set points?

1. Pressing the PAGE button repeatedly will scroll the user through the menu screens. Select the ADJUSTMENT screen.
2. Use ▲ or ▼ to select requested set points group.
3. Press ENTER to confirm.
4. Use ▲ or ▼ to select requested set point.
5. Set points marked **"*"** are password protected, necessary to input corresponding password first to enable setpoint edit.
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.

Press PAGE to leave selected set points group.

Hint:
Depending on the configuration of ID-DCU controller there can occur some PLC logic modules in configuration. Then the user can adjust them from "PLC" set point group.

How to view the HISTORY menu?

1. Pressing the PAGE button repeatedly will scroll the user through the menu screens. Select the HISTORY screen.
2. Use ▲ or ▼ to select a requested record.
3. Use ENTER to select requested screen (record items) within displayed records.

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 down the ENTER and the press PAGE. On the display you can see Controller INFO screen for 10 seconds:

Controller name (see **Basic setting** group)
Controller serial number (8 character number)
SW version: The firmware version number.
Application: ID
Branch: InteliDrive

Hint:
Only in MEASUREMENT screen.

How to change the display backlight intensity?

Press ENTER and ▲ or ▼ at the same time to adjust the best display backlight.

Hint:
Only in INFO screen.

How to change controller language?

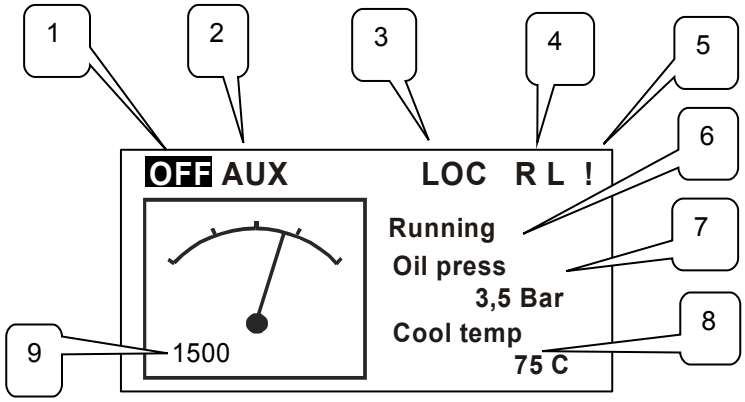
Press PAGE on controller INFO screen to go to Language screen. Select language ▲ or ▼ and press ENTER to confirm selection and exit window.

How to find active alarms ?

Active alarm list and J1939 alarm list are the last two screens in the MEASUREMENT menu.
Select MEASUREMENT menu. Press ▲ (▲). You will see the list of all active alarms with the number of alarms at the top-right corner. Inverted alarms are still active. Non-inverted alarms are not active, but not yet confirmed.
Press FAULT RESET accepts all alarms in case if Industrial version and accepts just displayed alarms in case of Marine version. 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, parameters or history.

Main screen indication



1. Active controller mode (inverse)
2. Available mode
3. Controller Local mode indication
4. R = Remote connection indication (connection to DriveMonitor is opened)
   L = Access lock indication
5. Record in Alarm list
6. State machine indication
7. Oil press indication
8. Coolant temperature indication
9. RPM indication

Controller screens

There are three screen groups available on ID-DCU controller: Measuring – Setpoints – History.
Measuring screen will be divided to more groups – ID-DCU, BIN/BOUT, AIN

Measuring (instrument) screens

Screen	Content
Hidden, but available by Key combination – see Function available from ID-DCU front panel keys	
	Info screen: Fw and App. version, s.n., … Language list and switch.
	Language screen
	Fast edit screen
Available using Up or Down front panel keys	
	ECU diagnostics code list
	Alarm list
1 =Main screen	ID Mode, RPM1, Vbatt, Engine state, Indication: Local, Alarm (in AL or ECU list), Remote data connection active, Access Lock
2	Analog 1 to Analog 4 , 4x single bargraph
3	Analog 5 to Analog 8 , 4x single bargraph
4	Battery ID-DCU, bargraph
5	ID-DCU BI 1 to 7
6	ID-DCU BI 8 to 14
7	ID-DCU BO 1 to 7
8	ID-DCU BO 8 to 14
9	Statistics: Run hours, Number of starts, Service time
Following screens appears depending on configuration	
Opt	Analog 1 to Analog 8, Name- value dimension, active alarm is negative (1x IS-AIN8)
Opt	IS-BIN BI indication 1 to 8
Opt	IS-BIN BI indication 9 to 16
Opt	IS-BIN BO indication 1 to 8
Opt	ECU values I.
Opt	ECU values II.

Setpoints screens correspond with Setpoint table above.

Alarm, ECU Alarm list screen

See the Alarm management chapter

Info screen

Info	Comment
CBH InteliDrive	Product type
ComAp 2003 – 2013	Company name
ID-DCU-Industrial	Controller name
Serial: 0200FFFF	Controller serial number
Sw ver: 3.0	Software version
Appl: SS	Application
Branch: DCU Industrial	Customer branch

Statistic values

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

Statistic values can be adjusted from DriveMonitor, password 3 level protected.

History records

Following table does not contain Wrn, Sd and Fls messages from external units.

Events specification	Protection type	Information available on binary output
Alarms		
Wrn Analog input 1 to 8	WRN	YES
Sd Analog input 1 to 8	SD	YES
ID-DCU Binary input 1 to 14	Configurable	YES
ID-DCU Battery voltage <, >	WRN	YES
Battery flat	WRN	
Start fail	WRN	YES
ParamFail	NONE	
Overspeed	SD	YES
Underspeed	WRN	YES
EmergencyStop	SD	
Pickup fail	WRN	
Stop fail	WRN	YES
WrnServiceTime	WRN	
ChrgAlternFail	WRN	YES
Fault reset		
Local mode ON		YES
Local mode OFF		
Harbour mode ON		YES
Harbour mode OFF		
SecBattery		YES
Emergency stop		

Engine events	Note
Starts	
Button start	Start from ID panel
CAN control + Button start	Start from ID RD
RS232 control + Button start	Start from DriveMonitor
Remote start	Start from BI
Stops	
Engine stop	Stop from ID panel or BI
CAN control + Engine stop	Stop from ID RD
RS232 control + Engine stop	Stop from DriveMonitor
Remote start	ID-DCU binary input
Blackout start	ID-DCU binary input
Button start	ID-DCU panel button
Fault reset	ID-DCU panel button
Local mode ON	ID-DCU panel button
Local mode OFF	ID-DCU panel button
HRB mode ON	ID-DCU panel button
HRB mode OFF	ID-DCU panel button
RS232 control	Start, Stop, Fault reset, On/Off button from DriveMonitor or I-RD
Modem control	Start, Stop, Fault reset, On/Off from Modem
SMS control	Received command from GSM modem
CAN control	Received command via CAN bus e.g. from I-RD or IG-MU
ActCallCH1-OK	Successful active call on channel 1
ActCallCH2-OK	Successful active call on channel 2
ActCallCH3-OK	Successful active call on channel 3
Extern start	Manual engine starter handling.
Engine stop	Engine changed state from
Emerg.man ON	Emergency manual mode ON
Emerg.man OFF	Emergency manual mode OFF
Clutch ON	Binary output clutch was closed
Clutch OFF	Binary output clutch was opened
Stop button	ID-DCU panel button
Switched on	Controller was switched on
Cfg loaded	Configuration archive was changed
FwLoaded	Firmware upgrade
Time stamp	Depends on setpoint setting period
Password set	Any level from any terminal
Password changed	Any level from any terminal
Access set	Access code was set
Access changed	Access code was changed
Watchdog	Controller internal watchdog protection
Param fail	Setpoints checksum fail
RTC battery	RTC battery fail

Hint:

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

Corresponding Sd BINx, Sd BOUTx or Sd AINx is indicated in Alarm list and history record when communication with any extension units (IS-BIN, IS-AIN, IGS-PTM) interrupted.
Example:
When IS-BIN16/8 is configured for addresses: Binary inputs = BIN1, BIN2 and Binary outputs = BOUT1, then three messages Sd BIN1, Sd BIN2, Sd BOUT1 are indicated after communication is interrupted.

Hint:
Any “State” information can be configured to any binary output by DriveConfig software.

Functions available from ID-DCU front panel keys

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

Alarm management

Following alarms are available in InteliDrive-DCU:

Binary alarms	Analog alarms
No protection	None
Warning	Warning
Shutdown	Sensor fail
Cool down	Wrn+shut down
Sensor fail	Wrn+cool down
Warning + BW	Alarm only
Shutdown + BW	HisRecOnly
Warning + Fls	

A new record containing selected values is written to the history file in the moment of any alarm comes up.
Detection of each binary input alarm is fix 1 sec time delayed.
Use DriveConfig to modify binary or analog inputs.

Warning

When warning comes up, only alarm outputs are closed.
Possible warnings:

- Binary inputs configured as Warning (alarms are displayed and stored under configured name)
- Analog inputs configured as Warning (alarms are displayed and stored under configured name)
- Battery voltage alarm level

Shut down

When a shutdown occurs, InteliDrive-DCU opens outputs FUEL SOLENOID, STARTER.
Possible shut-down alarms:

- Over speed
- Under speed
- Start fail
- Binary inputs configured as Shut down (alarms are displayed and stored under configured name)
- Analog inputs configured as Shut down (alarms are displayed and stored under configured name)

Cool down

When the cool down alarm comes up InteliDrive unloads engine, waits for *Cooling time* and opens FUEL SOLENOID output.
Binary inputs configured as Cooldown (alarms are displayed and stored under configured name)

Sensor fail

Sensor fail Fls is detected when measured value is 6,2 percent out of range. The controller screen will display #### instead of the measured value.

Alarms indication

There can be following actions when Alarm is active (depends on Alarm type and configuration):

- Alarm list record
- History list record
- Active call (when is enabled and modem is installed)
- Controller front panel LED indication
- Binary output ALARM is closed when Alarm is active or when was deactivated and FAULT RESET button was not pressed to confirm.
  Binary output ALARM opens when Alarm was deactivated (no other Alarm is active) and FAULT RESET button was pressed to confirm.
- Binary output HORN is closed for adjustable time when any new Alarm occurs.
- Corresponding value reading (binary input state, analog input value, generator voltage, ..) is inverse (e.g. **100**) on InteliDrive screen when value is out of limits (binary input protection is active).

Broken wire

Broken wire (BW) alarm is indicated on ID-RPU module only.

Alarm indication

Alarm list and History record prefixes

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

Three state Alarm list indication

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

ECU Alarm list - SPN/FMI codes screen

ECU Alarm list displays alarms from ECU unit of the engine. In the case there is no SPN translation available, the SPN number is displayed only.

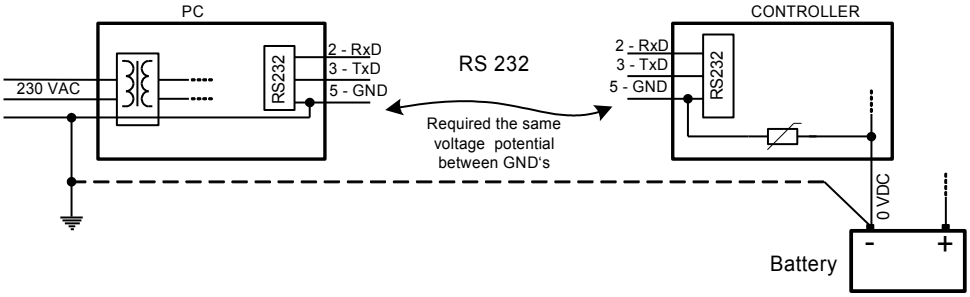
```
   EngOilPress                  WRN
   BoostPress                   FLS
   EngOilTemp                   FLS
   629                          FLS
>  Controller#1
   EngCoolTemp                  WRN

FC:110        OC:7        FMI:3
```

Controller monitoring

InteliDrive sw pack contains separate PC software tools: DriveConfig (DC) and DriveMonitor (DM). Drive Monitor is meant to be monitoring tool for remote controller connection.
DriveMonitor is based on Windows 95/98/NT/ME/2000/XP or higher platform and requires 50 MB of hard disc free space.

Direct connection to the PC

InteliDrive can be connected directly with PC via RS232 interface. Use the standard cable RS232 cable to connect PC with InteliDrive controller.
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 PTC protection activates and interrupts RS232 communication. In such case disconnect RS232 line wait a minute for PTC recovery and try again. The simple solution is to assure, that the PC supply 240/20V is ground free (GND terminal is not connected).



DriveMonitor

Functions

- On-line direct, Modem or Internet connection to one engine
- Active Modem or Internet call from engine to PC (activated by selected Alarm)
- Continuous one engine monitoring in on-line connection
- On-line or Off-line History record listing
- Setpoints listing and adjusting (password protected)
- Statistics value (e.g. Running hours) Set/Reset
- Password and Access code change

Connection type

Direct connection via RS232 (up to 10m). For longer distance use RS232/RS485 converters (e.g. ADVANTECH – ADAM 4520).

Modem connection via Analog, ISDN or GSM modem.

Internet via IG-IB (InteliGen internet interface unit). IG-IB Internet - Ethernet or Dial-up connection is available.

Active call (via modem). Controller calls to the preselected telephone number and sends the AID file when active call is activated. To receive AID file the DriveMonitor must be in Active call waiting window.

Off line connection enables open and list Application AID file stored in PC.

Hint:
More detail regarding different types of connection see in IG-IS Communication guide.

Control window: displays all ID-DCU and I/O states, enables engine control.

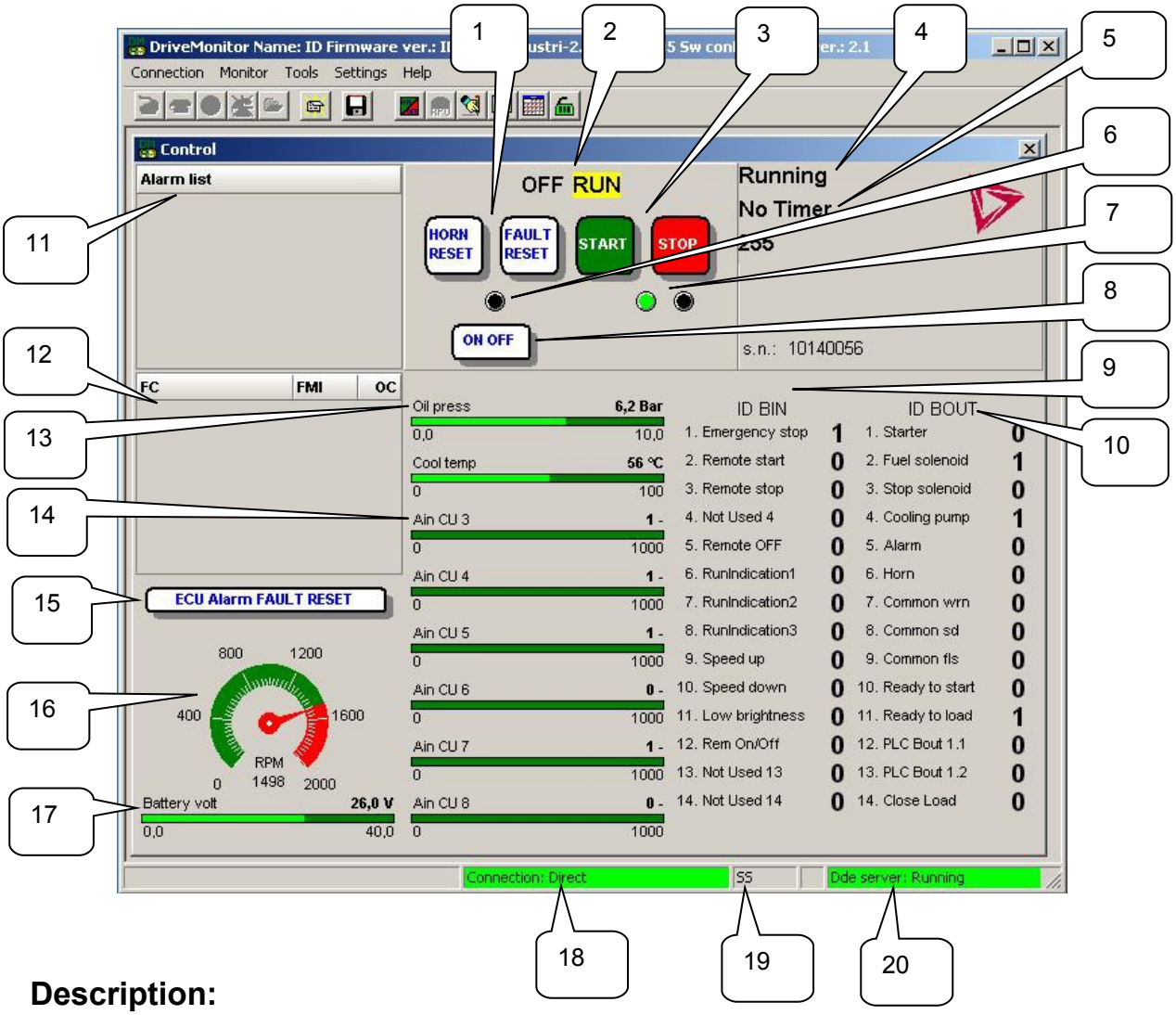
ID-RPU window … not available in Industrial version

Setpoints: listing and adjusting

Values: reading of all I/O include external modules

History list: complete history list.

DriveMonitor screen example (ID-DCU-Industrial, SS)



Description:

1. Buttons to deactivate Fault and Horn reset.
2. Buttons to switch-over the engine operation modes OFF and RUN (in ID-DCU-Industrial).
3. Buttons for Start or Stop of the engine.
4. Engine operation state indication.
5. Engine timer indication.
6. LED indication for load or clutch – GREEN = On/Off load is Closed / Opened, see point 8.
7. LED indication of engine state: GREEN = Engine running, RED = event in Alarm List.
8. Button for Close / Open load or clutch (Binary output control).
9. Binary inputs list
10. Binary outputs list.
11. Alarm list
12. ECU Alarm list
13. Defined analog input bar graph – Oil press.
14. Undefined analog input.
15. ECU Alarm fault reset button.
16. Engine speed measurement.
17. Bar graph of battery voltage.
18. Connection indication.
19. Archive type indication.
20. DDE Server indication.

Hint:

More details of DriveMonitor software can be found in DriveMonitor User guide.

Password protection

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

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

There can be password protected:
- Setpoints (depends on configuration)
- Statistics values (Level 3 only)
- Engine commands (depends on configuration)

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

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

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

Modbus protocol

- Direct connection: RS232, RS422, RS485
- Modem connection
- 9600, 19200 or 38400 bps, 8 data bits, 1 stop bit, no parity
- Transfer mode RTU
- Function 3 (Read Multiply Registers)
- Function 6 (Write Single Register)
- Function 16 (Write Multiply Registers)
- The response to an incoming message is sent with minimum 4.096 ms delay after message reception

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

Modbus Multipack message

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

Hint:
Detail Modbus command description see in ComAp Communication guide.

Communication object vs. Register

All the data intended for communication has its representation as communication objects in the controller. The communication object is represented by the n-byte array in the controller memory and identified by the unique 16-bit communication object number. The register, according to Modbus communication protocol, represents a two-byte data and in communication functions is referenced by 16-bit register address. Further in the description of communication functions **the communication object number will always be used as a register address** and length of the communication object will be expressed by number of registers. **Just one communication object can be read or written by one communication function.**
Hint:
It is possible to download the Actual InteliDrive controller object description corresponding to actual configuration from on-line controller or from aid archive using DriveConfig software.

Technical data

ID-DCU

Power supply

Voltage range	8-36V DC
Current consumption (depends on supply voltage)	0,34A at 8VDC 0,12A at 24VDC 0,09A at 36VDC
Battery voltage measurement tolerance	2 % at 24V
RTC battery life-cycle	10 year

Hint:

RTC battery flat causes wrong Date&Time information only.

Operating conditions

Operating temperature ID-DCU	-20 to +70 °C
Operating temperature ID-DCU-LT	-40 to +70 °C
Storage temperature	-30 to +80 °C
Humidity	95% without condensation
Flash memory data retention time	10 years
Protection front panel	IP65
Standard conformity	
Low Voltage Directive	EN 61010-1:95 +A1:97
Electromagnetic Compatibility	EN 61000-6-2, October 2001 EN 61000-6-4, October 2001 IEC 60533, Ed. 2; 1999-11
Vibration	5 - 25 Hz, ±1,6mm 25 - 100 Hz, a = 4 g
Shocks	a = 200 m/s$_2$

Dimensions and weight

Dimensions	(183x123x47mm) See chapter terminals and dimensions
Weight	800g