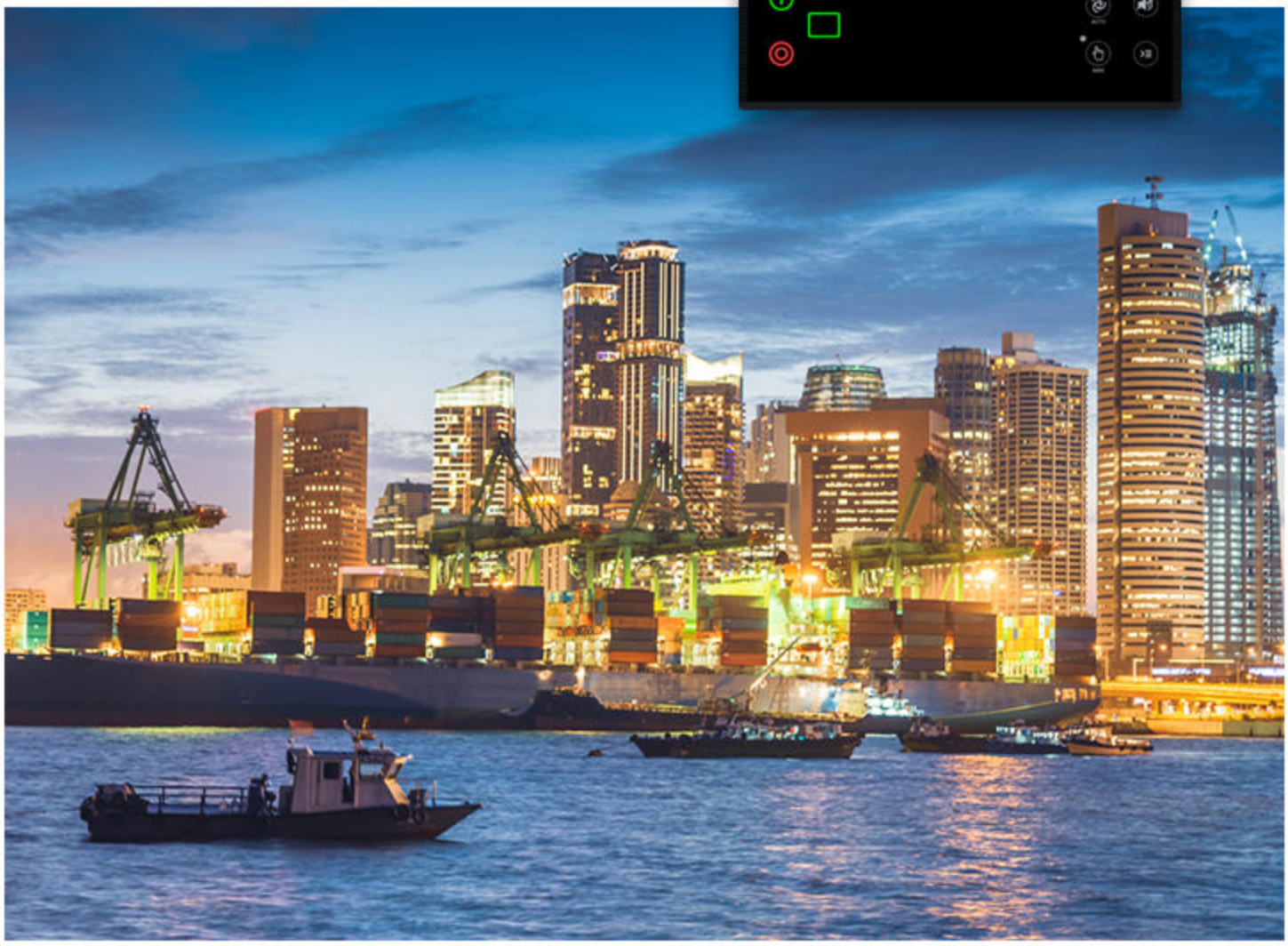
iE 150

4921240686A

Engine drive Marine

Data sheet

Improve
Tomorrow



1. iE 150 Engine drive Marine

2. Technical specifications

3. Legal information

1. iE 150 Engine drive Marine

1.1 About the controller

1.1.1 About

The iE 150 Engine drive is a single controller for one engine. The controller has all the functions needed to protect and control an engine. The values and alarms are shown on the LCD display screen, which is sunlight-readable.

The controller is simple to mount and the graphical display makes it easy to use. You can easily configure the parameters on the display or with the use of a PC and the utility software.

Key features

- Protect and monitor the engine
- Engine start and stop sequences
- Automatic and manual control of engine speed
- Tier 4F/Stage V
- Configurable inputs and outputs, including
  - CAN bus ports
  - Ethernet port
- Alarm and event log
- 3-level password protection
- Easy configuration with the utility software
- Pump function with fixed and variable speed

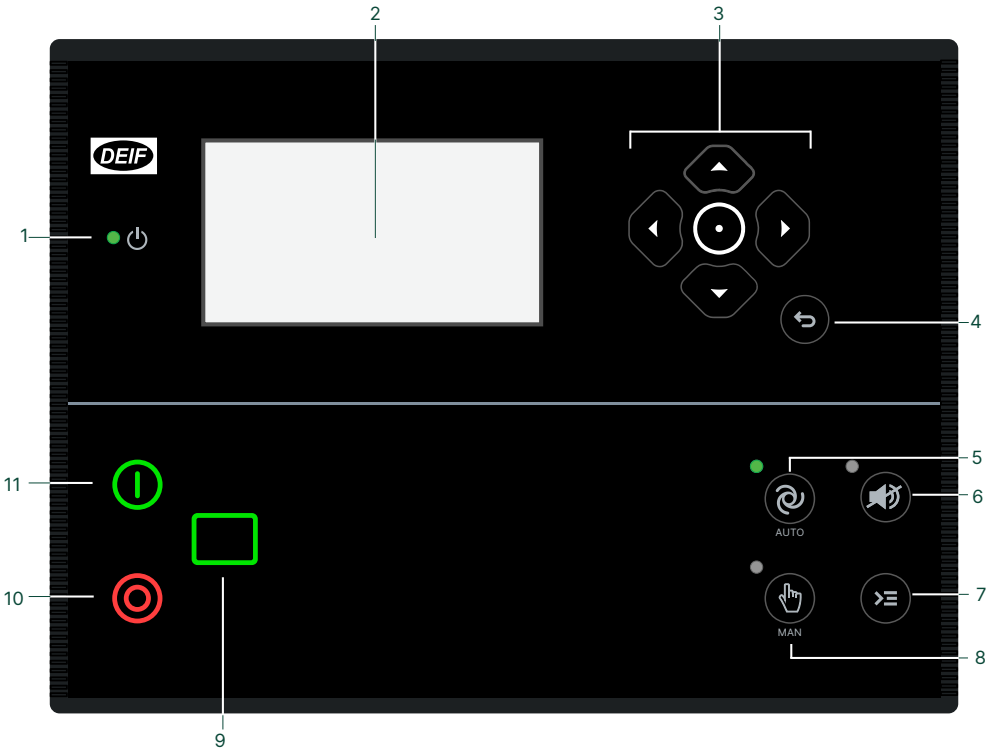
1.1.2 Software versions

The information in this document relates to software version:

Software	Details	Version
iE 150	Controller application	1.32.0

The controller comes with the **Core** software package.

1.1.3 Display layout



No.	Name	Function
1	Power	Green: The controller power is ON. OFF: The controller power is OFF.
2	Display screen	Resolution: 240 x 128 px. Viewing area: 88.50 x 51.40 mm. Six lines, each with 25 characters.
3	Navigation	Move the selector up, down, left and right on the screen.
	Enter button	Confirms the selection
4	Back button	Go to the previous page.
5	Remote	Remote equipment (digital inputs, Modbus commands, AOP-2 commands) controls the iE 150. The operator cannot control the iE 150 from the display.
6	Silence horn	Stops an alarm horn (if configured) and enters the Alarm menu.
7	Shortcut menu	Access the Engine and General shortcuts, Jump menu, Mode selection, Test, and Lamp test.
8	Local	The operator can use the display buttons to start and stop the engine. Remote equipment cannot start and stop the engine.
9	Engine	Green: There is running feedback. Green flashing: The engine is getting ready. Red: The engine is not running, or there is no running feedback.
10	Stop	Stops the engine if Local mode is selected.
11	Start	Starts the engine if Local mode is selected.

1.2 Functions and features

1.2.1 Engine functions

Start and stop functions
Engine start and stop sequence
Temperature-dependent cooling down
Time-based cooling down
Configurable crank and run coil
Built-in test sequence (simple test)

Regulation functions
PID regulation using: • Engine communication • Built-in analogue control • External analogue control using IOM 230 • Relays
Manual speed control using: • Digital inputs • Display screen menu (by the operator) • Analogue input • Modbus • Configured set point
Speed sensing using CAN or MPU
Derate engine
Fixed speed or variable regulation speed
Ramp function for loading and de-loading
Ventilation fan control

Other engine functions
Fuel usage monitoring
Fuel pump logic and refill
Diesel exhaust fluid monitoring
Diesel exhaust fluid logic and refill
Generic fluid monitoring
Generic fluid logic and refill

Counters
Start attempts
Running hours
Service intervals
Fan

1.2.2 General functions

Setting and parameter functions
Nominal settings
User-defined permission levels
Password-protected setup
Trending with the USW
Event logs with password, up to 500 entries

Display and language functions
Supports multiple languages (including Chinese, Russian, and other languages with special characters)
20 configurable display screens
Graphical display with six lines
Parameters can be changed on the display unit
5 engine function shortcuts
20 configurable shortcut buttons
5 configurable display screen "LED lamps" (on/off/blink)

Modbus functions
Modbus RS-485
Modbus TCP/IP
Configurable Modbus area

PID functions
PIDs for controlling user-defined set points
Reference value for PIDs with analogue inputs
2 x general purpose PID regulators (built-in analogue outputs)

Logic and output functions
PLC logic (M-Logic)
4 analogue outputs (using 2 x IOM 230)

1.2.3 Supported controllers and engines

The iE 150 can communicate with the following ECUs and engines.

Manufacturer	ECU	Engines	Tier 4/Stage V	iE 150 parameter 7561
Generic J1939	Any ECU that uses J1939	Any engine that uses J1939	●	Generic J1939
ANGLE			-	ANGLE
Baudouin			-	Baudouin CPCB IV
Baudouin	WOODWARD PG+	-	-	Baudouin Gas

Manufacturer	ECU	Engines	Tier 4/Stage V	iE 150 parameter 7561
Baudouin	Wise 10B	-	-	Baudouin Wise10B
Baudouin	Wise 15	-	●	Baudouin Wise15
Bosch	EDC17			Bosch EDC17CV54TMTL
Caterpillar	ADEM3	C4.4, C6.6, C9, C15, C18, C32, 3500, 3600	-	Caterpillar ADEM3
Caterpillar	ADEM4		-	Caterpillar ADEM4
Caterpillar	ADEM5		-	Caterpillar ADEM5
Caterpillar	ADEM6		-	Caterpillar ADEM6
Caterpillar	ADEM3, ADEM4	C4.4, C6.6, C9, C15, C18, C32, 3500, 3600	-	Caterpillar Generic*
Caterpillar			-	Caterpillar with C7.1 AT
Cummins	CM 500	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	-	Cummins CM500
Cummins	CM 558	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	-	Cummins CM558
Cummins	CM 570	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	-	Cummins CM570
Cummins	Cummins CM 570 Industrial		●	Cummins CM570 Industrial
Cummins	CM 850	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	-	Cummins CM850
Cummins	CM 2150	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	●	Cummins CM2150
Cummins	CM 2250	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	●	Cummins CM2250
Cummins	CM 500, CM 558, CM 570, CM 850, CM 2150 and CM 2250	-	ECU-dependent	Cummins Generic*
Cummins				Cummins Generic Industrial
Cummins	CM 2350		●	Cummins CM2350
Cummins	CM 2350 Industrial		●	Cummins CM2350 Industrial
Cummins	CM 2358		●	Cummins CM2358
Cummins	CM 2850		●	Cummins CM2850
Cummins	CM 2880		●	Cummins CM2880
Cummins	CM 2880 Industrial		●	Cummins CM2880 Industrial
Cummins	-	KTA19	-	Cummins KTA19
Cummins	PGI		●	Cummins PGI
Detroit Diesel	DDEC III	Series 50, 60 and 2000	-	DDEC III
Detroit Diesel	DDEC IV	Series 50, 60 and 2000	-	DDEC IV
Detroit Diesel	DDEC III, DDEC IV	Series 50, 60 and 2000	-	DDEC Generic*
Deutz	EMR2	-	-	Deutz EMR 2
Deutz	EMR3	-	-	Deutz EMR 3
Deutz	EMR 2, EMR 3	-	-	Deutz EMR Generic*

Manufacturer	ECU	Engines	Tier 4/Stage V	iE 150 parameter 7561
Deutz	EMR4	-	-	Deutz EMR 4
Deutz	EMR5	-	-	Deutz EMR 5
Deutz	EMR4 Stage V	-	●	Deutz EMR 4 Stage V
Deutz	EMR5 Stage V		●	Deutz EMR 5 Stage V
Doosan	EDC17	-	-	Doosan G2 EDC17
Doosan	MD1	-	●	Doosan MD1
Doosan	G2 EDC17		●	Doosan stage 5
FPT Industrial	EDC17	-	-	FPT EDC17CV41
FPT Industrial	Bosch MD1	-	●	FPT stage V
Hatz Diesel	-	3/4H50 TICD	●	Hatz
Hatz Diesel	EDC17	-	-	Hatz EDC17
Isuzu	ECM	4JJ1X, 4JJ1T, 6WG1X FT-4	-	Isuzu
Iveco	CURSOR	-	-	Iveco CURSOR
Iveco	EDC7 (Bosch MS6.2),	-	-	Iveco EDC7
Iveco	NEF	-	-	Iveco NEF
Iveco	Iveco NEF67		●	Iveco Stage V NEF67
Iveco	VECTOR 8	-	-	Iveco Vector8
Iveco	CURSOR, NEF, EDC7, VECTOR 8		●**	Iveco Generic*
Iveco	Bosch MD1	-	●	Iveco Stage V
JCB	-	ECOMAX DCM3.3+	●	JCB
JCB		P745 & P740 DieselMax Stage V Version 7	●	JCB 430/448 Stage V
Jichai	JC15D-ECU22	-	-	JC15D Weifu***
Jichai	JC15D WYS		-	JC15D WYS
Jichai	JC190		-	JC190
Jichai	JC15T JG		-	Jichai JC15T JG
Jing Guan		Gas	-	Jing Guan
John Deere	JDEC	PowerTech M, E and Plus	●	John Deere
John Deere	FOCUS controls (version 2.1)	-	●	John Deere Stage V
Kohler	ECU2-HD	KD62V12	●	Kohler KD62V12
Kohler	-	KDI 3404	-	Kohler KDI 3404
Kubota	KORD3		●	Kubota Stage V
MAN	EDC17	-		MAN EDC17
MAN	EMC 2.0	-	-	MAN EMC Step 2.0
MAN	EMC 2.5	-	-	MAN EMC Step 2.5
MAN	EMC 2.0 and 2.5	-	-	MAN Generic*
MTU	MDEC, module M.201	-		MDEC 2000/4000 M.201
MTU	MDEC module M.302	Series 2000 and 4000	-	MDEC 2000/4000 M.302

Manufacturer	ECU	Engines	Tier 4/Stage V	iE 150 parameter 7561
MTU	MDEC module M.303	Series 2000 and 4000	-	MDEC 2000/4000 M.303
MTU	MDEC, module M.304	-		MDEC 2000/4000 M.304
MTU	ADEC	Series 2000 and 4000 (ECU7), MTU PX	-	MTU ADEC
MTU	ADEC, ECU7 without SAM module (software module 501)	Series 2000 and 4000	-	MTU ADEC module 501
MTU	ECU7 with SAM module	-	-	MTU ECU7 with SAM
MTU	ECU8	-	-	MTU ECU8
MTU	ECU9	-	●	MTU ECU9
MTU	J1939 Smart Connect, ECU8, ECU9	Series 1600	● (ECU9 or later)	MTU J1939 Smart Connect
Perkins	ADEM3	-	-	Perkins ADEM3
Perkins	ADEM4	-	-	Perkins ADEM4
Perkins	ADEM3 and ADEM4	Series 850, 1100, 1200, 1300, 2300, 2500 and 2800	-	Perkins Generic*
Perkins	EDC17	-	-	Perkins EDC17C49
Perkins	-	Series 400 and 1200	●	Perkins Stage V
Perkins	-	Series 400 Model IQ IR IW IY IF	●	Perkins StV 400
Perkins	-	Series 1200F Model MT, MU, MV, MW, BM and BN	●	Perkins StV 1200
Perkins	-	Series 1200J Model SU, VM	●	Perkins StV 120xJ (SU/VM)
PSI/Power Solutions	-	PSI/Power Solutions	●	PSI/Power Solutions
QiYao			-	QiYao Gas
Scania	EMS	-	-	Scania EMS
Scania	EMS S6 (KWP2000)	Dx9x, Dx12x, Dx16x	-	Scania EMS 2 S6
Scania	EMS S6 (KWP2000)	Dx9x, Dx12x, Dx16x	-	Scania S6 Industrial
Scania	EMS 2 S8	DC9, DC13, DC16	●	Scania EMS 2 S8
Scania	EMS 2 S8	DC9, DC13, DC16	●	Scania S8 Industrial
SDEC	F20		-	SDEC F20
SDEC	F45		-	SDEV F45
Steyr	EDC17	-	-	Steyr EDC17
Volvo Penta	D12			Volvo Penta D12
Volvo Penta	EDC3	-	-	Volvo Penta EDC3
Volvo Penta	EDC4	-	-	Volvo Penta EDC4
Volvo Penta	EDC3, EDC4	TAD4x, TAD5x, TAD6x, TAD7x	-	Volvo Penta Generic*
Volvo Penta	EMS, EMS 2.0 to EMS2.3	D6, D7, D9, D12, D16 (GE and AUX variants only)	●	Volvo Penta EMS2

Manufacturer	ECU	Engines	Tier 4/Stage V	iE 150 parameter 7561
Volvo Penta	EMS2.3		●	Volvo Penta EMS2.3
Volvo Penta	EMS2.4	-	●	Volvo Penta EMS2.4
Weichai	WOODWARD PG+	Diesel	●	Weichai Diesel
Weichai	WOODWARD PG+	Gas	●	Weichai Gas
Weichai	Wise 10B	-	●	Weichai Wise10B
Weichai	Wise 13			Weichai Wise13
Weichai	Wise 15	-	●	Weichai Wise15
Weichai			-	Weichai Baudouin E6 Gas
Xichai				Xichai Gas
YANMAR	EDC17	-	-	YANMAR EDC17
YANMAR				YANMAR Gas 4G
YANMAR	-	TN, TNV	-	YANMAR Stage V
Yuchai United	YCGCU (Version 4.2)	Diesel	●	Yuchai United Diesel
Yuchai United	YCGCU (Version 4.2)	Gas	●	Yuchai United Gas
Yuchai United	YC-BCR	-	-	Yuchai YC-BCR
Yuchai United	YC-ECU	-	-	Yuchai YC-ECU
Yuchai United	YC-EDU-A			Yuchai YC-ECU-A

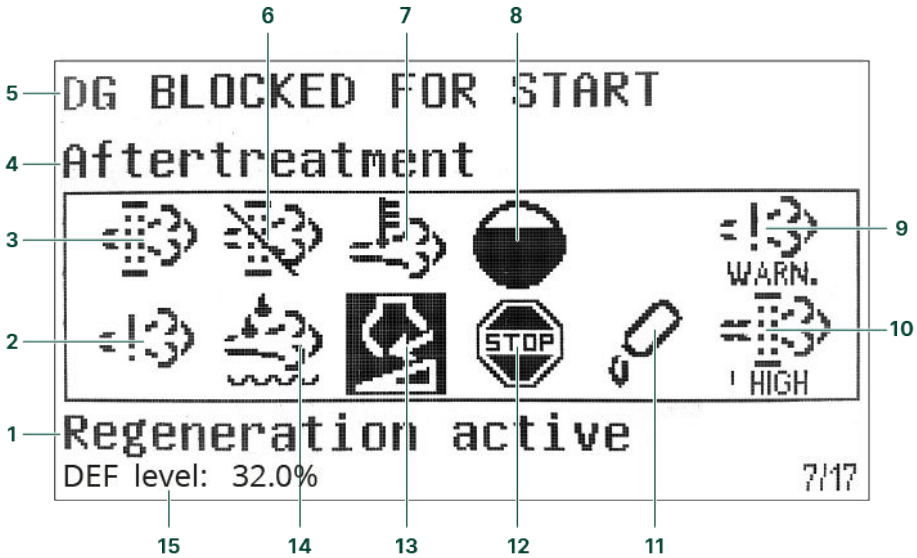
NOTE * Generic protocols are included for backward compatibility.
NOTE ** If supported by the ECU and engine.
NOTE *** Previously *Jichai*

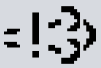
Other EIC protocols: Contact DEIF.

1.2.4 Exhaust after-treatment (Tier 4/Stage V)

iE 150 meets the Tier 4 (Final)/Stage V requirements. The user can use the display to monitor (and control) both the engine, and the exhaust after-treatment system.

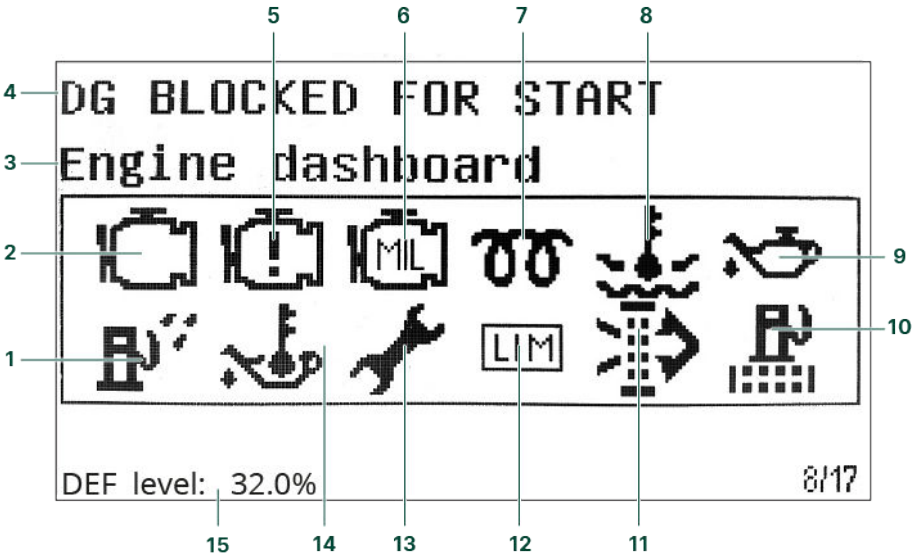
After-treatment page

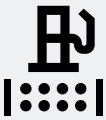


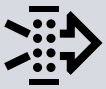
No.	Referent	Symbol	Description
1	After-treatment status	-	
2	Engine emission system failure		Emission failure or malfunction.
3	Diesel Particle Filter (DPF)		Regeneration is needed.
4	Page name	-	
5	Controller status	-	
6	Diesel Particle Filter (DPF) Inhibit		Regeneration is inhibited.
7	High temperature - Regeneration		There is a high temperature and regeneration is in process.
8	HC burn-off		Hydrocarbon accumulation that requires burn-off.
9	Engine emission system failure level		Emission failure or malfunction, with the severity.
10	Diesel Particle Filter (DPF) level		Regeneration needed, with the severity.
11	DEF level warning		Low DEF level.
12	DEF shutdown		DEF problem stops normal operation.
13	DEF level inducement		Mid-level inducement.
			Severe inducement.

No.	Referent	Symbol	Description
14	Diesel Exhaust Fluid (DEF)		DEF quality is low.
15	DEF level		DEF level.

Engine dashboard



No.	Referent	Symbol	Description
1	Water in fuel		There is water in the fuel.
2	Engine interface status		An engine warning.
3	Page name	-	-
4	Controller status	-	
5	Engine interface status		An engine shutdown.
6	Engine interface status		An engine malfunction.
7	Cold start		The engine is cold.
8	High engine coolant temperature		The engine coolant temperature is high.
9	Low engine oil pressure		The engine oil pressure is low.
10	Fuel filter clogging		The fuel filter is blocked.

No.	Referent	Symbol	Description
11	Air filter clogging		The air filter is blocked.
12	LIMIT lamp		Only for MTU engines.
13	Oil change		The engine needs an oil change.
14	High engine oil temperature		The engine oil temperature is high.
15	DEF level		DEF level.

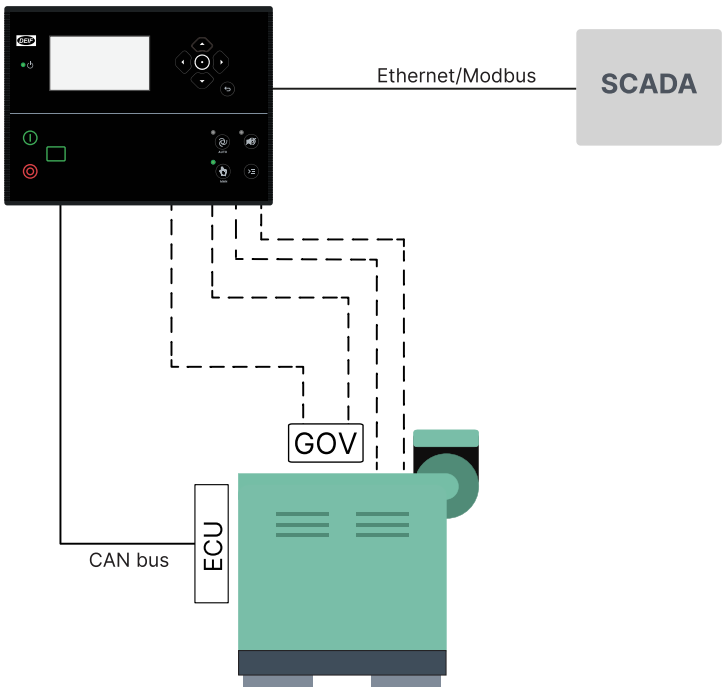
NOTE Grey symbols show that communication is available for the referent. An engine type might not support all of the referents.

1.3 Alarms and protections

Protections	ANSI
Overspeed	12
Crank failure	48
Running feedback error	34
MPU wire break	-
Start failure	48
Stop failure	-
Stop coil, wire break alarm	-
Emergency stop	-
Engine heater	26
Max. ventilation/radiator fan	-
Not in remote mode	34
Fuel fill check	-
Low auxiliary supply	27DC
High auxiliary supply	59DC
Maintenance alarms	-

1.4 Applications

Engine controller



1.5 Compatible products

1.5.1 Remote display: iE 150

The remote display is an iE 150 that only has a power supply and an Ethernet connection to an iE 150 controller. The remote display allows the operator to see the controller's operating data, as well as operate the controller remotely.

1.5.2 Shutdown unit, SDU 104

The SDU 104 is a safety device for the protection of engines. The unit keeps the engine running if the main controller fails. The unit can also safely shut down the engine.

See www.deif.com/products/sdu-104

1.5.3 Additional operator panel, AOP-2

The controller uses CAN bus communication to the additional operator panel (AOP-2). Configure the controller using M-Logic. On the AOP-2, the operator can then:

- Use the buttons to send commands to the controller.
- See LEDs light up to show statuses and/or alarms.

You can configure and connect two AOP-2s if the controller has the premium software package.

1.5.4 Additional inputs and outputs

iE 150 uses CAN bus communication with these:

- **CIO 116** is a remote input expansion module. See www.deif.com/products/cio-116
- **CIO 208** is a remote output expansion module. See www.deif.com/products/cio-208
- **CIO 308** is a remote I/O module. See www.deif.com/products/cio-308

- **IOM 220** and **IOM 230** each have two analogue outputs. These can be used for governor and AVR regulation, or general PID control. See www.deif.com/products/iom-200230

1.5.5 Controller types

LAND variants

Parameter	Setting	Controller type	Minimum software
9101	Genset unit	Generator Stand-alone controller	S1
	Genset unit	Generator controller	S2
	Mains unit	Mains controller	S2
	Bus Tie Breaker unit	BTB controller	S2
	Genset Hybrid unit	Genset-Solar hybrid controller	S2
	Engine Drive unit	Engine drive controller	S1
	Remote display unit	Remote display	None
	Battery unit	Battery storage controller	S4 + S10
	Solar unit	Solar controller	S4 + S10
	ATS unit	Automatic transfer switch (open transition)	S1
	ATS unit	Automatic transfer switch (closed transition)	S2
	Genset PMS lite unit	PMS lite controller	S2

MARINE variants

Parameter	Setting	Controller type	Minimum software
9101	Engine Drive Marine unit	Engine drive controller for marine use	S1
	Genset Marine unit	Core genset controller for marine use	S1
	Genset Marine unit	Genset controller for marine use	S2
	Shore Marine unit	Shore controller for marine use	S2
	BTB Marine unit	BTB controller for marine use	S2
	Battery Marine unit	Battery controller for marine use	S4 + S10
	Solar Marine unit	Solar controller for marine use	S4 + S10

Software packages and controller types

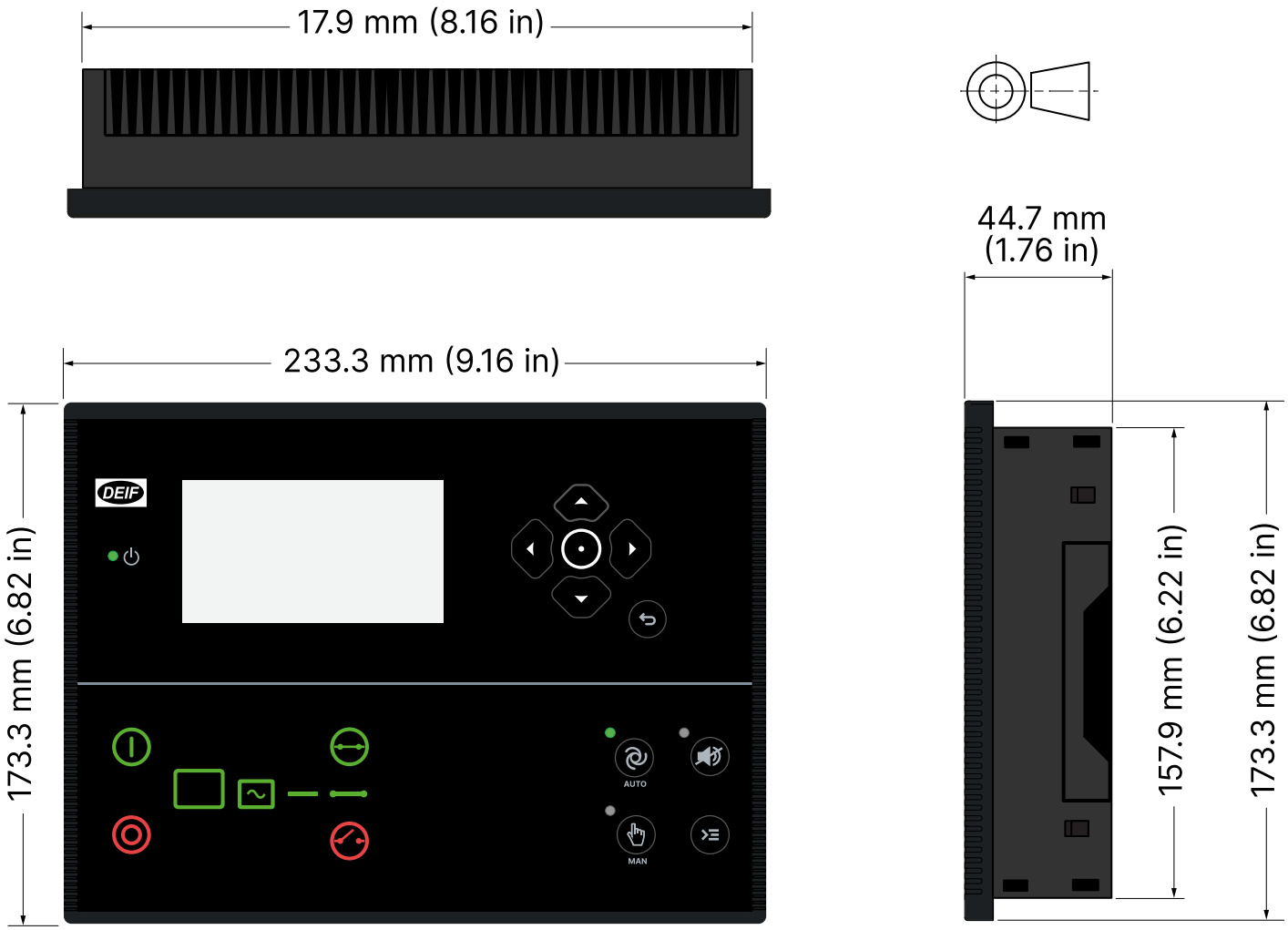
The controller software package determines which functions the controller can use.

- S1 = Core
  - You can change the controller type to any other controller that uses S1.
- S2 = Sync
  - You cannot change the controller type.
- S4 = PM (power management)
  - You cannot change the controller type.
- S4 + S10 = Premium
  - You can change the controller type to any other controller type.
  - All functions are supported.

You can select the controller type under `Basic settings > Controller settings > Type`.

2. Technical specifications

2.1 Dimensions



Dimensions and weight	
Dimensions	Length: 233.3 mm (9.16 in) Height: 173.3 mm (6.82 in) Depth: 44.7 mm (1.76 in)
Panel cutout	Length: 218.5 mm (8.60 in) Height: 158.5 mm (6.24 in) Tolerance: ± 0.3 mm (0.01 in)
Max. panel thickness	4.5 mm (0.18 in)
Mounting	UL/cUL Listed: Type complete device, open type 1 UL/cUL Listed: For use on a flat surface of a type 1 enclosure
Weight	0.79 kg

2.2 Mechanical specifications

Operation conditions	
Vibration	Response: • 10 to 58.1 Hz, 0.15 mmpp

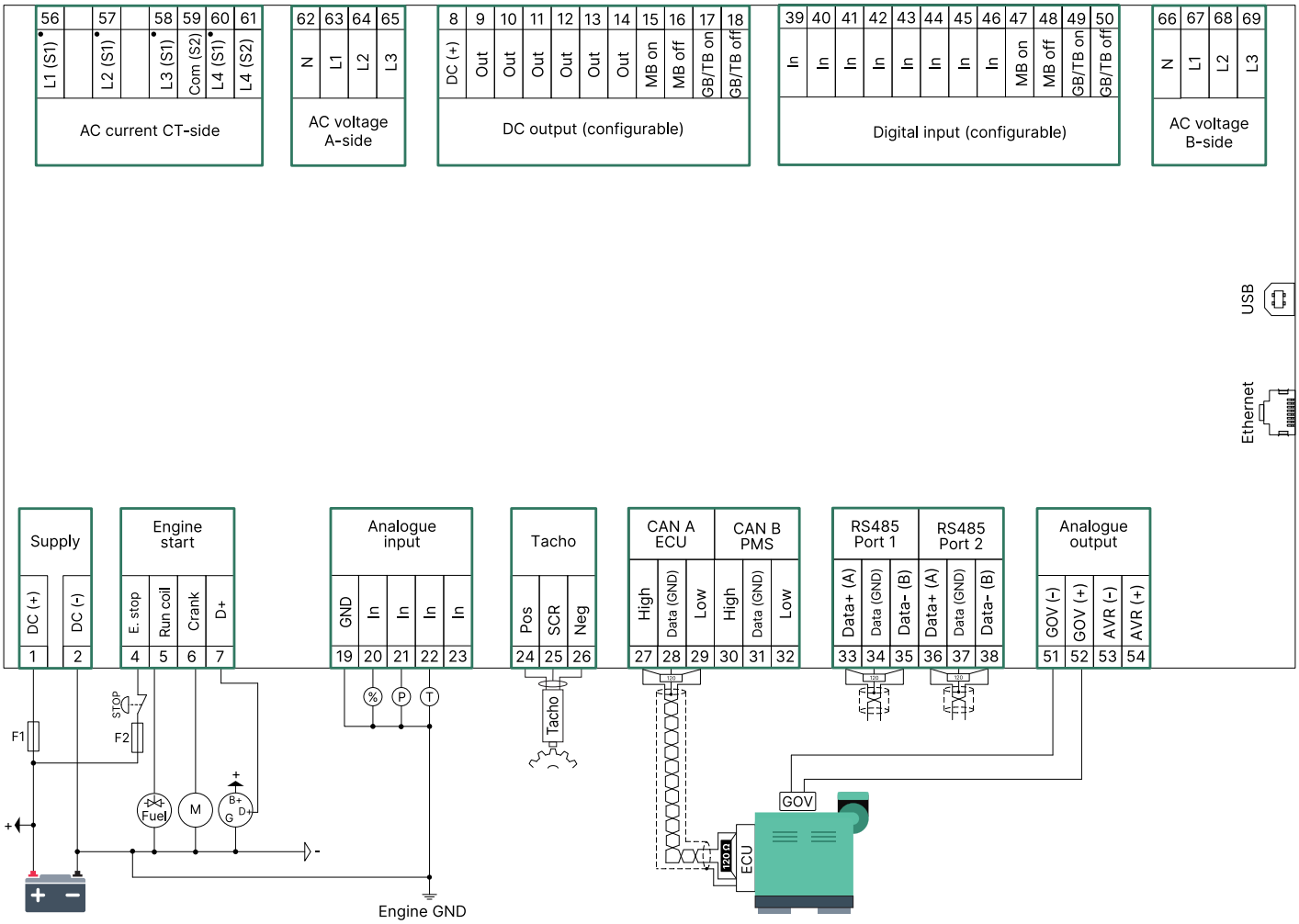
Operation conditions	
	• 58.1 to 150 Hz, 1 *g*. To IEC 60255-21-1 (Class 2) Endurance: • 10 to 150 Hz, 2 *g*. To IEC 60255-21-1 (Class 2) Seismic vibration: • 3 to 8.15 Hz, 15 mmpp • 8.15 to 35 Hz, 2 *g*. To IEC 60255-21-3 (Class 2)
Shock	10 *g*, 11 ms, half sine. To IEC 60255-21-2 Response (Class 2) 30 *g*, 11 ms, half sine. To IEC 60255-21-2 Withstand (Class 2) 50 *g*, 11 ms, half sine. To IEC 60068-2-27, test Ea Tested with three impacts in each direction in three axes (total of 18 impacts per test)
Bump	20 *g*, 16 ms, half sine IEC 60255-21-2 (Class 2) Tested with 1000 impacts in each direction on three axes (total of 6000 impacts per test)
Galvanic separation	CAN port 2 (CAN B): 550 V, 50 Hz, 1 minute RS-485 port 1: 550 V, 50 Hz, 1 minute Ethernet: 550 V, 50 Hz, 1 minute Analogue output 51-52 (GOV): 550 V, 50 Hz, 1 minute Analogue output 54-55 (AVR): 3000 V, 50 Hz, 1 minute Note: No galvanic separation on CAN port 1 (CAN A) and RS-485 port 2
Safety	Installation CAT. III 600 V Pollution degree 2 IEC/EN 60255-27
Flammability	All plastic parts are self-extinguishing to UL94-V0
EMC	IEC/EN 60255-26

2.3 Environmental specifications

Operation conditions	
Operating temperature (incl. display screen)	-40 to +70 °C (-40 to +158 °F)
Storage temperature (incl. display screen)	-40 to +85 °C (-40 to +185 °F)
Accuracy and temperature	Temperature coefficient: 0.2 % of full scale per 10 °C
Operating altitude	0 to 4000 m with derating
Operating humidity	Damp Heat Cyclic, 20/55 °C at 97 % relative humidity, 144 hours. To IEC 60255-1 Damp Heat Steady State, 40 °C at 93 % relative humidity, 240 hours. To IEC 60255-1
Change of temperature	70 to -40 °C, 1 °C / minute, 5 cycles. To IEC 60255-1
Protection degree	IEC/EN 60529 • IP65 (front of module when installed into the control panel with the supplied sealing gasket) • IP20 on terminal side

2.4 Controller

2.4.1 Typical wiring for engine drive controller



Fuses

- F1: 2 A DC max. time-delay fuse/MCB, c-curve
- F2: 6 A AC max. time-delay fuse/MCB, c-curve

2.4.2 Electrical specifications

Power supply	
Power supply range	Nominal voltage: 12 V DC or 24 V DC Operating range: 6.5 to 36 V DC
Voltage withstand	Reverse polarity
Power supply drop-out immunity	0 V DC for 50 ms (coming from min. 6 V DC)
Power supply load dump protection	Load dump protected according to ISO16750-2 test A
Power consumption	5 W typical 12 W max.
RTC clock	Time and date backup

Supply voltage monitoring	
Measuring range	0 V to 36 V DC

Supply voltage monitoring	
	Max. continuous operating voltage: 36 V DC
Resolution	0.1 V
Accuracy	±0.35 V

D+	
Excitation current	210 mA, 12 V 105 mA, 24 V
Charging fail threshold	6 V

Tacho input	
Voltage input range	+/- 1 V_{peak} to 70 V_{peak}
W	8 to 36 V
Frequency input range	10 to 10 kHz (max.)
Frequency measurement tolerance	1 % of reading

Digital inputs	
Number of inputs	12 x digital inputs Negative switching
Maximum input voltage	+36 V DC with respect to plant supply negative
Minimum input voltage	-24 V DC with respect to plant supply negative
Current source (contact cleaning)	Initial 10 mA, continuous 2 mA

DC outputs	
Number of 3 A outputs	2 x outputs (for fuel and crank) 15 A DC inrush and 3 A continuous, supply voltage 0 to 36 V DC Endurance tested according to UL/ULC6200:2019 1.ed: 24 V, 3 A, 100000 cycles (with an external freewheeling diode)
Number of 0.5 A outputs	10 x outputs 2 A DC inrush and 0.5 A continuous, supply voltage 4.5 to 36 V DC
Common	12/24 V DC

Analogue inputs	
Number of inputs	4 x analogue inputs
Electrical range	Configurable as: • Negative switching digital input • 0 V to 10 V sensor • 4 mA to 20 mA sensor • 0 Ω to 2.5 kΩ sensor
Accuracy	Current: • Accuracy: ±20 uA ±1.00 % rdg Voltage: • Range: 0 to 10 V DC • Accuracy: ±20 mV ±1.00 % rdg RMI 2-wire LOW:

Analogue inputs	
	• Range: 0 to 800 Ω • Accuracy: ±2 Ω ±1.00 % rdg RMI 2-wire HIGH: • Range: 0 to 2500 Ω • Accuracy: ±5 Ω ±1.00 % rdg

Analogue output	
Output types	Isolated DC voltage output
Voltage range	-10 to +10 V DC
Resolution in voltage mode	Better than 1 mV
Max Common Mode Voltage	±3 kV
Minimum load in voltage mode	500 Ω
Accuracy	±1 % of setting value

Speed governor output	
Output types	Isolated DC voltage output Isolated PWM output
Voltage range	-10 to +10 V DC
Resolution in voltage mode	Less than 1 mV
Max Common Mode Voltage	±550 V
Minimum load in voltage mode	500 Ω
PWM frequency range	1 to 2500 Hz ±25 Hz
PWM duty cycle resolution (0-100%)	12 bits (4096 steps)
PWM voltage range	1 to 10.5 V
Voltage accuracy	±1% of setting value

Display unit	
Type	Graphical display screen (monochrome)
Resolution	240 x 128 pixels
Navigation	Five-key menu navigation
Log book	Data log and trending function
Language	Multi-language display

2.4.3 Communication

Communication	
CAN A	Used for: • Engine CAN Port • CIO 116, CIO 208 and CIO 308 • IOM 220 and IOM 230 Data connection 2-wire + common, or 3-wire Not isolated External termination required (120 Ω + matching cable)

Communication	
	DEIF engine specification (J1939 + CANopen)
CAN B	Used for: • AOP-2 Data connection 2-wire + common, or 3-wire Isolated External termination required (120 Ω + matching cable) PMS 125 kbit and 250 kbit
RS-485 Port 1	Used for: Modbus RTU, PLC, SCADA Data connection 2-wire + common, or 3-wire Isolated External termination required (120 Ω + matching cable) 9600 to 115200
RS-485 Port 2	Used for: Modbus RTU, PLC, SCADA Data connection 2-wire + common, or 3-wire Not isolated External termination required (120 Ω + matching cable) 9600 to 115200
RJ45 Ethernet	Used for: • Modbus to PLC, SCADA and so on • NTP time synchronisation with NTP servers • PC utility software Isolated Auto detecting 10/100 Mbit Ethernet port
USB	Service port (USB-B)

2.5 Approvals

Standards
CE
UL/cUL Listed to UL/ULC6200:2019, 1. ed. controls for stationary engine gensets

NOTE Refer to www.deif.com for the most recent approvals.

2.5.1 UL/cUL Listed

Requirements	
Installation	To be installed in accordance with the NEC (US) or the CEC (Canada)
Enclosure	A suitable type 1 (flat surface) enclosure is required Unventilated/ventilated with filters for controlled/pollution degree 2 environment
Mounting	Flat surface mounting
Connections	Use 90 °C copper conductors only
Wire size	AWG 30-12
Terminals	Tightening torque: 5-7 lb-in.
Current transformers	Use Listed or Recognized isolating current transformers
Communication circuits	Only connect to communication circuits of a listed system/equipment

3. Legal information

3.1 Disclaimer and copyright

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