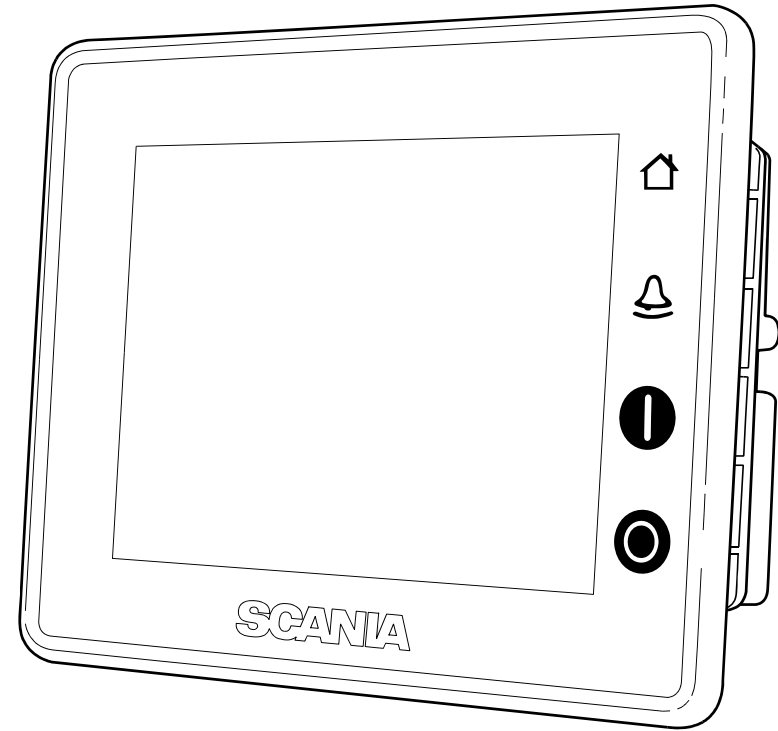# Installation manual

Instrumentation 2.1

Installation and configuration

Marine engines
DI09, DI13, DI16

383 761

SCANIA

Changes from the previous issue

The changes made in this document compared with the previous issue are marked with a black line in the left-hand margin. The changes are also described below.

• Information about Active throttle control has been added to the Junction box, connection section.

System overview

List of abbreviations

This manuals uses the abbreviations in the list below. DCU, RP and SDU occur in the display interfaces and in the configuration interface.

Abbreviation	Description
DCU	Main display
RP	Auxiliary display
SDU	Safety device unit
FMI	Failure Mode Identifier
SPN	Suspect Parameter Number

Voltage designations

The following voltage designations are used in this document. Unless otherwise specified, always +24 V.

Designation	Description
15 voltage	Starter key voltage (ignition voltage)
30 voltage	Battery voltage

System overview

The images on this and the next page show the component parts of a control system which is prepared for classification, and not prepared for classification, respectively.

Main display (DCU)

The main display is the basic unit of the engine management system. Different sensor values are displayed on the main display touch screen, and different commands are also carried out there.

The main display is configured using a computer with a web browser via the built in web server of the main display. This is described in the Configuring the main display and connecting equipment, examples and Configuring the main display, detailed description sections.

Auxiliary display (RP)

The auxiliary display is an option and has the same user interface as the main display. The auxiliary display reads the configuration from the main display. This makes it easy to retrofit.

Control panel

The engine can be started and stopped through the control panel. It can also be used to activate and adjust engine speed settings 1 or 2. The engine installation can be carried out with or without a control panel.

383 762
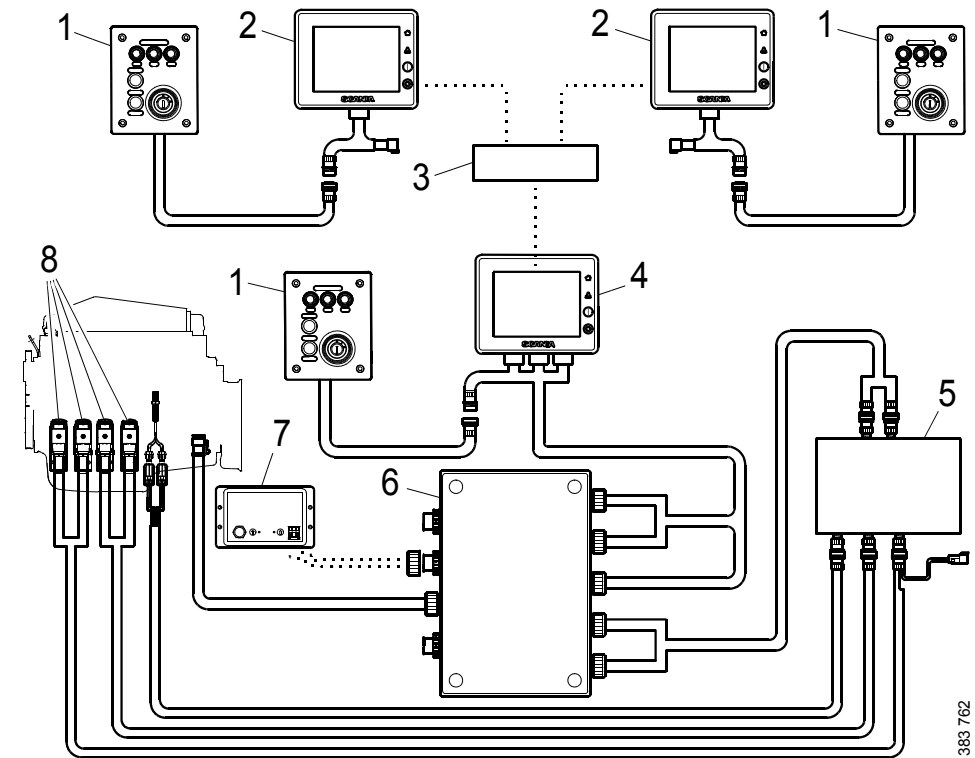
Example of the layout of a type approved control system.
1. *Control panel (option).*
2. *Auxiliary display (RP, option).*
3. *Network switch (option).*
4. *Main display (DCU).*
5. *Safety module (SDU).*
6. *Junction box.*
7. *Gateway (option).*
8. *Monitors on the engine required for classification.*

Network switch

A network switch is only required if more than one auxiliary display is connected to the engine management system. If the system only contains one auxiliary display, it is connected directly to the main display via a crossover network cable.

Safety module (SDU)

The safety device unit has monitoring and shutdown functions and is a requirement for classified engine management systems. It should be easily accessible so that alarms can be acknowledged in an easy way.

Junction box

The junction box is used to connect all the parts of the engine management system to the engine. The junction box also contains fuses. It should be easily accessible.

Gateway

The gateway, which is an option, reads specific messages about position and speed via NMEA 2000, so that the instrumentation can calculate fuel consumption per nautical mile. The gateway cannot process messages other than these.

383 143
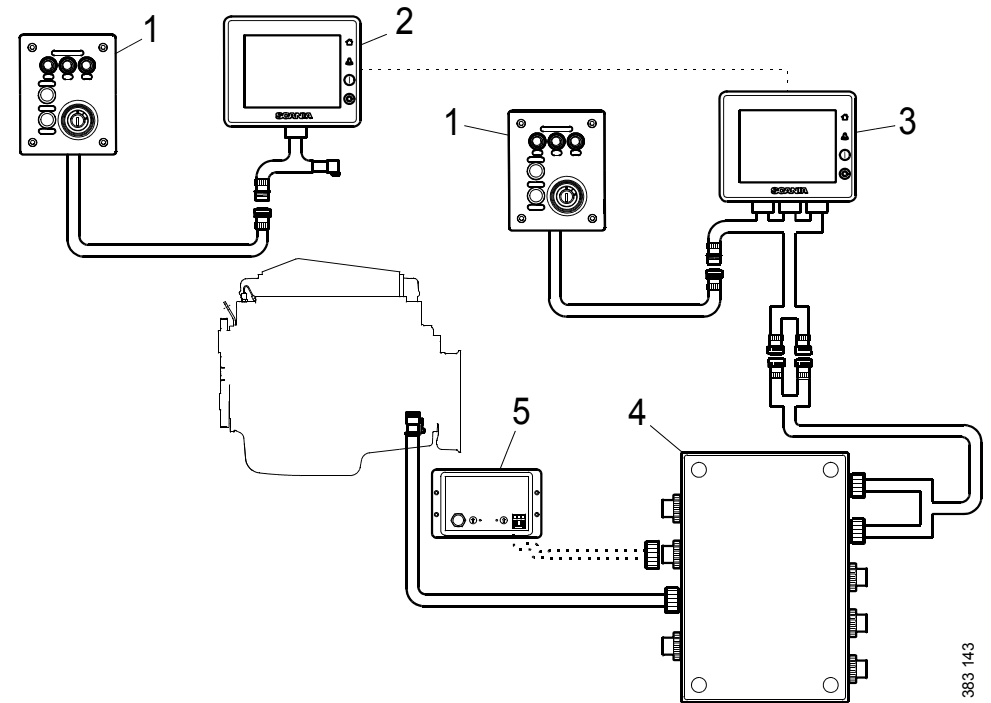
Example of the layout of a control system which is not prepared for classification, i.e. a system without safety device units.
  1. *Control panel (option).*
  2. *Auxiliary display (RP, option).*
  3. *Main display (DCU).*
  4. *Junction box.*
  5. *Gateway (option)*

Positioning of the displays

Do not position the displays so that they are exposed to direct sunlight. This impairs the readability of the displays. The user should have full access to the displays. It must also be easy to access the connections on the rear of the displays.

ⓘ IMPORTANT!

The displays must not be fitted on vibrating equipment. They may only be positioned next to the engine bed if either the engine or the display housing has vibration damping.

Main display

Scania recommends positioning the main display in the engine compartment for the following reasons:

- To ensure that operation and monitoring are close to the engine.
- To minimise the lengths of the electrical cables between the sensors and main display.
- To reduce the risk of electrical interference caused by long electrical cables.

✓ REQUIREMENT!

On a type approved installation, the main display must be located in the engine compartment.

Auxiliary display

The auxiliary display is normally positioned outside the engine compartment, but can also be positioned in the engine compartment.

Installation

1. Make a rectangular hole where the display is to be fitted (1). The hole should be 153 mm wide and 121 mm high. There must be at least 85 mm free space (A) behind the display.

2. Position the display (2) in the hole.

3. Fit the mounting frame (3) with the accompanying screws.

The accompanying screws can be used if the thickness of the surface the display is installed on (B) does not exceed 5 mm. Use the longer M3 screws for thicker surfaces.

! IMPORTANT!

If screws other than the accompanying screws are used, the length must be adjusted so that the screws go no further than 12 mm in the display screw holes. If the screws go in further, this may damage the electronics.
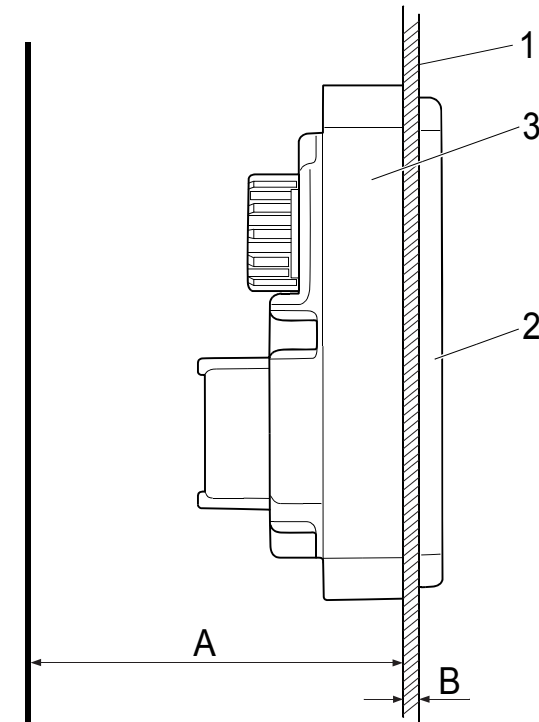
Installation of the displays.

Connection

Electrical cables

To protect against electromagnetic interference, Scania recommends that all electrical cables within the system are twisted in pairs with 35-40 turns/m. This only applies to external signal cables connected to the system.

! IMPORTANT!

If a shielded electrical cable is used, the shielding should be connected to ground, not to 0 V. Connect pin 3 in harness-to-harness connector C1 of the main display to ground. See Main display (DCU), connections. Only connect the shielding to one end of the electrical cable.

To provide good separation of the electromagnetic interference that can occur, some of the electrical cables can be routed separately from the others, e.g. the signal cable from a magnetic pulse sensor. The electrical cables for the auxiliary display electric power supply must have a cross-sectional area of at least 1.5 mm^2 and be connected to a fuse of their own, powered directly from the battery. The main display receives its electric power supply from the junction box.

Ground

! IMPORTANT!

Separate ground and 0 V. In marine installations, ground and 0 V must not be connected. The hull is ground and the battery negative terminal is 0 V.

24 V and 0 V are filtered in the main display in order to reduce electromagnetic interference. If ground and 0 V are connected together, the filters in the main display will not function.

Junction box, connection

Minimum connection

The minimum connection required for the system to function is for the pins on har-ness-to-harness connector C4066 to be connected.

Connecting the throttle control

Please refer to *03:01 Electrical system* for information on how to connect the throttle control to the engine control unit. If the throttle control is connected to the engine control unit, secondary throttle control cannot be used.

If the throttle control is to be controlled via the main display, the following must be connected:

Passive throttle control

Connect pins 1 and 2 in harness-to-harness connector C4068, according to C4068.

Active throttle control

If active throttle control is to be connected, the throttle control must be grounded. Bridge C4066 pin 2 and C4068 pin 3, and connect C4068 pin 3 to the electrical ground point of the throttle control.
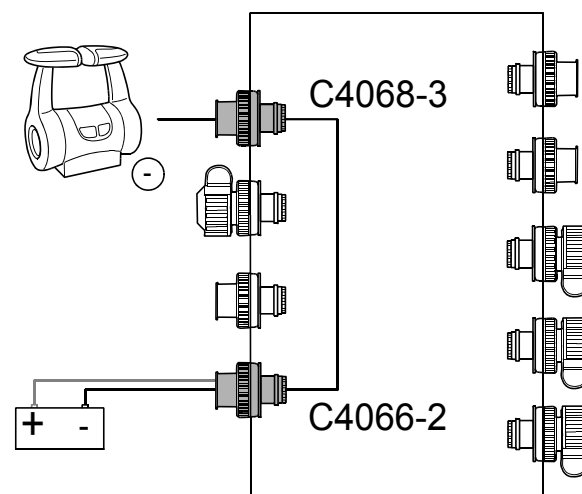
Connecting active throttle control.

C4066

Connection of power supply to the engine management system and instrumentation 2.1 (battery).

Pin	Description	I/O
1	30 voltage, 24 V	-
2	Ground (battery negative terminal) -	
3	30 voltage, 24 V	-
4	Ground (extra battery negative terminal)	-

Note:

Connect the junction box directly to the battery and not to the starter motor. Use twisted pair electrical cables and do not make the electrical cable longer than necessary. The cable cross-sectional area must be at least 2.5 mm².

If the system has a safety device unit (SDU), 2 separate groups of batteries must be used. If the system does not have a safety device unit, pins 1-4 must be connected to the same group of batteries.

Connecting the junction box.

C4062

Connection to engine harness-to-harness connector C4001.
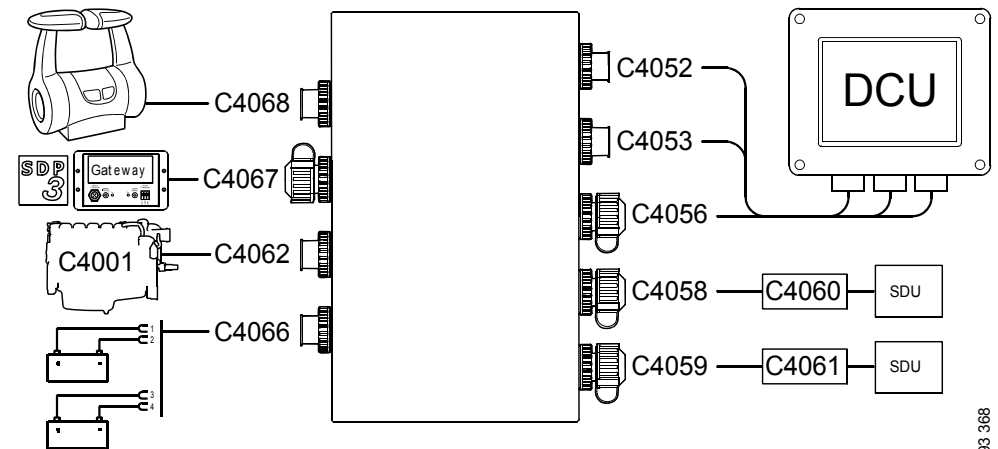
C4067

Diagnostic socket for connecting e.g. SDP3 and CAN communication. Use harness-to-harness connector 1 508 055 and hand crimping tool 99 494.

✓ REQUIREMENT!

Any equipment connected to the harness-to-harness connector must comply with the CAN specification. 15 voltage must only be used for SDP3 and CAN communication.

Pin	Description	I/O
1	15 voltage: 24 V after fuse F4005 and relay in the junction box. Controlled by the system being active.	-
2	Ground	-
3	CAN High	-
4	CAN Low	-
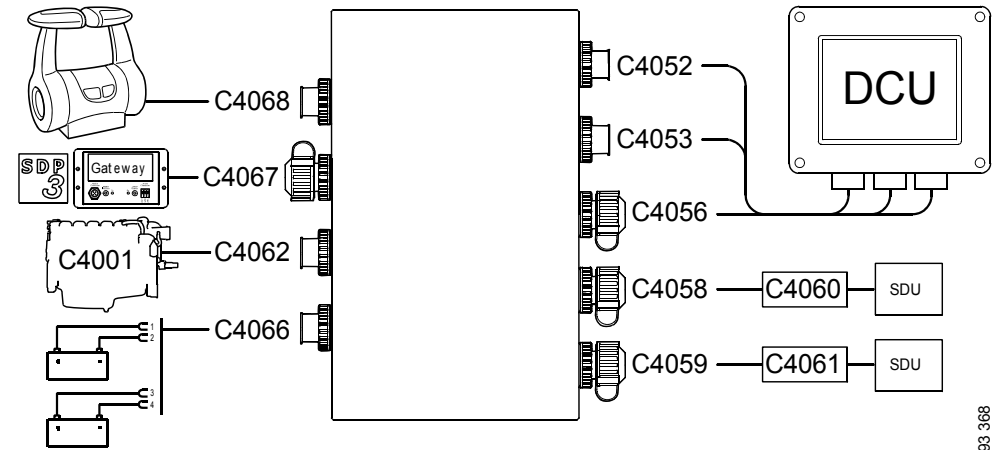
Connecting the junction box.

C4068

Connecting the incoming throttle actuation signal. The update frequency is 100 Hz, with a median filter on 3 readings.

Pin	Description	I/O
1	24 V (0.2 A), voltage supply to passive throttle control	O
2	Input for signal from passive throttle control, 4-20 mA	I
3	Not used	-
4	Not used	-

C4052

Connection to main display via C1 and C2. See Main display (DCU), connections.

C4053

Connection to main display via C1.

C4056

Connection to main display via C1 and C3.

C4058

Connection to safety device unit (SDU) via C4060 (classified systems only).

C4059

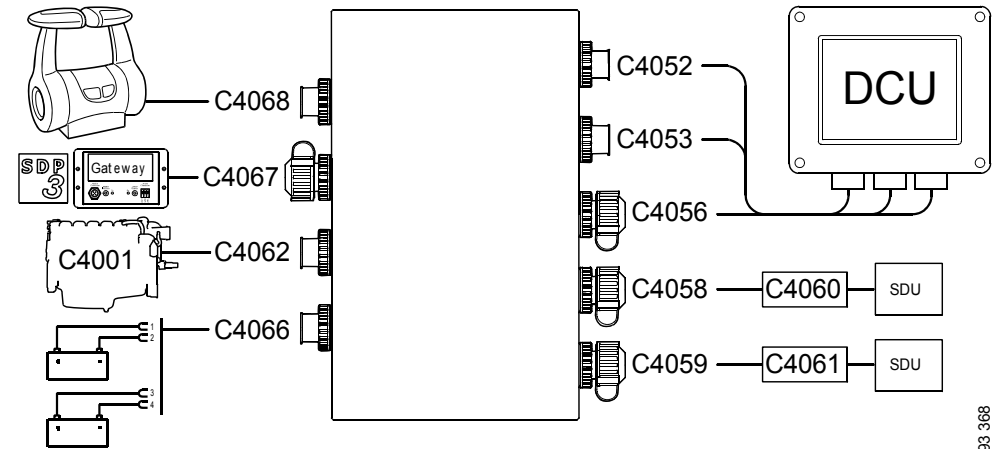Connection to safety device unit (SDU) via C4061 (classified systems only).
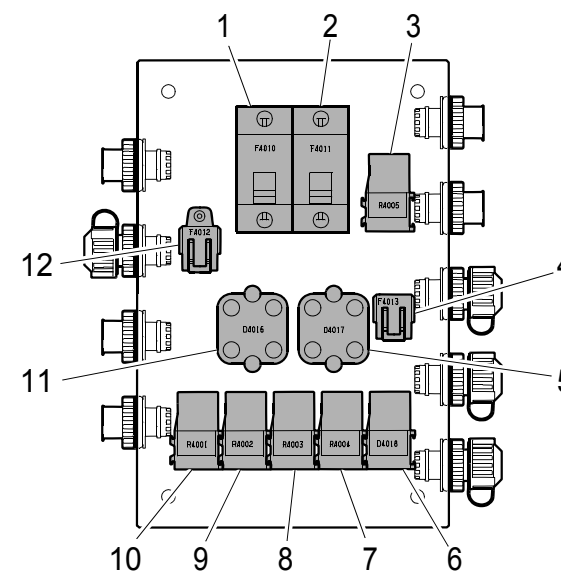

Connecting the junction box.

Junction box, components

There are two 20 A miniature circuit breakers in the junction box, one for each battery connection. Depending on the cable length, it may be necessary to fit extra fuses for the electrical cable. The junction box also has a number of blade fuses, diodes and relays as described below.

	Designation	Description
1	F4010	20 A miniature circuit breaker for incoming voltage from battery group, main supply
2	F4011	20 A miniature circuit breaker for incoming voltage from battery group, redundant supply
3	R4005	Relay for 15 voltage
4	F4013	2 x 2 A blade fuses for auxiliary socket
5	D4017	Diode to separate the battery groups, ground
6	D4018	Diode to request shutdown/activation of 15 voltage
7	R4004	Relay for engine shutdown (15 voltage)
8	R4003	Relay for engine shutdown (30 voltage)
9	R4002	Relay for detecting loss of redundant battery group
10	R4001	Relay for detecting loss of main battery group
11	D4016	Diode to separate the battery groups (30 voltage)
12	F4012	2 x 20 A blade fuses for engine control unit, 2 x 5 A blade fuses for internal supply to panels

Components in the junction box.

347 887

Main display (DCU), connections

The main display has 4 harness-to-harness connectors with 12 pins each: C1, C2, C3 and C4. Some of the pins are occupied by equipment and system functions. Others can optionally be connected and configured.

The only connection needed for the system to work is for the main display harness-to-harness connectors C1, C2 and C3 to be connected to junction box harness-to-harness connectors C4052, C4053 and C4056.

On the following pages, the functions of all pins on main display harness-to-harness connectors C1, C2, C3 and C4 are listed. The section below lists the pins according to function. The Pin list in numerical order section briefly lists the pins in numerical order.

Pin list according to function

Power supply

C1	Description	I/O
11	24 V main power supply.	I/O
12	0 V main power supply.	I
3	Ground connection.	I

The system is designed for a voltage of 24 V.

Alarm at low voltage

Warning: < 21 V   Alarm: < 18 V

There is a 30 second delay before the alarm or warning is activated.

Information about voltage level can be found in *Menu > Help > Troubleshooting > Troubleshooting DCU > Supply*. The supply voltage shown there applies to the main display, not to the battery.
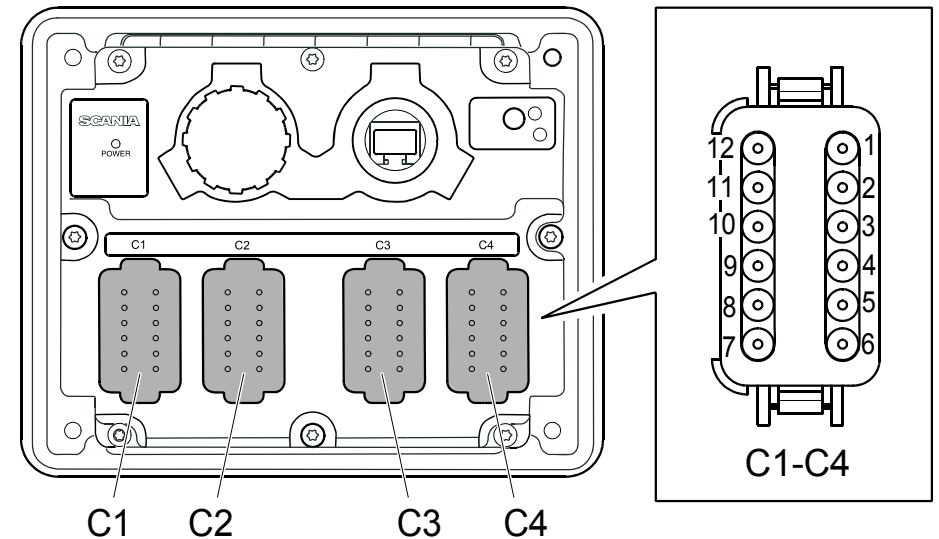
Main display harness-to-harness connectors. The pin numbering is shown as viewed from the electrical cable input side.

J1939 CAN interface

The CAN connection of the main display to the engine control unit is via harness-to-harness connector C1. The connection is terminated. CAN connection of other equipment occurs via harness-to-harness connector C2.

C1	Description	I/O
7	CAN 1 high.	I
8	CAN 1 low.	I
9	CAN 1 shielding.	I

C2	Description	I/O
10	CAN 2 high. Can also be configured as flexible I/O #20. Can only be configured as a digital signal in.	I
11	CAN 2 low. Can also be configured as flexible I/O #21. Can only be configured as a digital signal in.	I
12	CAN 2 shielding. Can also be configured as flexible I/O #5 or 0 V reference.	I

Main display harness-to-harness connectors. The pin numbering is shown as viewed from the electrical cable input side.

Relay for all faults
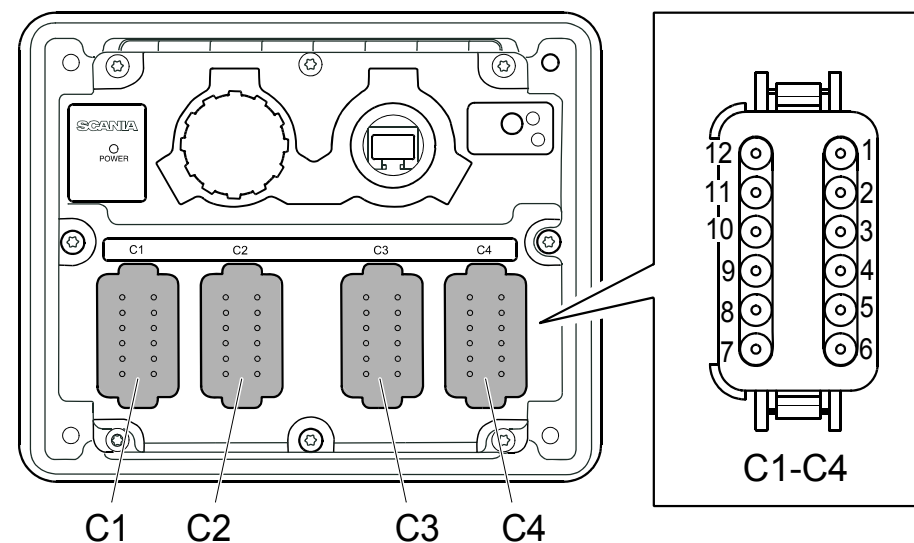
Every new event is counted as a fault in the alarm list, except diagnostics messages with a white ranking. The relay can be used to switch on an external lamp or emit an acoustic signal, for example.

C2	Description	I/O
1	NC (1 A) Closed when the display is switched of or in the event of an active fault.	-
2	C (1 A)	-
3	NO (1 A). Closed when there are no active faults.	-

Relay #1

The relay can be configured so that it is activated for any of the built in functions. See the Relay Functions section.

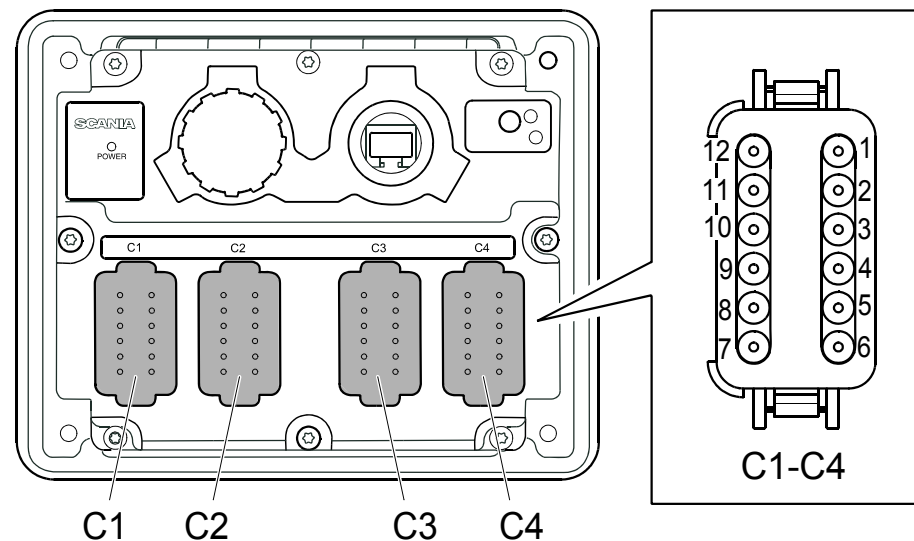| C2	Description	I/O
4	NC (1 A)	-
5	C (1 A)	-
6	NO (1 A)	-

Relay #2

The relay can be configured so that it is activated for any of the built in functions. See the Relay Functions section.

C2	Description	I/O
7	NC (1 A)	-
8	C (1 A)	-
9	NO (1 A)	-

*Main display harness-to-harness connectors. The pin numbering is shown as viewed from the electrical cable input side.*

Input for magnetic pulse sensor

An auxiliary rotational speed sensor is connected here. Only connect electrical cable shielding on the sensor side, or use an electrical cable twisted in pairs with 35-40 turns/m. An example of the connection is in the Connecting a magnetic pulse sensor section.

C4	Description	I/O
1	A	I
2	B. Can also be configured as flexible I/O #18 or as 0 V reference.	I
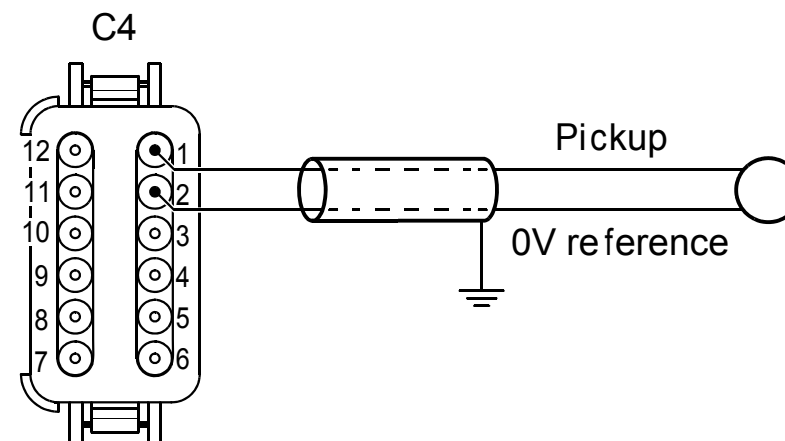
Connection of magnetic pulse sensor. The pin numbering is shown as viewed from the electrical cable input side.

Modbus RTU, RS-485

The main display has a built-in Modbus^{TM} interface, on both RS-485 and Ethernet. The latter can also be designated Modbus TCP. Information on configuration is in the Modbus RTU section.

C4	Description	I/O
3	Shielding	I
4	Low	I
5	High	I

Inputs for PT100 temperature sensor

There are 2 inputs for temperature sensors in the main display. The inputs are adapted for PT100 sensors with 2, 3 or 4 electrical cables. Connect the electrical cables as follows:

2 wire PT100: Bridge A and B. Connect one wire to AB and the other to C.

3 wire PT100: Connect A to A, B to B and C to C.

4 wire PT100: Connect in the same way as 3 filament PT100, but note that the fourth wire, D, should not be connected. It should hang loose or, if necessary, be cut off.

In the Connecting a PT100 temperature sensor section there is an example of the connection and configuration of a PT100 sensor.

If the signal is outside the following limit values, a warning is displayed on the display:

Below 90 ohms	short circuit
Above 390 ohms	defective

The updating frequency is 2 Hz.

Connection of
 1. 2 wire PT100.
 2. 3 wire PT100.
 3. 4 wire PT100.

C4	Description	I/O
6	PT100 #1 A	I
7	PT100 #1 B	I
8	PT100 #1 C	I
9	PT100 #2 A	I
10	PT100 #2 B	I
11	PT100 #2 C	I

Flexible connections

The main display has 19 flexible connections. If CAN 2 is not used, there are two further flexible connections, #20–21, for digital signal in.

The flexible connections can be configured to be used for voltage supply or as inputs and outputs for optional functions or events. If the system has a control panel, flexible connections #7 to #11 are reserved for the control panel.

Examples of the configuration of the flexible connections and connection of sensors and micro switches are given in the Examples of connection of sensors and micro switches section.

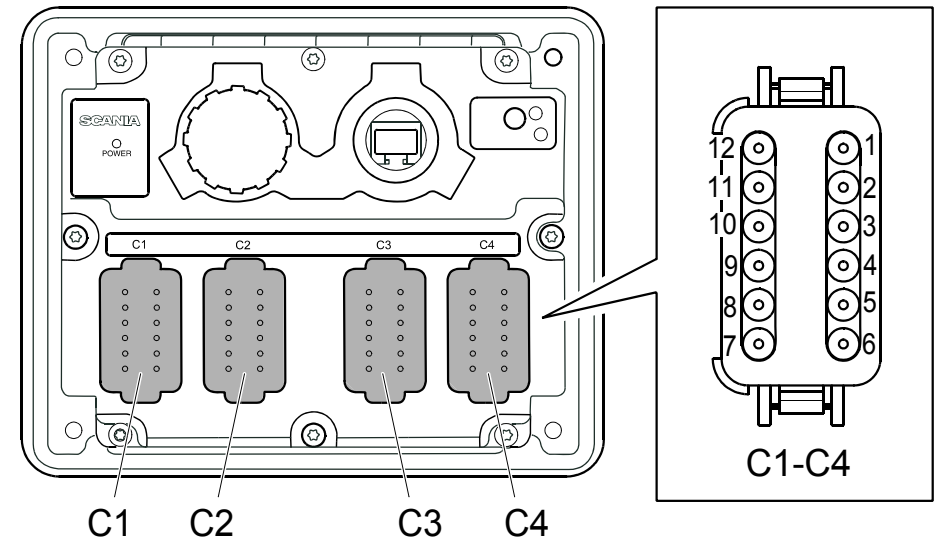| Pin	Description	I/O
C1-1	Flexible I/O #1.	I/O
C1-2	Flexible I/O #2. Can also be configured as 0 V reference.	I/O
C1-4	Flexible I/O #3.	I/O
C1-10	Flexible I/O #4.	I/O
C2-12	Flexibel I/O #5. Can also be configured as CAN 2 shielding or 0 V reference.	I/O
C3-1	Flexible I/O #6. Can also be configured for 0-5 V voltage supply to sensor.	I/O
C3-2	Flexible I/O #7. Reserved in systems with control panel (engine speed setting 1).	I/O
C3-3	Flexible I/O #8. Reserved in systems with control panel (engine speed setting 2).	I/O
C3-4	Flexible I/O #9. Reserved in systems with control panel (engine speed setting off).	I/O
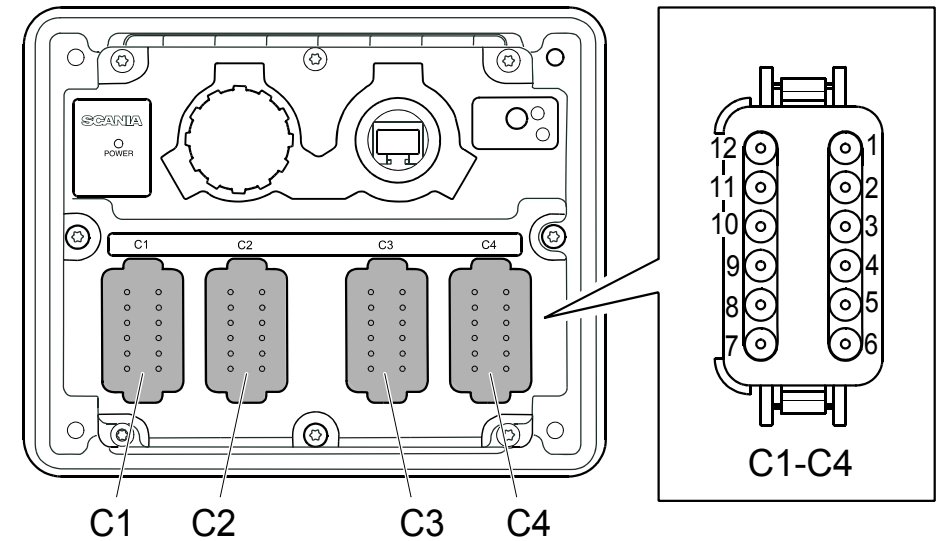
Main display harness-to-harness connectors. The pin numbering is shown as viewed from the electrical cable input side.

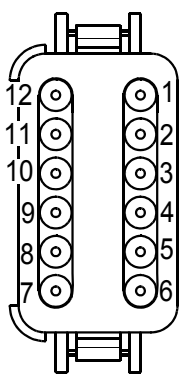| Pin	Description	I/O
C3-5	Flexible I/O #10. Reserved in systems with control panel (15 voltage).	I/O
C3-6	Flexible I/O #11. Reserved in systems with control panel (engine start).	I/O
C3-7	Flexible I/O #12. Can also be configured as 0 V reference.	I/O
C3-8	Flexible I/O #13. Can also be configured for 0-5 V voltage supply to sensor.	I/O
C3-9	Flexible I/O #14.	I/O
C3-10	Flexible I/O #15.	I/O
C3-11	Flexible I/O #16.	I/O
C3-12	Flexible I/O #17.	I/O
C4-2	Flexibel I/O #18. Can also be configured as input for magnetic pulse sensor B or 0 V reference.	I/O
C4-12	Flexible I/O #19.	I/O
C2-10	Flexible I/O #20. Digital signal in only. Can also be configured for CAN 2 high.	I
C2-11	Flexible I/O #21. Digital signal in only. Can also be configured for CAN 2 low.	I

Main display harness-to-harness connectors. The pin numbering is shown as viewed from the electrical cable input side.
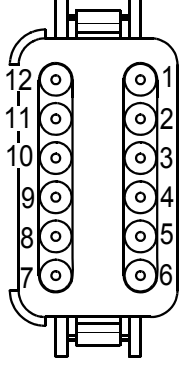
Pin list in numerical order

C1	Description	I/O	C1-C4 viewed from the electrical cable input side.	C2	Description	I/O
1	Flexible I/O #1.	I/O		1	Relay for all faults, NC (1 A). Closed when the display is switched of or in the event of an active fault.	-
2	Flexible I/O #2 or 0 V reference.	I/O		2	Relay for all faults, C (1 A).	-
3	Ground connection.	I		3	Relay for all faults, NO (1 A). Closed when there are no active faults.	-
4	Flexible I/O #3.	I/O		4	Relay #1, NC (1 A).	-
5	RIO link low. Not used.	I		5	Relay #1, C (1 A).	-
6	RIO link high. Not used.	I		6	Relay #1, NO (1 A).	-
7	CAN 1 high. The connection is terminated.	I		7	Relay #2, NC (1 A).	-
8	CAN 1 low. The connection is terminated.	I		8	Relay #2, C (1 A).	-
9	CAN 1 shielding. The connection is terminated.	I		9	Relay #2, NO (1 A).	-
10	Flexible I/O #4.	I/O		10	CAN 2 high or flexible I/O #20. Digital signal in only.	I
11	24 V main power supply.	I/O		11	CAN 2 low or flexible I/O #21. Digital signal in only.	I
12	0 V main power supply.	I		12	CAN 2 shielding, 0 V reference or flexible I/O #5.	I

C1-C4

C3	Description	I/O	C1-C4 viewed from the electrical cable input side.	C4	Description	
1	Flexible I/O #6 or 0–5 V voltage supply for sensor.	I/O		1	Magnetic pulse sensor A.	I
2	Flexible I/O #7. Reserved in systems with control panel.	I/O		2	Magnetic pulse sensor B, flexible I/O #18 or 0 V reference.	I
3	Flexible I/O #8. Reserved in systems with control panel.	I/O		3	Modbus RTU shielding.	I
4	Flexible I/O #9. Reserved in systems with control panel.	I/O		4	Modbus RTU low.	I
5	Flexible I/O #10. Reserved in systems with control panel.	I/O		5	Modbus RTU high.	I
6	Flexible I/O #11. Reserved in systems with control panel.	I/O		6	PT100 #1 A.	I
7	Flexible I/O #12 or 0 V reference.	I/O		7	PT100 #1 B.	I
8	Flexible I/O #13.	I/O		8	PT100 #1 C.	I
9	Flexible I/O #14.	I/O		9	PT100 #2 A.	I
10	Flexible I/O #15.	I/O		10	PT100 #2 B.	I
11	Flexible I/O #16.	I/O		11	PT100 #2 C.	I
12	Flexible I/O #17.	I/O		12	Flexible I/O #19.	I/O

C1-C4

Auxiliary display (RP), connections

Power supply

C1	Description	I/O
3	Ground connection	I
11	24 V main power supply	I/O
12	0 V main power supply	I

The auxiliary display must have a separate electric power supply. The system is designed for a voltage of 24 V.

Note:

Connect the display directly to the battery and not to the starter motor. Use twisted pair electrical cables and do not make the electrical cables longer than necessary. The cable cross-sectional area must be at least 1.5 mm².

Scania recommends connecting the auxiliary display to the same fuse group as the main display. Avoid connecting other electrical consumers to the same electrical cable, as it can interfere with the equipment.

Alarm at low voltage

Warning: < 21 V   Alarm: < 18 V

There is a 30 second delay before an alarm or warning is activated.

Information about voltage level can be found in *Menu > Help > Troubleshooting > General* in the auxiliary display. The supply voltage shown there applies to the auxiliary display, not to the battery.
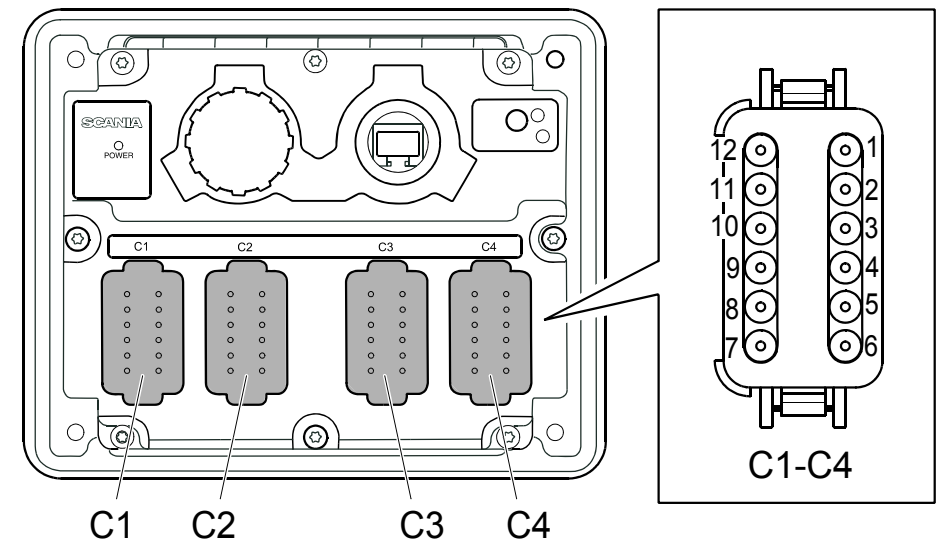
Auxiliary display harness-to-harness connectors. The pin numbering is shown as viewed from the electrical cable input side.
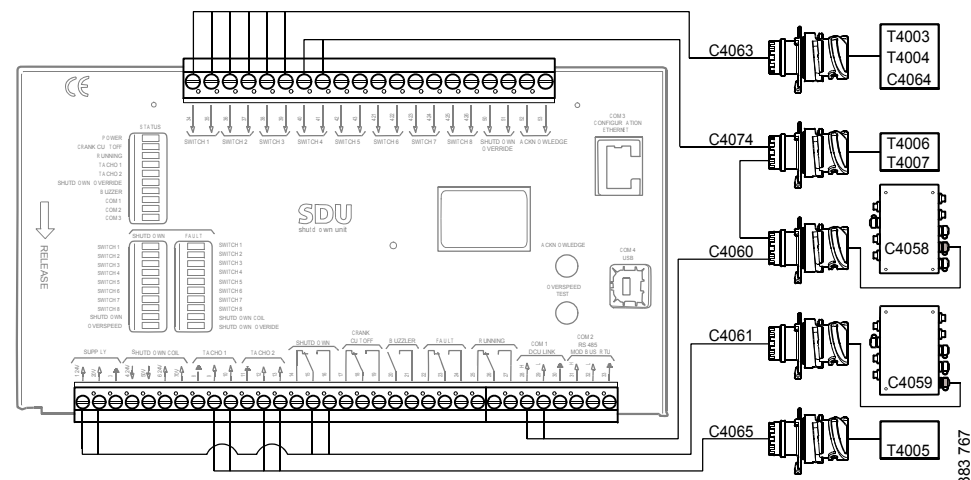
Relay for all faults

Every new event is counted as a fault in the alarm list, except diagnostics messages with a white ranking.

C2	Description	I/O
1	NC (1 A) Closed when the display is switched of or in the event of an active fault.	-
2	C (1 A)	-
3	NO (1 A). Closed when there are no active faults.	-

Connection of control panel

C3	Description	I/O
2	Engine speed setting 1.	I
3	Engine speed setting 2.	I
4	Deactivation of the engine speed setting.	I
5	15 voltage.	I
6	Engine start.	I
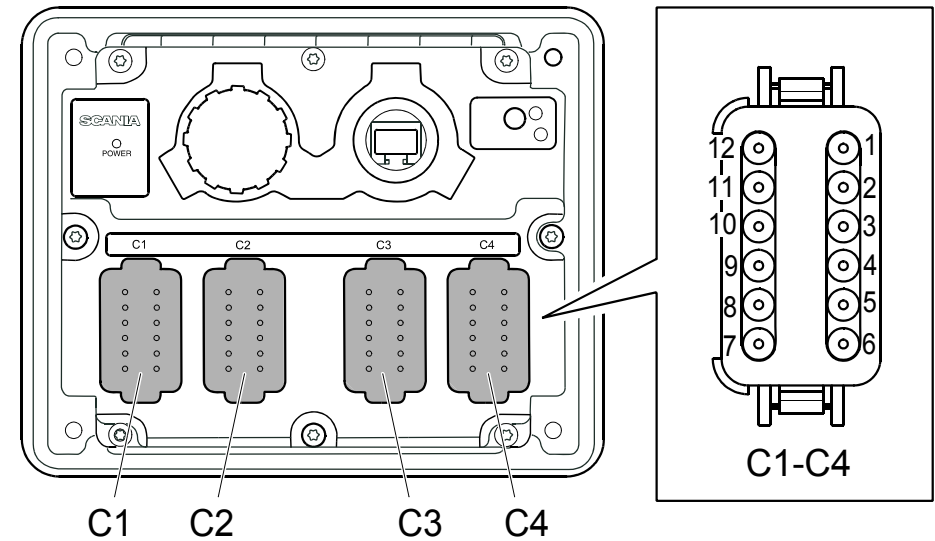
Auxiliary display harness-to-harness connectors. The pin numbering is shown as viewed from the electrical cable input side.

Safety module (SDU), connection

The illustration shows the safety device unit connections.

Gateway – overview

|	Description
1	Connection to the ship NMEA 2000 network.
2	NMEA Instance rotary control. Set the instance which the gateway transmits to other units. Used if 2 or more gateways are connected to the same NMEA 2000 network. In such a case, make sure that each gateway has a unique instance, e.g. "0" and "1".
3	Blue Tx LED, indicates that data is being received from NMEA 2000 every 2.5 seconds.
4	Green Rx LED, indicates that data is being sent to J1939.
5	J1939 Source rotary control. Set the instance for the NMEA 2000-GPS which the information should be loaded from. If the gateway does not receive any signals from a GPS with the selected instance within 30 seconds, all valid GPS data is transferred automatically.
6	Connection to harness-to-harness connector C4067 junction box. See C4067.
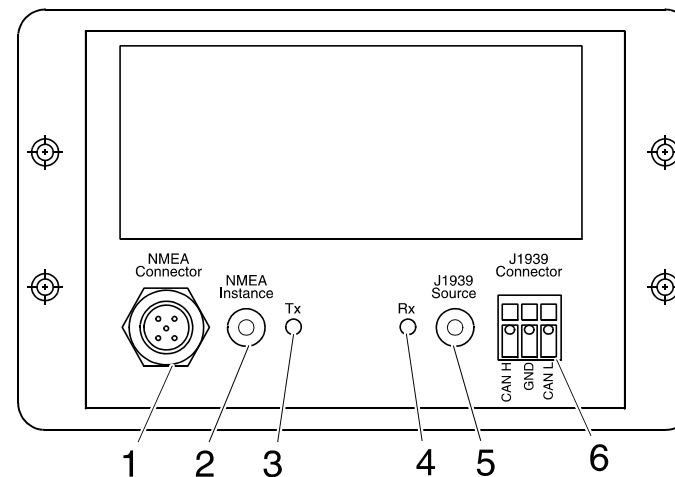
Position of the monitors on the engine

DI13
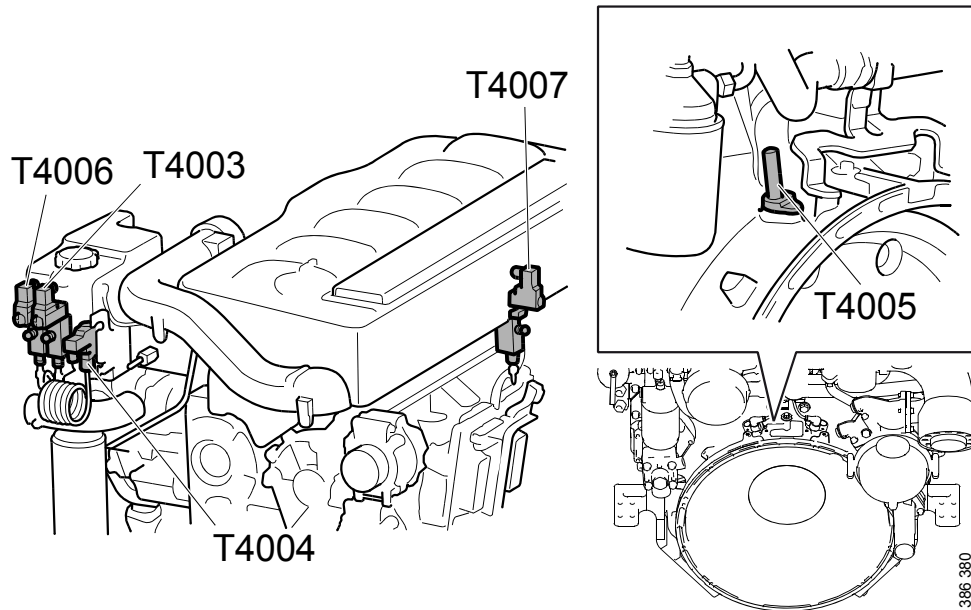
DI16

T4003: Oil pressure monitor.

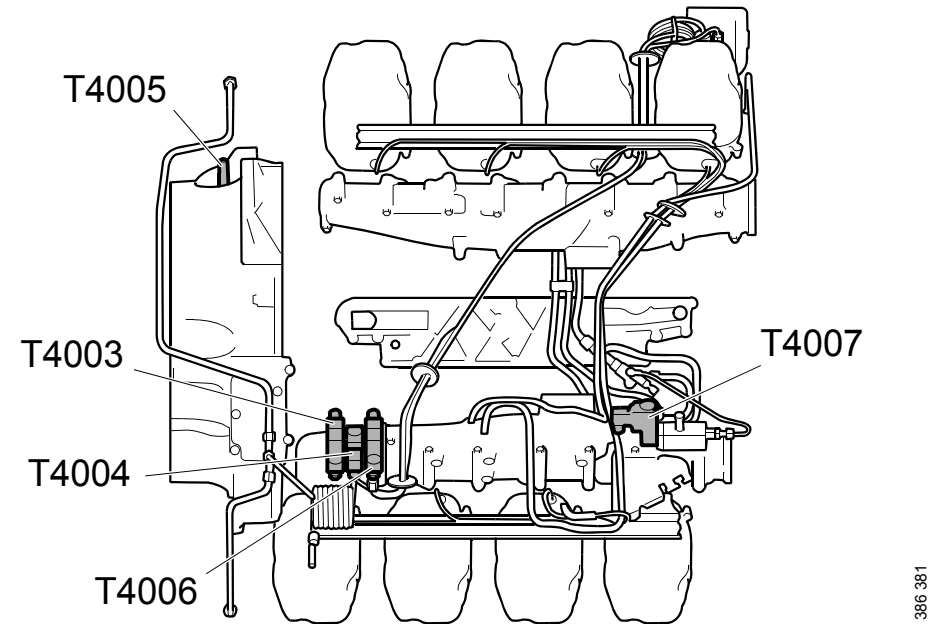*T4004: Coolant temperature monitor.*

T4005: Engine speed monitor.

T4006: Coolant pressure monitor.

T4007: Fuel pressure monitor.

See *02:01 Engine* for information on where to connect external monitoring sensors.
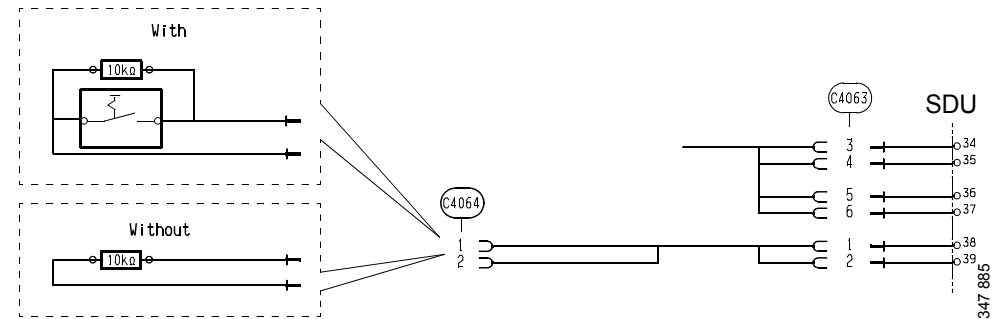
Connecting emergency stop

It is possible to connect an emergency stop which disconnects the voltage to the engine control unit. The connection is made in different ways, depending on whether the system has a safety device unit (SDU) or not.

System with safety device unit (SDU)

Connect a switch with a 10 kohms resistor to harness-to-harness connector C4064 in cable harness connected to the safety device unit.

Note:

The resistor must be connected even when there is no emergency stop. Otherwise, a fault code is generated.

System with safety device unit: connection of emergency stop to C4064.

System without safety device unit (SDU)

Connect a regular open switch to pin 3 in harness-to-harness connector C4059 in the junction box. The switch must be connected to 24 V from the same group of batteries as the junction box.

Use connector 2 131 199 and the following tools:

• Hand crimping tool 99 494

• Hand crimping tool 99 491
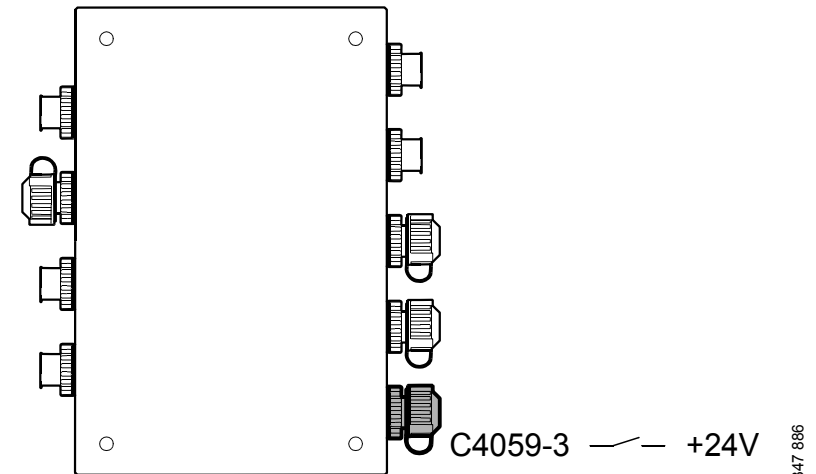
System without safety device unit: connecting an emergency stop to the junction box.

Engine shutdown override in systems with safety device unit (SDU)

It is possible to override engine shutdown requested by the safety device unit in systems prepared for classification. Proceed as follows:

1. Remove the existing 10 kohms resistor between junction blocks 50 and 51 in the safety device unit.
2. Connect a switch with a 10 kohms resistor between junction blocks 50 and 51.
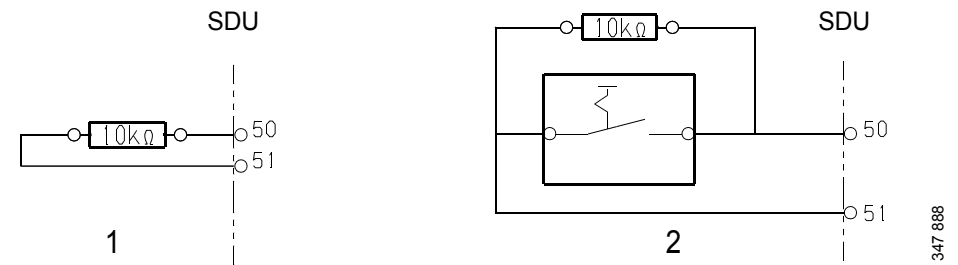
Overriding engine shutdown requested by the safety device unit.

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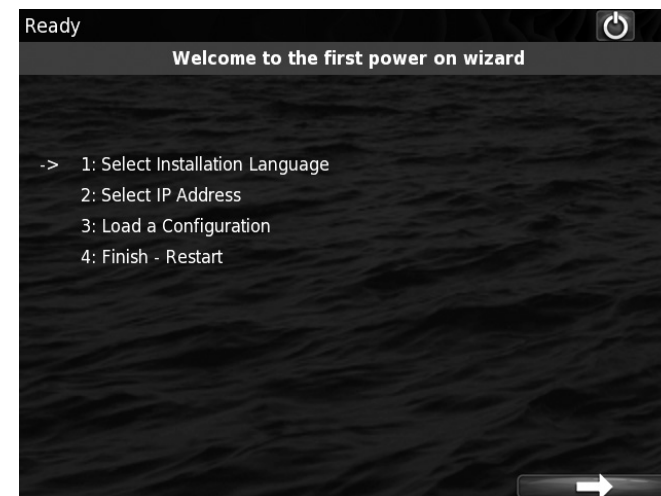
Using the main display

First start

When you start the main display for the first time or have performed a factory reset, a power-on wizard is displayed. All settings made in the wizard can also be made at a later stage. The first power-on wizard contains the following steps:

1.Select Installation Language

Select the language that should be used during the installation. There are 3 pages of language options.

Note:

In this installation manual, all buttons and options are in English.

2.Select IP number

Enter an IP address. The IP address in the factory settings is 192.168.0.101.

The last 2 numbers in the main display's IP address are displayed as the engine number in the auxiliary display. Examples:
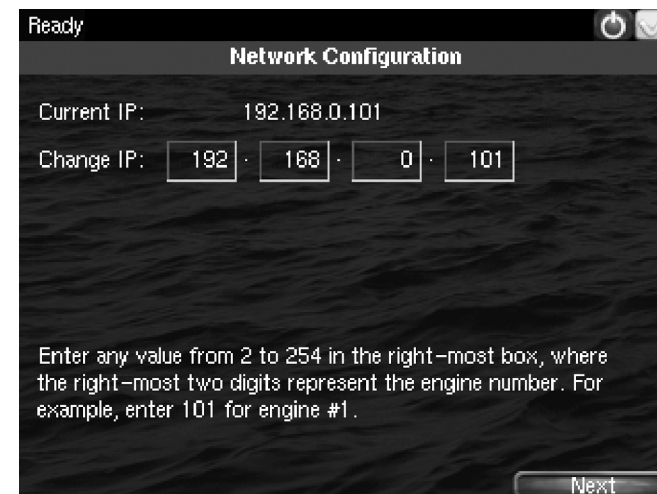
- 192.168.0.101 is displayed in the auxiliary display as *Engine #1*.
- 192.168.0.104 is displayed in the auxiliary display as *Engine #4*.

The main display IP address can be changed at a later stage. This is done via *Shortcuts > Menu > Settings > Administration > Network Configuration* in the main display.

✅ **REQUIREMENT!**

The last numeral in the IP address must always be unique to the network.

Ready

Network Configuration

Current IP: 192.168.0.101

Change IP: [192] · [168] · [0] · [101]

Enter any value from 2 to 254 in the right-most box, where the right-most two digits represent the engine number. For example, enter 101 for engine #1.
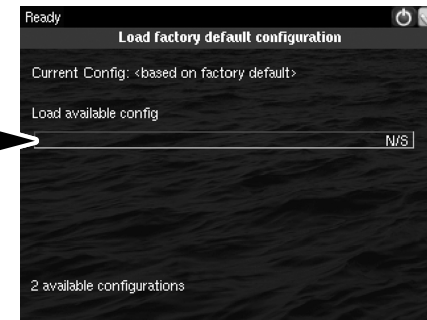
Next

372 514

3.Load a configuration

Load a configuration file depending on whether the system is prepared for classification or not. You can also save and upload configuration files to the main display, see File management: dcu > File.

1. Press the bar. See illustration.

372 515

2. Select one of the available configuration files:

  – Non-classified system with gateway for calculation of fuel consumption.
  – Non-classified system.
  – Classified system with gateway for calculation of fuel consumption.
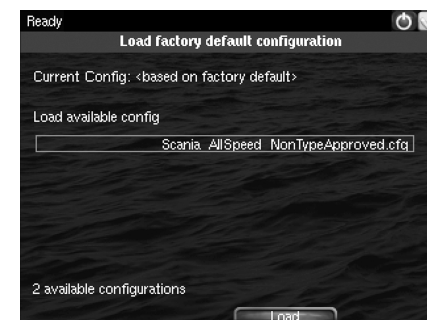 – Classified system.

3. Press the arrow button.

372 516

4.Finish – Restart

Exit the first power-on wizard by pressing *Load* and then *Restart*.

372 517

Buttons on the displays

On the right-hand side of the displays, there are four buttons for direct access to the following features:

1. First instruments page and *Menu*.
2. Alarm list.
3. Starting the engine.
4. Engine shutdown.

Functions and display modes

The displays are touch screens where you carry out every command by pressing directly on the display. Different touch areas on the display have different functions. For example, if you touch the left-hand side of the display on an instrument page, you get to the previous instrument page. The displays have four different display modes:

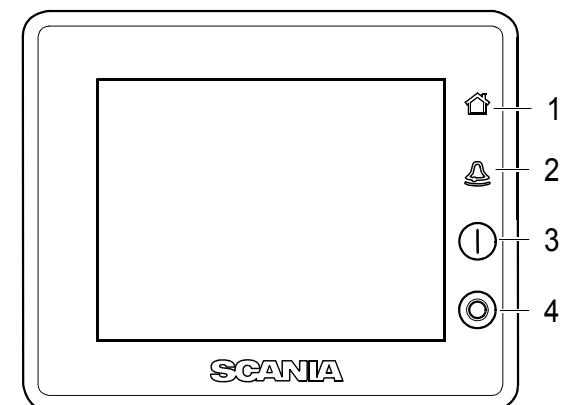• Instrument pages.
• Alarm list.
• *Select Page*.
• *Menu*.

Instrument pages

There are 4 preset instrument pages. If additional instrument pages have been configured, there may be more instrument pages.

• You scroll between the instrument pages by pressing on the right- or left-hand side of the display. See illustration.
• You reach the first instrument page, by pressing the home key (1) briefly.

Note:

A longer press on the home button (1 second) will open the main menu instead.

Buttons for direct access.

Scroll to the next instrument page.

Select Page

You get to *Select Page* by pressing in the middle of the display when on one of the instrument pages.

In *Select Page* thumbnails of the instrument pages and the *Menu* are shown. Select the instrument page you wish to display by pressing the corresponding thumbnail, or select *Menu*.

Alarm List

The *Alarm List* is described in the Operator's manual.

Menu

Only the administration section under *Menu > Settings* is described in this manual. See the Main display administration section section. Other sections in the *Menu* are described in the Operator's manual.

Note:

You can switch off the button beep by going to *Menu > Settings* and selecting *Disabled* with the *Button Beep* button.
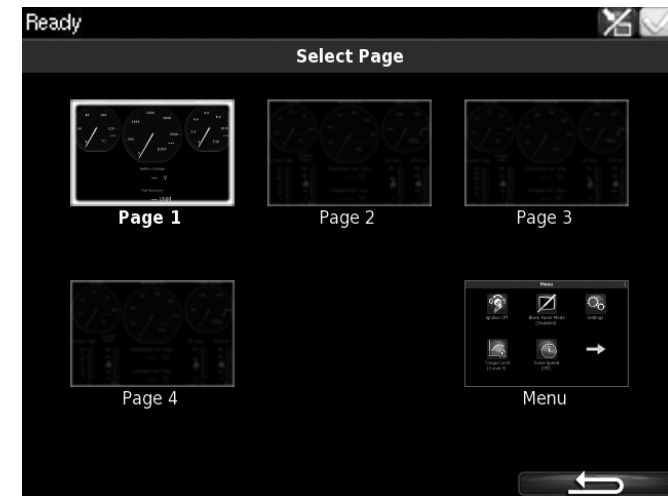
Select Page.

# Configuring the main display and upgrading software with USB memory stick

The USB inputs (1) on the main display and auxiliary display can be used to

- configure the main display,
- upgrade the main display software or an auxiliary display,
- copy an existing configuration file in the main display in order to save a backup copy of the configuration file or transfer the configuration to another display, for example.

Note:

The displays search for files in the route directory of the USB memory stick, so do not save files in subfolders. For example, if the USB memory stick has the designation E:, the files must be saved directly under E: for the displays to be able to find them.

Valid characters in the configuration file name are a-z, A-Z, 0-9, _ (underscore) and - (hyphen). If other characters are used, there is a risk that the display may not be able to interpret them.

1   2

383 766
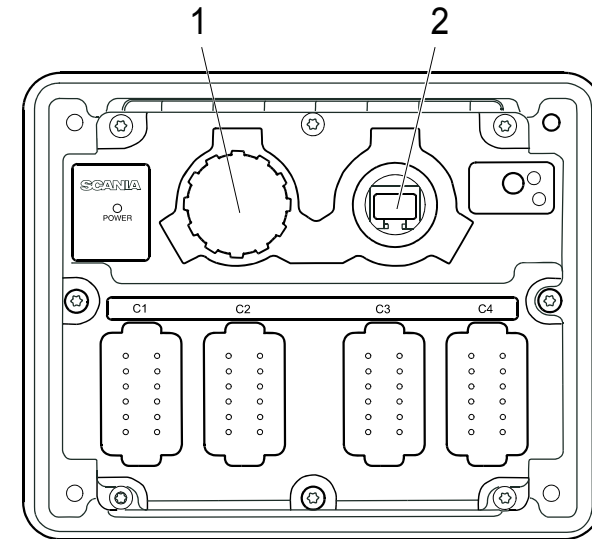
1. USB input.
2. Ethernet port.

Configuring the main display with a USB memory stick

1. Insert the USB memory stick with the configuration files into the display.

2. Enter the administrator password (4 digits).

3. The window *USB Storage* is opened. Press *Configuration Files*.

4. The configuration files available on the USB memory stick are listed in the display.

5. Select the file or files you want to copy to the display and press *Copy*.

6. Confirm by pressing *Yes*. The files are not activated, they are only copied to the display.

7. Select the configuration file you want to use and press *Use*.

8. Confirm by pressing *Yes*. The main display will restart.

Different configuration files in the same main display

It is possible to use different configuration files in the same main display. Do this by first copying the configuration files from the USB memory stick according to the instructions above. Then go to *Menu > Settings > Administration > Configuration Files > Load User File* to activate the file you want to use.

372 525

Upgrading the main display or auxiliary display software

Note:

If the display is new or has factory settings restored, you must first go through the first power-on wizard before you can upgrade the software.

1. Insert the USB memory stick with the new software version into the display.
2. Enter the administrator password (4 digits).
3. Press *DCU Firmware Files* and follow the instructions on the display.

Note:

When the software has been upgraded, the display will restart. This may take a few minutes. Do not turn off the power until you have waited for at least 5 minutes for the display to restart automatically.

Copying one configuration file in the main display

1. Insert the USB memory stick into the display.
2. Enter the administrator password (4 digits).
3. The window *USB Storage* is opened. Press *Copy Configuration File* and confirm by pressing *Yes*.

The configuration file is now copied to the USB memory stick.

372 525

Configuring the main display and connecting equipment, examples

This section broadly outlines how the main display is connected to a computer, and how equipment is connected and configured via a web browser. There is more detailed information on configuration in the Configuring the main display, detailed description section.

The main display is configured using a computer with a web browser via the built in web server of the main display. Therefore, connect a computer to the main display first.

Connecting a computer to the main display

1. Go to *Menu > Settings > Connect a PC*.

2. Note the IP address of the main display.

3. Tick the *Enabled* box and press *Ok*.

372 527

372 528
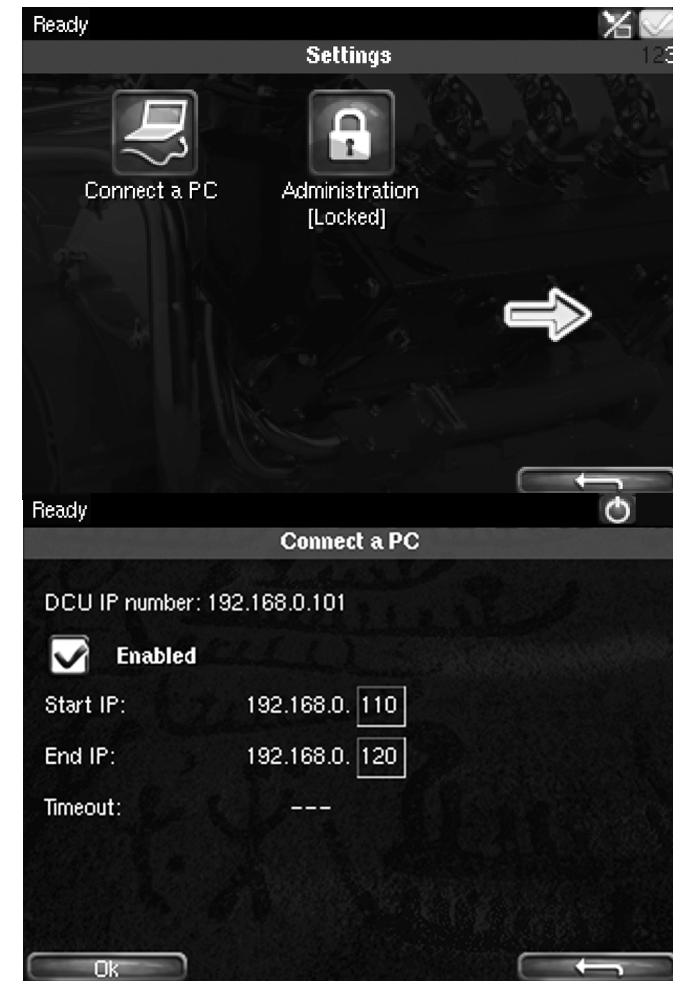
4. Connect a network cable between the computer and the main display, either directly to the Ethernet port (2) on the back of the main display or via LAN.

5. Enter the IP address of the main display in the address field of the web browser and press *Enter*. The factory default IP address is http://192.168.0.101.

6. On the homepage: Click *DCU* and then log in to the main display with the following details:

   – *User Name*: **dcu**
   – *Password*: **1234**

7. Now, if you are logged in, continue on to Important system settings. If you were unable to log in, please read the two following sections.

Connection problems

If you have connection problems:

- Check that the *Enabled* box is ticked as above. Close the web browser. Unplug the network cable and plug it in again. Open your web browser and enter the IP address again.

- Make sure that the computer and the main display are connected to the same subnet.

1   2

383 766
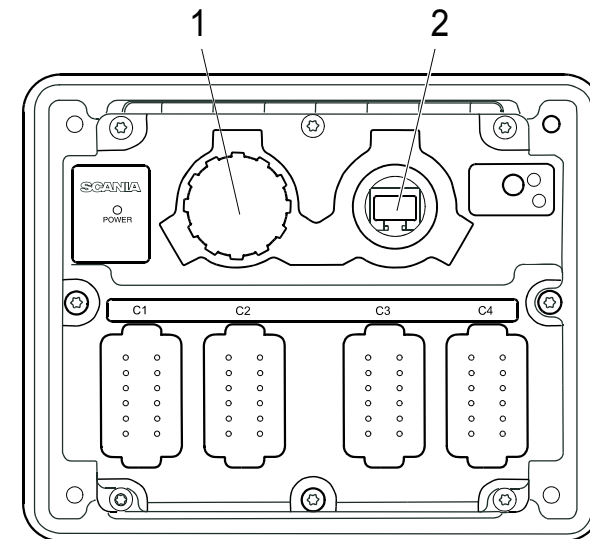
Main display IP address

The main display has a fixed IP address, which is set in the first power-on wizard. You can find the IP address under *Menu > Help > Version Information*. The IP address can always be changed later in the main display administration section: *Menu > Settings > Administration > Network Configuration*.

On the network, the three first groups in the IP address must always be the same, e.g. 192.168.0.x, where x represents another unit on the network.

Note:

The last numeral in the IP address must always be unique to the unit on the network. The last two digits after x are the engine number. A main display with the IP address 192.168.0.1**04** will be named *Engine #4*.

When the main display is started for the first time or after a factory reset has been performed, the default settings for the network apply.

- *IP-adress*: 192.168.0.101
- *Subnet Mask*: 255.255.255.0
- *Default gateway*: 192.168.0.1

Important system settings

Some important settings regarding system type, screensaver and password are made in the first step of the configuration. You do not have to change the factory settings, but you should be aware of them. The system settings can be found under *DCU > Miscellaneous > System Type*.

Setting	Description
System Type	Select *System Without Keyset* for systems without a control panel. Select *System With Keyset at This Station* if there is a control panel connected to this display. Select *System With Keyset at Another Station* if a control panel is connected to another display.
Goto Sleep Time [sec]	Set the timeout for shutting down the system when no control panel is being used (instead of starter key). The setting applies when the system is in *Ready* mode, i.e. once the engine has stopped. The standard setting is 1,000 seconds.
Pin Code	Change the system operator password if no control panel is being used. The default setting is 0000.
Pin Code On Wakeup	Specify whether an operator password should be used (instead of starter key) if no control panel is being used.

You can also change the configuration password under *DCU > Password*. If you have forgotten your password: Click *Get encrypted PIN*. An encrypted password is sent to you. The encrypted password can be decoded. Contact the Scania helpdesk for more information.

/ home / dcu / miscellaneous

Engine Application Configuration
Event Configuration
Counter Configuration
Counters
Acknowledge Configuration
Operation Mode Locked to Input
Event Log
Shutdown Override Configuration
System Voltage
System Type
Black Panel
Factory Reset

System Type

System Type: System With Keyset at This Station
Goto Sleep Time [sec]: 1000
Pin Code On Wakeup: No
Pin Code: 0000
Submit

383 570

/ home / dcu

Password
File
I/O Configuration
User Interface
Start/Stop/Prelube
Engine Model
Service Interval
Communication
Miscellaneous
Language

Password

Old Password:
New Password:
Confirm New Password:
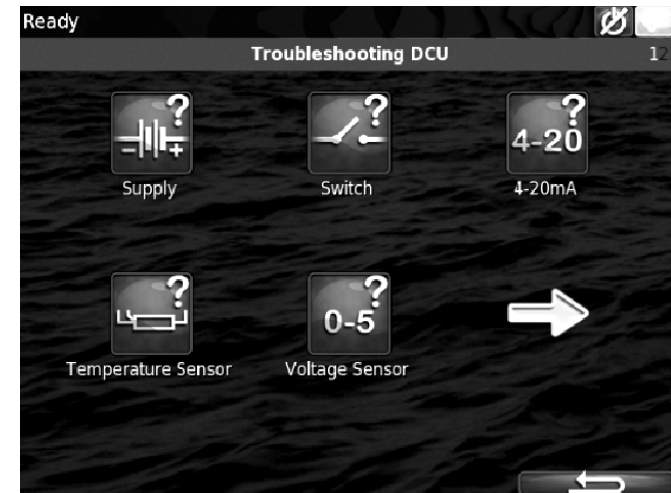Change
Forgot the password?
Get encrypted PIN

383 571

Examples of connection of sensors and micro switches

The following sections contain examples of how the connections of the display can be used and configured. The connections in the examples are specific, but the principle is the same no matter what connection you choose to use.

Checking the signal strength in the main display troubleshooting section

You can check the signals and signal strength of connected sensors and micro switches in the troubleshooting section of the main display. Go to *Menu > Help > Troubleshooting > Troubleshooting DCU*.

Troubleshooting section.

Button	Description
Switch	Configured micro switches are listed here. The status of the micro switch is displayed in the *Data* column. If the status changes when the micro switch is activated, the connection is working properly.
4-20 mA	The signal strength of the configured 4-20 mA inputs is displayed here. The *Data* column displays the current indicated by the sensor. If the current drops below 2 mA, a broken wire alarm is displayed. If the signal strength exceeds 22 mA, a short circuit warning is shown on the display.
	Note: The power supply to the sensor must match the specifications of the sensor. An incorrect power supply results in an incorrect signal strength. If the signal strength exceeds 30 mA, the main display will suffer damage.
	To ensure that the sensor does not damage the equipment, the maximum output signal of the sensor must be tested. Proceed as follows:
	1.Set the sensor to maximum.
	2.Check the signal strength of the sensor in the *Data* column. See illustration.

Button	Description
Temperature Sensor	This shows the current resistance of a PT100 sensor. To test the function of the sensor, you can compare the sensor resistance with a table for the PT100 sensor.

Checking and adjusting the throttle control signal

If a throttle control is connected to the main display and the signal of the connected throttle control is below 20 mA at maximum, the main display does not interpret this as 100% throttle actuation. The settings then need to be adjusted.

Check and adjust the throttle control maximum signal as follows:

1. Go to *Menu > Troubleshooting > Troubleshooting DCU > 4-20 mA* in the main display.

2. Set the throttle control to maximum. Make a note of the signal strength displayed. In this example, maximum gives 19.79 mA, which the main display interprets as 98.7 % throttle actuation. See the illustrations.

3. Connect a computer to the main display. See Connecting a computer to the main display.


Signal strength for 4-20 mA sensors.
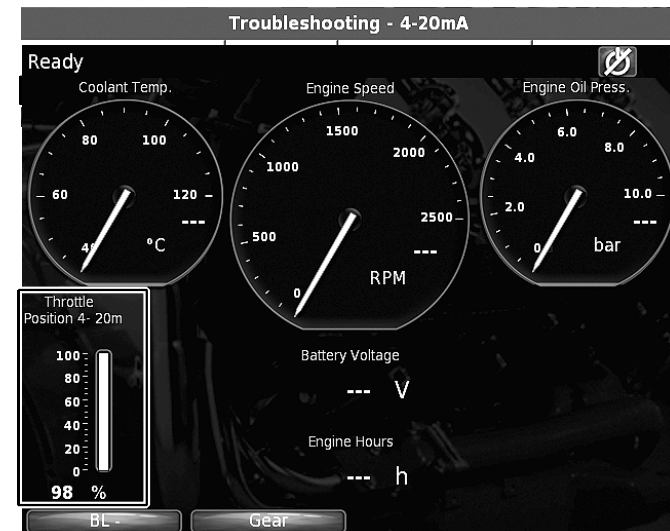
The signal is not interpreted as being 100% on the instruments page.

4. Go to *DCU > I/O configuration > 4-20 mA* in the configuration interface and click the connection the throttle control is connected to.

5. Enter the signal strength you noted in step 2 in the *mA at 100 percent* field.

6. Save the changes by clicking *Submit*.

7. Go to *Menu > Help > Troubleshooting > 4-20 mA* in the main display and check that the signal strength is being interpreted as 100%. See the illustrations. If the value is still below 100%, go into the configuration interface and reduce the *mA at 100 percent* value by 0.2.

4-20mA #13 (Disabled)	Japanese Used:		
4-20mA #14 (Disabled)	Portuguese Used:	Pos. acelerador	
4-20mA #15 (Disabled)	Korean Used:	스로틀 위치	
4-20mA #16 (Disabled)	**General**		
4-20mA #17 (Disabled)	Channel Use:	DCU+RP	
4-20mA #18	**Sensor**		Note! Submit to apply new unit.
4-20mA #19	Sensor Unit:	Percent	
	mA at 0 percent	4.00	
	mA at 100 percent	19.79	

	Display		Metric
Display Unit:		Percent	Percent
Display Range Min:		0.00	0.00
Display Range Max:		100.00	100.00
Display Major Divider:		20.00	20.00
Display Minor Divider:		5.00	5.00

383 983

Troubleshooting - 4-20mA

Description	Terminal	Status	Data
4-20mA #3	C1P4	100.01 %	19.79 mA
4-20mA #19	C4P12	24.03 °C	6.58 mA

383 994

383 995
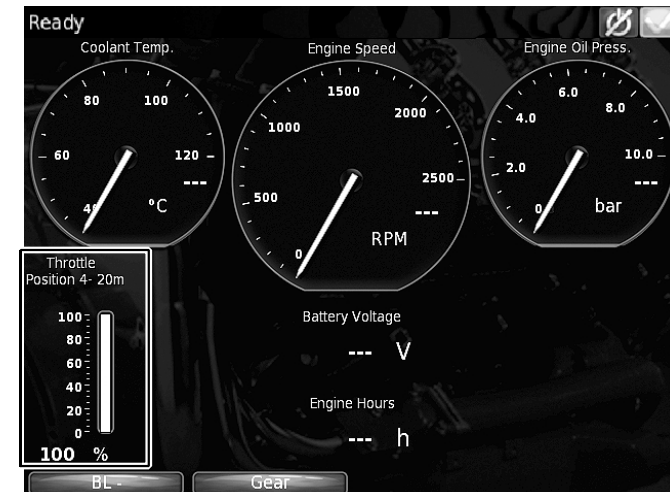
The signal is now interpreted as being 100% on the instruments page.

Connecting equipment to the 24 V output signal

In this example, a 24 V light-emitting diode is configured and connected to one of the flexible connections of the main display in order to signal an alarm. The LED lights up in the event of an alarm.

The connection works in the same way as other types of equipment. For example, a relay can also be connected.

The output signal gives a maximum of 200 mA.

1. Connect a computer to the main display. See Connecting a computer to the main display.

2. Go to *DCU > I/O Configuration* and click *Configure* (1) under *Flexible I/O*.

3. Select the flexible connection corresponding to the pin you wish to connect to. In this example, *Flexible I/O #6* is used. Select *User Config Output #6* (2) in the *Flexible I/O #6* drop-down list and save the changes by clicking *Submit*.

4. Go to *DCU > I/O Configuration* and click *12/24V Output Functions* under *Config Outputs*.

5. Click *User Config Output #6*.

6. Enter the function the output is to have in the drop-down list. *All Faults (Unacknowledged)* means that the output will be activated for all types of fault. More information is available in the Configure output signals: dcu > I/O Configuration / Config Outputs section.

7. Click *Submit*.

8. Connect the LED to flexible connection #6, i.e. C3 pin 1, on the back of the main display.

9. Test function by simulating an alarm.

Connection of 4-20 mA sensor

This example connects a sensor with a 4-20 mA output to one of the main display flexible connections. Provided the signal type is 4-20 mA, sensors for pressure, temperature or flow can be connected. In this case, an oil pressure sensor for reverse gear is being connected.

IMPORTANT!

The supply voltage to the sensor must match the specifications of the sensor. Incorrect supply voltage will provide an incorrect measurement. If the signal strength exceeds 30 mA, the main display will suffer damage. There is information on how to check the signal strength in the Checking the signal strength in the main display troubleshooting section section.

Use the same battery group to supply power to the sensor and the main display, as they require the same potential.

Configure the connections before connecting the sensor. If the connection is not configured properly for the sensor, it may suffer damage.

1. Connect a computer to the main display. See Connecting a computer to the main display.

2. Go to *DCU > I/O Configuration* and click *Configure* (1) under *Flexible I/O*.

3. Select the flexible connection corresponding to the pin you wish to connect to. In this example, *Flexible I/O #19* is used. Select *4-20 mA #19* (2) in the *Flexible I/O #19* drop-down list and save the changes by clicking *Submit*.
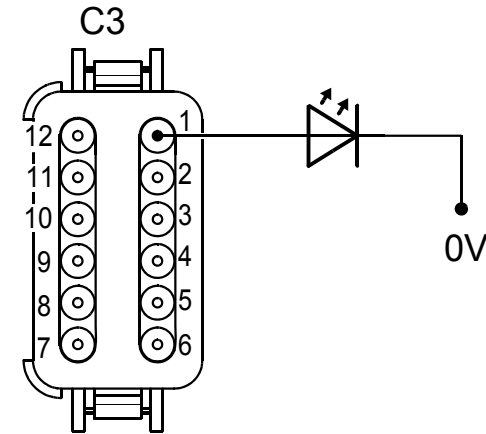
Connection of a 24 V LED to flexible connection #6. The pin numbering is shown viewed from the input side of the electrical cables.
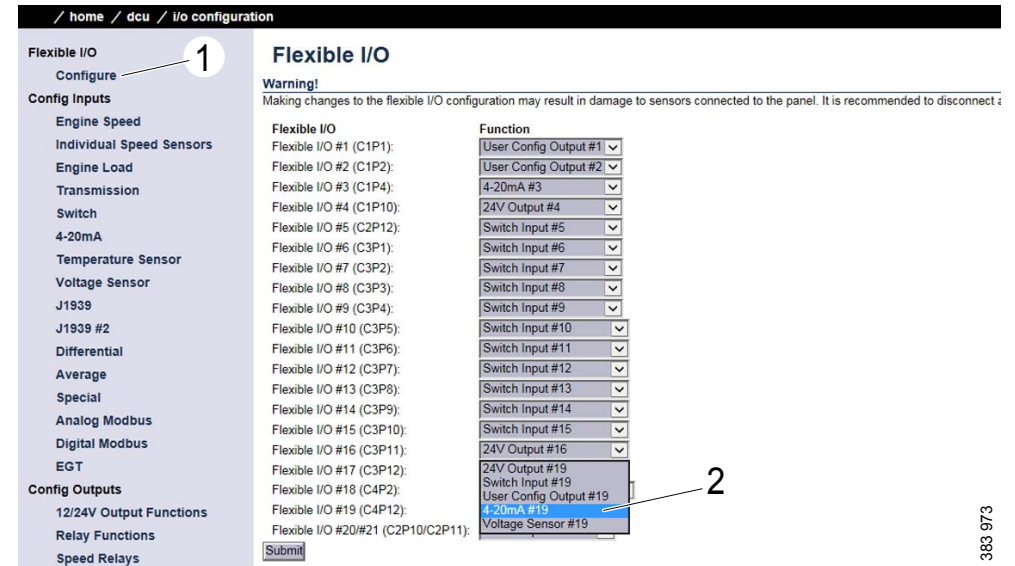
© Scania CV AB 2017, Sweden

4. Go to *DCU > I/O Configuration* and click *4-20 mA* under *Config Inputs*.

5. Click *4-20 mA #19* (1).

6. Click *assign custom name*. Select one language or more and give a name to the signal (2).

7. Enter how the signal is to be used under *Channel Use* (3). More information can be found under the heading Channel Use in the Switch section.

8. Set the sensor units and measuring range under *Sensor* (4). This oil pressure sensor has a specified measuring range of 0 to 5 bar.

9. Set how the sensor values are to be shown in the display under *Display* (5). More information can be found under the heading Display.

10. Set how the display gives a warning under *Alarming* (6). Contact the reverse gear manufacturer for alarm limits.

11. Save the changes by clicking *Submit*.

12. Connect the sensor to flexible connection #19, i.e. C4 pin 12, on the back of the main display. See illustration.

13. Check the sensor output signal. See the Checking the signal strength in the main display troubleshooting section section.
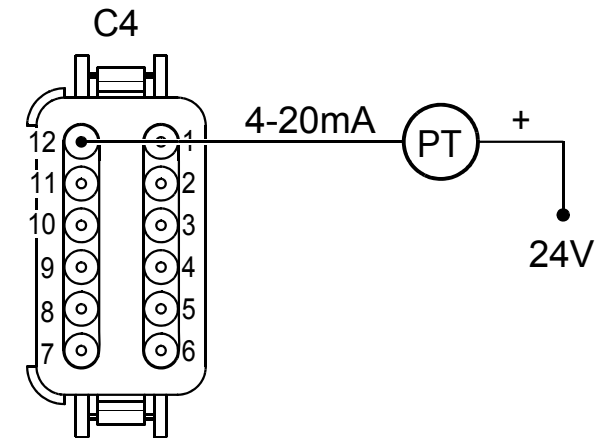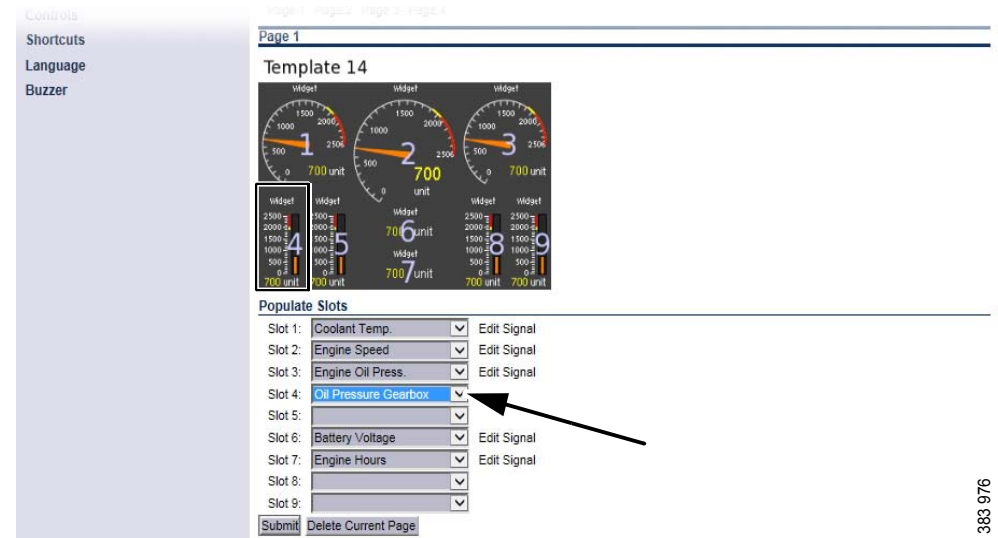
14. Add the signal to one of the instrument pages via *DCU > User Interface > Pages* as follows:

Select an instrument page (*Page*) and add the signal, which has here been named *Oil Pressure Gearbox*, in a free *Slot*. In this example, the signal has been added to *Slot 4* on instrument page 1.

More information is available in the Pages section.

383 976

15. This is what the signal looks like on the fully-configured instrument page in the main display.


383 984
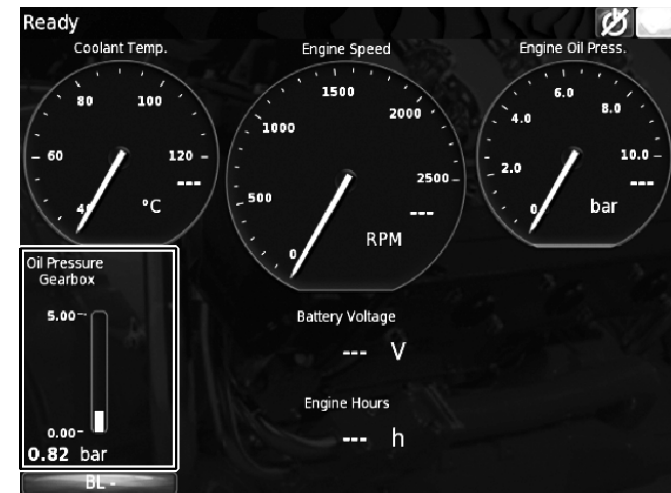
Connecting a PT100 temperature sensor

This example connects a PT100 sensor for the measurement of the temperature in the engine compartment. Connection works in the same way regardless of which temperature is to be measured.

1. Connect the sensor, which must be a PT100 sensor, to one of the two PT100 inputs on the rear of the main display. Each input consists of three pins in harness-to-harness connector C4. The illustration shows an example. See also Inputs for PT100 temperature sensor.
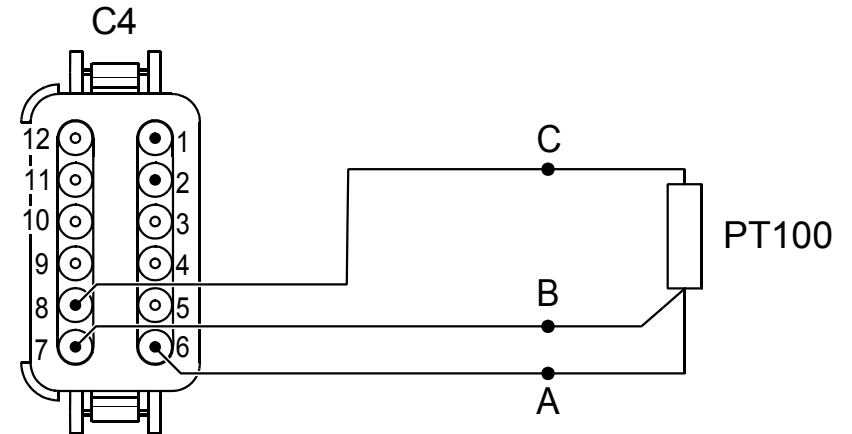
Example of a PT-100 sensor connection. The pin numbering is shown viewed from the input side of the electrical cables.

2 wire PT100: Bridge A and B. Connect one wire to AB and the other to C.

3 wire PT100: Connect A to A, B to B and C to C.

4 wire PT100: Connect in the same way as 3 filament PT100, but note that the fourth wire, D, should not be connected. It should hang loose or, if necessary, be cut off.
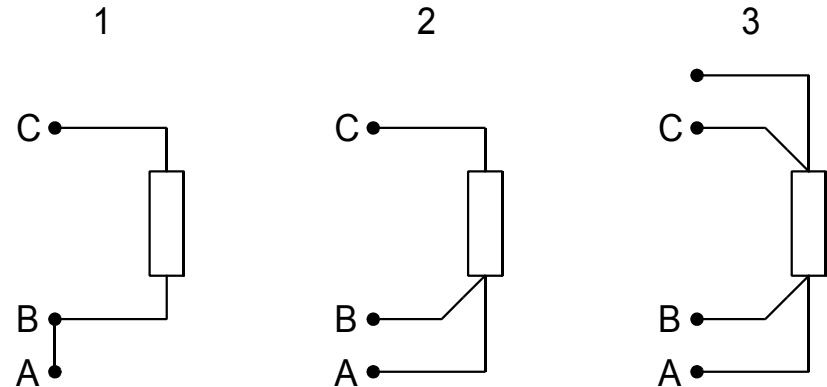
1. *2 wire PT100.*
2. *3 wire PT100.*
3. *4 wire PT100.*

2. Connect a computer to the main display. See Connecting a computer to the main display.

3. Go to *DCU > I/O Configuration > Temperature Sensor* and select the input you have connected the sensor to. In this example, the sensor has been connected to *Temperature Sensor #1* (1).

4. Click *assign custom name*. Select one language or more and give a name to the signal (2).

5. Enter how the signal is to be used under *Channel Use* (3). More information can be found under the heading Channel Use in the Switch section.

6. Select *PT100* as the sensor type and select the unit of temperature under *Sensor* (4).

7. Set how the sensor values are to be shown in the display under *Display* (5). More information can be found under the heading Display.

8. Set how the display gives a warning under *Alarming* (6).

9. Save the changes by clicking *Submit*.

10. Add the signal to one of the instrument pages via *DCU > User Interface > Pages* as follows:

Select an instrument page (*Page*) and add the signal, which has here been named *Engine Room Temperature*, in a free *Slot*. In this example, the signal has been added to *Slot 4* on instrument page 2.
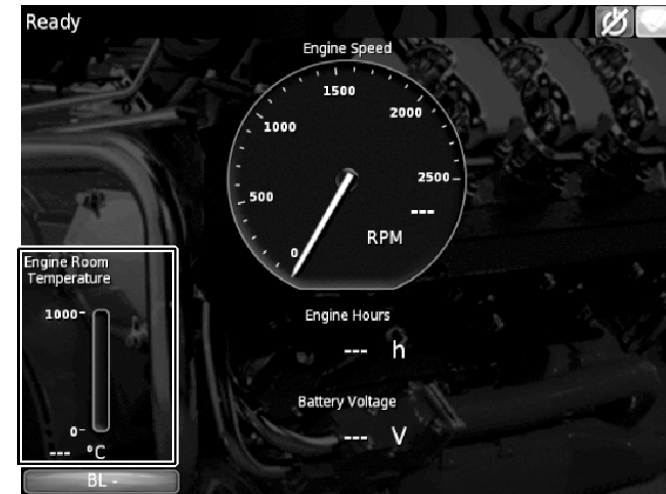
More information is available in the Pages section.

11. This is what the signal looks like on the fully-configured instrument page in the main display.

12. Test the function of the sensor, by comparing the sensor resistance with a table for the PT100 sensor.

Connecting a thermocouple to measure exhaust gas temperature

In order to connect a type K thermocouple to the main display, the signal must first be adjusted to work with the main display inputs. This example shows how a signal converter is used to connect a thermocouple to an input configured for 4-20 mA.

1. Connect a computer to the main display. See Connecting a computer to the main display.

2. Go to *DCU > I/O Configuration* and click *Configure* (1) under *Flexible I/O*.

3. Select the flexible connection corresponding to the pin you wish to connect to. In this example, *Flexible I/O #17* is used. Select *4-20 mA #17* (2) in the *Flexible I/O #17* drop-down list and save the changes by clicking *Submit*.

4. Go to *DCU > I/O Configuration* and click *4-20 mA* under *Config Inputs*.

5. Click *4-20 mA #17* (1).

6. Click *assign custom name*. Select one language or more and give a name to the signal (2).

7. Enter how the signal is to be used under *Channel Use* (3). More information can be found under the heading Channel Use in the Switch section.

8. Set the sensor units and measuring range under *Sensor* (4).

Note:

Enter the measuring range for which you are configuring the signal converter. If the settings are different, incorrect values are shown in the display.

9. Set how the sensor values are to be shown in the display under *Display* (5). More information can be found under the heading Display.

10. Set how the display gives a warning under *Alarming* (6).

11. Save the changes by clicking *Submit*.

12. Configure the signal converter according to the manufacturer's instructions.

13. Connect the sensor via the signal converter to flexible connection #17, i.e. C3 pin 12, on the back of the main display. See illustration.

14. Check the sensor output signal. See the Checking the signal strength in the main display troubleshooting section section.

15. Add the signal to one of the instrument pages via *DCU > User Interface > Pages* as follows:

    Select an instrument page (*Page*) and add the signal, which has here been named *Exhaust Temperature 1*, in a free *Slot*. In this example, the signal has been added to *Slot 5* on instrument page 2.

    More information is available in the Pages section.

383 982

16. This is what the signal looks like on the fully-configured instrument page in the main display.

383 987
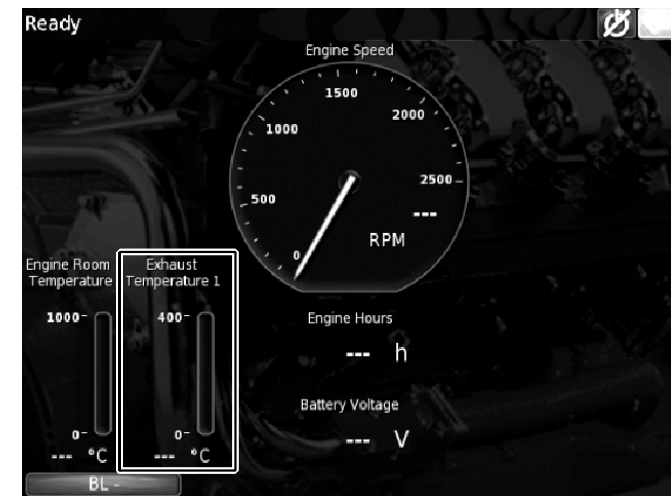
Connecting a micro switch

In this example a low engine oil pressure micro switch is connected, but connection works the same way no matter what is to be monitored.

1. Connect a computer to the main display. See Connecting a computer to the main display.

2. Go to *DCU > I/O Configuration* and click *Configure* (1) under *Flexible I/O*.

3. Select the flexible connection corresponding to the pin you wish to connect to. In this example, *Flexible I/O #10* is used. Select *Switch Input #10* (2) in the *Flexible I/O #10* drop-down list and save the changes by clicking *Submit*.

4. Go to *DCU > I/O Configuration* and click *Switch* under *Config Inputs*.

5. Click *Switch Input #10* (1).

6. Click *assign custom name*. Select one language or more and give a name to the signal (2).

7. Enter how the signal is to be used under *Channel Use* (3). More information can be found under the heading Channel Use in the Switch section.

8. Set how the display gives a warning under *Alarming* (4).

9. Save the changes by clicking *Submit*.

10. Connect the micro switch to flexible connection #10, i.e. C3 pin 5, on the back of the main display. See illustration.
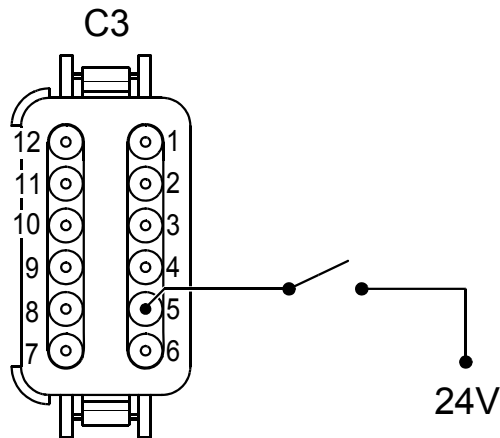
Connecting a micro switch to Flexible I/O #10.

11. Add the signal to one of the instrument pages via *DCU > User Interface > Pages* as follows:

    Select an instrument page (*Page*) and add the signal, which has here been named *Low Engine Oil Pressure*, in a free *Slot*. In this example, a new instrument page, 5 (2), has been created by clicking *Insert Page* (1) and then selecting a *Template* (3) for it. The signal is then added to *Slot 7* on the new instrument page 5.

    More information is available in the Pages section.
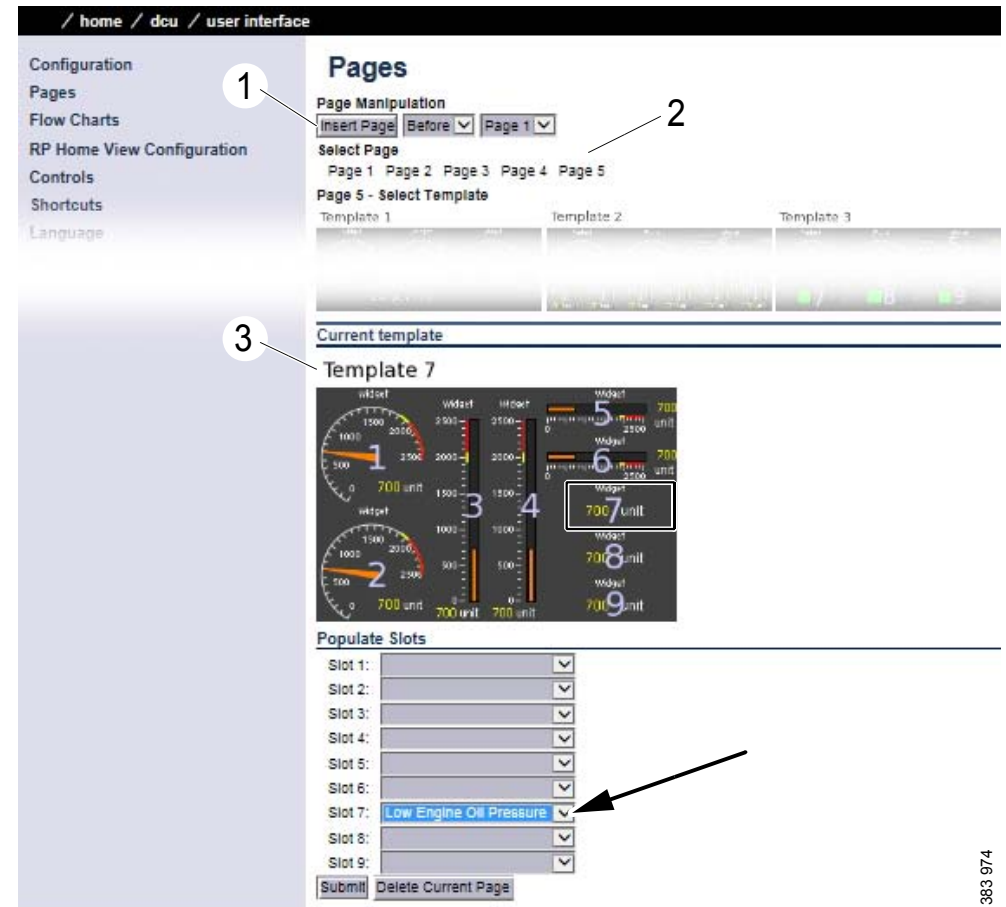
12. This is what the signal looks like on the fully-configured instrument page in the main display.
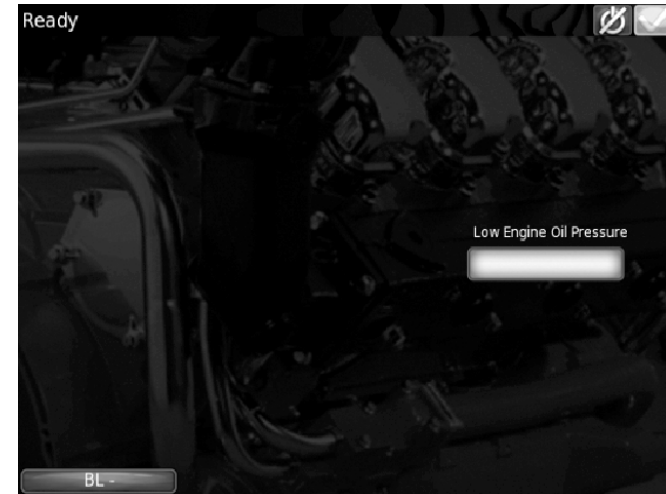
Connecting a magnetic pulse sensor

It is possible to connect an additional rotational speed sensor to the main display, for example to show the gearbox or output shaft rotational speed. It is also possible to show the wear to a clutch using the differential rotational speed, in order to facilitate flexible maintenance.

The sensor must be magnetically controlled (inductive) with a sinusoidal or digital (rectangular) signal. Only connect electrical cable shielding on the sensor side, or use an electrical cable twisted in pairs with 35-40 turns/m.

Frequency range: 100 HZ-10 kHz. Amplitude: 2 Vp-p–30 V p-p.
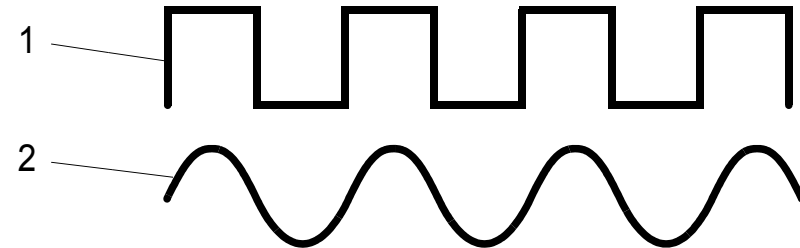
1. *Digital signal.*
2. *Sinusoidal signal.*

1. Connect the magnetic pulse sensor to C4, pins 1 and 2, on the back of the main display.

2. Connect a computer to the main display. See Connecting a computer to the main display.
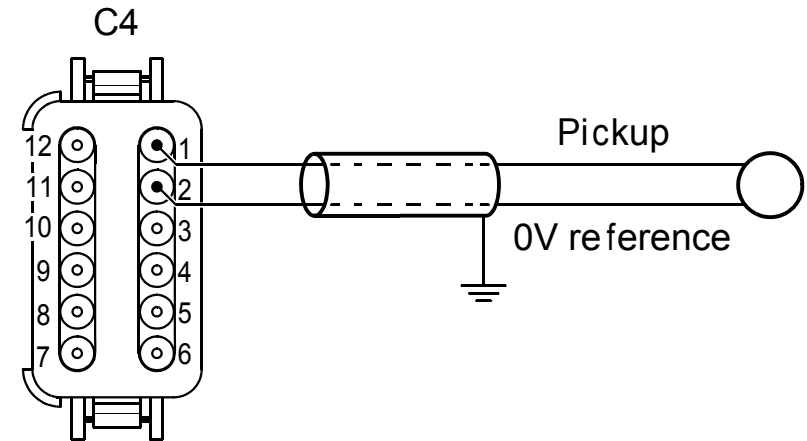
C4

Pickup

0V reference

383 966

Connection of magnetic pulse sensor. The pin numbering is shown viewed from the input side of the electrical cables.

3. Go to *DCU > I/O Configuration* and click *Configure* (1) under *Flexible I/O*.

4. Select *Flexible I/O #18*. Select *0V / MPU 0V Output #18* (2) in the *Flexible I/O #18* drop-down list and save the changes by clicking *Submit*.

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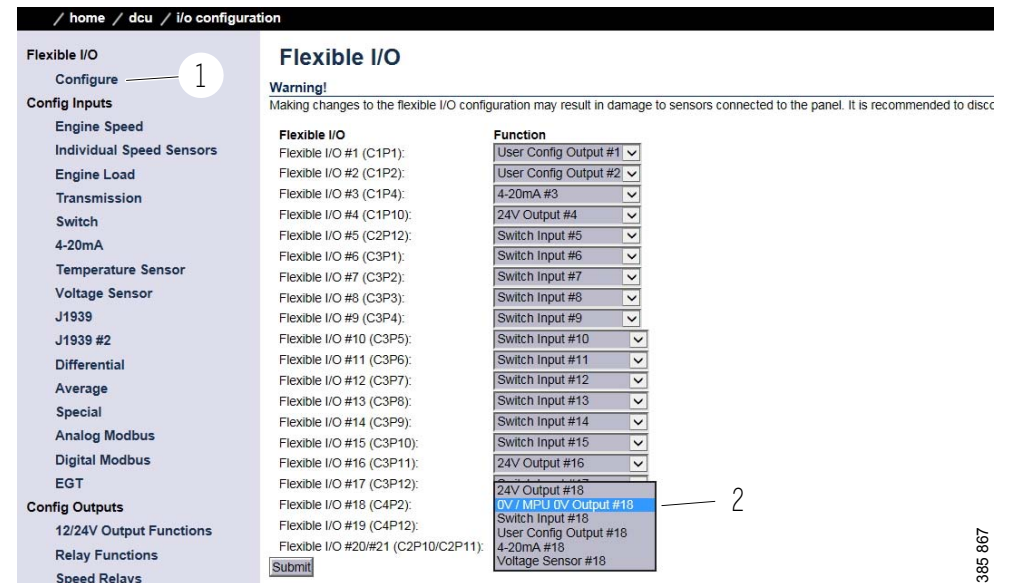
5. Go to *DCU > I/O Configuration* and click *Engine Speed* under *Config Inputs*.

6. Count the number of teeth of the wheel to be measured. Enter the number in the *DCU Pickup Pulses Per Revolution* field. The wheel in this example has 15 teeth.

Note:

This setting only configures the magnetic pulse sensor input on the main display, regardless of what is selected under *RPM Primary Source*.

7. Click *Submit*.

8. Go to *DCU > I/O Configuration > Individual Speed Sensors > Engine Speed (DCU)* (1).

Note:

The heading *Engine Speed (DCU)* is misleading. All types of rotational speed can be configured, not just engine speed.

9. Click *assign custom name*. Select one language or more and give a name to the signal (2).

10. Enter how the signal is to be used under *Channel Use* (3). More information can be found under the heading Channel Use in the Switch section.

11. Set how the sensor values are to be shown in the display under *Display* (4). More information can be found under the heading Display.

12. Set how the display gives a warning under *Alarming* (5).

13. Save by clicking *Submit*.

14. Add the signal to one of the instrument pages via *DCU > User Interface > Pages* as follows:

    Select an instrument page (*Page*) and add the signal, which has here been named *Shaft speed*, in a free *Slot*. In this example, the signal has been added to *Slot 3* on instrument page 4.

    More information is available in the Pages section.
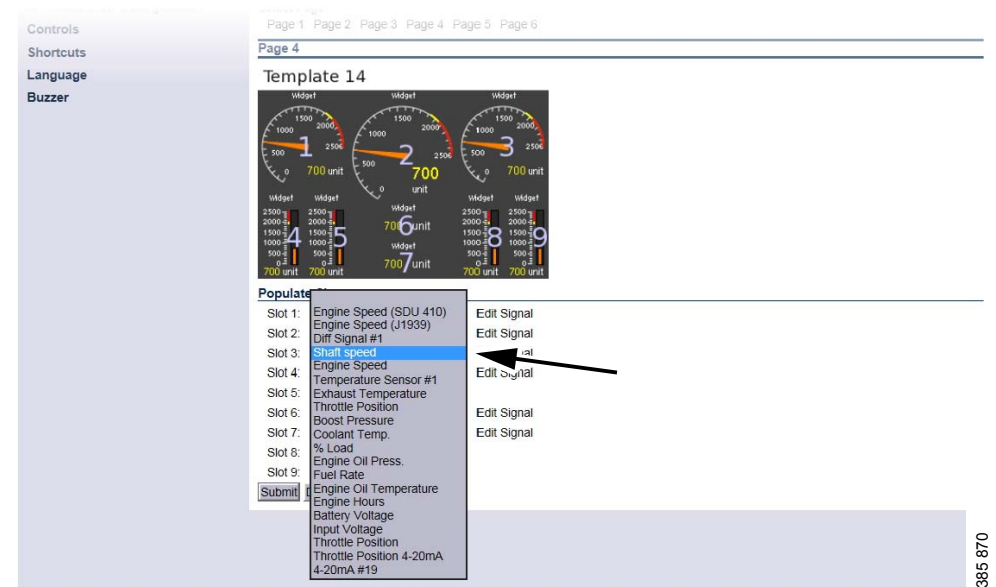
15. This is what the signal looks like on the fully-configured instrument page in the main display.
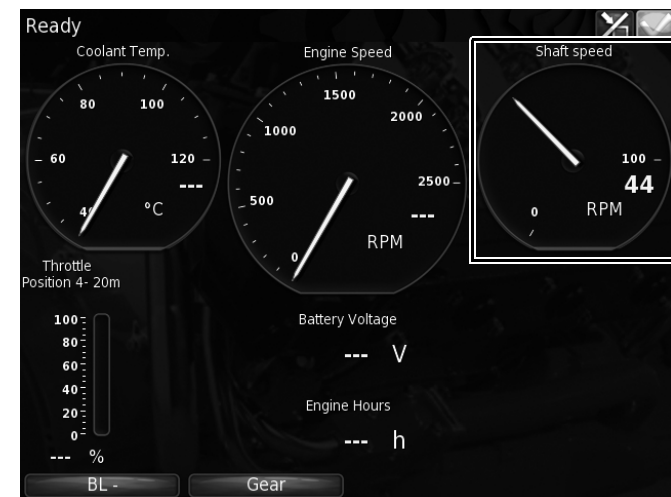
Configuring the main display, detailed description

The sections in this chapter contain more detailed information on the menus and options in the main display configuration interface.

To access the configuration interface, you first need to follow the steps in the first sections of Configuring the main display and connecting equipment, examples.

Homepage

When you have connected a computer to the main display and entered the IP address, the homepage is displayed. The following menu options are available on the homepage:

Menu option	Description
DCU	The main display is configured here. This menu option is described in the following section.
RIO	Not used.
SDU	Safety device unit. This contains information about the safety device unit, some settings can be also be made here. However, as a general rule, no safety device unit settings may be changed. If the settings are changed, the classification may no longer be valid.
Upload Wallpaper	Upload your own background images to the main display here. The file format must be .png.
Versions	Information on the hardware and software version of the main display.
Troubleshooting	Troubleshooting I/O communication in the main display.
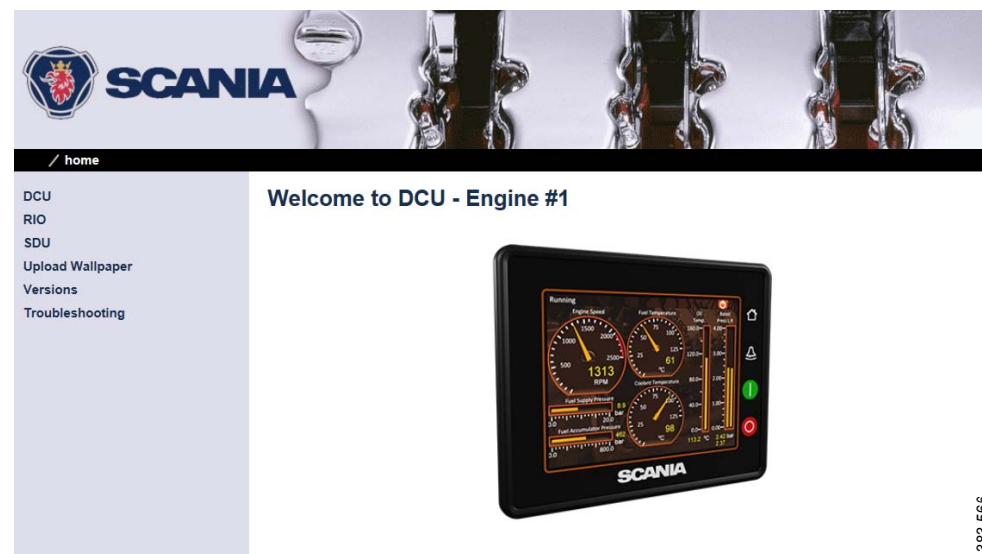
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File management: dcu > File

This menu is used for file management.

Submenu	Description
Load any file	Change the configuration of the main display by activating another configuration file.
	Factory Default: Activate a factory-configured file.
	User Uploaded: Activate a user-configured file which has previously been uploaded to the main display via *File > Upload to DCU > Configuration*. See *Upload to DCU* below. When you activate the new configuration file, the main display will restart.
Delete configuration file	Remove the user-configured files.
Configuration printout	Take a screenshot.
Save file as...	Save the current main display configuration as a file on the computer. The file is saved in .cfg format.
Upload to DCU	*Firmware*: Upgrade the software in the main display to the latest version.
	Wallpaper: Upload your own background images to the main display. The file format must be .png.
	Configuration: Upload a new configuration file to the main display. Note: The file will be uploaded but not activated. See *Load any file* above.

/ home / dcu / file

Load any File
Delete Configuration File
Configuration Printout
Save File as...
Upload to DCU

File

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/ home / dcu / file / load any file

Factory Default
User Uploaded

Load any File

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Configuring flexible connections: dcu > I/O Configuration > Flexible I/O

The 21 connections of the main display are configured here. If there is a control panel in the system, flexibel connections #7 to #11 are reserved for it.

! **IMPORTANT!**

Configure the flexible connection before connecting equipment to it. If the connection is not configured properly for the equipment, it may suffer damage.

Click *Configure* (1). Select the desired flexible connection and select the desired function for the connection (2).

Alternative	Function
24V Output	24 V voltage supply.
0V Output	0 V reference. Only applies to *Flexible I/O #2, 5, 12 and 18*.
5 V Output	5 V voltage supply. Only applies to *Flexible I/O #6*.
0V / MPU 0V Output	Input for magnetic pulse sensor. Only applies to *Flexible I/O #18*.
Switch Input	Input for micro switch.
User Config Output	Change-over 12/24 V output.
4-20 mA	Input for 4-20 mA sensors.
Voltage Sensor	Input for voltage sensors.

/ home / dcu / i/o configuration

Flexible I/O
Configure — 1

Config Inputs
Engine Speed
Individual Speed Sensors
Engine Load
Transmission
Switch
4-20mA
Temperature Sensor
Voltage Sensor
J1939
J1939 #2
Differential
Average
Special
Analog Modbus
Digital Modbus
EGT
Config Outputs
12/24V Output Functions
Relay Functions
Speed Relays

Flexible I/O

Warning!
Making changes to the flexible I/O configuration may result in damage to sensors connected to the panel. It is recommended to disconnect a

Flexible I/O	Function
Flexible I/O #1 (C1P1):	User Config Output #1
Flexible I/O #2 (C1P2):	User Config Output #2
Flexible I/O #3 (C1P4):	4-20mA #3
Flexible I/O #4 (C1P10):	24V Output #4
Flexible I/O #5 (C2P12):	Switch Input #5
Flexible I/O #6 (C3P1):	Switch Input #6
Flexible I/O #7 (C3P2):	Switch Input #7
Flexible I/O #8 (C3P3):	Switch Input #8
Flexible I/O #9 (C3P4):	Switch Input #9
Flexible I/O #10 (C3P5):	Switch Input #10
Flexible I/O #11 (C3P6):	Switch Input #11
Flexible I/O #12 (C3P7):	Switch Input #12
Flexible I/O #13 (C3P8):	Switch Input #13
Flexible I/O #14 (C3P9):	Switch Input #14
Flexible I/O #15 (C3P10):	Switch Input #15
Flexible I/O #16 (C3P11):	24V Output #16
Flexible I/O #17 (C3P12):	24V Output #19
Flexible I/O #18 (C4P2):	Switch Input #19
Flexible I/O #19 (C4P12):	User Config Output #19
	4-20mA #19
Flexible I/O #20/#21 (C2P10/C2P11):	Voltage Sensor #19

Submit

2

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Configuring input signals: dcu > I/O Configuration > Config Inputs

This is where you configure input signals to the main display.

Enter your own name for all input signals by clicking the *assign custom name* link, at the top of every section.

Note:

Remember to click *Submit* after every change, otherwise they will not be saved.

Engine Speed

This is where the engine speed sensors are configured and the engine overspeed limit value is set.

Source

The main display can receive signals for engine speeds from 3 different sources - *RPM Primary Source*, *RPM Secondary Source* and *RPM Third Source*.

Source	Description
J1939	J1939 CAN bus connected to inputs C1, pins 7-9.
J1939:2	J1939 CAN bus connected to inputs C1, pins 10-12.
DCU	Magnetic detection locally connected to inputs C4, pins 1 and 2.
SDU	Signal from the safety device unit, if there is one.

The engine speed sources have an order of priority. The main display uses the primary source in the first instance. The secondary source is only used if the main display loses contact with the primary source.

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Local Pickup

Enter the number of pulses per engine revolution if a magnetic pulse sensor is connected to the input for magnetic pulse sensors on the main display. See Input for magnetic pulse sensor.

General Configuration

Setting	Description
RPM Rounding	Rounds off the value displayed in the display to 1, 5 or 10 rpm.
RPM Setpoint	States the engine speed at which the starter motor is switched off and the main display indicates that the engine is running.
RPM Setpoint2-5	Optional engine speed settings which can be used together with other sensors.
RPM Ready To Take Load	A signal that can be configured to an output. The signal is activated when the set engine speed is reached. The signal is deactivated when a stop signal is sent, or when the engine speed drops by 15% or more below the set value.
RPM Nominal Speed	Nominal engine speed. This engine speed is used to calculate the engine overspeed limit value and the engine overspeed test limit value.

General > Channel Use

Select the display in which the signal should be displayed graphically. This display is possible on the main display (*DCU*), auxiliary display (*RP*) or on both simultaneously (*DCU+RP*).

/ home / dcu / i/o configuration

Flexible I/O
  Configure
Config Inputs
  Engine Speed
  Individual Speed Sensors
  Engine Load
  Transmission
  Switch
  4-20mA
  Temperature Sensor
  Voltage Sensor
  J1939
  J1939 #2
  Differential
  Average
  Special
  Analog Modbus
  Digital Modbus
  EGT
Config Outputs
  12/24V Output Functions
  Relay Functions
  Speed Relays
  DM1 Functions
  J1939 Outputs

Engine Speed

assign custom name

Source
RPM Primary Source: Engine Speed (J1939)
RPM Secondary Source: None
RPM Third Source: None

Local Pickup
DCU Pickup Pulses Per Revolution: 158

General Configuration
RPM Rounding [RPM]: 1
Run Setpoint / RPM Setpoint 1 [RPM]: 400   Valid range: 80 - 800 RPM
RPM Setpoint 2 [RPM]: 0
RPM Setpoint 3 [RPM]: 0
RPM Setpoint 4 [RPM]: 0
RPM Setpoint 5 [RPM]: 0
RPM Ready To Take Load [RPM]: 400
RPM Nominal Speed [RPM]: 1800   Valid range: 200 - 3000 RPM

General
Channel Use: DCU+RP

Display
Display Range Min [RPM]: 0.00
Display Range Max [RPM]: 2500.00
Display Major Divider [RPM]: 500.00
Display Minor Divider [RPM]: 100.00
Display Multiplier: 1

Overspeed
RPM Overspeed [RPM]: 2600
RPM Overspeed Delay [milliseconds]: 100
RPM Overspeed Shutdown Enabled: No

Submit

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Display

Set the way in which the signal will be displayed on the tachometer.

Setting	Description
Display Range Min	The lowest engine speed displayed on the tachometer, normally 0.
Display Range Max	The highest engine speed displayed on the tachometer. For an engine with a nominal engine speed of 1,500 rpm, the maximum engine speed may be 1,800 rpm, for example.
Display Major Divider	The larger scale marks on the tachometer, i.e. how often the tachometer records an rpm value. A common setting is every 500 rpm.
Display Minor Divider	The minor scale marks between the larger scale marks (*Major Divider*) on the tachometer. A common setting is every 100 rpm.
Display Multiplier	The multiplication factor displayed on the tachometer, e.g. x100 rpm.

Overspeed

Setting	Description
RPM Overspeed	The value at which the main display will indicate engine overspeed.
RPM Overspeed Delay	Delay in milliseconds before an alarm or engine shutdown occurs, normally 100 ms.
RPM Overspeed Shutdown Enabled	How the engine should react to engine overspeed. Select *Yes* if the engine should be shut down at engine overspeed, or *No* if the engine should not be shut down at engine overspeed.

/ home / dcu / i/o configuration

Flexible I/O
   Configure
Config Inputs
   Engine Speed
   Individual Speed Sensors
   Engine Load
   Transmission
   Switch
   4-20mA
   Temperature Sensor
   Voltage Sensor
   J1939
   J1939 #2
   Differential
   Average
   Special
   Analog Modbus
   Digital Modbus
   EGT
Config Outputs
   12/24V Output Functions
   Relay Functions
   Speed Relays
   DM1 Functions
   J1939 Outputs

Engine Speed

assign custom name

Source
RPM Primary Source: Engine Speed (J1939)
RPM Secondary Source: None
RPM Third Source: None

Local Pickup
DCU Pickup Pulses Per Revolution: 158

General Configuration
RPM Rounding [RPM]: 1
Run Setpoint / RPM Setpoint 1 [RPM]: 400   Valid range: 80 - 800 RPM
RPM Setpoint 2 [RPM]: 0
RPM Setpoint 3 [RPM]: 0
RPM Setpoint 4 [RPM]: 0
RPM Setpoint 5 [RPM]: 0
RPM Ready To Take Load [RPM]: 400
RPM Nominal Speed [RPM]: 1800   Valid range: 200 - 3000 RPM

General
Channel Use: DCU+RP

Display
Display Range Min [RPM]: 0.00
Display Range Max [RPM]: 2500.00
Display Major Divider [RPM]: 500.00
Display Minor Divider [RPM]: 100.00
Display Multiplier: 1

Overspeed
RPM Overspeed [RPM]: 2600
RPM Overspeed Delay [milliseconds]: 100
RPM Overspeed Shutdown Enabled: No

Submit

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Individual Speed Sensors

Set the inputs for optional engine speed signals in *Individual Speed Sensors*. Signals coming in via these inputs are handled separately from the engine speed signals that were configured in the previous section.

There is an example of the configuration and connection of a magnetic pulse sensor in the Connecting a magnetic pulse sensor section.

Engine speed (DCU)

Setting	Description
Channel Use	Select the display in which the signal should be displayed on the tachometer. Display is possible on the main display, on the auxiliary display or on both simultaneously.
Sensor Unit	Only *RPM* can be selected here.
Sensor Range Min/ *Sensor Range Max*	These are fixed values that cannot be changed.
Display Unit	Only *RPM* can be selected.
Display Range Min	Select the lower part of the scale.
Display Range Max	Select the upper part of the scale.
Display Major Divider	Select the larger scale marks, where the rpm value is also shown.
Display Minor Divider	Select the number of scale marks that should be displayed between the larger scale marks (*Major Divider*).
Display Multiplier	Select the multiplication factor to be displayed on the display: 1, 10, 100 or 1,000.
Event	Determine how the engine should react to different events for this input.
Mirrored View	Divides the scale with 0 in the middle so that negative values are also shown.

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Engine Speed (J1939)/Engine Speed (SDU)

See previous section.

Engine Load

Select an engine load source in the *Engine Load Source* drop-down list. You can now select engine load as a setting when configuring the alarm.

Transmission

This menu is used to display the gear engaged or to inhibit engine start if a gear is engaged.

Switch

In *Switch* you can configure the flexible connections selected to be used by micro switches. The inputs are activated by applying 24 V to each input.

There is an example of the configuration and connection of a micro switch in the Connecting a micro switch section.

IMPORTANT!

Configure the flexible connection before connecting equipment to it. If the connection is not configured properly for the equipment, it may suffer damage.

Use as

Set the input function. The functions written in **bold** are the most common.

Setting	Description
None	The input is used as an input for a regular engine sensor.
Local Mode	Sets the display into local mode, i.e. all external commands are blocked.
Remote Mode	External commands are accepted.
Backlight 100 Percent	Forces the background lighting to light at 100 per cent.
Prelube Override	Not used.
Prelube Complete	Not used.
Start Disabled	Engine start deactivated.
Automatic Mode	The display accepts automatic start and stop signals.
Automatic Start	The display initiates the start sequence. *Automatic Mode* must be activated.
Automatic Stop	The display initiates the shutdown sequence. *Automatic Mode* must be activated.
Remote Start	Same as starter button. The display must be in *Remote* mode.
Remote Stop	Same as stop button. The display must be in *Remote* mode.
Local Start	Same as starter button. The display must be in *Local* mode.
Local Stop	Same as stop button. The display must be in *Local* mode.

/ home / dcu / i/o configuration / switch

Switch Input #1 (Disabled)
Switch Input #2 (Disabled)
Switch Input #3 (Disabled)
Switch Input #4 (Disabled)
Switch Input #5
Switch Input #6
Switch Input #7
Switch Input #8
Switch Input #9
Switch Input #10
Switch Input #11
Switch Input #12
Switch Input #13
Switch Input #14
Switch Input #15
Switch Input #16 (Disabled)
Switch Input #17

Switch Input #1

Copy
Copy configuration from: None ▾ Copy

Configure
assign custom name

Function   Note! Enabling a function will automatically disable the channel use.
Use as: None ▾

General
Channel Use: DCU+Event ▾

Alarming
Event: Alarm ▾
Input State: Normally Closed, Event on Open ▾
Delay Before Event [sec]:   0
Requires Running Engine: No ▾
Requires In Gear: No ▾
Requires Engine Load: No ▾
Use As Additional Run: No ▾   Note! Run = Normal State
Submit

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Setting	Description
Local Acknowledge	Acknowledge all events in the alarm list. The display must be in *Local* mode.
Local/Remote Acknowledge	Acknowledge all events in the alarm list.
Remote Acknowledge	Acknowledge all events in the alarm list. The display must be in *Remote* mode.
Shutdown Override	Allows all configured engine shutdown inputs to become alarm inputs. The engine is then not shut down automatically. Engine shutdown during engine overspeed is however always active.
In Gear	Signal from the gearbox that engine start is not possible due to a gear being engaged. Applies only if the engine drives a gearbox. The function can be configured as *Normally open* or *Normally closed*.
In Gear (Astern)	Signal from the gearbox that engine start is not possible due to reverse gear being engaged. Only applies if the engine is used for propulsion.
In Gear (Ahead)	Signal from the gearbox that engine start is not possible due to a forward gear being engaged. Only applies if the engine is used for propulsion.
Toggle Crank Mode	Switch between running the engine normally and with the starter motor only.
Torque Limitation Curve1-3	Activate torque limitation curve 1-3.
Speed Mode1-2	Activate engine speed setting 1-2.
Speed Mode Off	Deactivate engine speed setting.
Ignition	Voltage on.
Start	Start the engine.

/ home / dcu / i/o configuration / switch

Switch Input #1 (Disabled)
Switch Input #2 (Disabled)
Switch Input #3 (Disabled)
Switch Input #4 (Disabled)
Switch Input #5
Switch Input #6
Switch Input #7
Switch Input #8
Switch Input #9
Switch Input #10
Switch Input #11
Switch Input #12
Switch Input #13
Switch Input #14
Switch Input #15
Switch Input #16 (Disabled)
Switch Input #17

Switch Input #1

Copy
Copy configuration from: None Copy

Configure
assign custom name
Function   Note! Enabling a function will automatically disable the channel use.
Use as: None
General
Channel Use: DCU+Event
Alarming
Event: Alarm
Input State: Normally Closed, Event on Open
Delay Before Event [sec]:   0
Requires Running Engine: No
Requires In Gear: No
Requires Engine Load: No
Use As Additional Run: No   Note! Run = Normal State
Submit

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Channel Use

Set the input should be used.

Event = Warning, alarm or, torque limitation or engine shutdown.

Setting	Description
Not in use	The input must not be used.
Event	The signal will activate an event.
DCU	The signal will only be displayed in the main display.
DCU+Event	The signal will activate an event that is only displayed in the main display.
RP	The signal will only be displayed in the auxiliary display.
RP+Event	The signal will activate an event that is only displayed in the auxiliary display.
DCU+RP	The signal will be displayed in both the main display and auxiliary display.
DCU+RP+Event	The signal will activate an event which is displayed in both the main display and auxiliary display.
Silent Event	The input will be active, but the signal will not trigger any event which is displayed in the display. The signal is only used for communication.
DCU+Silent Event	The signal will be shown in the main display and activate an event which is not shown in the main display.
RP+Silent Event	The signal will be shown in the auxiliary display and activate an event which is not shown in the main display.
DCU+RP+Silent Event	The signal will be displayed in both the main display and auxiliary display. The signal will activate an event that is not shown in the displays.

/ home / dcu / i/o configuration / switch

Switch Input #1 (Disabled)
Switch Input #2 (Disabled)
Switch Input #3 (Disabled)
Switch Input #4 (Disabled)
Switch Input #5
Switch Input #6
Switch Input #7
Switch Input #8
Switch Input #9
Switch Input #10
Switch Input #11
Switch Input #12
Switch Input #13
Switch Input #14
Switch Input #15
Switch Input #16 (Disabled)
Switch Input #17

Switch Input #1

Copy
Copy configuration from: None [ ] Copy

Configure
assign custom name
Function   Note! Enabling a function will automatically disable the channel use.
Use as: None
General
Channel Use: DCU+Event
Alarming
Event: Alarm
Input State: Normally Closed, Event on Open
Delay Before Event [sec]:   0
Requires Running Engine: No
Requires In Gear: No
Requires Engine Load: No
Use As Additional Run: No   Note! Run = Normal State
Submit

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Note:

Select normally *DCU+RP+Event*. Then the signal is displayed on both the main display and the auxiliary display. If the signal only needs to be displayed on the main display, select *DCU+Event*.

Event

If you have chosen a type of event (*Event* or *Silent Event*) under *Channel Use*, you should select the type of event here, i.e. warning, alarm or engine shutdown.

If *None* is selected then the input is active but no events are triggered.

Input State

Setting	Description
Normally Closed, Event on open	The micro switch must be open in order for an event to be triggered.
Normally Open, Event on Closed	The micro switch must close in order for an event to be triggered.

Delay Before Event

If you have selected an event under *Event*, here you enter the desired delay in seconds before the event is triggered.

Delayed Shutdown

If you have selected engine shutdown under *Event*, here you enter the desired delay in seconds before engine shutdown.

/ home / dcu / i/o configuration / switch

Switch Input #1 (Disabled)
Switch Input #2 (Disabled)
Switch Input #3 (Disabled)
Switch Input #4 (Disabled)
Switch Input #5
Switch Input #6
Switch Input #7
Switch Input #8
Switch Input #9
Switch Input #10
Switch Input #11
Switch Input #12
Switch Input #13
Switch Input #14
Switch Input #15
Switch Input #16 (Disabled)
Switch Input #17

Switch Input #1

Copy
Copy configuration from: None ⌄ Copy

Configure
assign custom name
Function   Note! Enabling a function will automatically disable the channel use.
Use as: None ⌄
General
Channel Use: DCU+Event ⌄
Alarming
Event: Alarm ⌄
Input State: Normally Closed, Event on Open ⌄
Delay Before Event [sec]: 0
Requires Running Engine: No ⌄
Requires In Gear: No ⌄
Requires Engine Load: No ⌄
Use As Additional Run: No ⌄   Note! Run = Normal State
Submit

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Requires Running Engine

Normally, select *Yes* for a pressure sensor and *No* for all other sensors. Select a different value in order to activate the input at another engine speed.

Requires In Gear

Select *Yes* if an engaged gear is required for an event to be triggered.

Requires Engine Load

Select *Yes* if engine load is required for an event to be triggered.

Initial Delay

Set the delay in seconds before which the input should be activated. This setting can only be made if *Requires Running Engine* is activated.

Use As Additional Run

If the main display only has one engine running indicator, Scania recommends adding the oil pressure sensor as an additional engine running indicator.

! IMPORTANT!

Use no other pressure sensor signals or other signals as engine running indicator.

- If the main display has two active engine running indicators[1]: Select *No*.
- If the main display only has one active engine running indicator: Select *Yes* and use the oil pressure sensor as a further engine running indicator.

---

1. An engine running signal can be a magnetic sensor or an SAE J1939 CAN bus signal connected to the main display.

4-20 mA

First select one of the 4-20 mA inputs. Then configure the input according to the instructions below.

There is an example of a sensor connection in the Connection of 4-20 mA sensor section.

Channel Use

See Channel Use in the Switch section.

Sensor

Setting	Description
Sensor Unit	Select the unit indicated on the sensor. An oil pressure sensor can, for example, have bar or psi as units.
Sensor Range Min/Sensor Range Max	Select the sensor measuring range, i.e. the highest and lowest values recorded by the sensor.

Display

Setting	Description
Display Unit	Select the unit in *US* and *Metric* to be shown in the sensor display.
Display Range Min/Display Range Max	Select the highest and lowest value in *US* and *Metric* that should be displayed on the display for the sensor.
Display Major Divider/ Display Minor Divider	Select the desired minor and larger scale marks in *US* and *Metric* that should be displayed on the display for the sensor.

/ home / dcu / i/o configuration / 4-20ma

4-20mA #1 (Disabled)
4-20mA #2 (Disabled)
4-20mA #3
4-20mA #4 (Disabled)
4-20mA #5 (Disabled)
4-20mA #6 (Disabled)
4-20mA #7 (Disabled)
4-20mA #8 (Disabled)
4-20mA #9 (Disabled)
4-20mA #10 (Disabled)
4-20mA #11 (Disabled)
4-20mA #12
4-20mA #13 (Disabled)
4-20mA #14 (Disabled)
4-20mA #15 (Disabled)
4-20mA #16 (Disabled)
4-20mA #17 (Disabled)
4-20mA #18 (Disabled)
4-20mA #19

4-20mA #2

Copy
Copy configuration from: None   Copy

Configure
assign custom name
General
Channel Use: Not in use

Sensor
Sensor Unit: milliAmpere   Note! Submit to apply new unit.
Sensor Range Min: 4.00
Sensor Range Max: 20.00

Display   US   Metric
Display Unit: milliAmpere   milliAmpere
Display Range Min: 0.00   0.00
Display Range Max: 0.00   0.00
Display Major Divider: 0.00   0.00
Display Minor Divider: 0.00   0.00
Display Multiplier: 1   1
                      Update Metric   Update US
Mirrored View: No
Alarming (in Metric Units)
Event: None

Submit

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Setting	Description
Display Multiplier	If necessary, select a multiplication factor. For an instrument with a display range of 0-10,000, e.g. 0-1,000 is displayed with a multiplication factor of 10. The multiplication factor of 10 will then be shown separately on the display (only applies to round dial meters).
Update Metric/Update US	When you have entered all values under either *US* or *Metric*, you can calculate the *Metric-* eller *US* values automatically by clicking *Update Metric* or *Update US*. **Note:** The values are not rounded. Scania therefore recommends adjusting the values manually afterwards, with a suitable number of decimal places.
Mirrored View	The scale will be displayed with 0 in the middle.

Alarming > Event

If you have chosen a type of event (*Event* or *Silent Event*) under *Channel Use*, you should select the type of event here, i.e. warning, alarm or engine shutdown. Select *RPM dependent* if the values should vary according to the engine speed.

Temperature Sensor

Note:

The inputs can be used with PT100 type sensors.

Select one of the temperature sensor inputs. Then configure in the same way as under the 4-20 mA heading on the previous pages.

There is an example of a PT100 sensor connection in the Connecting a PT100 temperature sensor section.

J1939

Select one of the two J1939 connections in the main display.

Find the desired signal in one of the following ways:

- Select the first letter of the signal in the column on the left-hand side. Examples: If you are looking for the *Fuel rate* signal, select D-F in the left-hand column. Then find the signal in the displayed list.

- Search for the signal by inputting information in one of the fields under *J1939 signal search* and then click *Search*.

- Click *All* in the left-hand column and find the signal in the displayed list.

Configure the signal in the same way as under the heading 4-20 mA on previous pages.

Differential

A differential input is a logical function. The function is supplied with values from 2 physical analogue inputs. The physical inputs can be connected directly from the main display or from the J1939 CAN bus. The value of the differential input is made up by the difference between the values of the 2 physical inputs.

Both of the physical inputs must have the same type of sensor. Examples: both sensors must send a value in bar. The differential signal can be displayed graphically in the display.

Average

An *Average Signal* is a logical function which produces the average of selected physical inputs. Up to 20 analogue sensors can be connected to the function. All sensors connected to the function must be of the same type. The average value can be displayed graphically in the display. You can configure up to three *Average* signals.

Special

These are signals which cannot be linked to any other group in a natural manner.

Submenu	Description
Input Voltage	The incoming voltage is monitored with fixed limit values according to the following: Warning: < 21 V Alarm: < 18 V You can add more limit values for warnings and alarms here. It is also possible to set how the voltage should be displayed graphically on the display.
Calc. Fuel Rate	The main display can calculate the fuel consumption and show an approximate value. Select an input and then configure in the same way as under the *4-20 mA* heading.
Engine Hours	If the engine's hour counter is not available on the J1939 CAN bus, it can be calculated by the main display. This is where you configure how the hour counter should be displayed in the display. The basis for the calculation is inputted via *Home > DCU > Miscellaneous > Fuel Consumption*.
Instantaneous Fuel Economy (DCU)	The main display can calculate the current fuel consumption using the values for calculated or measured fuel consumption and vehicle speed.

/ home / dcu / i/o configuration / special

Input Voltage
Calc. Fuel Rate
Engine Hours
Instantaneous Fuel Economy (DCU)

Input Voltage

Copy

Copy configuration from: None [Copy]

Configure

assign custom name

General

Channel Use: DCU+RP

Sensor

Sensor Unit: Volt   Note! Submit to apply new unit.

Sensor Range Min: 0.00
Sensor Range Max: 40.00

Display   US   Metric

Display Unit: Volt   Volt

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/ home / dcu / i/o configuration / special

Input Voltage
Calc. Fuel Rate
Engine Hours
Instantaneous Fuel Economy (DCU)

Calc. Fuel Rate

Copy

Copy configuration from: None [Copy]

Configure

assign custom name

Calculation Configuration

Enabled: No
Nominal/Max RPM: 2000
Nominal Consumption (from Engine Datasheet) [l/h]: 180.00
Nominal Boost Pressure (from Engine Datasheet) [bar]: 2.000
Idle/No-load Constant (Mul by RPM Equals Consumption) [l/h]: 0.005

General

Channel Use: Not in use

Sensor

Sensor Unit: liters/hour   Note! Submit to apply new unit.

Sensor Range Min: 0.00

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Configure output signals: dcu > I/O Configuration / Config Outputs

The output signals from the main display are configured from here. Enter your own name for all output signals by clicking *assign custom name*, at the top of every section.

 Note:

Remember to click *Submit* after every change, otherwise they will not be saved.

Some of the functions the outputs can have are listed in the table. The functions written in **bold** are the most common.

In addition to the fixed functions described in the table, the following functions are also in the list:

• Configured SAE J1939 signals.

• All configured events, e.g. a sensor that has been configured to generate a warning, alarm or engine shutdown.

Function	Description
Acknowledge Button	The acknowledgement button is activated
Buzzer Active	The buzzer is activated
Shutdown in Alarm List	There is an event in the alarm list which has caused an engine shutdown
Alarm in Alarm List	There is an event in the alarm list which has caused an alarm
Warning in Alarm List	There is an event in the alarm list which has caused a warning
All Faults (Unacknowledged)	There is a new event in the alarm list
Common DM1 in Alarm List	There is a diagnostic message from the engine control unit in the alarm list
Ready State	The main display is ready
Init. Delay State	The time which should pass between the sending of an automatic start signal and the first start attempt

Function	Description
Cranking State	The main display activates the starter motor
Awaiting Run State	The starter motor has been switched off and the main display is waiting for the engine to rev up
Running State	The engine is running
Crank Delay State	The time which should pass between automatic start attempts with the starter motor
Delayed Stopped State	Status is active and the timer is counting down
Cooling State	The display has activated alternator shutdown and the engine is idling
Stopping State	The engine shuts down
Stopped State	The engine has shut down (engine speed is under 5 rpm) and this status has been active for at least 10 seconds
Blocked State	The engine cannot be started, usually because there is an engine shutdown event which has not been acknowledged
Stopped For Unknown Reason	The display is not receiving signals indicating that the engine is running, but no shutdown command has been sent to the main display. Run out of fuel?
First Start Attempt Failed	The first in a series of automatic start attempts has failed
Final Start Attempt Failed	In a series of automatic start attempts, the last attempt has failed, including the starter motor rest periods between start attempts
In Local Mode	The display is in local mode, i.e. all external commands are blocked.
DCU Tacho Failure	Sensor signal lost during operation
Service Interval	A configured maintenance interval has been reached
Engine Protection Override	The display is in engine shutdown override mode, and engine shutdown signals are now sent as alarms only. Engine shutdown in the event of engine overspeed is always active
Power on	The display has power
Power off	The display has no power
Supply Voltage Low	The voltage is under the limit value
Speed Relay 1-4	The function is activated at configured engine speeds.
Alarm or Ack Button or Remote Acknowledge	An acknowledgement is carried out in the display and the buzzer is switched off
Common Start Failed	A collective message indicating that the engine has not started

Function	Description
Common Stop Failed	A collective message indicating that the engine has not stopped, e.g. the stop signal has been activated but the engine has not stopped within the given stop time
Soft Button 1, 2, 3, 4	One of the buttons on the bottom edge of the display is activated
Ready To Take Load	The engine speed is above the set value for *Ready to take load*
Ready for PMS Start	Active when the voltage is > 21 V and the display is in automatic mode
New Alarm Pulse	When a new event appears in the alarm list, this function is activated for 1 second and is then deactivated automatically
In Manual Mode	The display is in manual mode and cannot start automatically
In Automatic Mode	The display is in automatic mode
Overspeed	The engine speed is above the set value for engine overspeed
In Remote Mode	The display can receive remote commands
ETR	Activated when the engine is running or when it is started, deactivated by a stop command
ETS	Activated when the engine receives a stop command and remains active for 10 seconds after the engine has stopped
Shutdown	The engine is shut down automatically by a sensor signal, including engine overspeed
Running	The engine is running
Crank	The display sends a signal to the starter motor to start the engine
Prelube Activation	The display has activated the prelube function
Emergency Start/Mode	The display is in emergency mode, or an emergency start sequence has been activated

12/24V Output Functions

Select one of the outputs configured for *User Config Output* and set the function it should have by selecting an option in the *Event* drop-down list. Refer to previous pages.

There is an example of the connection of an LED to a flexible connection in the section.

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Relay Functions

The main display has 2 integrated potential free relay inputs where a function can be connected. See Relay #1 and Relay #2. Select 1 of the 2 relays and indicate which function it should have. See previous section.

Speed Relays

A speed relay is a relay that is activated at a certain engine speed and is deactivated below that engine speed. In the example below, *Speed Relay #1* is configured so that it is activated at an engine speed over 1,200 rpm and deactivated under 1,200 rpm. An event is created in the alarm list when the speed relay is activated.

1. Activate the speed relay by selecting *Yes* for *Speed Relay #1 Enabled*.

2. Select *1,200* for *Speed Relay #1 Activate Speed [RPM]*.

3. Select the type of event with *Event*.

4. Select *Yes* for *Event Log*. An event is now created in the alarm list when speed relay 1 is activated.

5. Enter a delay in seconds before which the event should be triggered using *Delay After Crossing Threshold*.

The selected speed relay can now be linked to any configurable output.

J1939 Outputs

Find the desired signal in one of the following ways:

- Select the first letter of the signal in the column on the left-hand side. Examples: If you are looking for the *Fuel rate* signal, select D-F in the left-hand column. Then find the signal in the displayed list.
- Search for the signal by inputting information in one of the fields under *J1939 signal search* and then click *Search*.
- Click *All* in the left-hand column and find the signal in the displayed list.
- Configure the signal in the same way as under the 4-20 mA heading.

Designing instrument pages: dcu > User Interface

Via *User Design* you can add the signals which were configured in *I/O Configuration* to the instrument pages.

Configuration

The display of gears and the colour markings used on the instrument pages are configured here.

Pages

The instrument pages are configured here. The main display can have a maximum of 9 different instrument pages.

This is how an instrument page is constructed:

- Each instrument page (*Page*) is based on a template (*Template*).
- A template has several different areas (*Slots*).
- Each *Slot* can contain one *Widget*. A *Widget* is a gauge needle or a bar, for example.
- Each *Widget* can be allocated one signal.
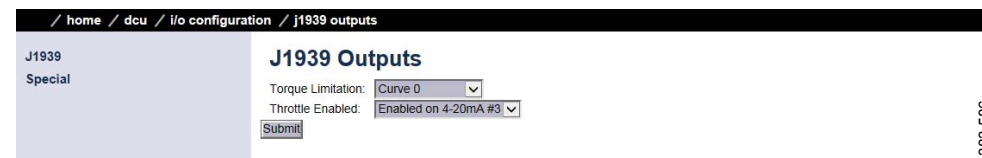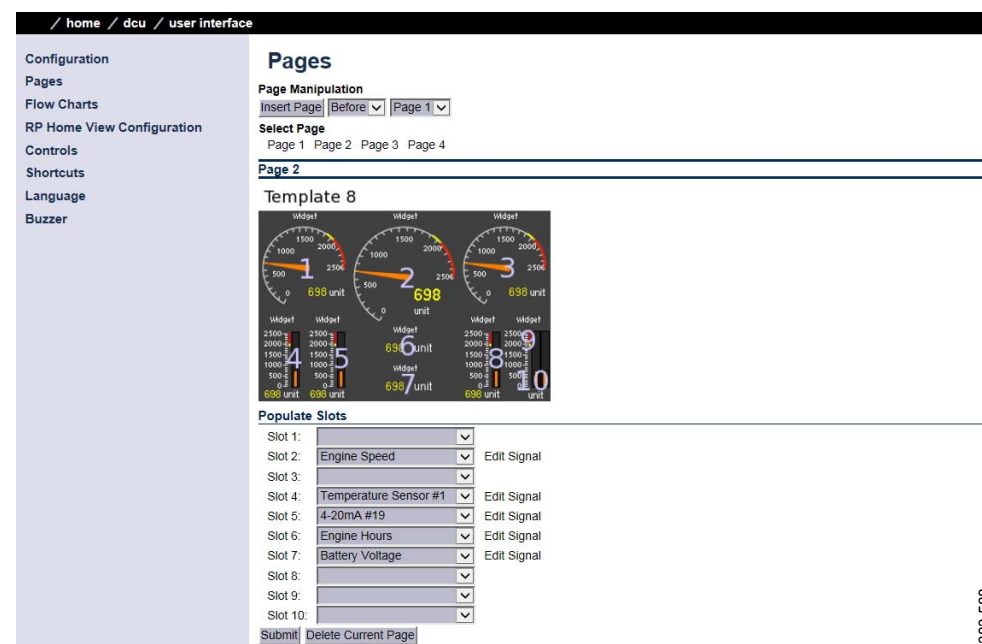
In the example in the illustration there are four instrument pages. Select one of the instrument pages by clicking it.

In the example on the right, *Page 1* has been selected. As you can see, this instrument page is based on *Template 8*. There are 10 *Slots* with one *Widget* in each *Slot*. *Slot* 2, 4, 5, 6 and 7 are each assigned a signal.

Adding a signal to a Slot

- Under *Populate Slots*, select a signal by clicking the drop-down list for the desired *Slot*. Only those signals that are configured will appear in the drop-down list.

Configuring a signal

- Click *Edit Signal* to the right of the desired *Slot*.

Adding a new instrument page

- Under *Page Manipulation* at the top of the window, select whether the new instrument page should be displayed before or after one of the existing instrument pages. Then click *Insert Page*. The instrument pages are automatically renumbered.

- Select a template for the current instrument page by clicking one of the templates displayed under *Select Template*. The *Template* currently selected for the instrument pages is displayed at the bottom of the window under *Current template*.

- Configure the instrument page according to the description above and click *Submit* when finished.

Deleting an instrument page

Select the instrument page you want to delete under *Select Page* and click *Delete Current Page* at the bottom of the window. The instrument pages are automatically renumbered. Check that you are deleting the correct instrument page, as there is no Undo function.

Shortcuts

The quick access buttons on the instrument pages are configured here. There are four buttons, F1-F4, which can be configured using the functions in the table below. By

default, F1 and F4 are configured to increase and decrease the brightness of the back-light.

Setting	Explanation
None	No function. The button is not displayed.
Language	Shortcut to language settings.
Units	Shortcut to measurement unit settings.
Mode	Shortcut to operating mode selection (*Remote/Local*).
Controls	Shortcut to *Overspeed test*.
Increase Backlight	Increases the brightness of the backlight.
Decrease Backlight	Decreases the brightness of the backlight.

Language

This is where you translate signal descriptions manually to other languages. The translated signal descriptions are then displayed in the displays.

All signals

By clicking *All signals*, all signals that are available in the main display are displayed. 3 text columns describing the signals are displayed. Examples:

English Default	English Used	Norwegian used
Engine Oil Press.	Engine Oil Pressure	Motoroljetrykk
Engine Speed	[default]	Motorturtall

The columns contain the following descriptions:

- **English Default**: The text used if no change is made.
- **English Used**: The text which will actually be displayed on the display. If *[default]* is displayed, the description in *English Default* is used.
- **Norwegian Used**: The text displayed on the display when the operator has selected this language (in this case Norwegian).

Click the signal description you want to change.

Enabled Signals Only

This section works in the same way as *All signals*. The difference is that only the signals which are used are displayed.

Buzzer

Set how the buzzer should be used in the display.

Select *Yes* under *Automatic Buzzer Off* if you want the buzzer to be switched off automatically. The buzzer is then activated as previously, but the main display will automatically switch it off after 0.5 seconds.

The function is designed to be used during configuration, when accidental alarms may occur. It is automatically deactivated after 1 hour.

/ home / dcu / user interface

Configuration
Pages
Flow Charts
RP Home View Configuration
Controls
Shortcuts
Language
Buzzer

Buzzer

Automatic Buzzer Off
Buzzer Off: No
Submit

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Set the sequences for starting, stopping and for lubrication: dcu > Start/Stop/Prelube

Set manual and automatic engine start and shutdown sequences.

General/Prelube

The following general settings under *General* and *Prelube* cannot be changed:

Setting	Description
Hold Button to Start/Stop	Must be *Yes*.
Allow E-Start	Must be *No*.
Prelube Type	Must be *No Prelube*.
Oscillating Prelube	Must be *No*.

Automatic Start/Starter

The main display can start the engine automatically. The following conditions must then be met:

- An input must be configured as automatic start and activated.

- The main display must be in automatic mode in *Menu > Settings > Operation Mode*.

Setting	Description
Initial Start Delay [seconds]	When the start sequence is activated, this amount of time must have passed before the main display performs the first attempt to start. Normal setting: 1 second.
No. of Start Attempts	The total number of start attempts. Normal setting: 3 start attempts.
Prelube Before Each Start Attempt	Not used, must be *No*.

/ home / dcu / start/stop/prelube

Settings

Settings

General

Hold Button to Start/Stop: Yes

Allow E-Start: No

Only Allow Local Start In Local or Emergency Mode: Yes

Prohibit Crank Above RPM Threshold [RPM]: 5

Note! Local start/stop buttons can only be active for 30s.
If longer start attempts are expected, use latched start/stop.

Prelube

Prelube Type: No Prelube

Oscillating Prelube

Oscillating Prelube: No

Automatic Start

Initial Start Delay [seconds]: 1

No. of Start Attempts (per starter): 3

Prelube Before Each Start Attempt: No

Starter

Cranking Time [seconds]: 7

Delay Between Start Attempts [seconds]: 7

Automatic Stop

Delay Before Disconnecting Generator Breaker [seconds]: 180

Cooling Time [minutes]: 3

Stopping

Stopping Time [minutes]: 1

Safety Stopping Time [seconds]: 30

Submit

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Setting	Description
Cranking Time [seconds]	The time the starter motor should be activated. Normal setting: 5-7 seconds.
Delay Between Start Attempts [seconds]	If the engine did not start during a previous start attempt, this setting dictates the time until the next start attempt. Normal setting: 5-7 seconds.

Automatic Stop/Stopping

The main display can shut down the engine automatically. The following conditions must then be met:

- An input must be configured as automatic stop and activated.
- The main display must be in automatic mode in *Menu > Settings > Operation Mode*.

Setting	Description
Delay Before Disconnecting Generator Breaker [seconds]	When automatic stop is activated, the main display waits for the number of seconds set here before sending the signal indicating that the alternator's battery master switch is to be disconnected. The *Disconnect Generator Breaker* signal is not a standard output signal. It must be configured to a 24 V output or a relay output. Normal setting: 1-60 seconds.
Cooling Time [minutes]	When a time setting has been exceeded, the engine continues to run without load for the time set here. Normal setting: 1-10 minutes.
Stopping Time [minutes]	Maximum stop time before the engine control unit sends an alarm that the engine has not shut down. Normal setting: 30 s.

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Changing the engine designation: dcu > Engine Model

Here you can change the name of the engine to a more suitable name, e.g. "Auxiliary engine" or "Vabis". The default name is "Engine".

The last 2 numbers in the main display's IP address show the engine number. Examples: If the IP address is 192.168.0.110, then the engine in the previous example will be called "Auxiliary engine #10" or "Vabis #10". The name of the engine is displayed in the auxiliary display.

/ home / dcu
Password
File
I/O Configuration
User Interface
Start/Stop/Prelube
Engine Model
Service Interval
Communication
Miscellaneous
Language

Engine Model

Engine Name: Engine
Engine Manufacturer: Scania
Submit

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Setting the maintenance interval: dcu > Service Interval

Set a maintenance interval at the request of the customer. There are no default settings. In the *View Service Status* submenu, the number of hours until the next maintenance is displayed. All values displayed are operating hours for the engine. You can set up to four different maintenance intervals in the *Configure* submenu. You can change the text for *Service x* by clicking the *assign custom name* link.

Setting	Description
Service Enabled	Activate the maintenance interval with *Yes*.
Next Service At	Enter a value for the first maintenance in the main display hour counter. The setting only gives one maintenance notification for the first maintenance. This setting is useful if the first maintenance is to take place within a shorter interval than the normal maintenance interval.

/ home / dcu / service interval
View Service Status
Configure

View Service Status

Service 1
Service Not Enabled
Service 2
Service Not Enabled
Service 3
Service Not Enabled
Service 4
Service Not Enabled

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Setting	Description
Then Every	Enter a maintenance interval in hours. The main display indicates whenever a maintenance interval is due to expire. Examples: The main display has a timer setting of 140 h. The next maintenance is at 150 h. The next maintenance then occurs every 250 h. The first maintenance reminder is displayed in the main display after 10 h. A reminder is then displayed every 250 h.

Network settings: dcu > Communication

Network Configuration

The IP address, netmask and gateway for the main display are entered here.

Check that the IP address is unique for the network. If the main display is to be installed in an existing network: Contact your network manager to receive an IP address.

Modbus RTU

The main display has a built-in Modbus RTU interface. See Modbus RTU, RS-485.

Modbus parameters

Transfer speed	19,200
Data bits	8
Stop bit	1
Parity	Even

Setting	Description
Address	Modbus identity number for the RS-485 channel. The ID number can be any integer between 1 and 247. It must also be unique to the network.

Modbus I/O list

The I/O list for communication is at this address: http://bit.ly/K41IbK

J1939 Configuration

This is where you configure how the SAE J1939 CAN bus should work.

Submenu	Description
Source address	The preset source address for the display is 27 (hexadecimal).
Allowed Addresses	Filtering units on the CAN bus so that the main display can read data from selected units. Normally, all sources are accepted.
Allowed DM1 Addresses	Filtering units on the CAN bus so that the main display can read data from selected units. Normally, all sources are accepted.

/ **home** / **dcu** / **communication** / **j1939 configuration**

Source Address
Request Address
Allowed Addresses
Allowed DM1 Addresses
J1939:2 Request Address
J1939:2 Allowed Addresses
J1939:2 Allowed DM1 Addresses

J1939 Source Address

J1939 Source Address [hex]: 27
J1939:2 Source Address [hex]: 27
Submit

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Other functions: dcu > Miscellaneous

This is where other functions are configured.

Engine Application Configuration

Set how the engine should be used. Depending on the settings made here, the operator can select from the display modes offered.

Event Configuration

Miscellaneous Events

This is where you configure how the SAE J1939 CAN bus should work in the event of an alarm.

Setting	Description
J1939 CANbus Broken Wire Alarm When Engine Not Running	The setting should be *No*.

/ **home** / **dcu** / **miscellaneous** / **event configuration**

Miscellaneous Events
Suppress DM1 Faults
DM1 FMI Severity
Output Event Configuration

Miscellaneous Events

J1939 CANbus Broken Wire Alarm When Engine Not Running: No
J1939 CANbus Nodes Lost Warning Enabled: No
Erratic J1939 Data Warning Enabled: No
J1939 CANbus Red Lamp Severity: Disabled
J1939 CANbus Amber Warning Lamp Enabled: No
RP Lost Warning Enabled: Yes
Submit

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Setting	Description
J1939 CANbus Red Lamp Severity	Set how *Red Lamp* signals that are sent from the engine control unit to the main display should be handled. Select *Disabled* if the main display should disregard red alarms. Select *Alarm* if a red alarm should be triggered or *Shutdown* for engine shutdown.
J1939 CANbus Amber Warning Lamp Enabled	Set how *Amber Lamp* signals that are sent from the engine control unit to the main display should be handled. Select if a warning (yellow alarm) should be displayed in the main display or whether the signal should be deactivated.
RP Lost Warning Enabled	Use this setting if a warning should be displayed if communication with the auxiliary display is broken.

Suppress DM1 Faults

Enter the combinations of SPN and FMI messages which are not to be displayed on the main display.

DM1 FMI Severity

Here you can choose how FMI messages are to be displayed in the alarm list.

Counter configuration/Counters

No changes may be made. The source for calculating the engine operating time should come from the J1939 CAN bus. All changes that are made under *Update Local Engine Hours* will be overwritten by the J1939 CAN bus.

Acknowledge Configuration

If you activate the function by selecting *Yes*, all alarms are acknowledged at once when the operator presses the acknowledge button for one second. The standard setting is *No*. If there are more alarms in the alarm list than those displayed in the display, the alarms which are not displayed are also acknowledged.

Event Log

The main display has a log where all events are saved. Set how the log should be displayed.

Setting	Description
Everything	A list of all events in chronological order.
Alarms Only	A list of all warnings, alarms and engine shutdowns.
User Interaction Only	A list of all buttons pressed on the display.
Commands Only	A list of all executed remote commands on the main display.
Events Only	A list of all events that are not alarms, e.g. power on.
Sequence Only	
Save as...	Save the list displayed to the computer as a text file.

/ home / dcu / miscellaneous

Engine Application Configuration
Event Configuration
Counter Configuration
Counters
Acknowledge Configuration
Operation Mode Locked to Input
Event Log
Shutdown Override Configuration
System Voltage
System Type
Black Panel
Factory Reset

Acknowledge Configuration

Only Acknowledge Visible Events: Yes
Disable Remote Acknowledge: No
Submit

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/ home / dcu / miscellaneous / event log

Everything
Alarms Only
User Interaction Only
Commands Only
Events Only
Sequence Only
Save as...

Everything

IDX	TYPE	ID	CREATION	LEVEL	ACK	REMOVAL
0	Event	Power On	0h0min0sec	1	-	-
1	Alarm	SDU found, update DCU configuration	0h0min0sec	Warning	-	-
2	Alarm	DCU/SDU Configuration Mismatch	0h0min0sec	Warning	-	-
3	Event	Power On	0h0min0sec	1	-	-
4	Event	Power On	0h0min0sec	1	-	-
5	Event	Power On	0h0min0sec	1	-	-
6	Event	Power On	0h0min0sec	1	-	-
7	Event	Power On	0h0min0sec	1	-	-
8	Event	Power On	0h0min0sec	1	-	-
9	Event	Power On	0h0min0sec	1	-	-
10	Event	Power On	0h0min0sec	1	-	-
11	Event	Power On	0h0min0sec	1	-	-
12	Event	Power On	0h0min0sec	1	-	-
13	Event	Power On	0h0min0sec	1	-	-
14	User Interaction	Alarm List Button	0h0min0sec	-	-	-
15	User Interaction	Stop Button	0h0min0sec	-	-	-
16	User Interaction	Stop Button	0h0min0sec	-	-	-
17	User Interaction	Start Button	0h0min0sec	-	-	-
18	User Interaction	Stop Button	0h0min0sec	-	-	-
19	User Interaction	Stop Button	0h0min0sec	-	-	-
20	Alarm	RP Lost	0h0min0sec	Warning	0h0min0sec	0h0min0sec
21	User Interaction	Alarm List Button	0h0min0sec	-	-	-
22	Event	Power On	0h0min0sec	1		

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Shutdown Override Configuration

Setting	Description
SDU	
Transmit Shutdown Override to SDU	Signal to the safety device unit to override engine shutdown.
J1939	
Transmit Shutdown Override [SPN 1237]	Signal to override engine shutdown to engine control unit via the CAN bus.
Shutdown Override from J1939	Signal to override engine shutdown from engine control unit via the CAN bus.

/ home / dcu / miscellaneous

Shutdown Override Configuration

SDU

Transmit Shutdown Override to SDU: No

J1939

Transmit Shutdown Override [SPN 1237]: J1939 & J1939 #2
Shutdown Override from J1939: No
Submit

383 599

System Voltage

The system voltage must always be set to 24 V.

System Type

More information can be found under the heading Important system settings.

Black Panel

Configuration

The screensaver for improved night vision can be activated here by selecting *Yes* under *Black Panel Support*. When the function is activated, the display comes on at minimum brightness if the operator touches the display and the alarm. It is then turned off again after the number of seconds you have set in *Timeout*.

DM1

Enter which combinations of SPN and FMI messages should switch the display on when the screensaver is activated.

Factory Reset

Perform a factory reset of the main display. After resetting, the main display restarts.

SDU

Under *Home > SDU*, there are settings for the safety device unit, if the system has one.

🛇 **IMPORTANT!**

The settings in the *Speed Sensor* submenu must not be changed. If changes are made, this affects the type approval of the system.

The settings for Switch 1-4 in the *Switch* submenu must not be changed. If changes are made, this affects the type approval of the system.

Switch 5-8 can be configured according to customer wishes or type approval requirements, e.g. monitoring of oil pressure in reverse gear.

/ home / dcu / miscellaneous / black panel

Configuration
DM1

Black Panel

SPN/FMI combinations configured here will notify the operator by turning on the backlight of the panel, when received from the engine.

SPN	FMI	
100 (Engine Oil Press.)	1 - Data Valid but below normal, highest severity	Delete
100 (Engine Oil Press.)	18 - Data valid but below normal, moderate severity	Delete
110 (Coolant Temp.)	0 - Data Valid but above normal, highest severity	Delete
110 (Coolant Temp.)	16 - Data valid but above normal, moderate severity	Delete
110 (Coolant Temp.)	20 - Reserved	Delete
111 (Coolant Level)	1 - Data Valid but below normal, highest severity	Delete
111 (Coolant Level)	18 - Data valid but below normal, moderate severity	Delete
105 (Intake Manif. Temp.)	11 - Root Cause Not Known	Delete

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/ home / sdu / sdu 410 / switch

SDU Switch #1
SDU Switch #2
SDU Switch #3
SDU Switch #4
SDU Switch #5
SDU Switch #6
SDU Switch #7
SDU Switch #8

SDU Switch #1

assign custom name
General
Password Protected: Yes
Event: Shutdown ⌄
On RUN Only: Yes ⌄
Shutdown Override Disabled: No ⌄
Enable Speed Dependency: No ⌄
Delay Time [sec]:   2   Valid range: 1 - 255
Initial Delay [sec]:   15   Valid range: 1 - 255
Submit

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/ home / sdu / sdu 410

Version
Speed Sensor
Switch
Miscellaneous
Synchronize

SDU 410

SDU 410 unit detected
Hardware Configuration
SDU: Yes ⌄
Submit

383 604

Main display administration section

Some settings can be made via the main display administration section. How to open the administration section:

- Go to *Menu > Settings*.

- Scroll to page 3 in *Settings* and press *Administration*.

- The administration section is password-protected. Enter the password, which is set at the factory to *1234*.

The administration section consists of three pages and contains the buttons below. The buttons are described in the following section.
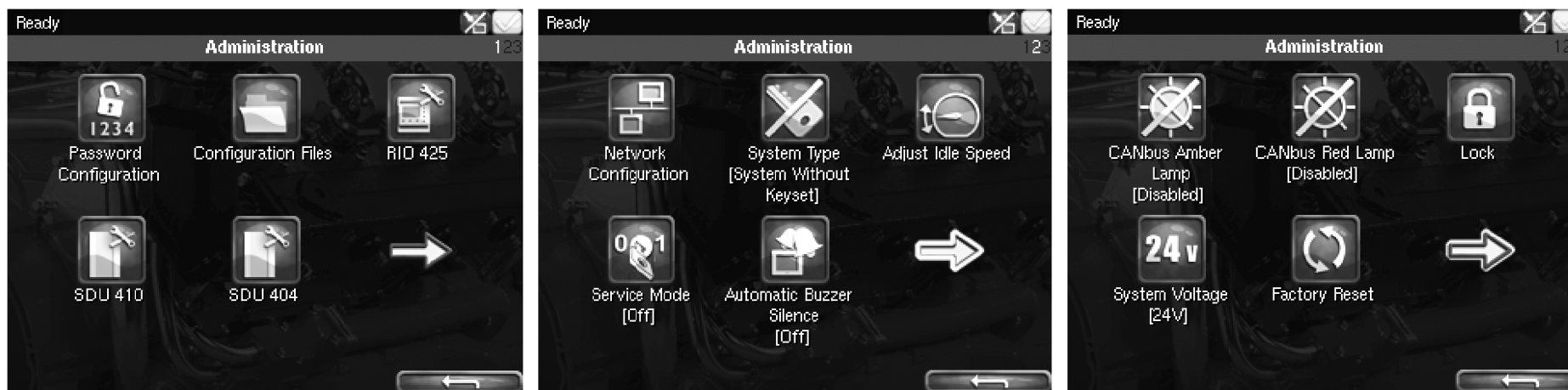
Administration in the main display: pages 1, 2 and 3

Password Configuration

This is where you can change the password for access to the administration section. First, you have to enter the existing password.

Configuration Files

This is where you can restore the display to factory settings, load user-configured files or delete user-configured files.

RIO 425

Not used.

SDU 410/SDU 404

This is where you synchronise the main display to the safety device unit and vice versa, if the system has a safety device unit. To update the safety device unit with the main display settings, select *Update DCU -> SDU*.

Update DCU -> SDU: The safety device unit is updated with the main display settings.

Update SDU -> DCU: The main display is updated with the safety device unit settings.
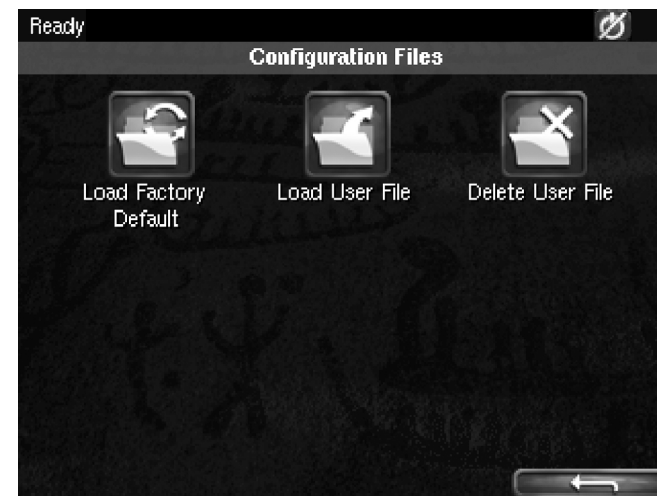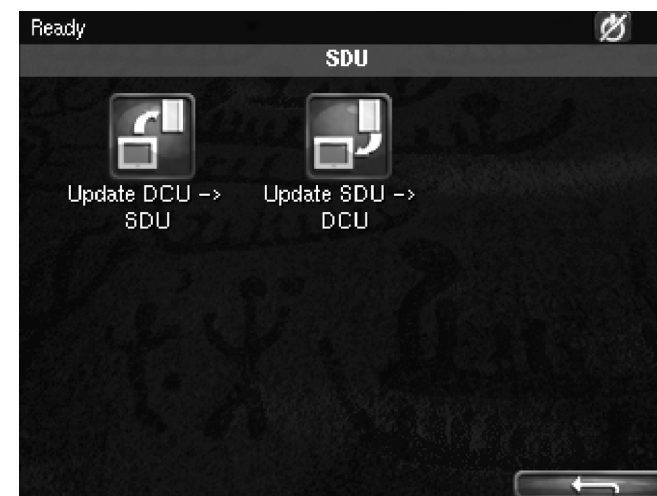
Network Configuration

This is where you change the IP address of the main display.

Note:

The last numeral in the IP address becomes the engine number in the auxiliary display.
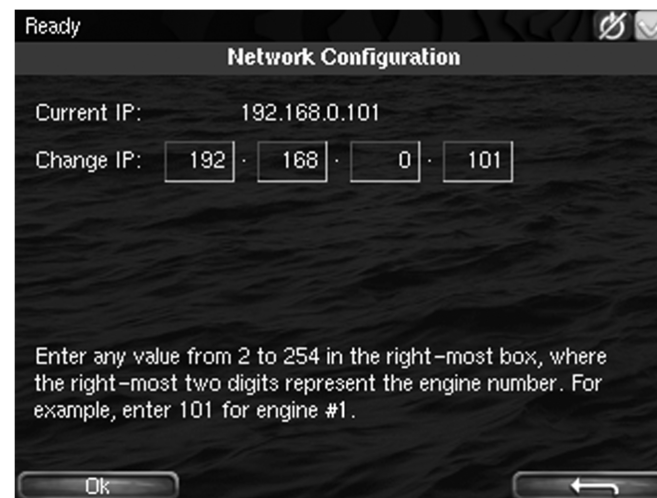
System Type

This is where control panel settings are made:

Setting	Description
System Without Keyset	System without control panel
System With Keyset at This Station	Control panel connected to this display
System With Keyset at Another Station	Control panel connected to another display

Note:

The default setting is *System Without Keyset*. If the system has a control panel, you must change the default setting.

372 056

372 057

Adjust Idle Speed

Adjusting low idling. The following conditions must be met in order to adjust low idling:

- The accelerator control should be at 0% and the engine should be idling.

- The engine coolant temperature should be at least 50°C.

Service Mode

If you activate *Service Mode*, the system is kept active, so that work on the engine control unit, for example, can be carried out. The screensaver timer configured in the *Goto Sleep Time* setting is bypassed. See Important system settings.

Automatic Buzzer Silence

Activating and deactivating the automatic buzzer switch-off.

CANbus Amber Lamp

Set how *Amber Lamp* signals that are sent from the engine control unit to the main display should be handled. Select if a warning (yellow alarm) should be displayed in the main display or whether the signal should be deactivated.
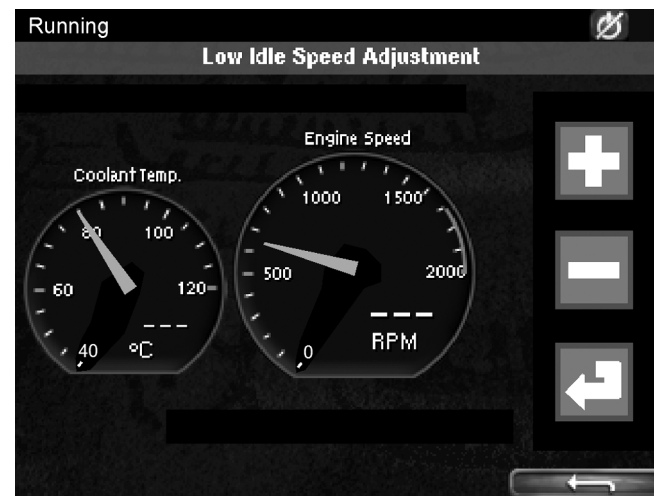
Adjust Idle Speed.

CANbus Red Lamp

Set how *Red Lamp* signals that are sent from the engine control unit to the main display should be handled. You can select from the following options:

Disabled	Red alarm via CAN bus deactivated
Alarm	Red alarm via CAN bus activated
Shutdown	Red alarm via CAN bus results in engine shutdown

Lock

Once the administrator password has been entered, the administration section is unlocked for 1 hour. Press *Lock* to lock the administration section immediately.

Factory Reset

This is where you reset the main display to factory settings.

Options for CANbus Red Lamp.

Auxiliary display

The auxiliary display reads the configuration from the main display when it is connected to the main display. It does not therefore need to be configured separately. Navigation in the auxiliary display works in the same way as the main display. See the Functions and display modes section.

First start

When the main display is started for the first time or after a factory reset, a power-on wizard is displayed. All settings which can be made in the wizard can also be made at a later stage. The first power-on wizard contains the following steps:

1. *Select Installation Language*

   Select the language that should be used during the installation.

2. *Select Administrator Password*

   Enter a new administrator password. You have to enter the preset password first, i.e. 1234. A prompt to enter a new administrator password twice will follow.

3. *Select IP number*

   Enter an IP address. The IP address in the factory settings is 192.168.0.201.

Note:

The last numeral in the IP address must always be unique to the display.

4. *Select Panel Location*

   Select where the auxiliary display should be placed. See illustration. The information is only used by other auxiliary displays.

5. *Scan for DCUs*

   Search for main displays on the network by pressing *Search*. An extra display can only be connected to a main display. If the main display is not ready, continue with the wizard. It is possible to connect to the main display later.

6. *Done*

Options for Select Panel Location.

The First power-on wizard is complete. If no main display is connected, the auxiliary display menu is now displayed.

Auxiliary display administration section

This section describes how to connect the auxiliary display to the main display and make settings which are unique to the auxiliary display.

1. Go to *Select Page > Shortcuts > Menu > Settings*.

2. Press *Administration*.

3. Enter the password you set in the auxiliary display power-on wizard.

The administration section consists of three pages and contains the buttons below. These are described in the following section.

Administration in the auxiliary display: pages 1, 2 and 3

DCU Connection

Connect the auxiliary display to the main display as follows:

1. Press *DCU Connection*.
2. Press *Search*. A list of available main displays on the network is displayed.
3. Select the main display for the engine you wish to connect and press *Ok*.

Note:

You must actively select the required main display. If you press *Ok* without selecting a display, the auxiliary display will not be able to connect, even if only one main display is listed.

The auxiliary display connects to the selected main display and the instrument pages of the main display are displayed.

DCU Alarms

Set whether the alarms triggered in the main display should be displayed in the auxiliary display or not.

•   Select *Enabled* if you want all alarms triggered in the main display to be displayed in the auxiliary display.

•   Select *Disabled* if you do not want alarms triggered in the main display to be displayed in the auxiliary display.

Engine #1 – Ready
DCU Connection
Engine #1
192.168.0.101
2.7
Ok   Search

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DCU Acknowledge

Determine how main display alarm acknowledgements can be handled from the auxiliary display. You can make the following settings:

Setting	Description
Acknowledge Mode	
Not Allowed	Select this option if no alarms should be acknowledged from the auxiliary display. Alarms can then only be acknowledged from another display.
Silence Only	Select this option if it should be possible to disable the buzzer without acknowledging any alarms in the auxiliary display.
Ack & Silence	Select this option if all alarms should be acknowledged from the auxiliary display in the same way as in the main display.
Acknowledge Options	
Allow Acknowledge All	Tick this check box if it should be possible to acknowledge all alarms at the same time. Acknowledgement is then carried out with 1 long press (1 s) on the acknowledgement button.
	Untick this check box if only one alarm at a time should be acknowledged.
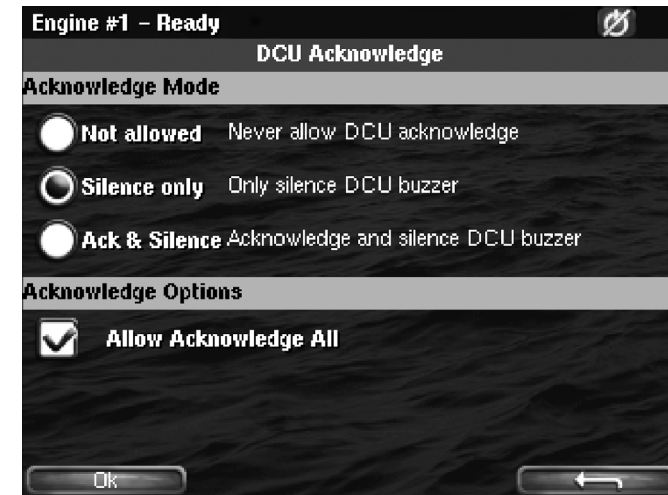
Options for DCU Acknowledge.

IP Address

Change the IP address of the auxiliary display if necessary.

Note:

- The first 3 numbers in the IP address must be the same for all displays on the network.

- The last numeral in the auxiliary display IP address must be unique to the network.

You do not need to reconnect to the main display once you have changed the IP address.

System Type

Make settings for the control panel:

Setting	Description
System Without Keyset	System without control panel
System With Keyset at This Station	Control panel connected to this display
System With Keyset at Another Station	Control panel connected to another display

Note:

The default setting is *System Without Keyset*. If the system has a control panel, you must therefore change this setting.

Adjust Idle Speed

Adjusting low idling. The following conditions must be met in order to adjust low idling from the auxiliary display:

- The accelerator control should be at 0% and the engine should be idling.

- The engine coolant temperature should be at least 50°C.

- The main display must be in *Remote Mode*.

Cameras

This function is not supported.

Station Location

Select an option for the location of this auxiliary display. The information is only used by other auxiliary displays.

Options for Station Location.

Functional Outputs

When an alarm or a fault code appears during running in *Black Panel* mode, you can select whether it should switch on the display or not. With alarms and fault codes which do not switch on the screen, you can activate an output which switches on a light, for example, here.

Change Password

Change the administrator password. If you enter the wrong password, an encrypted password is sent. The encrypted password can be decoded. Contact the Scania help-desk for more information.
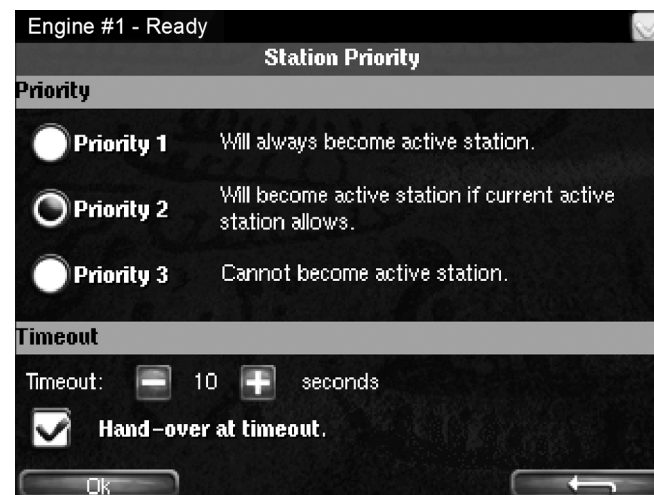
Station Priority

Enter the priority the auxiliary panel should have on the network. This setting controls how the auxiliary panel works together with other auxiliary panels on the network.

How to select the correct priority:

- Select *Priority 1* if this auxiliary display is the only auxiliary display on the network.
- Select *Priority 1* or *Priority 2* if there are other auxiliary displays on the network than this auxiliary display.
- Select *Priority 3* if this auxiliary display should only be used for monitoring.

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	Priority 1	Priority 2	Priority 3
Description	Select this option if this auxiliary display should have the highest prority, e.g. if it is to be located in the engine compartment. Also choose *Priority 1* if there is only one auxiliary display on the network.	Select this option if this auxiliary display should have a lower prority, e.g. if it is to be located on the bridge.	Select this option if this auxiliary display is to be located in a public area, where no commands should be executed.
Function to take control	An auxiliary display with priority 1 can always take control from the auxiliary display which is the active display. If the operator tries to execute a command on an auxiliary display with priority 1 which is not the active display, it will immediately become the active display and execute the command.	An auxiliary display with priority 2 can take control from an active display with priority 1 or 2 if confirmed on the active display.	An auxiliary display with priority 3 can never become an active display.

	Priority 1	**Priority 2**	**Priority 3**
Function to hand over control	An auxiliary display with priority 1 will immediately hand over control to another auxiliary display with priority 1. If control is handed over to an auxiliary display with priority 2, this is due to the operator at the display allowing it.	An auxiliary display with priority 2 will immediately hand over control to another auxiliary display with priority 1. If control is handed over to an auxiliary display with priority 2, this is due to the operator at the display allowing it.	An auxiliary display with priority 3 hands over control directly to auxiliary displays with priority 1 and 2.

Lock

Once the administrator password has been entered, the administration section is unlocked for 1 hour. Press *Lock* if you want to lock the administration section immediately.

System Voltage

The system voltage should always be set to 24 V. Otherwise an alarm for incorrect voltage is activated.

Reset to Factory Defaults

Reset the auxiliary display to factory settings.