
Configuration Manual

400 Series / 200 Series

DCU 410E Engine Controller, P/N 1006445

DCU 408E Engine Controller, P/N 1006510

DCU 210E Engine Controller, P/N 1006475

DCU 208E Engine Controller, P/N 1006477

RP 410E Remote Panel, P/N 1006446

RP 210E Remote Panel, P/N 1006476

RP 220E Remote Panel, P/N 1006472

RP 206E Remote Panel, P/N 1006478



Auto MASKIN

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1 Preface

1.1 About this Manual

This manual has been published primarily for professionals and qualified personnel.

The user of this material is assumed to have basic knowledge in marine systems, and must be able to carry out related electrical work.



Work on the low-voltage circuit should only be carried out by qualified and experienced personnel.

Installation or work on the shore power equipment must only be carried out by electricians authorised to work with such installations.

1.2 Responsibilities



It is the sole responsibility of the installer to ensure that the installation work is carried out in a satisfactory manner, that it is operationally in good order, that the approved material and accessories are used and that the installation meets all applicable rules and regulations.



Auto-Maskin continuously upgrades its products and reserves the right to make changes and improvements without prior notice.

All information in this manual is based upon information at the time of printing. For updated information, please contact your local distributor.

1.3 Revisions

This Configuration Manual is valid for the following firmware version of the DCU Engine Controllers.

| Edition | Firmware Version | Release |
|---------|------------------|---------------|
| Release | 3.10 P5 | February 2022 |

Configuration Manual revision: **May 2023**

2 Configuration

This section explains the configuration of the DCU. All configuration except password and network configuration is stored in a portable configuration file within the DCU.

2.1 Configuration & Firmware Files

The DCU may be configured in one of the following three ways.

1. DCU Web Server Configuration Interface
2. DCU User Interface Menu
3. USB Memory Interface

2.1.1 DCU Web Server Configuration Interface

The DCU has a built-in web server, offering access to full configuration of the DCU.

 This is the primary configuration interface.

2.1.2 DCU User Interface Menu

For quick and easy changes to the configuration, there is a configuration entry point in the menu.

 This manual will not describe the panel menu configuration interface in detail. Only the web server menu operation is covered.

2.1.3 USB Memory Interface

Insert a USB memory stick and follow the guidelines appearing on the DCU screen.

 The DCU 408E/208E does not have a screen interface and hence this method does not work on those units.



2.1.3.1 Configuration Files

If the USB memory stick contains configuration files, they will be listed here.



The configuration filename can only contain the following characters:

- A-z
- A-Z
- 0-9
- “_” (underscore)
- “-” (hyphen)

The DCU 408E/208E does not have a screen interface and hence this method does not work on that unit.

If other characters are being used, then the DCU will not “see” it. Rename the configuration file to solve the issue.

Copy Configuration File

1. When the USB memory is inserted, the DCU asks for the administration password (4-8 digits).
2. The DCU then lists the configuration file(s) available on the USB memory.
3. Select file(s), then select COPY to copy these files into the User Files area in the DCU. Note that this does not activate the file; it is merely a copy of the file into the DCU.

Use Configuration File

Insert USB memory stick, select a file, and then select USE to copy and activate this configuration file.

2.1.3.2 Firmware Files

The USB memory can be used to copy a new firmware to the DCU and also any connected RP.



If upgrading both the DCU and the RP firmware, then make sure to upgrade the RP firmware first!

2.1.3.3 Copy Configuration File or Event Log

This function copies the current configuration file and/or the event log to the USB memory stick. The configuration file will be named/labeled *current_config.cfg*.

2.2 Connecting to the DCU

It is possible to connect to the DCU either directly or through a LAN (Local Area Network) Ethernet network.



For use in an existing Ethernet, check the configuration of the LAN with the LAN manager.

The components in Marine Pro, including the DCU, use fixed (not dynamic) IP addresses, which must be set manually.

2.2.1 To Connect to the DCU

- Connect an Ethernet cable between your laptop and the DCU port COM 6 (Ethernet port).

Either use the DCU Discover Tool, downloadable from Auto-Maskin web page, or follow the following steps.

1. In the DCU menu, select Version Information. Note the IP address. From the factory, the IP address is 192.168.0.101.
2. In your web browser, type the IP address, eg. <http://192.168.0.101> in the address field.
3. Press Enter, and note the login screen.
4. In the login screen, type
 - Username = dcu
 - Password = 1234 (from factory)



If the password is unknown or forgotten, then find the Encrypted PIN and send this to service@auto-maskin.com to obtain the correct PIN.

- Logged In: Proceed to the Web Server Configuration chapter.
- Not Logged In: Continue with connection settings as described below.

2.2.2 Further Connection Settings

2.2.2.1 Change the IP address of the DCU

If necessary, the IP address of the DCU can easily be changed.



The last two digits in the IP address becomes the engine number.

Example: IP address 192.168.0.**104** becomes **Engine #4**

The DCU has a fixed IP address that is set during the first power-on set up. The IP address may also be changed later, in the DCU panel menu:

DCU 410E: Menu / Settings / Administration (locked/open) / Miscellaneous / Network

DCU 210E: Menu / Settings / Administration (locked/open) / Network Configuration

The Administration folder is password protected by a password. It will remain open for 60 minutes after valid password has been provided.

Use the up / down arrows to select each of the four groups of numbers and press edit to edit each group.

2.2.2.2 IP Address Convention

The factory default IP of the DCU is 192.168.0.101. The first three groups must be the same for all components in the LAN, for instance 192.168.0.X, where X is the other unit in the LAN.



The X-figure must be unique within the LAN. Also, the two last digits in X will represent the engine number.

Example: A DCU with the IP address 192.168.0.**104** will be named **Engine #4**

2.2.2.3 Connect the DCU to a Single PC

First, make sure that the PC's Ethernet network configuration is set to automatically receive an IP address (as most PCs are). Then in the DCU panel menu:

Menu / Settings / Connect a PC...

Press the down arrow and then Toggle. The DHCP-server will now be active for 10 min. Repeat if it takes longer than 10 min to ready the PC.

Connect the PC to the DCU with a CAT-5 Ethernet cable. The DCU's DHCP-server will now automatically set up the PC to communicate with the DCU. It may be necessary to use a network reset/repair function for the PC's Ethernet connection in order for the PC to receive the new IP address.

Alternatively, set the IP address of the PC manually to a free IP address in the same subnet as the DCU.

For instance, if the DCU's IP address is 192.168.0.101, the PC may use any IP address starting with 192.168.0 except 192.168.0.101.

2.2.2.4 To Connect the DCU to a LAN with a DHCP server

For use in a LAN with a DHCP server (Dynamic Host Configuration Protocol), the IP addresses to be used by Marine Pro components must be set outside the IP address range used by the DHCP server. Most DHCP servers are configured with an IP address range that leaves room for fixed addresses outside it.

If for instance the LANs subnet is 192.168.230 and the DHCP's IP address range is set to 50 – 210, valid IP addresses of the DCU would be for instance 192.168.230.211, 192.168.230.7 or 192.168.230.231.

Do not use the DCU built-in DHCP-server (the Menu / Connect a PC... menu entry) in a LAN with its own DHCP server, since two DHCP servers in the same LAN may create conflicting IP addresses.

2.2.2.5 Connection to a LAN using Fixed IP Addresses

Set the IP address of the DCU to a free/available IP address within the LAN's subnet.

2.2.2.6 Factory Defaults for the DCU

Factory defaults are valid at initial startup only.

- IP address: 192.168.0.101
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.0.1

For later resets, the current IP configuration will be kept even through the manual Factory reset operation.

DHCP IP address range: 101 – 199 within the subnet defined by the DCUs IP address.

2.2.2.7 IP Address Conflict

Two or more DCU units with the same IP address should not be connected in the same network. The result may be that a PC or RP 410E remote panel will be able to address one of the DCU units only.

Change the IP addresses until all units have a unique address.

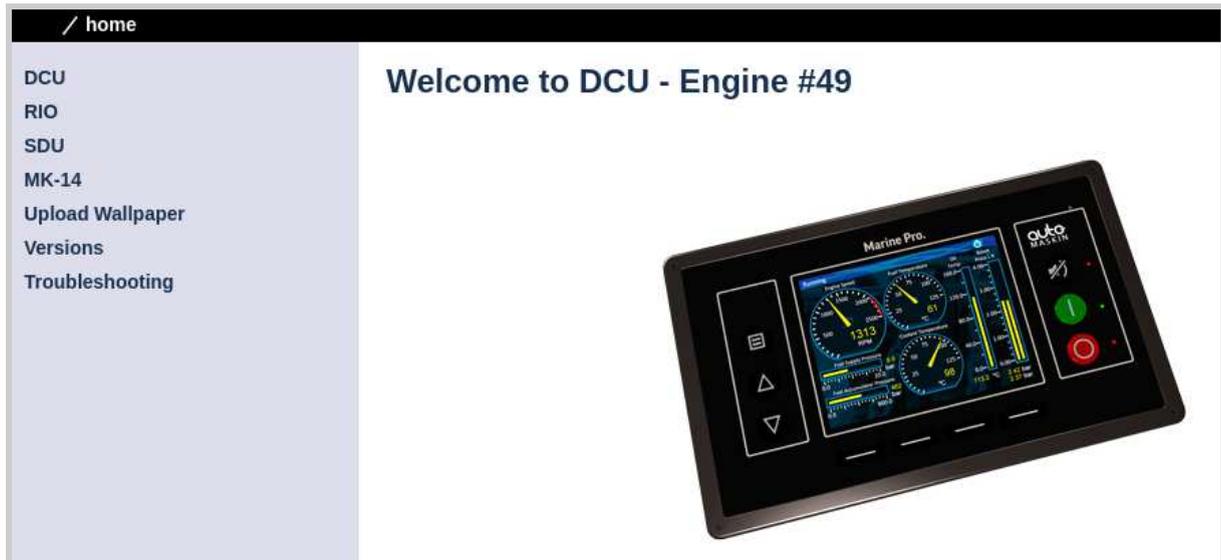
2.3 Web Server Configuration

Once logged in, the DCU can be configured. The following are the Web Server main menu items.



This chapter is not applicable for the RP products.

When logged in, the browser displays the following.



The Home screen lists the following menu items.

2.3.1 DCU

This is the top level menu for the entire DCU configuration.

All configuration performed, except password and network configuration, is stored in the portable configuration file within the DCU.

2.3.2 RIO

This is the top level menu for the optional expansion I/O modules, the RIO modules.

All configuration performed is stored in the portable configuration file within the DCU.

2.3.3 SDU

This is the menu top level for the SDU 404/410/420 safety shutdown unit configuration.

The SDU is mandatory in classed installation.

All configuration performed is stored in the portable configuration file within the DCU. If a SDU is attached the configuration is transferred to the SDU as well.

2.3.4 MK-14

The relays on the optional relay module MK-14 can be assigned a function here.

All configuration performed is stored in the portable configuration file within the DCU.

2.3.5 Upload Wallpaper

A user wallpaper can be uploaded, and can be used as background for instruments, popups and other dialogs.

2.3.6 Versions

This top level menu item lists the hardware and software version of the DCU, and the software version of the SDU.



If contacting Auto-Maskin for help or questions regarding your product, the data in the Versions page provide vital data that might help speed up the resolution to your inquiry.

2.3.7 Troubleshooting

The troubleshooting section makes it possible to troubleshoot I/O and communication on the DCU, and also the RIO units.

The following can be verified for the DCU:

- Supplies
- Switch inputs
- 4-20 mA inputs
- PT100 inputs
- Voltage inputs
- Communication channels
- J1939 Nodes
- MK-14 outputs
- Outputs (functional 24V outputs and relays)
- Inputs (functional inputs)
- Run sources (engine running indications)
- RPM sources (which sources are in use) and their priority
- Diagnostics

The following can be verified for the RIO:

- Versions
- Supplies
- Switch inputs
- 4-20 mA inputs
- PT100 inputs
- TC
- 0-5V
- Outputs

3 Main DCU Web Server Menu



3.1 Access Control

The DCU configuration is protected with a PIN code.

Select this option to change the PIN code. First, type in the old PIN, and then the new PIN twice.

If the PIN is unknown or forgotten, then find the encrypted code and send this to service@auto-maskin.com to obtain the correct PIN.

3.1.1 Access Control Levels

If enabled, the DCU supports three levels of access control.

- Factory (highest priority)
- Dealer
- User

Each access control level can lock any configuration, making it impossible to change for lower priority access.



When access control is enabled, make sure to close your browser after use (when logging out) to prohibit any unauthorized access.

3.2 File

This section provides functions for management of configuration files and other file operations, such as upgrading of firmware and uploading of custom wallpapers.

3.2.1 Load any File

To change the configuration of the DCU, load a new configuration file.



When a configuration file is selected, the panel will restart with the new configuration file.

3.2.1.1 Factory Default

From here, a predefined factory configuration file can be opened.

3.2.1.2 User Uploaded

This lists the files previously uploaded to this DCU. Pick a file to select a new configuration for the DCU.

Note! To get access to the configuration file, it needs to be uploaded to DCU first. See “Upload to DCU” for more information.

3.2.2 Delete Configuration File

Delete any number of configuration files on the DCU. It is only the user uploaded configuration files that can be deleted. The configuration files supplied from the factory will always be available and can not be deleted.

3.2.3 Configuration Printout

This gives a quick overview of the current configuration.

3.2.4 Save File as

This saves the current configuration of the DCU into a file. The default file extension is .cfg.

3.2.5 Save CANopen EDS-file



DCU 410E/408E only.

This saves the CANopen I/O electrical datasheet to a file on your PC.

3.2.6 Upload to DCU

Uploaded files are files transferred to the DCU.

The built-in firmware can be updated whenever there is a new firmware available.

New configuration files can be added to the DCU panel.

3.2.6.1 Firmware Update

Select the new DCU panel firmware to upload. The file name shall be **dcu410e_<release>.tar.gz** or **dcu210e_<release>.tar.gz**.

The latest firmware release can be obtained from the Auto-Maskin web site.



Before upgrading the DCU it is recommended to take a backup of the current configuration file, see “Save File as” chapter.

When upgrading a DCU to a new firmware it is recommended to also upgrade any connected RPs to the latest available firmware as well.

If upgrading an RP it is similarly recommended to upgrade related DCUs.

3.2.6.2 Wallpaper

Select a picture file for the DCU. The file must be of type .png. Only one user wallpaper may be uploaded. Uploading a new file will remove the old one.

3.2.6.3 Configuration File Upload

Select a user configuration file for the DCU. The file must be of type **<file_name>.cfg**.

When uploaded, the file is stored in the DCU, and is later available for use from the User Uploaded files section.

3.3 I/O Configuration

Described in a separate chapter.

3.4 User Interface

Described in a separate chapter.

3.5 Start/Stop/Prelube

Described in a separate chapter.

3.6 Engine Model

Engine Model

Engine Name:

Engine Manufacturer:

 home / dcu / engine model

The default name is “Engine”.

Name the engine better, for example “Auxiliary” or “Doris”.

 The last two digits in the DCU IP address becomes the engine number. If the IP address is 192.168.0.110, then the engine in this example is named “Auxiliary #10”.

3.7 Service Interval

See and configure regular service intervals.

[/ home / dcu / service interval](#)

[View Service Status](#)
[Configure](#)

Service Interval

 home / dcu / service interval

3.7.1 View Service Status

This will list the number of hours until the next service is due.

3.7.2 Configure

Up to four different timers can be configured to indicate it is time for engine service.

The default text “Service 1” can be changed by selecting the assign custom name link.

Configure

Service 1 - assign custom name

Service Enabled: No ▼

Next Service At [hours]:

Then Every [hours]:

Pre-Warning Enabled: Yes ▼

Service 2 - assign custom name

Service Enabled: No ▼

Next Service At [hours]:

Then Every [hours]:

Pre-Warning Enabled: Yes ▼

Service 3 - assign custom name

Service Enabled: No ▼

Next Service At [hours]:

Then Every [hours]:

Pre-Warning Enabled: Yes ▼

Service 4 - assign custom name

Service Enabled: No ▼

Next Service At [hours]:

Then Every [hours]:

Pre-Warning Enabled: Yes ▼



home / dcu / service interval / configure

Service Enabled selects whether the service interval timer is active or not.

Next Service At selects the hour counter value in the DCU for the first service. Note that this happens only one time. This is useful if the first service should have a shorter interval than the regular service interval.

Then Every selects the service interval in hours. The DCU will indicate every time this number of hours has elapsed.

Example

Current DCU hour counter is 123 hours.

- Next Service At: 150 hours
- Then every: 250 hours

The first service notification will appear in 27 hours, then every 250 hours. All hours are engine running hours.

Pre-Warning Enabled enables an information popup whenever the service is within 10 % of the service interval.

3.8 Communication

Described in a separate chapter.

3.9 Miscellaneous

Described in a separate chapter.

3.10 Language

See Language description in the User Interface chapter.

This section is identical.

4 I/O Configuration

The I/O section holds menu items for input and output channels. Input channels are sensors going in to the DCU (eg. Switch Input, 4-20 mA Input) and output channels are sensors being controlled by the DCU (eg. 24 V Output, J1939 Output).



Always remember to press the **Submit** button after each change on the configuration pages.

No changes are saved until this button is pressed.

4.1 Common I/O Configuration

Much of the configuration is common for all channels. This section describes the common configuration.

Naming

Each channel can be configured with a custom name for all supported languages. The naming of the channel in the panel is determined using the following prioritization.

1. Use channel custom name in selected language, if any.
2. Use channel custom name in English, if any.
3. Use channel default name in selected language.

Channel Use

Each channel can be individually configured for display on DCU, RP or both. In addition, each channel can be individually configured for event.

Channel Use:

The channel use configuration defines how the channel is configured according to the following table.

| Channel Use | DCU | | RP | |
|-------------|---------|-------|---------|-------|
| | Display | Event | Display | Event |
| Not in use | | | | |
| Event | | X | | X |

| | | | | |
|-----------------------------|---|---|---|---|
| DCU | X | | | |
| DCU + Event | X | X | | X |
| RP | | | X | |
| RP + Event | | X | X | X |
| DCU + RP | X | | X | |
| DCU + RP + Event | X | X | X | X |
| Silent Event | | | | |
| DCU + Silent Event | X | | | |
| RP + Silent Event | | | X | |
| DCU + RP + Silent Event | X | | X | |
| Sea Trial Only ¹ | | | | |

Select **Not in use** if the channel shall be disabled.

Select **Event** if the channel shall make any form of event. An event can be a warning, an alarm, a load reduction or an engine shutdown.

Select **Silent Event** for an active channel, but no panel alarms. The event will be available on communication only.

Select **DCU** and/or **RP** if the channel is to be displayed on a page.

The **Sea Trial Only** option is used to tag a channel for use in Sea Trial Mode only. This is only applicable for a DCU that will provide data logging during a sea trial. Choosing this option makes the channel active for viewing and data logging only when Sea Trial Mode is active on the DCU.



Normally, and in most cases, the selection should be “DCU + RP + Event”, as **highlighted** in the table above. This makes sure the channel is displayed in the DCU and in the RP, if – or when – the RP is installed.

¹ Can be displayed when Sea Trial mode is active.

4.1.1 Common Configuration for Switch Channels

Switch Input #3

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: Not in use

Submit

Any switch input channel can be configured to either be used as a configurable input function, or as an ordinary channel.



If a function is configured, the DCU will automatically disable the ordinary channel use.

Function

Whenever a function is configured, that function will be assigned to the switch channel. The following functions are available for the switch channels. The highlighted functions are the most typically being used.

The function is activated when the input is connected to 24V. The function is deactivated when the input is left open, or connected to 0V.

| Function Name | Description |
|------------------|---|
| None | The channel is being used as an (ordinary) engine sensor switch input. |
| Local Mode | Sets the panel to local mode, meaning all external commands are blocked. |
| Remote Mode | Sets the panel to remote mode, meaning all local commands are blocked. |
| Backlight 100% | Force backlight to 100% |
| Prelube Override | The configured prelube sequence is aborted. |
| Prelube Complete | Signal shall come from the prelube system, notifying the panel that the prelube sequence is completed. The panel will leave the prelube phase and commence start. |
| Start Disabled | Start is disabled. |
| Automatic Mode | 210E only. The panel accepts automatic start/stop signals. |

| | |
|--------------------------|--|
| Automatic Start | 210E only. Panel will commence the start sequence. Requires Automatic mode. |
| Automatic Stop | 210E only. Panel will commence the stop sequence. Requires Automatic mode. |
| Automatic Start/Stop | Panel will commence start when active, and commence stop when inactive. Requires Automatic mode. |
| Remote Start | 210E only. Same as the local start button. Disabled if panel in local mode. |
| Remote Stop | 210E only. Same as the local stop button. Disabled if panel in local mode. |
| Local Start | Local Start button |
| Local Stop | Local Stop button |
| Local Acknowledge | Used to acknowledge all events in the alarm list. |
| Local/Remote Acknowledge | Used to acknowledge all events in the alarm list |
| Remote Acknowledge | Used to acknowledge all events in the alarm list |
| Silence Buzzer | Silences the buzzer. Edge triggered. |
| Load Reduction Override | Puts the DCU in load reduction override mode. |
| Shutdown Override | 210E only. Makes all the configured shutdown channels into alarm channels, so engine will not shut down automatically. Engine overspeed shutdown is however always enabled. |
| In Gear | 210E only. From gearbox on prop. Engines. Disables start attempts. |
| In Neutral | Neutral gear indication. Overrides any other In Gear signal if configured. |
| In Gear (Ahead) | From gearbox on prop. Engines to indicate Ahead gear. |
| In Gear (Astern) | From gearbox on prop. Engines to indicate Astern gear. |
| Toggle Crank Mode | Toggle between crank modes. |
| Power On | Toggle Sleep mode. |

Use As configures the function used. Select **None** if the channel is to be used as an ordinary switch input channel.

Input State makes it possible to invert the behaviour of the function.

Alarming

The Alarming section configures how the switch channel will generate events.

| Alarming | |
|---------------------------|----------------------------------|
| Event: | Warning ▼ |
| Input State: | Normally Closed, Event on Open ▼ |
| Delay Before Event [sec]: | 0 |
| Requires Running Engine: | No ▼ |
| Requires In Gear: | No ▼ |
| Requires Engine Load: | No ▼ |
| Disable While Trolling: | No ▼ |
| Use As Additional Run: | No ▼ |

Note! Run = Normal State

Event can either be **Warning**, **Alarm**, **Load Reduction** or **Shutdown**. If any type of event (Event or Silent Event) was selected under Channel Use, then select the event severity here. If **None** is selected, then the channel is active but no events are created.

Input State can be configured to **Normally Closed, Event on Open**, or **Normally Open, Event on Closed**. Normally Open means the contact must close to make the event, whereas Normally Closed means the contact must open to make the event.

Delay Before Event is the desired persistence time before the channel activates the event.

Typical values:

Engine Oil Pressure Low: 2 seconds.

Engine Coolant Temp. High: 5-10 seconds.

Requires Running Engine is configured if the event requires a running engine. Several RPM setpoints are available.

Requires In Gear is configured if the event requires the engine to be in gear.

Requires Engine Load is configured if event shall only be monitored at a certain engine load.

Whenever Requires Engine Load is used, Engine Load Threshold is shown. Engine Load Threshold configures the required load in order for event to be monitored.

Whenever a Requires condition is used, the Initial Delay is shown. Initial Delay defines the time before event monitoring starts, once all Requires conditions are fulfilled.

Disable While Trolling is used to disable event monitoring when trolling.

Use As Additional Run is used to let this channel act as a run indication. If the DCU has only one pickup source, it is recommended to add an engine oil pressure switch as an engine running indication.



Do not use any other pressure sensors – or any other signals – as the engine running indication!

Normal denotes a running engine with no alarm.

If two or more engine speed (pickup) sources² are in use, then it is recommended leaving this off for all switches. Set to No.

If one engine speed source only, locate the engine oil pressure switch and use this as the Additional Run signal. Set to Yes.

² An engine speed source can be the magnetic pickup connected to the DCU, the J1939 CAN bus signal connected to the DCU, or the speed signal coming from the connected SDU 404/410 safety shutdown unit.

4.1.2 Common Configuration for Analog Channels

Active Sensor Range

The active sensor range section is only available for 4-20 mA inputs and voltage sensor inputs.

| Active Sensor Range | |
|---------------------------------|-------|
| Sensor Range Min [milliAmpere]: | 4.00 |
| Sensor Range Max [milliAmpere]: | 20.00 |

Sensor Range Min and Sensor Range Max select the high and low limits for the sensor, meaning values outside the value sensor range will be determined as out of range.

Sensor

The sensor section configures the sensor capabilities.

| Sensor | | |
|-------------------|---------|--|
| Sensor Unit: | Percent | Note! Submit to apply new unit. Corresponds to active sensor range min. Corresponds to active sensor range max. |
| Sensor Range Min: | 4.00 | |
| Sensor Range Max: | 20.00 | |

Sensor Unit selects the sensor unit for the sensor, as printed on the sensor. An oil pressure sensor might for instance be in Bar or psi. If the channel has a predefined sensor unit such as thermistor or J1939 inputs, the sensor unit can not be changed.

Sensor Range Min and Sensor Range Max select the sensor range values for minimum and maximum values, as printed on the sensor.



Channels with a predefined sensor range can not be modified.

The sensor range min and max correspond to the active sensor range min and max, if any.

Display

Configures how the channel is presented in gauges or bar graphs in the panels.

| Display | US | Metric |
|------------------------|---------------|-----------|
| Display Unit: | RPM | RPM |
| Display Range Min: | 0.00 | 0.00 |
| Display Range Max: | 2000.00 | 2000.00 |
| Display Major Divider: | 500.00 | 500.00 |
| Display Minor Divider: | 250.00 | 250.00 |
| Display Multiplier: | 1 | 1 |
| | Update Metric | Update US |
| Mirrored View: | No | |

The channel can be configured to different views depending on what unit is selected. This is seen in the US and Metric column.

Display Unit selects the desired displayed unit for US and Metric values. The display unit must be convertible from the Sensor Unit.

Display Range Min and Display Range Max select the desired minimum and maximum values displayed in the instrument, for US and Metric values.



The number of decimals shown is dependent on the configured display range.

- Range 0 to 9: Display 2 decimals (8.43)
- Range 10 to 99: Display 1 decimal (8.4)
- Range larger than 99: Display no decimals (8)

Display Major Divider selects the desired major divisions in the instrument, for US and Metric values. The major divider number is displayed at each major divider.

Display Minor Divider selects the desired minor divisions in the instrument, for US and Metric values.



It is recommended to assign the major divider to a value which can be divided with the total display range.

It is recommended to assign the minor divider to a value which can be divided with the major divider.

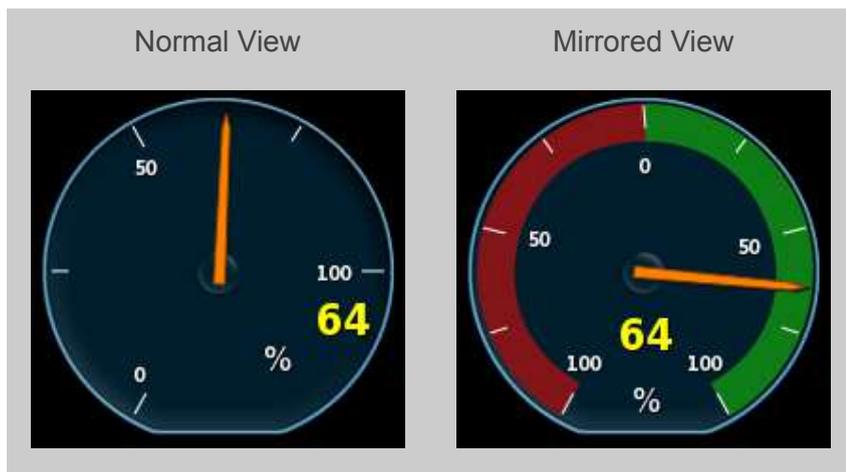
Display Multiplier selects the multiplication factor as necessary. An instrument with displayed range 0-10,000 would display as 0-1,000 with a multiplication factor of 10. The multiplication factor is displayed in the instrument (round gauges only).

Update Metric and Update US can be used to copy and convert display configuration to Metric or US units.



When using Update Metric or Update US, the application does not round off values. It is highly recommended to adjust the calculated values by hand, and set sensible round figure values.

Mirrored View configures the gauges to have the minimum display range set to the maximum together with a colored indication. This is typically used for rudder angle display.



Alarming

Settings for how the events are configured for the channel. This section is always completed in the currently selected system unit. To switch units, simply change units using the DCU panel..

| Alarming (in Metric Units) | |
|---|----------------------------------|
| Event: | Warning & Alarm ▼ |
| Warning Threshold [Percent]: | 0.00 |
| Alarm Threshold [Percent]: | 0.00 |
| Delay After Crossing Warning Threshold [sec]: | 0 |
| Delay After Crossing Alarm Threshold [sec]: | 0 |
| Threshold Type: | Low ▼ |
| Requires Running Engine: | No ▼ |
| Requires In Gear: | No ▼ |
| Requires Engine Load: | No ▼ |
| Disable While Trolling: | No ▼ |
| Use As Additional Run: | No ▼ Note! Run = No Alarm |

Event selects the desired combination of warning, alarm and shutdown. Select “RPM dependent” for a setpoint that varies with RPM, and complete the boxes.

The event threshold (Warning Threshold, Alarm Threshold etc) settings contain the event threshold value, in the correct units.

Delay After Crossing Alarm Threshold sets the persistence time before the event. Value is in seconds.

Threshold Type sets the event to appear on a rising (higher) or falling (lower) signal. A temperature fail is normally “too high”, and a pressure fail is normally “too low”. In addition, a high and low threshold setpoint can be configured.

Requires Running Engine is configured if the event requires a running engine. Several RPM setpoints are available.

Requires In Gear is configured if the event requires the engine to be in gear.

Requires Engine Load is configured if the event shall only be monitored at a certain engine load.

Whenever Requires Engine Load is used, Engine Load Threshold is shown. Engine Load Threshold configures the required load in order for event to be monitored.

Whenever a Requires condition is used, the Initial Delay is shown. Initial Delay defines the time before event monitoring starts, once all Requires conditions are fulfilled.

Disable While Trolling is used to disable event monitoring when trolling.

Use As Additional Run is used to let this channel act as a run indication. If the DCU has only one pickup source, it is recommended to add an engine oil pressure sensor channel as an engine running indication.



Do not use any other pressure sensors – or any other signals – as the engine running indication!

4.2 Flexible I/O

This is where the Flexible I/O channels are configured.



This is only applicable for DCU 210E/208E.

Each channel can be used for a variety of input and output functions, such as:

- 24VDC Supply
- 0VDC
- Switch Input
- Configurable Output
- 4-20mA sensor
- Voltage sensor
- 5V (#6)
- J1939#2 (#20 and #21)



Making changes to the flexible I/O configuration may result in damage to sensors connected to the panel.

It is recommended to disconnect all sensors from the panel before making changes.

After a flexible I/O channel has been defined it will appear in the respective menu as enabled.

Eg. Terminal C1.1 has been defined as a “4-20mA” channel in the Flexible I/O section. It will now be available in DCU Config Inputs 4-20mA.

4.3 Config Inputs

This is where the I/O input channels are configured, such as 4-20 mA, PT100 and switch inputs.

4.3.1 Engine Speed

This is where engine speed sensors are configured, and the overspeed setpoint is set. The majority of the configuration is synchronized with SDU.



This section is central to any installation. It provides the DCU with data required to form an exact and reliable reading of the engine speed.

Engine Speed

assign custom name

Source

| | | |
|-----------------------|----------------------|-------------|
| RPM Primary Source: | Engine Speed (DCU) ▼ | Edit Signal |
| RPM Secondary Source: | None ▼ | |
| RPM Third Source: | None ▼ | |
| RPM Fourth Source: | None ▼ | |
| RPM Fifth Source: | None ▼ | |

Local Pickup

DCU Pickup Pulses Per Revolution: 150

General Configuration

| | | |
|--------------------------------------|------|-----------------------------|
| RPM Rounding [RPM]: | 10 ▼ | |
| 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]: | 1410 | |
| RPM Nominal Speed [RPM]: | 1500 | Valid range: 200 - 3000 RPM |

General

Channel Use: DCU+RP ▼

Display

| | |
|------------------------------|---------|
| Display Range Min [RPM]: | 0.00 |
| Display Range Max [RPM]: | 2000.00 |
| Display Major Divider [RPM]: | 500.00 |
| Display Minor Divider [RPM]: | 100.00 |
| Display Multiplier: | 1 ▼ |

Overspeed

| | |
|-------------------------------------|-------|
| RPM Overspeed [RPM]: | 1725 |
| RPM Overspeed Delay [milliseconds]: | 100 ▼ |
| RPM Overspeed Shutdown Enabled: | Yes ▼ |

Submit



home / dcu / i/o configuration / engine speed

Source

The Engine Speed is constructed by reading data from up to five sources simultaneously. These sources are prioritized by the DCU. As long as the RPM Primary Source is functional, it is used to form the actual Engine Speed.

Should the RPM Primary Source fail, the DCU uses the RPM Secondary Source if available. Likewise, the RPM Third Source is used only when both Primary and Secondary fails.

Each of the RPM Sources can be configured to receive data from a number of possible sensors.

| Source | DCU 410E/408E | DCU 210E/208E |
|----------|--|---|
| J1939 #1 | J1939 CAN bus connected to terminals 49-51 (COM 4) | J1939 CANbus connected to terminals C1.7-8. |
| J1939 #2 | J1939 CAN bus connected to terminals 47-48 (COM5) | J1939 CANbus #2 connected to Flexible I/O #20-#21. |
| DCU | Magnetic pickup locally connected to DCU, terminal 44 and 45 | Magnetic pickup locally connected to DCU, terminals C4.1 and Flexible I/O#18. |
| SDU 410 | One of the two pickups connected to the SDU 410 Safety Shutdown Unit. The SDU 410 has a scheme for selecting from its two connected pickups. | |
| SDU 404 | Magnetic pickup locally connected to SDU 404. | |
| SDU 420 | Magnetic pickup locally connected to SDU 420. | |

Local Pickup

DCU Pickup Pulses Per Revolution

If there is a pickup connected to the DCU, or “DCU” is selected among the sources above, then set the flywheel teeth count here.

General Configuration

RPM Rounding rounds off the displayed value to nearest 1, 5 or 10 RPM.

Run Setpoint is the RPM at which the DCU indicates the engine is running.

There are also four additional RPM Setpoints that can be used as input to event handling.

RPM Ready to take Load is a signal that can be configured to an output relay. It activates when that RPM is reached. It deactivates when a stop command is given, OR the speed drops below the threshold minus 15%.

RPM Nominal Speed is the engine's nominal speed, and is used to calculate the overspeed setpoint and RPM overspeed test setpoints.

General

Configures how the channel is used.

Display

Configure how the channel is displayed on the panels.

Overspeed

RPM Overspeed is the setpoint where the DCU indicates overspeed.

RPM Overspeed Delay is the delay – in milliseconds – before shutdown. Typical setpoint is 100ms.

RPM Overspeed Shutdown Enabled is where the overspeed behaviour is selected.

Select Yes for the DCU to shutdown the engine. Select No to disable overspeed shutdown.



Disabling DCU overspeed is valid for the DCU only. The SDU is able to shutdown the engine.

4.3.2 Individual Speed Sensors

Note that any speed signal can be configured here, and that this is treated separately from the Engine Speed channel configured above.

By configuring these sensors it is possible to view the current RPM from an individual speed sensor as opposed to the standard Engine Speed sensor that acts on many inputs at once.

This is where the display and alarm settings of the three different types of speed sensors available, can be configured.

- Engine Speed - DCU
- Engine Speed - J1939
- Engine Speed - J1939:2 (If enabled)
- Engine Speed - SDU 410
- Engine Speed - SDU 404
- Engine Speed - SDU 420

All Individual Speed sensors are configured the same way.

Engine Speed (DCU)

Copy

Copy configuration from: None Copy

Configure

assign custom name

General

Channel Use: DCU+RP

Sensor

Sensor Unit: RPM

Sensor Range Min: 0.00

Sensor Range Max: 10000.00

Display

Display Unit: RPM

Display Range Min: 0.00

Display Range Max: 2000.00

Display Major Divider: 500.00

Display Minor Divider: 250.00

Display Multiplier: 1

Mirrored View: No

Alarming (in Metric Units)

Event: None

Metric

RPM

0.00

2000.00

500.00

250.00

1

Update Metric

Update US

Note! Submit to apply new unit.

Submit



home / dcu / i/o configuration / individual speed sensor

The individual speed sensors are configured as any standard analog channel.

4.3.3 Engine Load

The engine load is used within the DCU as an additional setting when configuring alarms.

Engine Load

Source

Engine Load Source: None ▼



home / dcu / i/o configuration / engine load

In order to configure engine load, the DCU is required to have at least one analog channel (4-20 mA, 0-5 V input or J1939) with a Sensor Unit of Percent. For electronic engines this can typically be J1939 PGN 0XF003, SPN 92.

The engine load selected is now used as engine load when configuring alarms.

4.3.4 Transmission

The transmission section is used to configure transmission related channels. They are used for Gear Control and visualization. For information on how to enable Gear Control, see the User Interface chapter.

[/ home](#) / [dcu](#) / [i/o configuration](#) / [transmission](#)

| | Transmission | | |
|----------------------------------|---------------------------|------------|----------------|
| Transmission | Name | Status | Source |
| Gear | Gear | Not In Use | In Gear Switch |
| Interlocks/Indications | Clutch Slip | Not In Use | None |
| Clutch Slip | Clutch Temperature | Not In Use | None |
| Clutch Temperature | Clutch Pressure | Not In Use | None |
| Clutch Pressure | Thrustbearing Temperature | Not In Use | None |
| Thrustbearing Temperature | Shaft Speed | Not In Use | None |
| Shaft Speed | Troll Mode | Not In Use | None |
| | Clutch Interlock | Not In Use | None |
| | Shaft Lock | Not In Use | None |
| | RPM Interlock | Not In Use | None |
| | Shaft Brake | Not In Use | None |



home / dcu / i/o configuration / transmission

4.3.4.1 Gear

Gear is used as a start interlock, and can also be configured as an additional setting for alarms. Gear can also be configured to be shown in the header, as well as in pages.

Gear

Source
Gear Source: In Gear Switch ▼

General
Channel Use: Not in use ▼

Troll Mode

Source
Troll Mode Source: None ▼

Submit



home / dcu / i/o configuration / transmission / gear

Gear Source

Gear Source configures the source for the gear information in the DCU. It can be any of the following.

- In Gear Switch (T95 on DCU 410E, configurable on DCU 210E)
- Ahead / Astern / Neutral Switches
- Ahead / Astern / Neutral / In gear Switches
- J1939 Transmission Current Gear (SPN 523)
- J1939:2 Transmission Current Gear (SPN 523)

Ahead / Astern / Neutral Switches

No input active gives Neutral gear state.

Neutral takes precedence over ahead and astern.

Ahead takes precedence over astern.

Ahead / Astern / Neutral / In Gear Switches

No input active gives Unknown gear state.

Ahead takes precedence over Astern, Neutral and In Gear.

Astern takes precedence over Neutral and In Gear.

In Gear takes precedence over Neutral.

Gear General

Configures how the channel is used.

Troll Mode Source

Configures the source for troll mode.



The troll mode source must be an enabled switch input.

Troll mode is indicated as an overlay on gear in Gear Control form and in the header, if configured.



4.3.4.2 Interlock/Indications

Interlocks

Shaft Lock

Source
 Shaft Lock Source:

RPM Interlock

Source
 RPM Interlock Source:

Clutch Interlock

Source
 Clutch Interlock Source:

Indications

Shaft Brake

Source
 Shaft Brake Source:



home / dcu / i/o configuration / transmission / interlocks

All of the interlocks and indications are used in conjunction with Gear Control. Configure the source for each interlock / indication.

! The sources must be an enabled switch input.

4.3.4.3 Clutch Slip

Clutch Slip, if enabled, can be configured to all analog widgets in pages. In addition, Clutch Slip is shown in the Gear Control page.

Clutch Slip

Configure

assign custom name

Source
Clutch Slip Source:

General
Channel Use:

Sensor
Sensor Unit: **Note! Submit to apply new unit.**
Sensor Range Min: 0.00
Sensor Range Max: 100.00

| | |
|--|--|
| Display | Metric |
| Display Unit: <input type="text" value="Percent"/> | <input type="text" value="Percent"/> |
| Display Range Min: <input type="text" value="0.00"/> | <input type="text" value="0.00"/> |
| Display Range Max: <input type="text" value="100.00"/> | <input type="text" value="100.00"/> |
| Display Major Divider: <input type="text" value="0.00"/> | <input type="text" value="0.00"/> |
| Display Minor Divider: <input type="text" value="0.00"/> | <input type="text" value="0.00"/> |
| Display Multiplier: <input type="text" value="1"/> | <input type="text" value="1"/> |
| <input type="button" value="Update Metric"/> | <input type="button" value="Update US"/> |

Mirrored View:

Alarming (in Metric Units)
Event:

☰ home / dcu / i/o configuration / transmission / clutch slip

Source

Clutch Slip Source configures the source for the clutch slip signal. It can be configured to the following.

- J1939: Percent Clutch Slip
Uses the pre-calculated sensor from J1939.
- DCU: Engine Speed
The DCU calculates clutch slip internally according to the following formula.
$$\text{Clutch Slip} = (\text{Engine Speed} - \text{Shaft Speed}) / \text{Engine Speed}$$

! DCU only calculates Clutch Slip while Trolling.

The rest of the Clutch Slip configuration follows common analog channel configuration.

4.3.4.4 Clutch Temperature

Clutch Temperature

Configure

assign custom name

Source
Clutch Temperature Source:

General
Channel Use:

Sensor
Sensor Unit: **Note! Submit to apply new unit.**
Sensor Range Min:
Sensor Range Max:

| | | |
|--|--|--|
| Display | US | Metric |
| Display Unit: <input type="text" value="Fahrenheit"/> | | <input type="text" value="Celsius"/> |
| Display Range Min: <input type="text" value="0.00"/> | | <input type="text" value="0.00"/> |
| Display Range Max: <input type="text" value="0.00"/> | | <input type="text" value="0.00"/> |
| Display Major Divider: <input type="text" value="0.00"/> | | <input type="text" value="0.00"/> |
| Display Minor Divider: <input type="text" value="0.00"/> | | <input type="text" value="0.00"/> |
| Display Multiplier: <input type="text" value="1"/> | | <input type="text" value="1"/> |
| | <input type="button" value="Update Metric"/> | <input type="button" value="Update US"/> |

Mirrored View:

Alarming (in Metric Units)
Event:



home / dcu / i/o configuration / transmission / clutch temperature

Source

Clutch Temperature Source configures the source channel for the Clutch Temperature.

The rest of the configuration follows common analog channel configuration.

4.3.4.5 Clutch Pressure

Similar to Clutch Temperature configuration.

4.3.4.6 Thrustbearing Temperature

Similar to Clutch Temperature configuration.

4.3.4.7 Shaft Speed

The Shaft Speed channel can be configured to any enabled RPM channel in the system.

Shaft Speed

Configure

assign custom name

Source

Shaft Speed Source: ▼

Use "Gear": ▼ Indicates forward/reverse.

Gearbox Ratio:

General

Channel Use: ▼

Sensor

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

Sensor Range Min:

Sensor Range Max:

Display

| | US | Metric |
|------------------------|--|--|
| Display Unit: | <input type="text" value="RPM"/> ▼ | <input type="text" value="RPM"/> ▼ |
| Display Range Min: | <input type="text" value="0.00"/> | <input type="text" value="0.00"/> |
| Display Range Max: | <input type="text" value="0.00"/> | <input type="text" value="0.00"/> |
| Display Major Divider: | <input type="text" value="0.00"/> | <input type="text" value="0.00"/> |
| Display Minor Divider: | <input type="text" value="0.00"/> | <input type="text" value="0.00"/> |
| Display Multiplier: | <input type="text" value="1"/> ▼ | <input type="text" value="1"/> ▼ |
| | <input type="text" value="Update Metric"/> | <input type="text" value="Update US"/> |

Mirrored View: ▼

Alarming (in Metric Units)

Event: ▼



home / dcu / i/o configuration / transmission / shaft speed

The Shaft Speed channel is configured as any standard analog channel, with the exception of the Source section which is described here.

Source

Shaft Speed Source sets the source for the Shaft Speed channel.

Use "Gear" controls the rotation direction of the shaft, if used.

Gearbox Ratio is a multiplier for the Shaft Speed.



If gear is used to control direction, it is recommended to enable "Mirrored view" which will put the zero value on top of the gauge.

4.3.5 Switch

Switch Input #3

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: Not in use

Submit



home / dcu / i/o configuration / switch

The switch input channels are configured as any standard switch channel.

4.3.6 4-20 mA

4-20mA #1

Configure

assign custom name

General

Channel Use: Not in use

Active Sensor Range

Sensor Range Min [milliAmpere]: 4.00

Sensor Range Max [milliAmpere]: 20.00

Sensor

Sensor Unit: Percent

Sensor Range Min: 4.00

Sensor Range Max: 20.00

Display

Display Unit: US

Display Range Min: Percent

Display Range Max: 0.00

Display Major Divider: 0.00

Display Minor Divider: 0.00

Display Multiplier: 0.00

Display Multiplier: 1

Update Metric

Mirrored View: No

Alarming (in Metric Units)

Event: None

Submit

Note! Submit to apply new unit.

Corresponds to active sensor range min.

Corresponds to active sensor range max.

Metric

Percent

0.00

0.00

0.00

0.00

1

Update US



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

The 4-20 mA input channels are configured as any standard analog channel.

4.3.7 PT100



DCU 410E/408E only.

PT100 #1

Configure

assign custom name

General

Channel Use: Not in use ▼

Sensor

Sensor Unit: Celsius ▼ Note! Submit to apply new unit.

Sensor Range Min: 0.00

Sensor Range Max: 800.00

Display **US** **Metric**

Display Unit: Fahrenheit ▼ Celsius ▼

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 ▼

Mirrored View: No ▼ Update Metric Update US

Alarming (in Metric Units)

Event: None ▼

Submit



home / dcu / i/o configuration / pt100

The PT100 input channels are configured as any standard analog channel.

4.3.8 Temperature Sensor



DCU 210E/208E only.

Temperature Sensor #1

Configure

assign custom name

General

Channel Use:

Sensor

Sensor Type:

Sensor Unit:

Sensor Range Min: 0.00

Sensor Range Max: 800.00

Note! Submit to apply new unit.

Display

Display Unit:

Display Range Min:

Display Range Max:

Display Major Divider:

Display Minor Divider:

Display Multiplier:

US

Metric

Mirrored View:

Alarming (in Metric Units)

Event:



home / dcu / i/o configuration / temperature sensor

The Temperature Sensor channels are configured as any standard analog channel, with the exception of the Sensor Type in the Sensor section which is described here.

Sensor

Sensor Type sets the type of sensor used. This is typically PT100.

4.3.9 Voltage sensor

Voltage Sensor #1

Configure

assign custom name

General

Channel Use:

Active Sensor Range

Sensor Range Min [Volt]:

Sensor Range Max [Volt]:

Sensor

Sensor Unit:

Sensor Range Min:

Sensor Range Max:

Display

Display Unit:

Display Range Min:

Display Range Max:

Display Major Divider:

Display Minor Divider:

Display Multiplier:

Mirrored View:

Alarming (in Metric Units)

Event:

Note! Submit to apply new unit.
Corresponds to active sensor range min.
Corresponds to active sensor range max.

Metric



home / dcu / i/o configuration / voltage sensor

The voltage sensor channels are configured as any standard analog channel.



For DCU 210E/208E, flexible I/O #6 (C3.1) can be configured as supply for 0 - 5 V sensors.

For DCU 210E/208E, flexible I/O #2, #5, #12 and #18 can be configured for 0 V.

4.3.10 24V Input Functions



DCU 410E/408E only.

The 24V input functions are used for configurable input functions. In this section it is also possible to change the polarity of Fixed Functional Inputs on the DCU 410E.

User Config Switch Input #1

Function:

Input State:



home / dcu / i/o configuration / 24v input functions

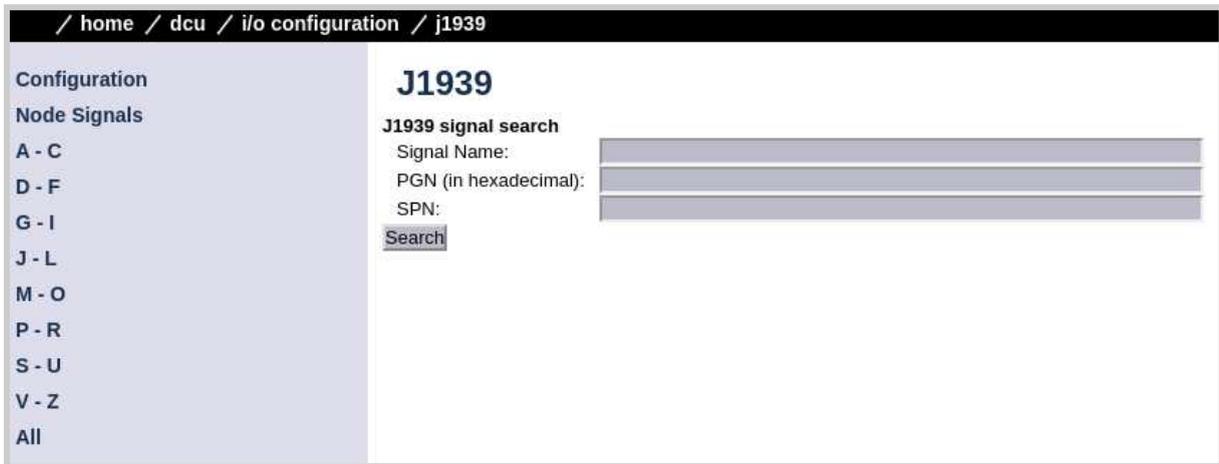
The input functions are configured as the Function part of any standard switch channel. The available functions are listed in that chapter as well.



These are configurable input functions only, and not available for standard switch input channel configuration.

4.3.11 J1939

The DCU supports a large number of the standard SAE J1939 SPNs. To verify that a SPN is supported, the DCU supports a search mechanism in the web interface. Either search by one term or several. If several search terms are used they must all match.



home / dcu / i/o configuration / j1939

In order to configure a SPN, either search for it using the search mechanism provided or browse through the supported SPNs in the left side column.

For instance, if looking for “Fuel Rate” signal, select D-F in the left side column.

Depending on the SPN selected for configuration, it can be configured as a standard analog channel or a standard switch channel.



Some SPNs are categorised as enumerable SPNs, such as SPN 3543 (Engine Operating State). These are configured similar to standard switch channels with the exception that the event configuration is extended to the different enumerable states of the SPN.

4.3.11.1 Configuration

Configuration

Enable Average Filters [SPN 92, SPN 94, SPN 101, SPN 183, SPN 7469]: Yes ▼

Note!
This selection applies to all J1939 interfaces.

Submit



home / dcu / i/o configuration / j1939 / configuration

It is possible to configure a 32 samples mean filter for the SPNs listed above.

4.3.11.2 Node Signals

The node signals makes it possible to configure a SPN from an individual J1939 node.

J1939 Node Signal #1

Configure

assign custom name

Source

Node 0x01 ▼

SPN 190 (Engine Speed (J1939)) ▼

Submit



home / dcu / i/o configuration / j1939 / node signal

Source

Once a Node and SPN is selected, and Submit is pressed, the node signal is locked to the configured J1939 node. The Node Signal is thereafter configured as any standard J1939 channel.

4.3.12 Differential

A differential channel is a logical (not physical) channel, made up of two physical channels. The physical channels may be hardwired or from the J1939 CAN bus. The differential channel will output the difference between the two source channels.

Diff Signal #1

Configure

assign custom name

General

Diff Source Signal #1: None ▼

Diff Source Signal #2: None ▼



home / dcu / i/o configuration / differential

General

Select Diff Source Signal #1 and Diff Source Signal #2. The sensor unit must be the same for the two selected source signals, for instance they must both be bar, and not one bar and one psi.

After two channels with the same units have been selected, the differential signals are configured as any standard analog channel.

4.3.13 Average

An average channel is a logical (not physical) channel, made up of the average of two or more physical channels. The physical channels may be hardwired or from the J1939 CAN bus.

/ home / dcu / i/o configuration / average / average signal #1

| | |
|--|---|
| <p>Average Signal</p> <p>Deviation Configuration</p> <p>Exclude From Average</p> <p>Naming</p> | <h2 style="margin: 0;">Average Signal #1</h2> |
|--|---|



home / dcu / i/o configuration / average

It is possible to configure deviation from average, as well as exclusion from the average channel.

4.3.13.1 Average Signal

The average channel will output the average between the two or more source channels. The sensor unit must be the same for the selected source signals, for instance they must both be bar, and not one bar and one psi.

Average Signal #1

Configure

assign custom name

General
Signal Use:

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



home / dcu / i/o configuration / average / average signal

Once a Sensor Unit is selected, all enabled channels with that sensor unit are selectable for the average signal.

Average Signal #1

Configure

assign custom name

General
Signal Use:

Sensor
Sensor Unit: **Note! Submit to**
Sensor Range Min:
Sensor Range Max:

Source Signals

| | |
|--------------------|-----------------------------------|
| Source Signal #1: | <input type="text" value="None"/> |
| Source Signal #2: | <input type="text" value="None"/> |
| Source Signal #3: | <input type="text" value="None"/> |
| Source Signal #4: | <input type="text" value="None"/> |
| Source Signal #5: | <input type="text" value="None"/> |
| Source Signal #6: | <input type="text" value="None"/> |
| Source Signal #7: | <input type="text" value="None"/> |
| Source Signal #8: | <input type="text" value="None"/> |
| Source Signal #9: | <input type="text" value="None"/> |
| Source Signal #10: | <input type="text" value="None"/> |
| Source Signal #11: | <input type="text" value="None"/> |
| Source Signal #12: | <input type="text" value="None"/> |
| Source Signal #13: | <input type="text" value="None"/> |
| Source Signal #14: | <input type="text" value="None"/> |
| Source Signal #15: | <input type="text" value="None"/> |
| Source Signal #16: | <input type="text" value="None"/> |
| Source Signal #17: | <input type="text" value="None"/> |
| Source Signal #18: | <input type="text" value="None"/> |
| Source Signal #19: | <input type="text" value="None"/> |
| Source Signal #20: | <input type="text" value="None"/> |

Display
Display Unit: **Metric**
Display Range Min:
Display Range Max:
Display Major Divider:
Display Minor Divider:
Display Multiplier:

Mirrored View:

Alarming (in Metric Units)
Event:



home / dcu / i/o configuration / average / average signal

Source Signals

Selects the signals to be included in the average channel.



The channels selected will be shown in the same order if the Average Signal is configured in an Average template.



4.3.13.2 Deviation Configuration

Configures the deviation from average for all channels included in the average channel.

Average Signal #1 - Deviation Configuration

Configure Deviation Signals

General
Signal Use: DCU+RP

Sensor
Sensor Unit: Celsius ▼ **Note! Submit to apply new unit.**
Sensor Range Min: -800.00
Sensor Range Max: 800.00

| Display | US | Metric |
|------------------------|---------------|-----------|
| Display Unit: | Fahrenheit ▼ | Celsius ▼ |
| 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 ▼

Configure Deviation Event
When configuring a low threshold value, keep in mind that the low warning threshold normally should be negative.

Alarming (in Metric Units)
Event: None ▼



home / dcu / i/o configuration / average / deviation configuration

4.3.13.3 Exclude From Average

If any of the included average channels shall be excluded from the average calculation, this can be configured here.

4.3.13.4 Naming

If any deviation events are configured for the average channel, the custom name of the individual deviation channel can be configured here.



The default naming for a deviation from average is “Deviation: <Channel Name>”, for instance “Deviation: PT100 #1”.

4.3.14 Special

These are a group of “special” signals as follows.

4.3.14.1 Input Voltage

The Input Voltage channel monitors the currently active power supply to the unit.



For DCU 410E/408E, this channel monitors either Supply 1 or Supply 2, whichever the DCU chooses.

Input Voltage

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 ▼ |
| Display Range Min: 0.00 | | 0.00 |
| Display Range Max: 40.00 | | 40.00 |
| Display Major Divider: 10.00 | | 10.00 |
| Display Minor Divider: 5.00 | | 5.00 |
| Display Multiplier: 1 ▼ | | 1 ▼ |
| | Update Metric | Update US |

Mirrored View: No ▼

Alarming (in Metric Units)
 Event: None ▼

Submit

☰ | home / dcu / i/o configuration / special / input voltage

The Input Voltage channel is configured as any standard analog channel.

4.3.14.2 Calculated Fuel Rate

The DCU can calculate the fuel consumption and present an approximate figure.

Calc. Fuel Rate

Configure

assign custom name

Calculation Configuration

Enabled:

Nominal/Max RPM:

Nominal Consumption (from Engine Datasheet) [l/h]:

Nominal Boost Pressure (from Engine Datasheet) [bar]:

Idle/No-load Constant (Mul by RPM Equals Consumption) [l/h]:

General

Channel Use:

Sensor

Sensor Unit:

Sensor Range Min:

Sensor Range Max:

Display

Display Unit:

Display Range Min:

Display Range Max:

Display Major Divider:

Display Minor Divider:

Display Multiplier:

Mirrored View:

Alarming (in Metric Units)

Event:

Note! Submit to apply new unit.

Metric



home / dcu / i/o configuration / special / calc. fuel rate

Calculation Configuration

Enabled sets if the calculated consumption should be enabled or not.



The Boost Pressure MUST be connected to 4-20 mA channel #2.

The channel is configured as any standard analog channel.

4.3.14.3 Calculated Engine Hours

If the engine hours are not sourced from the J1939 CAN bus, it is being calculated internally by the DCU.

The appearance of the counter is configured in this dialog.

It is possible to set an alarm or other event connected to the engine hours.

4.3.14.4 Instantaneous Fuel Economy (DCU)

The DCU can be configured to calculate instantaneous fuel economy. In order to do so, fuel rate and vessel speed need to be supplied to the DCU.

Instantaneous Fuel Economy (DCU)

Configure

assign custom name

General

Inst. Fuel Rate Signal:

Vessel Speed Signal:



home / dcu / i/o configuration / special / instantaneous fuel economy

General

Inst Fuel Rate Signal selects the instantaneous fuel rate channel.

Vessel Speed Signal selects the vessel speed channel.

Once both are selected, the instantaneous fuel economy channel is configured as any standard analog channel.

4.3.15 Analog Modbus

The DCU has 50 analog Modbus channels that external devices can access.

Please see the communication manual for further technical description of the registers.

Modbus Analog Sensor #1

Configure

assign custom name

Sensor

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

Sensor Range Min:

Sensor Range Max:



home / dcu / i/o configuration / modbus analog

The Analog Modbus channels are configured as any standard analog channel.



The Modbus Watchdog can be used to detect loss of communication to an external device.

4.3.16 Digital Modbus

The DCU has 500 digital Modbus channels that external devices can access.

Please see the communication manual for further technical description of the registers.

The Digital Modbus channels are configured as any standard switch channel.



The Modbus Watchdog can be used to detect loss of communication to an external device.

4.3.17 EGT (Exhaust Gas Temperature)

4.3.17.1 Cylinder Deviation Event

The deviation is the difference between the cylinder value and the average value. Deviation is positive (above zero) if the cylinder value is above the average, and negative (below zero) if the cylinder value is below the average.



home / dcu / i/o configuration / egt / cylinder deviation event

4.3.17.2 Turbo Deviation Event

The deviation is the difference between the turbo value and the average value. Deviation is positive (above zero) if the turbo value is above the average, and negative (below zero) if the turbo value is below the turbo average.

4.3.18 Constant

Constant signals can be used in the DCU to define a constant value. This constant value can be used to realize sensor signal offset using differential signals.



home / dcu / i/o configuration / constant

4.3.19 Logical Signal

Logic signals can be used to define internal logical signals based on Boolean algebra.

The logical signals can be configured for view, alarm monitoring, and they can be connected to any configurable output.

Logic Signal #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: Not in use

Submit

Logic Statement
Choose an operand to enable selection of input signals. Select inputs and an output.
When statement is complete a submit button or an add button will appear at the end of the line.
Maximum number of lines is 20.

-: Select output... := Select discrete signal... Select operand... Select discrete signal...

Select output function... Select output function...
Select event... Select event...

Clear

home / dcu / i/o configuration / logic signal

The logical signal has a Logic Statement attached to it which defines the logic signal. The Logic Statement can consist of up to 20 lines of Boolean algebra.

`<line> = <value> <operator> <value>`

Each line of the Logic Statement can utilize AND, OR, or NOT operators.

Each Boolean value in the expression can consist of the following

- Any configured discrete signal (e.g. Switch Input #1)
- Any fixed functional output (e.g. In Local Mode)
- Any configured Event or Silent Event (e.g. Event: High Coolant Temp)

In addition, if the Logic Statement has defined any intermediate signals, they can be used in the expression as well.

The Logic Statement is completed by configuring “Output” as the output type. Whenever a Logic Statement is completed it can not be modified unless entirely cleared.

The output from a logic signal can either be configured as a normal digital signal, for instance to drive diagnostic rules, or it can be directly mapped onto an input function.

4.4 Config Outputs

4.4.1 Common Output Configuration

Any discrete output in the DCU can be configured to one of the following selections.

Select discrete signal...

Select output function...

Select event...

Select discrete signal...

This selects any configured switch input channel. If selected, the output will follow that switch input channel.

Select output function...

This selected any builtin output function. If selected, the output will follow that function.

The **highlighted** functions are the most typically being used.

| Function Name | Description |
|---------------------------------|--|
| Acknowledge button | The acknowledge button is activated |
| Buzzer active | The buzzer is active |
| Shutdown in alarm list | There is a shutdown event in the alarm list |
| Load Reduction in Alarm List | There is a Load Reduction event in the alarm list |
| Alarm in alarm list | There is an alarm event in the alarm list |
| Warning in alarm list | There is a warning event in the alarm list |
| Unacknowledged Shutdown | Any unacknowledged shutdowns |
| Unacknowledged Load Reduction | Any unacknowledged load reductions |
| Unacknowledged Alarm | Any unacknowledged alarms |
| Unacknowledged Warning | Any unacknowledged warnings |
| All faults (Unacknowledged) | Any new event in the alarm list |
| Active Faults | Any active faults |
| Unacknowledged or Active Faults | Any unacknowledged or active faults |
| Common DM1 in Alarm List | Any ECM-sourced diagnostic message in the alarm list |
| Ready state | The DCU is in Ready state |
| Init. delay state | The time between reception of the automatic start signal until the first start attempt |

| | |
|--|---|
| Cranking state | Panel is cranking (starting) the engine |
| Awaiting run state | Panel finished cranking and is waiting for the engine to spin up |
| Running state | Engine is running |
| Crank delay state | Crank rest time between automatic start attempts |
| Delay before disconnecting generator breaker | Delayed Stopped state is active and the timer is running. |
| Cooling state | Panel has activated the Gen. Breaker Disconnect signal and the engine is now running on idle load |
| Stopping state | Engine is stopping |
| Cooling or stopping state | Cooling or stopping state |
| Stopped state | Engine has stopped/is below 5 rpm. This state is minimum 10 sec in duration. |
| Blocked state | Engine cannot be started, usually caused by a shutdown that is not acknowledged |
| Stopped for unknown reason | The panel lost all signals indicating that the engine is running, but no stop command was ever given to the panel. Out of fuel? |
| First start attempt failed | The first in a sequence of start attempts has failed |
| Final start attempt failed | During an automatic start sequence, after the final start attempt, + crank rest time |
| In Local mode | The panel is in local mode and will not accept remote commands |
| In Remote mode | Panel can be commanded from remote |

| | |
|--|---|
| Prelube Override | Prelube override |
| DCU Tacho Failure | The pickup (MPU) signal is lost during engine run |
| Service Interval | One of the configured service intervals are due |
| Engine Protection Override | The panel is in shutdown override state, and shutdown channels are now alarming only. Overspeed setpoint is always enabled. |
| Engine Protection Override /Emergency Mode | Same as “Engine Protection Override” but also with Emergency mode activated. |
| Power on | The panel is powered |
| Power off | The panel is powered off |
| Supply Voltage Low | The supply voltage is below the fixed setpoint. Note different setpoints for 12V and 24V systems. |
| Speed Relay 1, 2, 3, 4 | The function activates at the configured rpm value |
| Alarm or Ack Button or Remote Acknowledge | The panel is being acknowledged and the buzzer is silenced |
| Common Start Failed | Start or crank failure |
| Common Stop Failed | Stop failed. A configurable timer (Engine Stopping Time) passed without the engine stopping. |
| Start, Stop, Alarm, Up, Down, Home Button | Individual buttons pressed |
| Soft Button 1, 2, 3, 4 | One of the soft buttons at the bottom of the screen is pressed |
| Ready To Take Load | Engine rpm is above the setpoint |
| Ready for PMS | Panel is ready for power |

| | |
|-------------------------|--|
| Start | management start: - Panel is in Auto - Panel is not in Local - Panel supply V. is OK - Panel is in Ready state |
| In Gear | In gear |
| On Secondary Supply | Panel is running on secondary supply |
| New Alarm Pulse | Whenever a new event appears in the alarm list, this function activates for a second, then de-activates automatically |
| In Manual Mode | Panel is in manual mode and will not start automatically |
| In Automatic Mode | Panel is in automatic mode |
| Primary Power Failure | Primary power failure |
| Secondary Power Failure | Secondary power failure |
| Overspeed | Engine rpm is above configured setpoint for overspeed |
| Overspeed Test Active | The DCU is in Overpeed Test Mode. |
| ETR | Energize to Run. Active when engine cranks or runs. |
| ETS | Energize to Stop. Activates when engine is stopping |
| Load Reduction | Load reduction active |
| Shutdown | Engine is being stopped automatically from a sensor input, including overspeed |
| Running | Engine is running |
| Crank | Panel is cranking/ starting the engine |

| | |
|----------------------|---|
| Prelube Activation | The panel has activated the prelube function |
| J1939 <State> | Individual states of SPN 3543 |
| Emergency start/mode | Panel is in emergency mode, or an E-Start sequence is activated |
| Crank#2 | Secondary crank |
| Prelube Failed | Prelube failed |
| J1939 DM1 Amber Lamp | DM1 Amber Lamp in alarm list |
| J1939 DM1 Red Lamp | DM1 Red Lamp in alarm list |
| J1939:2 DM1 | DM1 Amber Lamp in |

| | |
|---------------------------|--------------------------------------|
| Amber Lamp | alarm list |
| J1939:2 DM1 Red Lamp | DM1 Red Lamp in alarm list |
| Delayed Shutdown Imminent | Shutdown is imminent |
| SDU Acknowledge | Pulse when SDU event is acknowledged |
| Event Indicator | Event indicator |
| DM1 Function | DM1 function is active |
| Postlube Activation | Postlube active |

Select event...

This selects any configured event in the DCU. If selected, the output will follow the event state of the configured channel.



Output functions starting with “Event:”, the function will activate when any event on that channel activates. The function will deactivate when all events for that channel are cleared from the alarm list (both inactive and acknowledged).

All other output functions (such as “Silent Event:” or “Warning High Event:”), the function will activate when that particular event on the channel activates. The function will deactivate when the corresponding event is inactivated.

4.4.2 24V Output Functions

The 24 V outputs of the unit are configured here.

User Config Output #1

Select discrete signal... ▼

Select output function... ▼

Select event... ▼



home / dcu / i/o configuration / 24v output functions

The configuration is the same as any common output configuration.

4.4.3 Relay Functions

The on-board relays are configured here.

The configuration is the same as any common output configuration.



The Alarm Relay can not be assigned any other function. However, the Alarm Relay can be configured to Normal or Pulsed operation.

4.4.4 Speed Relays

A Speed Relay is a relay that activates on a certain engine speed RPM, and deactivates at below the same RPM.

Speed Relays

| | |
|---------------------------------------|--------|
| Speed Relay #1 Enabled: | No ▼ |
| Speed Relay #1 Activate Speed [RPM]: | 0 |
| Event: | None ▼ |
| Speed Relay #1 Event Log: | No ▼ |
| Delay After Crossing Threshold [sec]: | 0 |
| | |
| Speed Relay #2 Enabled: | No ▼ |
| Speed Relay #2 Activate Speed [RPM]: | 0 |
| Event: | None ▼ |
| Speed Relay #2 Event Log: | No ▼ |
| Delay After Crossing Threshold [sec]: | 0 |
| | |
| Speed Relay #3 Enabled: | No ▼ |
| Speed Relay #3 Activate Speed [RPM]: | 0 |
| Event: | None ▼ |
| Speed Relay #3 Event Log: | No ▼ |
| Delay After Crossing Threshold [sec]: | 0 |
| | |
| Speed Relay #4 Enabled: | No ▼ |
| Speed Relay #4 Activate Speed [RPM]: | 0 |
| Event: | None ▼ |
| Speed Relay #4 Event Log: | No ▼ |
| Delay After Crossing Threshold [sec]: | 0 |

Submit



home / dcu / i/o configuration / speed relays

For instance, speed relay #1 can be configured to activate at 1200 RPM, and will then deactivate at 1199 RPM.

Set Event Log to Yes to create an event in the log when the speed relay activates.

The Speed Relay can be assigned to any output.

4.4.5 DM1 Functions

The DCU contains 40 internal DM1 functions which can be configured individually.

| | | |
|------------------|----------|-----------------|
| DM1 Function #1: | SPN 0 | FMI All FMIs |
|------------------|----------|-----------------|

When a DM1 function is configured, for instance SPN 91, FMI 3, it can be assigned to any output.

 DM1 Functions are active if the DM1 is active or unacknowledged in the DCU.

4.4.6 J1939 Outputs

The DCU has a variety of predefined messages available to be transmitted over J1939.

J1939 Outputs

Transmit J1939 On Idle Bus: ▼

Transmit DM1: ▼

Receive Transmitted Signals: ▼

 `home / dcu / i/o configuration / j1939 outputs`

Transmit J1939 On Idle Bus means that the DCU will continue to transmit J1939 data even though the DCU is not receiving any data.

Transmit DM1 means that the DCU will transmit DM1 for the configured transmit J1939 SPNs.

| Event Type | FMI | |
|------------------------|-----|------|
| | Low | High |
| Warning | 17 | 15 |
| Alarm / Load Reduction | 18 | 16 |
| Shutdown | 1 | 0 |
| Out of Range | 2 | |

Receive Transmitted Signals makes it possible for the DCU to receive SPNs transmitted by the DCU.

4.4.6.1 J1939

The DCU is able to broadcast J1939 data by mapping any input signal to any standard J1939 SPN as long as the quantity of the signals match.

Select the SPN which the DCU should transmit. This can be accomplished either by manually selecting the DPN in the left side column or by using the builtin search mechanism of the DCU.

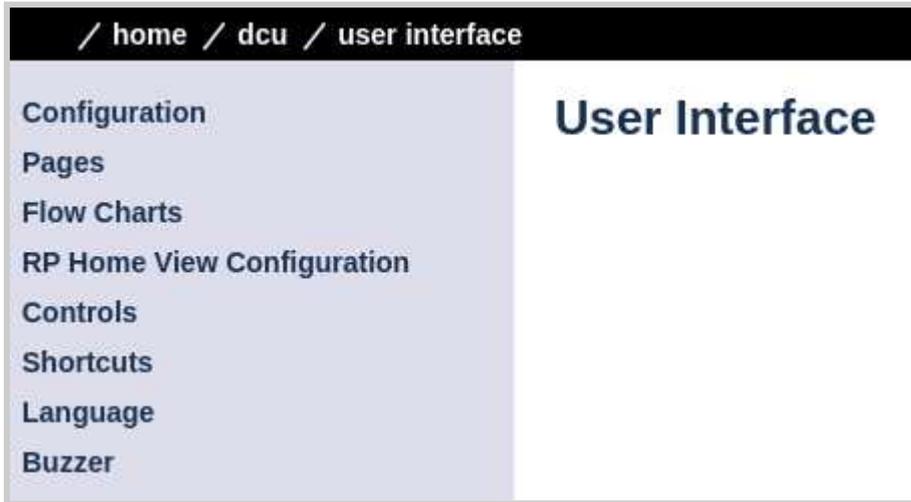
Once a SPN is selected, the DCU will present a list of possible source signals in a drop down combo box called "Signal to be Transmitted".



The channels presented must be enabled and of the same quantity. Otherwise, they will not show up in the list.

5 User Interface

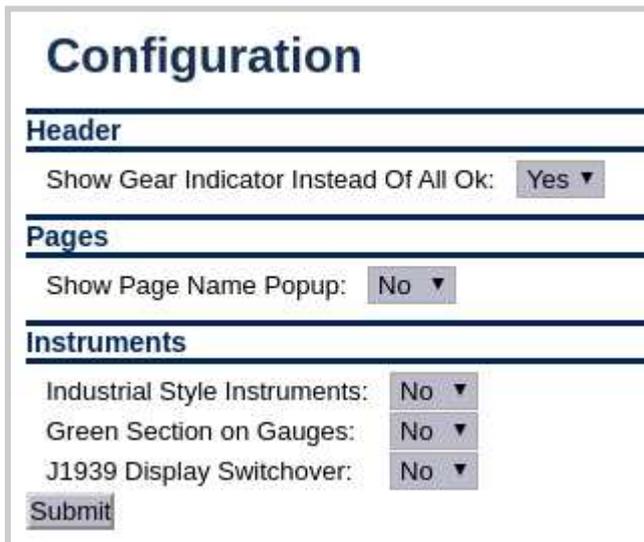
In this section aspects of the operator user interface is defined.



home / dcu / user interface

5.1 Configuration

Changes done in configuration will apply globally.



home / dcu / user interface / configuration

Header

Show Gear indicator Instead Of All Ok should only be set to yes if “ahead/astern” switches are used.

This will enable an arrow in the upper right corner of the screen displaying gear position.

Pages

Show Page Name Popup configures the page number and potential naming to be shown for a brief period of time when switching pages.

Instruments

Industrial Style Instruments will not show yellow or red indication unless active.

Green section on Gauges will change the outer line of all gauges to green. If a warning or an alarming threshold is set, this will still be red.

J1939 Display Switchover is an option for displaying automatic switchover from J1939#1 to J1939#2.

5.2 Pages

This is where the configuration of the different pages is done.

A Page is a screen on the panel. The DCU 410E panel can maximum have 40 instrument screens, whereas the DCU 210E can maximum have 9 instrument screens.

- A **page** is built using one of several available **templates**.
- A **template** has several slot positions. A **slot** is simply an area on the screen.
- Each slot position can hold one **widget** type. A **widget** is for example a needle instrument or a bar graph.

Each **widget** can be assigned a **signal** configured in the I/O section.

Widget Types

There are two different types of widgets amongst the available templates.

1. **Value Widgets**. Displays the value of a signal, for instance Engine Speed
2. **Event Widgets**. Displays the event status of a signal, for instance Warning.

Analog channels can be assigned to the following widgets.

| Value Widgets | | Event Widgets | |
|---|---|--|---|
|  |  |  |  |
|  | |  |  |

Digital channels can be assigned to the following widgets.

| Value Widgets | | Event Widgets | |
|---------------|--|---|---|
| | |  |  |
| | | |  |

Enumerable channels can be assigned to the following widgets.

| Value Widgets | | Event Widgets | |
|---------------|--|--|---|
| | |  |  |
| | |  |  |

Gear channel can be assigned to the following widgets.

| Value Widgets | | Event Widget | |
|---------------|---|--------------|--|
| |  | | |



☰ home / dcu / user interface / pages

In the example above, two pages are already created. Click on a page to select it, for instance click on Page 1.

Page Details

In the picture below, Page 1 is selected.



As can be seen above, **Page 1** is made using **Template 14**. There are **9 slot sections** in the template, each with a **Widget**. Slots 1, 2, 3, 6 and 7 are assigned a signal.

Apply a Signal to a Slot

To add a signal to a slot position, select the drop-down list for the desired slot, then select the signal from the selection of available signals.

Only signals that have been configured for use are visible in the drop-down list.

Edit a Signal

Click on the Edit Signal link to edit the signal.

Insert a New Page

Choose whether the new page is to appear before or after an existing page, then press the Insert Page button.

The pages will be renumbered automatically.

Choose a Template

A range of templates will be presented. Choose a template and start populating the page with predefined signals.

The chosen template will appear at the bottom of the screen. Select a signal and press Submit to clear the other templates.

Delete a Page

First Select the page, and then press the Delete button.

There is no undo-function, so make sure the correct page is deleted.

The pages will be renumbered automatically.

5.2.1 EGT Page

The EGT page is a dynamic page adapting to its configuration.

EGT Configuration

Setup

Engine Type:

Number of Turbos per Bank:

Cylinders And Turbo

Left Bank

Values Below Bar Graph

Right Bank

Values Below Bar Graph

Display Bank Label Letter For Each Cylinder:

Cylinder

Cylinder Average Per Bank:

Turbo

Turbo Temperature Average Per Bank:

Engine Type selects the engine type, for instance V8 or Inline 9.

Number of Turbos per Bank defines the number of turbos per bank in case of V-engines. For inline engines, this is the number of turbos.

- **1:** One T/C inlet and one T/C outlet sensor (per bank)
- **2:** Two T/C inlet and two T/C outlet sensors (per bank)

The Display Bank Label Letter For Each Cylinder is used to prepend bank information to the cylinder labels.

Cylinder Average Per Bank and Turbo Temperature Average Per Bank are only available for V-engines, and defines whether average shall be calculated per bank or not.

5.2.1.1 EGT Turbo Configuration

The EGT turbo configuration can be used in a variety of different applications.

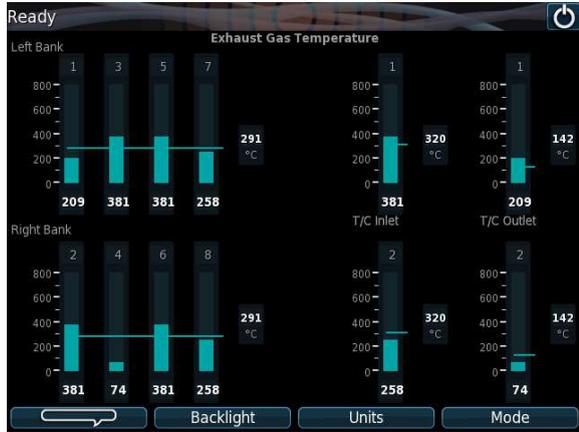


Turbo Temperature per Bank

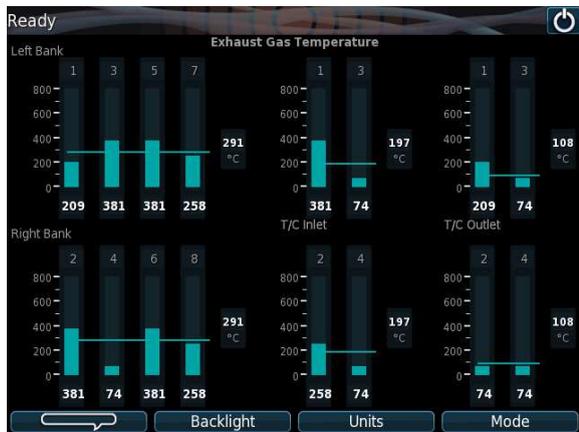
- **No:** Calculate turbo temperate average over T/C inlet sensors and T/C outlet sensors respectively. The average value is always displayed.
- **Yes:** Calculate turbo temperature average per bank. In case of only 1 turbo the average for that bank is the same as the sensor value, and the average is NOT displayed.

Below follows different EG turbo configurations, all with a V8 engine.

One Turbo per Bank Examples

| Turbo Temperature Per Bank: No | Turbo Temperature Per Bank: Yes |
|---|--|
|  <p>Ready</p> <p>Exhaust Gas Temperature</p> <p>Left Bank: 1, 3, 5, 7. Values: 209, 381, 381, 258. Average: 291 °C.</p> <p>Right Bank: 2, 4, 6, 8. Values: 381, 74, 381, 258. Average: 291 °C.</p> <p>T/C Inlet: 320 °C. T/C Outlet: 142 °C.</p> <p>Buttons: Backlight, Units, Mode.</p> |  <p>Ready</p> <p>Exhaust Gas Temperature</p> <p>Left Bank: 1, 3, 5, 7. Values: 209, 381, 381, 258. Average: 291 °C.</p> <p>Right Bank: 2, 4, 6, 8. Values: 381, 74, 381, 258. Average: 291 °C.</p> <p>T/C Inlet: 381 °C. T/C Outlet: 209 °C.</p> <p>Buttons: Backlight, Units, Mode.</p> |
| <p>Since the average is for all turbo sensors, the average value needs to be displayed.</p> | <p>Since the average value for 1 turbo is the same as the turbo value, the average value is not displayed, to make the display less cluttered.</p> |

Two Turbo per Bank Examples

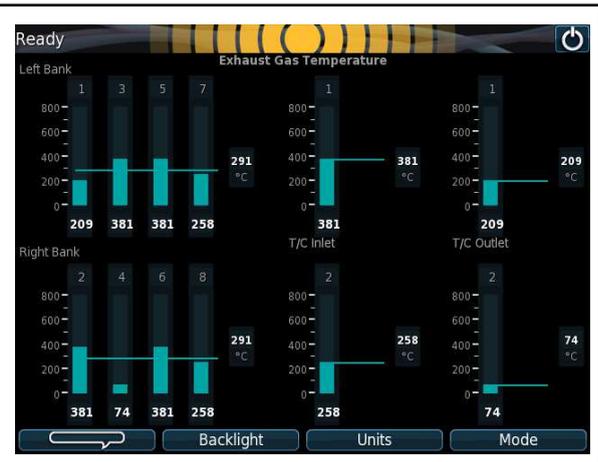
| Turbo Temperature Per Bank: No | Turbo Temperature Per Bank: Yes |
|---|--|
|  <p>Ready</p> <p>Exhaust Gas Temperature</p> <p>Left Bank: 1, 3, 5, 7. Values: 209, 381, 381, 258. Average: 291 °C.</p> <p>Right Bank: 2, 4, 6, 8. Values: 381, 74, 381, 258. Average: 291 °C.</p> <p>T/C Inlet: 197 °C. T/C Outlet: 108 °C.</p> <p>Buttons: Backlight, Units, Mode.</p> |  <p>Ready</p> <p>Exhaust Gas Temperature</p> <p>Left Bank: 1, 3, 5, 7. Values: 209, 381, 381, 258. Average: 291 °C.</p> <p>Right Bank: 2, 4, 6, 8. Values: 381, 74, 381, 258. Average: 291 °C.</p> <p>T/C Inlet: 228 °C. T/C Outlet: 142 °C.</p> <p>Buttons: Backlight, Units, Mode.</p> |
| <p>T/C Inlet average is calculated over all 4 T/C inlet sensors. Same for T/C Outlet.</p> | <p>T/C Inlet average and Outlet average is calculated per bank.</p> |

Two Turbo Per Bank, Only Configuring One Examples

| Turbo Temperature Per Bank: No | Turbo Temperature Per Bank: Yes |
|--------------------------------|---------------------------------|
|--------------------------------|---------------------------------|

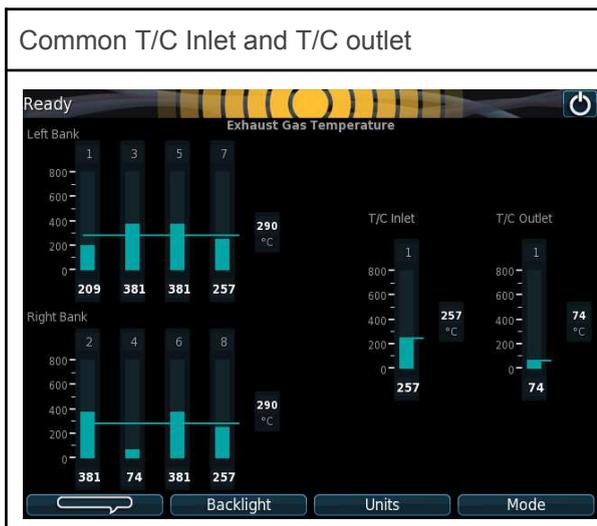


T/C Inlet average is calculated over all 4 T/C inlet sensors. By only configuring 1 we trick the DCU to only present one.

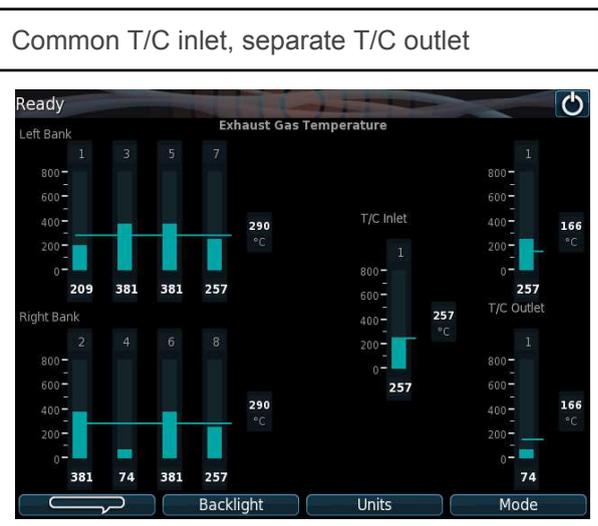


T/C Inlet average is calculated per bank. By only configuring 1 we trick the DCU to only present one, and hence displaying the turbo reading as well as the average line and value.

Common Turbo Sensor for Both Banks



Only configure one T/C inlet and one T/C outlet sensor will display the following.



By configuring both banks outlet sensors the following is displayed. Same for inlet.

5.3 Flow Charts

Flow charts are specialized pages that displays signal data for a predefined process. Flow charts are added to the same display rotation as normal pages.

Currently there's only one flowchart available. This flowchart is only applicable for Genset installations and can be used to display specialized data when the DCU is connected to a RIO 425 module or the LSU 408.

5.4 RP Home View Configuration

This section can be used to customize the contents of the home screens of Remote Panels (RP 410E or RP 210E/220E/206E) connected to this DCU.

Assign signals to dual and quad view.



These settings will only affect connected RPs and have no impact on the DCU itself.

5.5 Controls

Some controls of the DCU can be enabled here. If enabled they will appear in the DCU menu structure, directly under Controls.

Controls

Aftertreatment

Enable Aftertreatment System Control [SPN 8148]: No ▾

External Aftertreatment System Control [SPN 8148]: None ▾

Enable Aftertreatment Operating Mode Control [SPN 9175]: No ▾

External Aftertreatment Operating Mode Control [SPN 9175]: None ▾

Note: External aftertreatment control will override panel control.

Gear

Enable Gear Control: Yes ▾

Propulsion Type: Bi-directional Propeller ▾

In Local Mode Only: Yes ▾

Automatic Neutral Gear on Shutdown: No ▾

Request Neutral on Modbus Watchdog Timeout: No ▾

Submit



home / dcu / user interface / controls

Aftertreatment

Aftertreatment system control, SPN 8148, and operating mode, SPN 9175, can be controlled by DCU if configured.

Enable Aftertreatment System Control enables the transmission of SPN 8148. If enabled the operator can toggle this in the DCU interface, under Controls. If External Aftertreatment System Control is configured to any switch channel, this will override the current setting making aftertreatment system control available by switch channel only.

Enable Aftertreatment Operating Mode Control enables the transmission of SPN 9175. If enabled the operator can toggle the mode (Standard / Reduced) in the DCU interface, under

Controls. If External Aftertreatment Operating Mode Control is configured to any switch channel, this will override the current setting making mode control available by switch channel only.

Gear

Enable Gear Control enables gear control and will show a Gear Control Form in the DCU.



The Gear Control form can be configured as a Shortcut.

The Gear Control form is highly dependent on how the Transmission section in Config Inputs under I/O Configuration is configured.

The “Gear” widget displays current gear status according to the Gear Source for the Transmission Input. Gear requests are performed by setting dedicated Modbus registers. In order to make full use of this function an external PLC or similar is required to read gear requests from the DCU via Modbus, as well as physically order the change of gear.

Propulsion Type defines the types of gear commands shall be available as function buttons commands in the Gear Control form. For example **Waterjet With Backflush** provides these commands: “Engage”, “Disengage” and “Backflush” whereas **Bi-directional Propeller** provide the following commands: “Ahead”, “Neutral” and “Astern”

In Local Mode Only will only allow for gear changes to be requested when the DCU is in Local Mode.

Automatic Neutral Gear on Shutdown instructs the DCU to request neutral gear should a shutdown occur. Neutral Gear is requested when the RPM drops below the configured RPM during the shutdown sequence.

Request Neutral on Modbus Watchdog Timeout configures DCU to utilize the internal Gear Watchdog feature. If enabled, a Watchdog Time configures the time in which the external transmission unit must refresh the watchdog before DCU requests neutral gear.

5.6 Shortcuts

This section allows overriding of the default functions connected to the four soft buttons while in instrument page view.

The following shortcuts are available for configuration.

| Shortcut | Function |
|-----------|--|
| None | No function. |
| Language | Show the language selection form. |
| Backlight | Show the backlight selection form. |
| Units | Show the unit selection form. |
| Mode | Show the mode selection form. |
| Controls | Show the Controls menu form., |
| Gear | Show the Gear Control form. |
| Quick Nav | DCU 410E only. Show the quick navigation page. |

Select any function from the dropdown boxes for each function button and press Submit.

5.7 Language

In this section, the custom language can be configured for channels, services, and built-in events.

[/ home](#) / [/ dcu](#) / [/ user interface](#) / [/ language](#)

All Signals

Enabled Signals Only

Service

Built-in Events

Language

 [home](#) / [dcu](#) / [language](#)

5.7.1 All Signals

Press All Signals to display all signals available in the DCU.

All Signals

Note!
This page only shows the custom naming for different languages, if available.
If a custom naming exists, that name will be used for the specific language.
All signals have a default translation to the corresponding language, but this translation is not seen here.

Select Languages: English

| English Default | English Used | 2nd Language |
|------------------------|--------------|--------------|
| Throttle Position | [default] | |
| Air Filter Diff Press. | [default] | |
| Air Inlet Pressure | [default] | |
| Barometric Pressure | [default] | |

 [home](#) / [dcu](#) / [language](#) / [all signals](#)

The page displays three columns of signal text. The first column is the English Default text, the second column is the currently selected language (for example English), and the third column is a selectable language in the web interface.

| English Default | English Used | 2nd Language |
|-------------------|---------------------|----------------|
| Engine Oil Press. | Engine Oil Pressure | Motoroljetrykk |
| Engine Speed | [default] | Motorturtall |

 The English language is always available in the DCU and the RP.

The text [default] means that the English default text (column 1) will be used. Select any [default] text to change the signal text description.

5.7.2 Enabled Signals Only

This is the same as All Signals, except that only signals that are in use are listed.

Enabled Signals Only

Note!

This page only shows the custom naming for different languages, if available.

If a custom naming exists, that name will be used for the specific language.

All signals have a default translation to the corresponding language, but this translation is not seen here.

Select Languages: English **None** ▼

Submit

| Default Text | English |
|----------------------|-----------|
| 4-20mA #1 | [default] |
| Average Signal #1 | [default] |
| Deviation: 4-20mA #1 | [default] |



home / dcu / language / enabled signals only

5.7.3 Service

Service

Note!

This page only shows the custom naming for different languages, if available.

If a custom naming exists, that name will be used for the specific language.

All service names have a default translation to the corresponding language, but this translation is not seen here.

Select Languages: English **None** ▼

Submit

| Service | English |
|-----------|-----------|
| Service 1 | [default] |
| Service 2 | [default] |
| Service 3 | [default] |
| Service 4 | [default] |



home / dcu / language / service

The four Service intervals will indicate with a text. The default text can be changed.

As above, press the [default] text to change the default text.

5.7.4 Built-in Events

All internal events that can be generated can be customized to a different name.

Built-in Events

Note!

This page only shows the custom naming for different languages, if available.

If a custom naming exists, that name will be used for the specific language.

All signals have a default translation to the corresponding language, but this translation is not seen here.

Select Languages:

English

None

Submit

English Default

Engine Start Failed

Engine Stopped?

Engine Stop Failed

Prelube Failure

English Used

[default]

[default]

[default]

[default]



home / dcu / language / built-in events

The only place where the text is shown is in the alarm list.

5.8 Buzzer

Automatic Buzzer Off is a function that may be used during the configuration phase of a DCU. When active, any new event that triggers the Buzzer, will be automatically silenced by the DCU. Each new event will only produce a single short buzzer beep.

This setting is automatically turned off after 10 hours or when the DCU is powered off.

6 Start/Stop/Prelube

This menu section covers the manual and automatic start and stop sequence. There are several settings for start/stop on the DCU.

6.1 Settings

Settings

General

DCU Engine Start/Stop Control: Exclusive ▾

Disable Local Start/Stop Buttons: No ▾

Hold Button to Start/Stop: No ▾

Allow E-Start: Yes ▾

Only Allow Local Start In Local or Emergency Mode: Yes ▾

Allow Automatic Start/Stop in All Operation Modes: No ▾

Prohibit Crank Above RPM Threshold [RPM]: 5 ▾

Prohibit Stop if Engine Running and Clutch Engaged: No ▾

Prelube

Prelube Type: No Prelube ▾

Oscillating Prelube

Oscillating Prelube: No ▾

Postlube

Postlube Type: No Postlube ▾

Automatic Start

Initial Start Delay [seconds]: 1

No. of Start Attempts (per starter): 3

Prelube Before Each Start Attempt: No ▾

Starter 1

Cranking Time [seconds]: 7

Delay Between Start Attempts [seconds]: 7

Starter 2

Enable Secondary Starter: No ▾

Automatic Stop

Delay Before Disconnecting Generator Breaker [seconds]: 180

Cooling Time [minutes]: 3

Stopping

Stopping Time [minutes]: 1

Safety Stopping Time [seconds]: 30

Time Hysteresis for Unsolicited Stopped [seconds]: 0

Submit



home / dcu / start/stop/prelube / settings

General

| General | |
|---|-------------|
| DCU Engine Start/Stop Control: | Exclusive ▼ |
| Disable Local Start/Stop Buttons: | No ▼ |
| Hold Button to Start/Stop: | No ▼ |
| Allow E-Start: | Yes ▼ |
| Only Allow Local Start In Local or Emergency Mode: | Yes ▼ |
| Allow Automatic Start/Stop in All Operation Modes: | No ▼ |
| Prohibit Crank Above RPM Threshold [RPM]: | 5 ▼ |
| Prohibit Stop if Engine Running and Clutch Engaged: | No ▼ |

DCU Engine Start/Stop Control

The DCU Engine Start/Stop Control can be configured to three different modes.

- **Exclusive**, the DCU has exclusive control of the engine start/stop. Warnings will be given for unexpected state changes.
- **Shared**, the DCU has shared control of the engine start/stop. No warnings will be given for unexpected state changes.
- **Deactivated**, the DCU is not in control of the engine start/stop. No warnings will be given for unexpected state changes.

Disable Local Start/Stop Buttons disables the local start/stop buttons on the DCU.

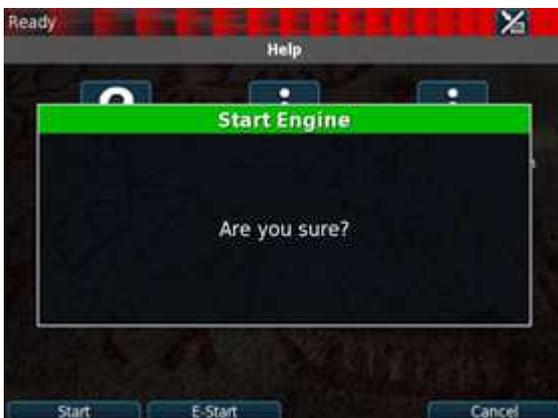


Any functional inputs configured for Local Start or Local Stop will still work.

Hold Buttons to Start/Stop selects if the Start and Stop buttons shall be Latched or Momentary. Set to **Yes** for a momentary Hold-To-Start/Stop button. The button must be pressed until the engine has started/stopped. Set to **No** for a latched button. The button needs to be pressed momentarily, after which the DCU completes the start/stop sequence as if the button was held continuously.

Typical setting is No (gives a latched button operation, which is normally preferred).

Allow E-Start allows the option to emergency start the engine. The E-Start will automatically override any prelube sequence and override and shutdowns.



Only Allow Local Start in Local or Emergency Mode should in virtually all installations be set to **Yes**. If the setting is **No**, local start/stop will work in any mode of operation.

Allow Automatic Start/Stop in All Operation Mode should in virtually all installations be set to **No**. If the setting is **Yes**, automatic start/stop will work in any mode of operation.

Prohibit Crank Above RPM Threshold selects if the DCU should prohibit crank if engine is turning. Selectable choices are **Not in use**, **5 RPM**, or **300 RPM**.

Prohibit Stop if Engine Running and Clutch Engaged selects if stop should be prohibited if clutch is engaged.

Prelube

The DCU can prelube the engine at certain regular intervals, and/or before start.

Prelube Type selects the prelube operation before start. It can be **No Prelube**, **Fixed Time**, or **Until Prelube Complete Signal**.

| Fixed Time | Until Prelube Complete Signal |
|--|--|
| <p>Prelube</p> <p>Prelube Type: Fixed Time ▼</p> <p>Prelube Time [seconds]: 1</p> <p>Prelube Until Running: No ▼</p> <p>Override Allowed: No ▼</p> <p>Activate ETR During Prelube: No ▼</p> | <p>Prelube</p> <p>Prelube Type: Until Prelube Complete Signal ▼</p> <p>Prelube Timeout [seconds]: 1</p> <p>Action Upon Timeout: Abort Start ▼</p> <p>Prelube Until Running: No ▼</p> <p>Override Allowed: No ▼</p> <p>Activate ETR During Prelube: No ▼</p> |
| <p><u>Prelube Time</u> sets the time to prelube. Typical setting is 5 - 30 seconds.</p> | <p><u>Prelube Timeout</u> is the time the DCU will wait for a prelube completion indication. Typical setting to 5 - 30 seconds.</p> <p><u>Action Upon Timeout</u> sets the action if the prelube times out. If set to Allow Start, the DCU will crank the engine upon timeout. If set to Abort Start, the DCU will abort the start sequence and issue a Prelube Failure alarm.</p> |

Prelube Until Running selects if the prelube output shall be activated until engine RPM passes the Run Setpoint.

Override Allowed selects if a prelube should be possible to manually override, to continue the start sequence with an incomplete prelube sequence.



The override is performed in the Controls form on the DCU.

Activate ETR During Prelube selects if the ETR output should be activated when prelubing.

Oscillating Prelube

The DCU can prelube the engine continuously, in a never ending sequence. The sequence is disabled while the engine is running.

| | |
|--------------------------------------|-------|
| Oscillating Prelube | |
| Oscillating Prelube: | Yes ▾ |
| Oscillating On Time [seconds]: | 60 |
| Oscillating Off Time [minutes]: | 60 |
| | |
| Oscillating Feedback: | Yes ▾ |
| Oscillating Feedback Time [seconds]: | 15 |

Oscillating Prelube enables the oscillating prelube.

Oscillating On Time sets the number of seconds the DCU shall lubricate the engine. Typical setting is 60 seconds.

Oscillating Off Time sets the number of minutes between each lubrication action. Typical setting is 60 minutes.

Oscillating Feedback selects if feedback from the oscillating prelube is required. The feedback will have to be connected to prelube complete.

Oscillating Feedback Time sets the time for oscillating feedback failed warning, Prelube Failure.

Prelube Complete Signal

Prelube Complete Source selects the channel to be used as a prelube complete indication. This is typically the “Prelube Complete Switch” input signal, but can be changed if needed.



The prelube complete signal is used for both normal prelube and oscillating prelube.

Postlube

The DCU can be configured to postlube the engine at stopping. Postlubing takes place in Stopping and Stopped states.

| | |
|--|--------------|
| Postlube | |
| Postlube Type: | Fixed Time ▾ |
| Postlube Time [minutes]: | 10 |
| Postlube RPM Threshold [RPM]: | 400 |
| Postlube Activate "Prelube Activation" Output: | No ▾ |

Postlube Type enables the postlube. Selectable choices are **No Postlube** or **Fixed Time**.

Postlube Time specifies the total time to postlube during a stop sequence.



The postlube time can make the DCU stay in Stopped state longer than normal before going to Ready state.

Postlube RPM Threshold specifies under which RPM level Postlubing should start during the stop sequence of the engine.

Postlube Activate “Prelube Activation” Output selects whether postlube shall also activate any “Prelube Activation” outputs.



There is an output function called Postlube Activation. This output function can be used to signal an lube pump or similar to perform the actual postlubing.

Automatic Start

The DCU can start the engine automatically. In order for an automatic start to begin the DCU must be in automatic mode, and an automatic start request must be initiated (for instance terminal 89 on DCU 410E).

| Automatic Start | |
|--------------------------------------|-------------------------------------|
| Initial Start Delay [seconds]: | <input type="text" value="1"/> |
| No. of Start Attempts (per starter): | <input type="text" value="3"/> |
| Prelube Before Each Start Attempt: | <input type="button" value="No"/> ▾ |

Initial Start Delay sets the time before the first start attempt is performed when an automatic start attempt is initiated. Typical setting is 1 second.

No. of Start Attempts sets the total number of start attempts. Typical setting is 3.

Prelube Before Each Start Attempt selects how the prelubing shall be performed on an automatic start attempt. Select **Yes** to prelube before each start attempt. Select **No** to prelube before the first attempt only.

Starter 1

| Starter 1 | |
|---|---|
| Cranking Time [seconds]: | <input type="text" value="7"/> |
| Disengage Crank Output [RPM]: | <input type="text" value="0"/> |
| Delay Between Start Attempts [seconds]: | <input type="text" value="7"/> |
| Starter Type: | <input type="button" value="Electric"/> ▾ |

Cranking Time sets the time the starter engine is engaged. Typical setting is 5 - 7 seconds.

Disengage Crank Output allows the crank output to be disengaged before the RPM Setpoint is reached. This is achieved by assigning this value slightly lower than the configured setpoint. The DCU de-energizes the crank output, but remains in the cranking state when this threshold is reached.



When this setting is used it applies to both Starter 1 and Starter 2 if Secondary Starter is enabled..

Set to 0 to disable this feature. In this case the crank output is energized throughout the entire cranking phase.

Delay Between Start Attempts selects the delay between start attempts in an automatic start. If the engine did not start after the previous attempt, it will delay this many seconds until it does the next start attempt. Typical setting is 5 - 7 seconds.



The timer starts when the engine rpm is less than 5 RPM.

Starter Type sets the starter type.



Starter Type is only available if Secondary Starter is selected.

Starter 2

| | |
|---|-------|
| Starter 2 | |
| Enable Secondary Starter: | Yes ▼ |
| Cranking Time [seconds]: | 7 |
| Delay Between Start Attempts [seconds]: | 7 |
| Starter Type: | Air ▼ |

Enable Secondary Starter enables a dual starting functionality. Select **Yes** for dual starting, and **No** for just starting the one engine.



If the Secondary Starter is enabled, a 2nd crank output needs to be configured on an output.

Cranking Time and Delay Between Start Attempts are the same as for Starter 1.

When Starter 2 is enabled, start modes can be selected under the General section.

| | |
|-----------------------|------------------|
| Automatic Start Mode: | Starter 1 Only ▼ |
| Manual Start Mode: | Starter 1 Only ▼ |

Automatic Stop

The DCU can stop the engine automatically. In order for an automatic stop to begin the DCU must be in automatic mode, and an automatic stop request must be initiated (for instance terminal 90 on DCU 410E).

| | |
|---|-----|
| Automatic Stop | |
| Delay Before Disconnecting Generator Breaker [seconds]: | 180 |
| Cooling Time [minutes]: | 3 |

Delay Before Disconnecting Generator Breaker sets the time the DCU will wait when an automatic stop is initiated before disconnecting the generator breaker, if any. Typical setting is 1 - 60 seconds.



The Disconnect Generator Breaker signal is not a standard output signal, and must be configured to a suitable 24V or relay output.

Cooling Time sets the time the engine will continue to run (with no load) to cool down. When the timer has elapsed, the DCU will stop the engine. Typical setting is 1 - 5 minutes.

Stopping

Configurable settings for stopping.

| | |
|--|---------------------------------|
| Stopping | |
| Stopping Time [minutes]: | <input type="text" value="1"/> |
| Safety Stopping Time [seconds]: | <input type="text" value="30"/> |
| Time Hysteresis for Unsolicited Stopped [seconds]: | <input type="text" value="0"/> |

Stopping Time sets the time for the duration of the stop sequence before issuing a stopping failure event.

Safety Stopping Time is the time for the duration of safety stopping, where the DCU has lost all run indications.

Time Hysteresis for Unsolicited Stopped is the configurable time for which the engine speed needs to be below 5 RPM in order to transition to stopping from a running state.

7 Communication

All the panel communication interfaces.



 | home / dcu / communication

7.1 Network Configuration

Set the IP address, netmask and gateway for the DCU.

The default values are as follows:

- IP address: 192.168.0.101
- Netmask: 255.255.255.0
- Gateway: 192.168.0.1

Make sure the IP address is unique on the network.

If installing the DCU in an already established ship Ethernet environment, consult the network manager to obtain an IP address.



The last two digits becomes the engine number, as part of the engine name.
Example: The Engine name is “Auxiliary”, the IP address is selected as 192.168.0.110. The engine name then becomes “Auxiliary #10”.

7.2 LSU 408

Selects the IP address for the LSU 408.

7.3 CANopen

The DCU has a built-in CANopen communication interface. This port can be used as a second J1939 interface.



DCU 410E/408E only.

The CANopen interface is no longer maintained.

CANopen

Baudrate: ▾

Node Id:

[Download EDS file](#)



home / dcu / communication / canopen

Baudrate selects the communication speed for the CANopen interface (COM 5 on DCU 410E). Typical setting is 125 kbps.

Node Id sets to Node ID for the DCU CANopen interface.



The Node ID must be a unique identifier.

Download EDS file downloads the EDS file for the DCU. The EDS file is the Electronic Data Sheet for a CANopen device.

7.4 Modbus RTU

The DCU has an built-in Modbus RTU communication interface.



The Modbus register map is the same as for the Modbus TCP interface.

For DCU410E/408E, the Modbus RTU interface is optocoupled and needs to be powered with 24 V.

Modbus RTU

Note!

For best performance consider the following tips:

- Use a high-quality twisted pair cable with shield.
- Take care to use the shortest possible cable.
- Make sure the cable shield is connected at only one end.
- If possible have the cable travel alone. Not together with any other cables, especially power cables.
- Make sure the cable is terminated with 120 Ohm resistors at both ends.

Address:

Baudrate:

Parity:

Maximum Timeout [s]:



home / dcu / communication / modbus rtu

Address selects the Modbus address for the DCU.

Baudrate and Parity selects the communication parameters. The interface always uses 8 data bits and 1 stop bit.

Maximum Timeout selects the maximum time a request is allowed to take. If a request takes longer the reply is silently discarded.

7.5 Modbus TCP

The DCU has a built-in Modbus TCP communication interface.



The Modbus register map is the same as for the Modbus RTU interface.

Modbus TCP

Maximum Timeout [s]:

Block Write Requests [FC 05, 06, 15, 16]:



home / dcu / communication / modbus tcp

Maximum Timeout selects the maximum time a request is allowed to take. If a request takes longer the reply is silently discarded.

Block Write Requests selects whether all write requests shall be blocked.

7.6 J1939 Configuration

J1939 Configuration

Secondary J1939 on COM5: No ▼

 home / dcu / communication / j1939 configuration

Secondary J1939 on COM5 selects if the secondary CAN interface shall use J1939 as a high level protocol instead of CANopen.

 The Secondary J1939 configuration is only selectable here for DCU 410E/408E. For DCU210E/208E the secondary J1939 interface is configured in the flexible I/O section.

7.6.1 Configuration

J1939:1 and J1939:2 configuration is similar unless noted in this section.

/ home / dcu / communication / j1939 configuration / j1939:1

| | |
|--|---|
| <p>Source Address</p> <p>Request Address</p> <p>Allowed Addresses</p> <p>Allowed DM1 Addresses</p> <p>Periodic DM53 Requests</p> <p>Function Specific Configuration</p> <p>Node Specific Configuration</p> <p>OEM Specific Configuration</p> | <h2 style="margin: 0;">J1939:1 Configuration</h2> |
|--|---|

 home / dcu / communication / j1939 configuration / j1939:1

Source Address sets the DCU address for the J1939 interface. Default setting is 0xF2.

Request Address selects which J1939 address the DCU should request PGNs which are defined by SAE to be on-request. 0xFF is a broadcast request. Default setting is 0x00.

Allowed Addresses makes it possible to filter J1939 nodes on the J1939 network, so that the DCU is only reading data for specific units. Normally, all sources are accepted. Up to 10 addresses can be filtered by the DCU.

Allowed DM1 Addresses makes it possible to filter DM1, so that the DCU only received DM1 from certain J1939 nodes on the network. Up to 10 addresses can be filtered by the DCU.

Periodic DM53 Requests sets if the DCU should periodically request DM53 (Active service codes). Any DM53 replies will be added to the alarm list.

7.6.1.1 Function Specific Configuration

J1939:1 Function Specific Configuration

Engine Control

Distribute Start/Stop over SPN 3542: No ▼

Distribute Engine Control Mode [SPN 695]: Disabled ▼

Transmit Nominal Speed to Engines Desired Operating Speed [SPN 515]: No ▼

Load Reduction / Load Reduction Override

Transmit Load Reduction [SPN 3644]: No ▼

Load Reduction [%]: 100.00

Transmit Load Reduction Override [SPN 9174]: No ▼

Shutdown Override

Transmit Shutdown Override [SPN 1237]: No ▼



home / dcu / communication / j1939 configuration / j1939:1 / function specific configuration

Engine Control

Distribute Start/Stop over SPN 3542 selects if the DCU should perform start/stop over J1939.

Distribute Engine Control Mode selects if the DCU should transmit **Speed/Torque Limit Control** or not. If selected, the Torque Limit can be configured as well.



Distribute Engine Control Mode is only selectable for J1939:1.

Transmit Nominal Speed to Engines Desired Operating Speed selects if the DCU should transmit nominal speed (as configured for Engine Speed in the I/O configuration section) over J1939.

Load Reduction / Load Reduction Override

Transmit Load Reduction selects whether the DCU should transmit the configurable Load Reduction value over J1939 in a load reduction situation.

Transmit Load Reduction Override selects if the DCU should transmit load reduction override over J1939 in a load reduction override situation.

Shutdown Override

Transmit Shutdown Override selects if the DCU should transmit shutdown override over J1939 in a shutdown override situation.

7.6.1.2 Node Specific Configuration

J1939 Node Specific Configuration

NOTE!
 A Configured Node With No EVENT Will Be Ignored In The Alarm List.
 The logical signal associated with a configured node is "high" when the node is not communicating on the J1939 network.

Number of Configured Nodes: (max.: 32 nodes)

| # | Name | Address | Event When Lost | |
|----|------|----------|-----------------|---------------------------|
| 1. | ECM | 0 (0x00) | Alarm | Edit Node |

home / dcu / communication / j1939 configuration / j1939:1 / node specific configuration

Configure, and optionally name, the J1939 nodes that shall be available on the J1939 network. Nodes not available will raise an event.

7.6.1.3 OEM Specific Configuration

This section is only available on the J1939:1 interface.

J1939:1 OEM Specific Configuration

ECM Configuration
 ECM Type:

home / dcu / communication / j1939 configuration / j1939:1 / oem specific configuration

ECM Configuration

ECM Type selects the ECM type which the DCU is compatible with.

7.7 Communication Info

The page on the web interface contains useful information, especially when utilising the Modbus Alarm Log.

Carefully read through the register encoding and download the id-mapping files to be able to decode the Modbus registers for the Modbus Alarm Log.

8 Miscellaneous

These configuration items do not naturally belong in other sections.



Do not skip this section, as it highlights important configurations.

[/ home](#) / [/ dcu](#) / [miscellaneous](#)

Engine Application Configuration

Event Configuration

Counter Configuration

Counters

Acknowledge Configuration

Operation Mode Configuration

Event Log

Override Configuration

Sea Trial

Custom Version Text

Factory Reset

Miscellaneous



[home](#) / [dcu](#) / [miscellaneous](#)

8.1 Engine Application Configuration

Configuration of the Engine Application and displays which modes of operation are available for said application.

Engine Application

Engine Application: Auxiliary ▼

Submit

| Engine Application | Available Modes |
|--------------------|------------------------------|
| Auxiliary | Local Manual Automatic |
| Combined | Local Harbor Emergency |
| Propulsion | Local Remote |
| Emergency | Local Emergency |



home / dcu / miscellaneous / engine application configuration

Auxiliary

Operator Mode selections

- Automatic
- Manual
- Local

Combined

Operator Mode selections

- Emergency
- Harbor
- Local

Propulsion

Operator Mode selections

- Remote
- Local

Emergency

Operator Mode selections

- Emergency
- Local

8.2 Event Configuration



home / dcu / miscellaneous / event configuration

8.2.1 Miscellaneous Events

Miscellaneous Events

Power

Primary Power Fail Alarm Enabled: No ▾

Secondary Power Fail Warning Enabled: No ▾

Communication

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: No ▾

LSU 408 Lost Warning Enabled: Yes ▾

Other

Shutdown Override Warning Enabled: No ▾



home / dcu / miscellaneous / event configuration / miscellaneous events

Primary Power Fail Enabled and Secondary Power Fail Enabled are used to enable events when either supply is low. Typical setting is **Yes**, as the DCU 410E/408E should be powered by two individual power supplies.



Primary Power Fail Enabled and Secondary Power Fail Enabled are only available on DCU 410E/408E.

If the secondary power is not in use, the low voltage alarm on this input needs to be disabled.

J1939 CAN bus Broken Wire Alarm When Engine Not Running selects if the DCU should issue an event (J1939 Data Link Inactive) when the J1939 link is detected as idle. Some engines electronic control modules (ECM) stops sending CAN traffic when the engine is not running or when stopping a running engine. To avoid nuisance alarms in these situations, set this setting to **No**.

J1939 CAN bus Nodes Lost Warning selects if the DCU should issue an event (J1939 Nodes Lost) when a J1939 node is lost on the network.

Erratic J1939 Data Warning Enabled selects if erratic data on the SPN should generate a sensor fault warning for that SPN.

J1939 CANbus Red Lamp Severity configures how the DM1 red lamp signal status is handled by the DCU. The DCU can be configured to **Disabled**, **Alarm**, or **Shutdown**.

J1939 CAN bus Amber Warning Lamp Enabled configures whether the DM1 amber lamp should generate a warning or not.

RP Lost Warning Enabled selects whether the DCU should issue a warning when a connected RP is lost.

Shutdown Override Warning Enable Control whether shutdown override should drive the buzzer or not.

8.2.2 Suppress DM1 Fault

The ability to suppress combinations of SPN and FMI appearing on the J1939 interface.

Suppress DM1 Faults

| SPN | FMI | |
|--------------------------------|---------------------------------------|---|
| <input type="text" value="0"/> | <input type="text" value="All FMIs"/> | <input type="button" value="Suppress"/> |



home / dcu / miscellaneous / event configuration / suppress dm1 faults

8.2.3 DM1 FMI Severity

Each FMI can be configured to either **Inactive**, **Maintenance**, **Warning**, **Alarm**, or **Load Reduction**.

8.2.4 Output Event Configuration

Output Event Configuration

Latched is defined as active or unacknowledged event in alarm list.

Latched Outputs For Threshold Events:



home / dcu / miscellaneous / event configuration / output event configuration

Latched Outputs For Threshold Events selects whether the individual threshold events (Warning High Event, Alarm High Event etc) used within the DCU should be latched or not. Latched is defined as an active or unacknowledged event in the alarm list.



The common output events (for instance Event: 4-20mA #1) are always latched.

8.2.5 Modbus Watchdogs

Modbus Watchdogs can be used to generate events if an external device does not kick the watchdog in the DCU within a configured time.



In order to kick the watchdog, external devices must write a logical '1' to the Modbus coil.

Reading the Modbus coil will show if the watchdog has timed out or not.

Modbus Watchdogs

| Name | Channel Use | Update Interval [sec] | Address |
|--------------------|-------------|-----------------------|---------|
| Modbus Watchdog #1 | Not In Use | 5 | 70 |
| Modbus Watchdog #2 | Not In Use | 5 | 71 |
| Modbus Watchdog #3 | Not In Use | 5 | 72 |
| Modbus Watchdog #4 | Not In Use | 5 | 73 |
| Modbus Watchdog #5 | Not In Use | 5 | 74 |



home / dcu / miscellaneous / event configuration / modbus watchdogs

8.3 Counter Configuration

Counter Configuration

Display

General

By enabling any of the general counters below, a dedicated "Counters" form is made available in the "Log & Counters" menu form on the DCU and RP.

Show Hours: Yes

Show Idle Hours: Yes

Show Fuel: Yes

Show Fuel Average: Yes

Show Distance: Yes

Show Fuel Economy: Yes

Diesel Exhaust Fluid and Aftertreatment

By enabling any of the diesel exhaust fluid or aftertreatment counters below, a dedicated "Aftertreatment Counters" form is made available in the "Log & Counters" menu form on the DCU and RP.

Show Diesel Exhaust Fluid Tank 1 Empty: No

Show Diesel Exhaust Fluid Quality Malfunction: No

Show Diesel Exhaust Fluid Frozen: No

Show Aftertreatment SCR Malfunction: No

Show SCR Operator Inducement Total: No

Show SCR High Temperature Time: No

Source

General

Engine Hours Input Source:

Idle Hours Input Source:

Total Fuel Input Source:

Instantaneous Fuel Input Source:

Diesel Exhaust Fluid and Aftertreatment

| | | |
|---|--|----------|
| Diesel Exhaust Fluid Tank 1 Empty Source | J1939: Diesel Exhaust Fluid Tank 1 Empty Time | SPN 6817 |
| Diesel Exhaust Fluid Quality Malfunction Source | J1939: Diesel Exhaust Fluid Quality Malfunction Time | SPN 6818 |
| Diesel Exhaust Fluid Frozen Source | J1939: Diesel Exhaust Fluid Frozen Time | SPN 7938 |
| Aftertreatment SCR Malfunction Source | J1939: Aftertreatment SCR Malfunction Time | SPN 6819 |
| SCR Operator Inducement Total Source | J1939: SCR Operator Inducement Total Time | SPN 7095 |
| SCR High Temperature Time Source | J1939: SCR 1 High Temperature Time | SPN 8327 |



home / dcu / miscellaneous / counter configuration

Display

Configures what counters to show.

Source

Set the counter source to be either from the J1939 CAN bus, or from a locally generated counter in the DCU.

- Typically, on an electronic engine this shall be set to J1939.
- Likewise, if there is no CANbus on the engine, this setting must be Local for the counters to work.

8.4 Counters

The DCU calculates and stores engine running hours.

Counters

General

| | Total | Since Start | Since Reset |
|---------------------|-------|-------------|-------------|
| Engine Hours | N/A | N/A | N/A |
| Idle Hours | N/A | N/A | N/A |
| Total Fuel | N/A | N/A | N/A |
| Fuel Average | N/A | N/A | N/A |
| Distance | N/A | N/A | N/A |
| Fuel Economy | N/A | N/A | N/A |

Update Local Calculated Values

| | | | |
|----------------------|--------------------------------|------------------------------------|--|
| Engine Hours [h]: | <input type="text" value="0"/> | <input type="button" value="Set"/> | |
| Idle Hours [h]: | <input type="text" value="0"/> | <input type="button" value="Set"/> | Idle Hours is incremented when engine is running below 600 RPM |
| Total Fuel [l]: | <input type="text" value="0"/> | <input type="button" value="Set"/> | |
| Total Distance [NM]: | <input type="text" value="0"/> | <input type="button" value="Set"/> | |



home / dcu / miscellaneous / counters

General

Display of current counters.

Update Local Calculated Values

If required, the local calculated counters can be updated / adjusted here.

8.5 Acknowledge Configuration

Acknowledge Configuration

Only Acknowledge Visible Events: ▼

Disable Remote Acknowledge: ▼

Enable DM11: ▼

Perform SDU Acknowledge over Modbus: ▼



home / dcu / miscellaneous / acknowledge configuration

Only Acknowledge Visible Events selects if the DCU can only acknowledge events that are visible in the current view of the alarm list when performing an acknowledge all.

Disable Remote Acknowledge can disable all types or remote acknowledge.

Enable DM11 selects if the DCU should perform a DM11 request when an acknowledge all is performed.

Perform SDU Acknowledge over Modbus is used to acknowledge SDU events over the SDU Link when one or many SDU events are acknowledged in the DCU alarm list.

8.6 Operation Mode Configuration

Operation Mode Locked to Input can be used to lock the operation mode to switch inputs, so that any operator mode change is prohibited.

When this is selected, the DCU will react to operation mode changes on fixed or configured input channels only. The DCU also defaults to the following:

- LOCAL (set REMOTE on input channel to change)
- MANUAL (set REMOTE and AUTOMATIC on input channel to change)

8.7 Event Log

The DCU has a built-in event log. The event log is the same as seen on the unit.



Everything

This displays a list of all events in chronological order.

Alarms Only

This displays a list of all warning, alarm and autostop (shutdown) events.

User Interaction Only

This displays a list of all button presses.

- Local Start/Stop Button
- Local Alarm List Button
- Service Complete Button
- Service Remind me later Button

Commands Only

This displays a list of all remote commands to the DCU.

Events Only

This displays a list of all events that are not alarms.

- Automatic Mode input (terminal 88, or configurable input configured as Automatic Mode).
- Speed Switches
- Prelube Override
- Power On/Off
- Crank Without Prelube
- Start Disabled input (terminal 87)

Sequence Only

The following events are logged as Sequence.

- Automatic Start/Stop (terminal 89/90)
- Remote Start/Stop (terminal 91/92)
- Remote Acknowledge (terminal 93)
- Remote Start/Stop by command (RP and Modbus)
- Remote Acknowledge by command (RP and Modbus)

Save As...

The current list of events can be saved into a text file.

8.8 Override Configuration

Override Configuration

Shutdown Override Configuration

SDU

Transmit Shutdown Override to SDU:

J1939

Transmit Shutdown Override J1939:1 [SPN 1237]:

Transmit Shutdown Override J1939:2 [SPN 1237]:

Shutdown Override from J1939:

Load Reduction Override Configuration

J1939

Transmit Load Reduction Override J1939:1 [SPN 9174]:

Transmit Load Reduction Override J1939:2 [SPN 9174]:

Load Reduction Override from J1939 [SPN 9173]:



Shutdown Override Configuration

Transmit Shutdown Override to SDU automatically transmits shutdown override to SDU over the SDU Link.



This does not affect the transmitting of shutdown override from SDU to DCU.

Transmit Shutdown Override J1939 selects if the DCU should transmit shutdown override over J1939 link.

Shutdown Override from J1939 selects if the DCU should use shutdown override from J1939.

Load Reduction Override Configuration

Transmit Load Reduction Override J1939 selects if the DCU should transmit load reduction over J1939 link.

Load Reduction Override from J1939 selects if the DCU should use load reduction override from J1939.

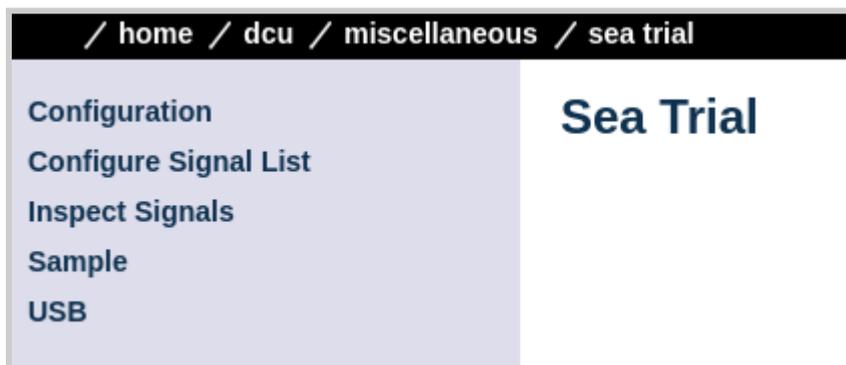
8.9 System Voltage Configuration



DCU 210E/208E only.

The 200E Series is designed to be used in either 12VDC or 24VDC installations. Select the correct system voltage for this application.

8.10 Sea Trial



home / dcu / miscellaneous / sea trial

The Sea Trial functionality in the DCU provides tools to define and sample sensor data during sea trial.

8.10.1 Configuration

Configuration

Sea Trial Mode Enabled: Yes ▼

Sea Trial Active Reminder Warning: Yes ▼



home / dcu / miscellaneous / sea trial / configuration

Sea Trial Mode Enabled activates sea trial related functions and configuration options.

Sea Trial Active Reminder Warning makes it possible to deactivate a reminder warning that would otherwise be displayed in the Alarm List as long as Sea Trial Mode is enabled.

8.10.2 Configure Signal List

Configure Signal List

Signals

| | |
|-----------------|---------------------------------------|
| 4-20mA #1 | <input type="button" value="Remove"/> |
| Switch Input #1 | <input type="button" value="Remove"/> |
| Gear | <input type="button" value="Remove"/> |
| Engine Hours | <input type="button" value="Remove"/> |
| Input Voltage | <input type="button" value="Remove"/> |
| Engine Speed | <input type="button" value="Remove"/> |
| Coolant Temp. | <input type="button" value="Remove"/> |

Append Signal

Signal: None ▼

List Presets

<Select Preset Command> ▼



home / dcu / miscellaneous / sea trial / configure signal list

This section is used to define a list of sensor data that is to be sampled during a sea trial run.

Signals

Displays the currently configured list of signals.

Append Signal

By selecting a signal from the combo box and clicking Submit, the chosen signal is added to the list. Any signal currently enabled (including signals configured as Seatrial Only can be added to the list. It is only possible to add a signal once, so only signals currently not on the list are available.

List Presets

Provides a few predefined list options. If selecting any of these options and pressing submit, the current list is replaced by a preset list of signals.

8.10.3 Inspect Signals

| Inspect Signals | |
|-----------------|---------------|
| Description | Status |
| 4-20mA #1 | 25.71 Percent |
| Switch Input #1 | 1 (Digital) |
| Gear | 0 (Enum) |
| Engine Hours | 1.77 hour |
| Input Voltage | 21.65 Volt |
| Engine Speed | Not Available |
| Coolant Temp. | Not Available |

 home / dcu / miscellaneous / sea trial / inspect signals

Provide a quick view of the status of the current list of sea trial signals. Each signal is displayed together with its current value if available. Reload the page to get a new reading of signal values.

8.10.4 Sample

 home / dcu / miscellaneous / sea trial / sample

Can be used to sea trial to retrieve a sample of all configured signals. If a USB stick is inserted in the DCU the sample is also stored on the USB drive.

8.10.5 USB



home / dcu / miscellaneous / sea trial / usb

Provides USB related functions during sea trial mode if a USB stick is inserted. For example the complete data log can be downloaded.

8.11 Custom Version Text

Any custom version text can be entered here and be made available for view in the DCU panel.

8.12 Factory Reset

Command for factory resetting the DCU.

9 Communication Interface List

The DCU Communications Interface List covers the communication interface for

- Modbus RTU (COM 3 for DCU410E/408E)
- Modbus TCP (COM 6 for DCU410E/408E)

The Communication I/O list is available online from one of the following links

- Click [here](#), or
- <https://goo.gl/MP7EQM>

9.1 DCU Capacity

9.1.1 Functionality and Content Highlights

- 2 x 24 V DC redundant supply (DCU 410E/408E only)
- 5.7" TFT colour
- Touch interface (DCU 210E only)
- RP 410E Remote Panel link (TCP/IP)
- Internal web server for configuration and support
- Password protected configuration
- User selectable units (U.S. / Metric)
- True multilingual
- Sophisticated alarm configuration
- Supply voltage monitoring and alarm
- Extensive alarm list with ECM diagnostics
- SPN/FMI codes, translated into current selected language
- Log of all events
- Configurable prelube functionality
- Service interval timers
- Ambient light sensor for automatic backlight adjustment (DCU 410E only)
- Calculated approximate fuel consumption values

- Certified by major classification societies (DCU 410E/408E only)

9.1.2 Total I/O capacity

The I/O capacity of the DCU can be expanded using one or more of the RIO units.

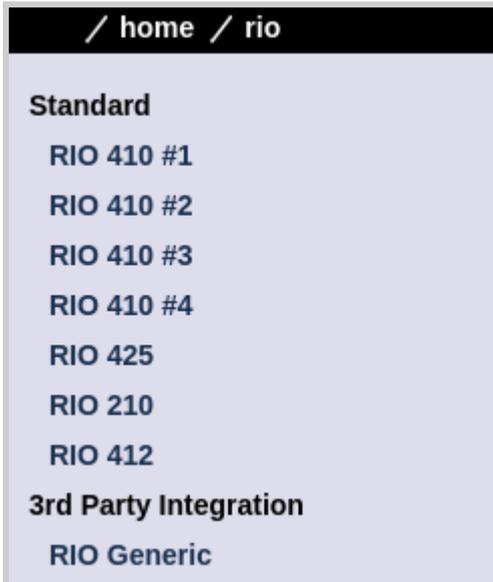
| Signal type | DCU 400E | DCU 200E | RIO 410 | RIO 210 | RIO 412 | MK-14 |
|----------------------|----------|----------|---------|---------|---------|-------|
| 4-20 mA | 4 | 19 | 9 | - | - | - |
| PT100 | 4 | 2 | 8 | 8 | - | - |
| Switch Inputs | 8 | 21 | 4 | 6 | - | - |
| Thermocouple K-type | 0 | 0 | 2 | 2 | 20 | - |
| Configurable Relays | 2 | 2 | 2 | 2 | - | 14 |
| Configurable 24V Out | 4 | 19 | 2 | 2 | - | - |
| 0-5V Inputs | 0 | 19 | 1 | 8 | - | - |
| J1939 Channels | Many | Many | - | - | - | - |
| RIO 410 Support | 4 | 1 | | | | |
| RIO 210 Support | 1 | 1 | | | | |
| RIO 412 Support | 1 | 1 | | | | |
| MK-14 Support | 1 | - | | | | |



Note that the standard I/O capacity of the DCU210E/208E utilises flexible I/O, meaning a total of 19 I/O are available for 4-20mA, Switch Input, 24V output, and voltage input. If the secondary J1939 interface is not used, additional 2 switch inputs can be used.

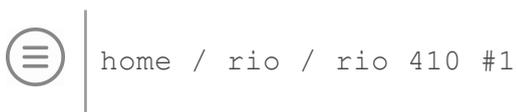
10 RIO Configuration

The configuration of RIO units is part of the DCU configuration. From the DCU web server home page, select RIO.



10.1 Standard RIO

All standard RIO units, such as RIO 410, can be configured in the DCU web interface.



Hardware Configuration

Enable for every RIO device if a warning for lost device should be given.

All I/O configuration of the RIO 410 is configured as normal channel configuration as described earlier.

10.2 3rd Party Integration

The DCU supports custom integration to any Modbus RTU device.

RIO Generic Analog #1

Configure

assign custom name

Modbus

Node Id:

Address:

Function Code:

Data Type:

Resolution:

General

Channel Use:

Sensor

Sensor Unit:

Display

Display Unit:

Display Range Min:

Display Range Max:

Display Major Divider:

Display Minor Divider:

Display Multiplier:

Mirrored View:

Alarming (in Metric Units)

Event:

Note! Submit to apply new unit.

Metric

Percent

0.00

100.00

20.00

10.00

1



home / rio / rio generic / i/o configuration

All I/O configuration of the RIO Generic is configured as normal channel configuration as described earlier, with the following additional configuration.

Node Id specifies Modbus node address.

Address defines the Modbus register address, and the Function Code defines the actual function code to be used.

Data Type specifies the actual data type. Selections are 16-bit, 32-bit, and 32-bit swapped.

Resolution defines the multiplier.



Any RIO generic signal configured will perform a Modbus request, which can impact the responsiveness of other RIO units.

11 SDU Configuration

The configuration of SDU units is part of the DCU configuration. From the DCU web server home page, select SDU.

The supported SDU units have similar configuration, example here is for SDU 404.

[/ home / sdu / sdu 404](#)

| | |
|---|--|
| Version Speed Sensor Switch Miscellaneous Output Functions Synchronize | <h3 style="margin: 0;">SDU 404</h3> <p style="margin: 0;">No SDU 404 unit detected</p> <p style="margin: 0;">Hardware Configuration</p> <p style="margin: 0;">SDU 404: <input type="text" value="No"/></p> <p style="margin: 0;"><input type="button" value="Submit"/></p> |
|---|--|

 | [home / sdu / sdu 404](#)

Hardware Configuration

Enable for every SDU device if a warning for lost device should be given.

12 RP Configuration

The RP remote panel reads the engine configuration from the DCU panel, so no detailed configuration is necessary.

In addition to the Power-On wizard, this chapter explains the Administration section of the panel.

 | The screenshots in this section are mixed from RP 210E and RP 410E. The functionality is however the same.

12.1 Power On Wizard

When power is first applied, the RP will perform a first power-on startup wizard.

Finish the steps to proceed with the installation.

 | Everything in the startup wizard can be changed in the panel menu later.



Select Installation Language

The selected language is used during the installation process only. The operator can change language in the menu later.

Select Administrator Password

First, the RP asks for the default password. From the factory, this is 1234.

Next, the RP asks for the administrator password, which must be typed twice. The password must be at least 4 digits long and no longer than 8 digits.

Select IP Address

The IP address shall be unique on the ethernet network.

The RP default address is 192.168.0.201.



If installing several panels in the same network, make sure they all have unique addresses.

Select Panel Location

Select the location that best matches the location of the panel.

This information is used on other RP remote panels only.

DCU Connection / Scan for DCUs

Press the Search button to search for DCU engine panels in the network.



The RP 210E can connect to one DCU engine panel only.

The RP 220E can connect to two DCU engine panels.

The RP 410E can connect to eight DCU engine panels.

If the engine panel is not ready at this time, simply proceed. This step can be revisited in the RP panel menu later.

Done

The RP startup wizard has now finished.

If no DCU panel has been attached, then the RP menu is displayed.

12.2 Administration Menu

To get to the Administrative menu, do as follows.

1. Press the Home button
2. Select the Settings icons
3. Select the Administration icon
4. Type the Administration password made during the startup wizard.

The RP administration menu has installation selections that should be considered for each installation.



12.2.1 DCU Connection / Connections

In the DCU Connection menu, press the Search button. The panel will list all available DCU engine panels on the network.

For the RP 210E, select an engine and press the Ok button.

For the RP 220E, select up two engines and press the Ok button.

For the RP 410E, select up to eight engines and press the Ok button.



For RP 220E and RP 410E, toggle the ignore check box on or off to assign a desired set of connected DCUs.

Ignoring a DCU makes it completely invisible to an operator on the RP.

Once ready with the selection, press Ok and the RP will automatically self-configure to match each of the selected DCUs configuration.

The RP has now saved the connection and will be displaying the instruments pages from the connected DCU.

12.2.1.1 Manually Assignment of DCUs

It is possible to manually assign DCUs to the RP, in case a router is used blocking the DCU / RP discovery protocol mechanism.



home / rp / communication / manual dcu

Add the IP address of the DCU. Up to 5 DCUs can be manually added.



When a DCU is manually added, the operator needs to enable it manually using the DCU Connection in the RP panel.

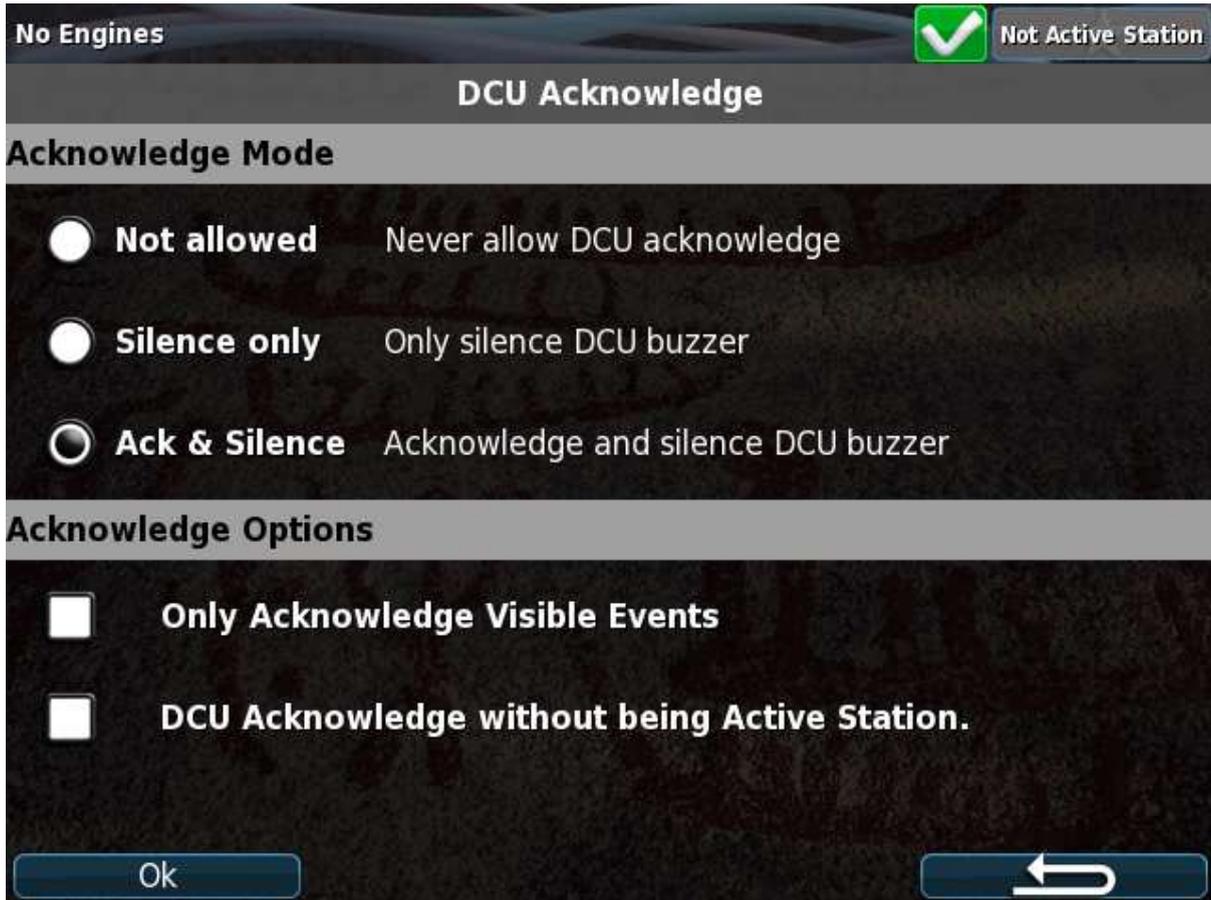
12.2.2 DCU Alarms

If enabled, the RP will display all alarms from the DCU engine panel.

If disabled, the RP will not display any alarms from the DCU engine panel. This is typically used in the wheelhouse, if there is another RP panel in a manned engine control room.

12.2.3 DCU Acknowledge

This controls how the RP shall handle alarm reset and acknowledge.



Acknowledge Mode

- **Not allowed.** The RP can not acknowledge engine alarms. Select this only if the alarms are to be acknowledged in another panel instead.
- **Silence only.** The Buzzer can be silenced, but the alarms can not be acknowledged.
- **Ack & Silence.** Full acknowledge control, just as on the local DCU engine panel.

Acknowledge Options

- **Only Acknowledge Visible Events.** Check this option to not be able to acknowledge all alarms with a long-press (1 sec) on the Acknowledge button.
- **DCU Acknowledge without being Active Station.** Allow acknowledge of DCU engine alarms independent of active station.

12.2.4 IP Address

If necessary, change the RP panel IP address.

Always make sure that

- The three first digits are equal for all panels in the network.
- The last digit is unique in the Ethernet network.

Changing the RP IP address does not require a new DCU Connection to be performed.



Make sure the new IP address is unique on the network.

12.2.5 Cameras

Connect an IP camera to the Ethernet network, and key in the camera IP address. The RP can connect and display images from IP cameras. Below is an example picture from the galley.



Select the camera type and set the IP address (as printed on the camera) for the camera.



The RP 210E/220E support 1 camera, where the RP 410E supports up to 4 cameras.

Each camera needs to have a unique IP address.

If using the Generic Camera Type, the protocol must be selected, either HTTP or RTSP. Only limited configuration of the Generic camera type is available from the panel screen. Should more advanced configuration be required, such as login details and paths etc, such options are available from the Web Interface of the RP.



Connecting a Generic camera to the RP normally requires specific configuration of the camera itself. Consult the documentation from the Camera provider.

12.2.6 Station Location

Select the current location for this panel.

This is used in conjunction with multiple RP remote panels, where there is a need for the other panels to see which panel is asking to become the active station for a certain engine.

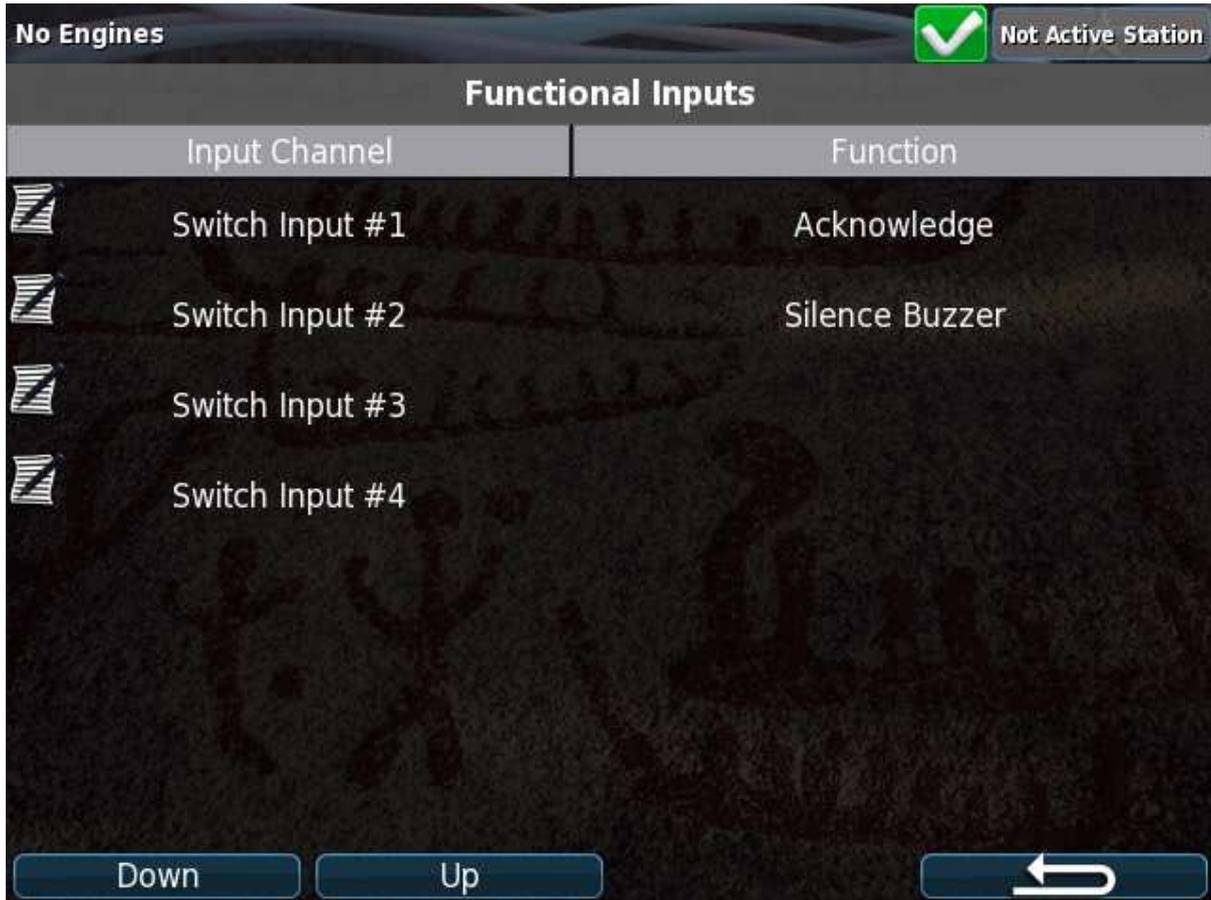
12.2.7 Functional Inputs

Assign input functions to available switch inputs.



RP 210E/220E supports 3 functional inputs, C1.1, C1.2, and C1.4.

RP 410E supports 4 functional inputs, terminal 4 - 7.



To assign or change the function for an Input Channel, click the channel and select the desired option from the popup dialog.

Available functions are:

| Function | Description |
|------------------------|--|
| None | No function. |
| Acknowledge | Acknowledge all events. |
| Silence Buzzer | Silence buzzer. |
| Request Active Station | When energised, makes an Active Station request. No action if the RP is already Active Station. On RP 220E/410E the request is made for all DCUs not already under Active Station. |
| Start | The input replicates the start button behaviour when energised . |
| Stop | The input replicates the stop button behaviour when energised . |
| Operator Lock | While energised all operator input is blocked. Neither the touch interface nor the buttons respond to user input. An indicator is shown at the bottom right to signify this state. |

| | |
|-------------|---|
| Night Theme | An external input to be able to toggle between night theme and day theme. |
|-------------|---|

12.2.8 Functional Outputs

Certain functions can be configured to control the onboard relays.

If the optional relay board module MK-14 is connected to the RP, 14 additional relays will be available.



The MK-14 option is only available for RP 410E through COM 5.

| Function | Description |
|-------------------------------------|---|
| None | No function. |
| Buzzer Active | Buzzer is active. |
| Active Station | RP is active station over at least one DCU. |
| Engine(s) Running | At least one configured engine is in a running state. |
| All Engines Running | All configured engines are in running states. |
| Acknowledge Button | Acknowledge button is pressed. |
| Acknowledge Button (1 second pulse) | 1 second pulse when the acknowledge button is pressed. |
| Alarms in Alarm List | Warnings, Alarms, Shutdowns in Alarm List. |
| Diagnostics in Alarm List | J1939 Diagnostics in Alarm List. |
| All Faults | Unacknowledged Warnings, Alarms, Shutdowns in Alarm List. |

12.2.9 Change Password

The default password is 1234.

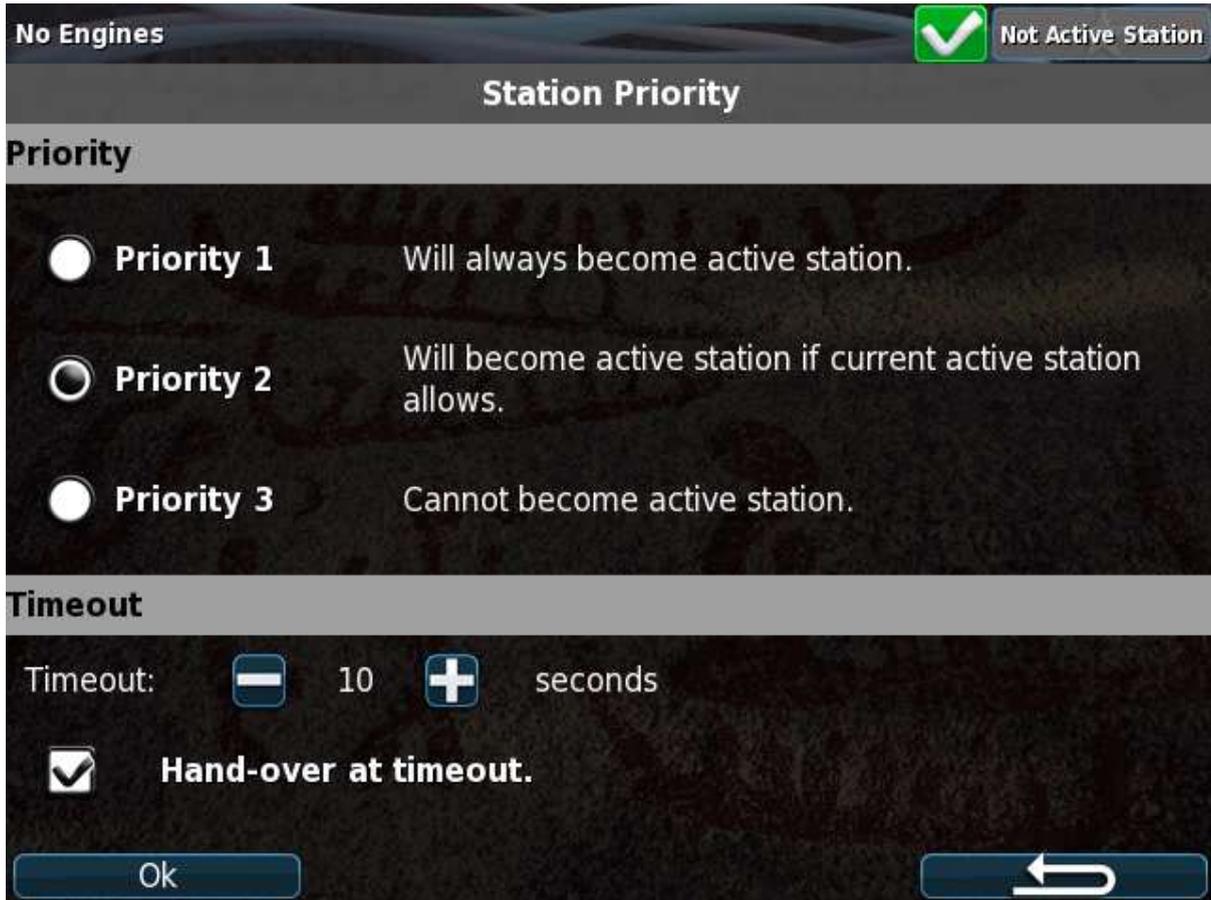
In order to preserve the configuration from unauthorised access, the password should be changed. Enter a code, 4 to 8 digits long, to secure the configuration, and keep this password in a safe place.



If the password is lost, the encrypted code can be used to recreate the original password.

12.2.10 Station Priority

Set the RP panel priority that is right for the application. Depending on the priority the panel is given it acts differently in conjunction with other RP remote panels.



Priority

There are three RP priorities.

- **Priority 1** panels will always become an active station if required. It will take the engine control from panels with priority 1, 2 or 3.
- **Priority 2** panels must ask for engine control. Priority 1 and Priority 2 panels with engine control must agree to the handover.
- **Priority 3** panels can never do engine commands.

The following are guidelines for selecting a station priority.

- If this RP is the only remote panel in the installation, then select **Priority 1**.
- If there are more RP remote panels than this one, then select **Priority 1 or 2**.
- If this RP remote panel is for monitoring only, then select **Priority 3**.

| | Priority 1 Typically highest priority control station, like the engine control room. Also if one RP in the network only. | Priority 2 Typically lower priority control station or wheelhouse. | Priority 3 Typically in a possible public area, or where commands shall not be possible. |
|--------------|---|--|--|
| Take command | Can always take command from the current active panel; | Can take command from active station panels with priority 1 | Disabled. This priority can never |

| | | | |
|-----------------|--|--|---|
| | no question asked. Note! If the operator tries to execute a command, and the panel is not the active station, it will immediately become the active station and execute the command. | or 2 after confirmation at the current active panel. | be an Active Station. |
| Release command | Will handover command to any other priority 1 panel immediately. May handover command to priority 2 panels, depending upon Confirmation Timeout Priority. | Will handover command to any other priority 1 panel immediately. May handover command to priority 2 panels, depending upon Confirmation Timeout Priority. | If in command, will handover command to priority 1 or 2 panels immediately. |

Timeout

This function is used in conjunction with multiple RP remote panels and active station handover.

Example: An RP panel X is currently the active station for an engine.

If an RP panel Y is requesting active station for an engine, and the operator at RP panel X does not respond to the request within the defined period of time, then it is assumed there is no operator at RP panel X.

In these instances, the RP panel X can be configured to automatically either release its active station status for the engine, or deny the request altogether.



Either action takes place after the defined timeout

12.2.11 Lock

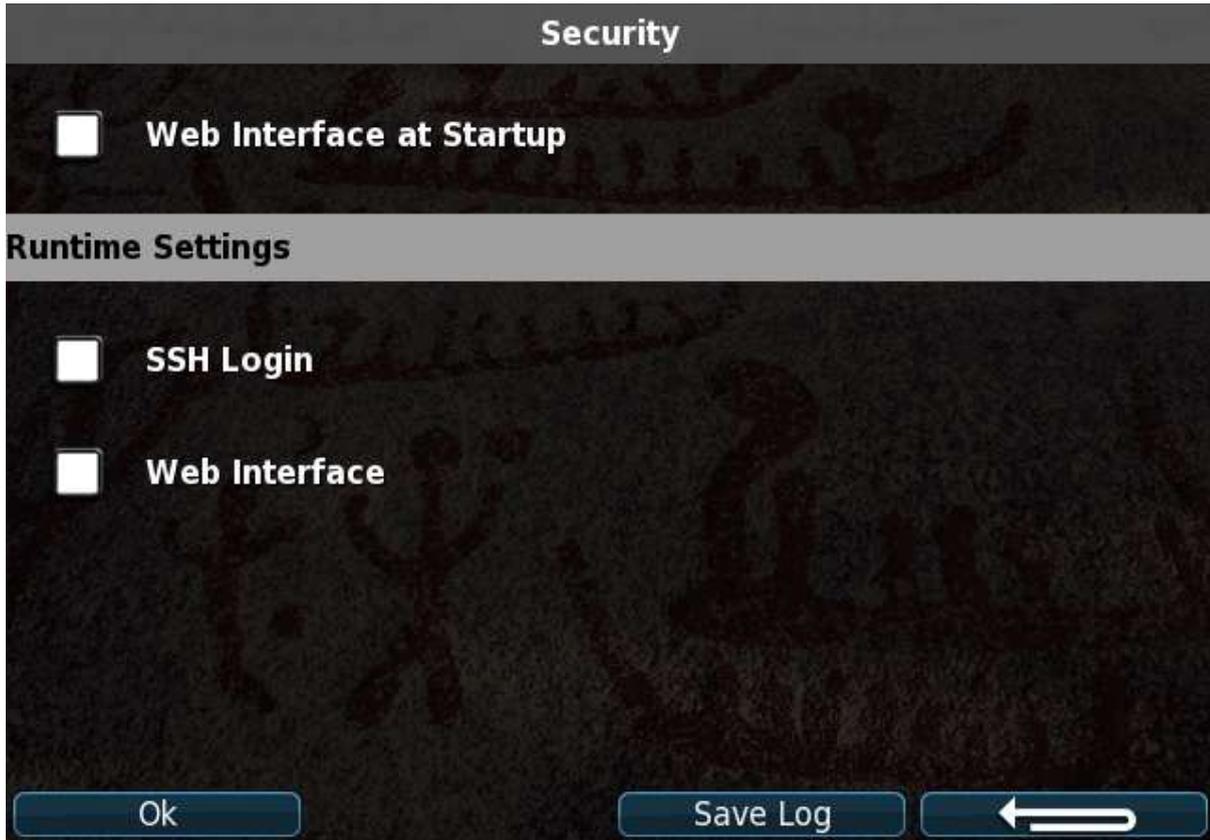
Leave the administrative menu area, and lock the unit.

12.2.12 Start/Stop Buttons

Enable or disable the start/stop buttons of the RP.

12.2.13 Security

This form covers security related functions and parameters.



Web Interface at Startup controls if the RP should always enable access to its web interface even after a power cycle of the panel. The default state of this setting is: Not enabled

Runtime Settings

SSH Login enables SSH connectivity. This feature is normally never needed and has no practical impact on the function of the RP.

Web Interface enables access to the internal web server of the RP. The web server remains available until this setting is disabled or a power cycle of the RP is performed. This setting is only available if **Web Interface at Startup** is disabled.

Save Log button extracts the security log of the RP to a USB drive. To extract the log insert a USB drive into the RP's USB port and select "Save Log".

12.2.14 Reset to Factory Defaults

Command to restore factory defaults. All configuration will be lost.

13 Cyber Security

This chapter is applicable for all DCUs and RPs in a system, except RP480i, See the Cyber Security chapter in RP 480i User's Guide for applicable information.

In order to comply with the cyber security regulations by IACS, this chapter describes the configuration required, and any input to a potential Cyber Security Management System.

13.1 Configuration

Required Configuration

On each panel (DCU or RP):

- Web Interface at Startup shall be disabled, which is the default for factory produced units.
- SSH Login shall be disabled, which is the default for factory produced units.
- Web Interface shall be disabled. (Enable this setting temporarily if web access to the DCU is needed for service or re-configuration purposes)

Recommended Configuration

- Change the PIN code on each panel in the system to something which is not the default.



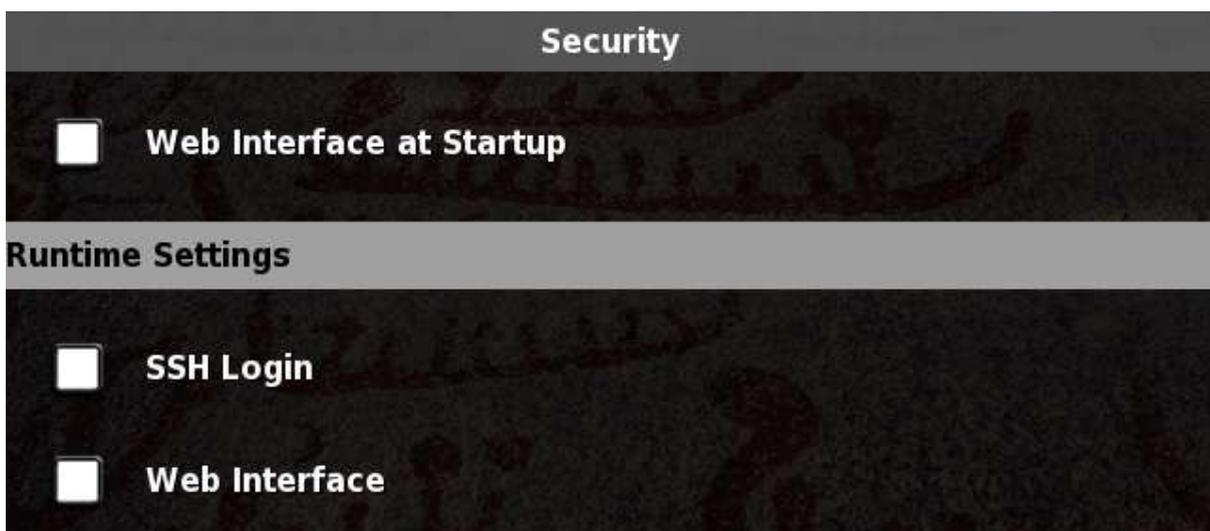
It is recommended, but not required, to assign different PIN codes on each panel.

- For the DCUs, if no external commanding over Modbus is required, turn off Modbus Write access.

Inspect Configuration

The configuration can be inspected from the Administrative Menu on each panel.

On DCU 410E, the security information is reached from the Miscellaneous section in the Administration menu. On all other types of panels, the security information is reached directly from the Administrative menu.



13.2 Integration to Cyber Security Management System

Each panel (DCUs and RPs) shall be backed up and the backups are to be stored in a safe place.



If recovering a system with one or several RPs in the system, start by recovering DCU(s) first before proceeding to RP(s).

Backup and recovery of a DCU

| | Step | Description |
|----------|---|--|
| Backup | Take note of the DCU software version and IP address | The Software Version and IP address can be inspected from the Version Information screen, available under Help in the Menu. |
| | Copy configuration file | Use a USB drive to extract a copy of the current configuration and store it. |
| Recovery | Remove Ethernet cable(s) | Disconnect the DCU from the Ethernet network by disconnecting the network cable from the back of the DCU. |
| | Perform software update to the version in the backup | Perform software update of the DCU to the version noted in the backup using a USB drive. |
| | Perform factory reset | Perform factory reset |
| | Complete wizard | Complete the startup wizard. Assign a PIN and the IP number noted in the backup during this phase. Choose any values for System Type and Classed option. |
| | Restore the backed up configuration by loading configuration from USB | Restore the saved configuration using a USB. If a SDU configuration mismatch event is generated, synchronise the SDU with the DCU. (DCU -> SDU) |
| | Insert Ethernet cable(s) | Insert Ethernet cable |

Backup and recovery of an RP

| | Step | Description |
|--------|---|---|
| Backup | Take note of the RP software version and IP address | The Software Version and IP address can be inspected from the Version Information screen, available under Help in the Menu. |

| | | |
|----------|---|---|
| | Take note of additional settings | Take note of the following from the Administrative settings - IP Addresses if all connected DCUs - DCU Alarms - DCU Acknowledge - Panel Location - Functional Inputs - Functional Outputs - Panel Location - Panel Priority - Start/Stop Buttons |
| Recovery | Remove Ethernet cable(s) | Disconnect the RP from the Ethernet network by disconnecting the network cable from the back of the RP. |
| | Perform software update to the version in the backup | Perform software update of the RP to the version noted in the backup using a USB drive. |
| | Perform factory reset | Perform factory reset |
| | Complete wizard | Complete the startup wizard. Change the PIN and Assign IP number noted in the backup during this phase. Skip the DCU Connections step (by pressing next). |
| | Restore the backed up configuration by loading configuration from USB | Reassign all settings from the backup except DCU Connection(s) |
| | Insert Ethernet cable(s) | Insert Ethernet cable |
| | Reconnect to DCU(s) | Using the DCU Connections form in the Administration menu to re-connect to the DCUs noted in the backup. Note: This step require that recovery has been already performed on all DCUs in the system |

Periodical Functionality Audit

For DCUs and RPs, at a minimum, perform the following periodically to verify security functionality.

1. Attempt to login to the Administrative menu with an incorrect PIN.
2. Login to the Administrative menu with the correct PIN.
3. Insert a USB memory stick, and extract the security log from the Security section of the Administrative menu.
4. On a PC, verify two latest records are "FACTORY unsuccessful log in" and "FACTORY log in" in each log file.

14 Troubleshooting

14.1 Password

The panel will issue an encrypted code if a wrong password is entered.



The factory default password is **1234**. If this password does not work, a new password has been set.

This encrypted code can be sent to your distributor, who will be able to obtain the original password.