Installation Manual

Marine Pro.

SDU 404

Shutdown Unit

auto MASKIN
Installation Manual

for

SDU 404

Safety/Shutdown Unit

Revision 1.3
Revised August 31, 2017

Revision history:

<table>
<thead>
<tr>
<th>Rev.</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
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<tr>
<td>1.0</td>
<td>19.02.16</td>
<td>Initial Revision (based on former QIG)</td>
</tr>
<tr>
<td>1.1</td>
<td>21.03.16</td>
<td>Added Appendix A and minor updates</td>
</tr>
<tr>
<td>1.2</td>
<td>11.08.17</td>
<td>Added DCU 210E/208E to the DCU Communication/terminals table</td>
</tr>
<tr>
<td>1.3</td>
<td>31.08.17</td>
<td>Enhanced description of SDU/DCU Link termination</td>
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Document Information

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.

⚠️ Warning!

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 authorized to work with such installations.

Responsibilities

⚠️ Warning!

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

Note! 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.

Matching firmware

This version of the Manual is updated to match the following firmware release.

<table>
<thead>
<tr>
<th>Product</th>
<th>Firmw.</th>
<th>Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDU 404</td>
<td>1.2</td>
<td>Oct. 2014</td>
</tr>
</tbody>
</table>

Ordering information

The Marine Pro covers a wide range of compatible products within both the 200- and 400 Series. Please visit our web site for more information.

http://auto-maskin.com/marine/
System Overview

The figure below shows a simple layout with the SDU included for one engine.

![System Diagram]

DCU Engine Control Unit
The DCU 410/210 (E or Classic) engine panel is the main building block in the 400 Series.
Engine sensor values are displayed on the color touch screen, and commands and other user interaction is also here.

RP Remote Panel
The optional RP 410/210 (E or Classic) remote panel brings the DCU display to a remote location with no need for any configuration.

Ethernet Switch
It's recommended to always use an Ethernet switch even it is possible to use a cable only in an installation with only one DCU and one RP. PC connection for configuration and setup is also more convenient with the Ethernet switch available.

Expansion
The system can be expanded with more input and output channels using different RIO (Remote I/O) units.
# Installation

This chapter covers the installation of the SDU 404.

## General

The SDU 404 is an engine safety module. It is primarily designed to be used together with the Marine Pro Series. It can be installed separate from the DCU or in the same cabinet. The engine shutdown switches shall be wired to the switch input channels on the SDU. The two-wire **SDU Link** shall be established between the DCU and the SDU.

## LED Overview

Details regarding indicators are described in the User’s manual but the illustration and the following table has a brief description:

<table>
<thead>
<tr>
<th>LED</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Lit when power supply is OK. Flashing when below the configurable &quot;very low threshold&quot;. (Green)</td>
</tr>
<tr>
<td>Running</td>
<td>Lit when engine is running. (Green)</td>
</tr>
<tr>
<td>Overspeed</td>
<td>Unacknowledged, acknowledged or test mode (Flashing/Red/Green)</td>
</tr>
<tr>
<td>Shutdown</td>
<td>Unacknowledged, acknowledged. (Flashing/Red)</td>
</tr>
<tr>
<td>Shutdown Override</td>
<td>Lit when active. (Green)</td>
</tr>
<tr>
<td>Load Reduction</td>
<td>Unacknowledged, acknowledged. (Flashing/Red)</td>
</tr>
<tr>
<td>Config</td>
<td>Unacknowledged, acknowledged. (Flashing/Amber)</td>
</tr>
<tr>
<td>MPU</td>
<td>MPU connected. (Green) Unacknowledged, acknowledged fault. (Flashing/Amber)</td>
</tr>
<tr>
<td>ACK.</td>
<td>Active. (Green) Unacknowledged, acknowledged fault. (Flashing/Amber)</td>
</tr>
<tr>
<td>Shutdown Override (Switch)</td>
<td>Shutdown override active. (Green) Fault (Amber).</td>
</tr>
<tr>
<td>SW 1–4</td>
<td>Unacknowledged, acknowledged shutdown/load reduction (Flashing/Red). Unacknowledged, acknowledged fault. (Amber)</td>
</tr>
</tbody>
</table>
Wiring

Follow these wiring guidelines.

24VDC Supply

Connect 24VDC to terminals 1 (positive) and 2 (0V). Connect a ground connection to terminal 3.

Wire Requirement

SDU supply wires shall have a minimum area of 1.0 mm².

Switch Channels

Switch Channels are configurable for loop monitoring and short circuit.
All switch channels use a two-wire layout, where both wires from the switch are to be routed to the SDU.

Wire Requirement

Switch wires shall have a minimum area of 0.5 mm².

Broken Wire Detection

Requirement for type approved installations. Each switch shall have a 10k resistor connected across.

Note! The 10k resistors shall be connected directly at the switch, and not at the SDU 404.

Switches shall be normally open (NO), and shall close to indicate engine shutdown.

Short Circuit Detection

Each switch shall have a 10k resistor connected in series.

Note! The 10k resistors shall be connected directly at the switch, and not at the SDU 404.

Pickup Channel

The SDU can operate with a magnetic or active pickup source.
Connect the pickup to terminals 4 and 5, with shield to terminal 3.

Note! Make sure the cable shield is connected at the SDU side and not at the pickup side.

Shutdown Override

This is to be wired exactly like a Switch Input, that is; it shall be a normally open switch. Close the switch to activate Shutdown Override.

Note! Make sure a 10k resistor is connected across the switch.
DCU Communication

Depending on the DCU model connect the wires in the shielded communication cable to the terminals as shown in the table below:

<table>
<thead>
<tr>
<th>SDU 404</th>
<th>DCU 410(E)/408</th>
<th>DCU 210E/208E</th>
<th>DCU 210/208</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 (+)</td>
<td>60 (+)</td>
<td>22 (+)</td>
<td></td>
</tr>
<tr>
<td>29 (L)</td>
<td>61 (L)</td>
<td>5 (L)</td>
<td>23 (L)</td>
</tr>
<tr>
<td>30 (H)</td>
<td>62 (H)</td>
<td>6 (H)</td>
<td>24 (H)</td>
</tr>
</tbody>
</table>

**Note!** Do not connect the cable shield (+) at both ends.

To minimize the effect of external noise it is recommended to use twisted pair wires.

**Note!** The SDU Link shall be terminated with a 120 ohm resistor at the end of the communication link. Note that the DCU is already terminated internally.

Connections

The two-wire *SDU Link* has fixed communication parameters.

- The Baud rate is 19200 baud.
- 8 data bits
- 1 stop bit
- Even parity

When properly connected, the DCU will find the SDU automatically. To start using the SDU, enable it via the DCU web interface.

Configuration Mismatch Warning

When the SDU is connected to the DCU, the DCU will analyze the configuration in the SDU and compare it to the stored configuration in the DCU. If these do not match, the DCU will give a “Configuration Mismatch” warning.

The warning can be acknowledged, but DCU login rights are required to reset this warning. With login rights, the configuration can be copied from the DCU to the SDU, or vice versa. Please see the relevant Marine Pro manual for further details.

Buttons

**Acknowledge**

This button is used to acknowledge alarms and faults. See User’s Manual for more details.

**Overspeed Test**

Press and hold the “Overspeed Test” button for more than two seconds to enter the overspeed test mode. See User’s Manual for more details.
Configuration

Configure SDU through the DCU

The easiest and preferred method of configuring the SDU is to login to the DCU via the web interface.

When logged in, enter the SDU section and configure the SDU.

Next, from the menu on the left, select the sub-section to be configured.

Press the Submit button after each configuration change.

**Note!** The configuration is stored in the DCU’s current active configuration file. If a new SDU is connected to the DCU the configuration is transferred to the SDU when it is connected.

For more configuration information, please consult the Marine Pro 400E Series Configuration Manual.

**Version**

This page give the information about the hardware and software version of the SDU 404.

**Speed Sensor**

This page has the configuration of the pickup channel.

**Switch**

This page has the configuration for each of the four switch channels.

**Type**

Select the type of short circuit and broken wire detection.

**Type 1.**

Short circuit and broken wire detection. A 10k resistor to be connected in series and a 10k resistor to be connected in parallel over the switch.

**Type 2.**

Broken wire detection. Minimum requirement for type approved installations. A 10k resistor to be connected in parallel over the switch.

**Type 3.**

No fault detection.

**Event**

Select the event (Shutdown and/or Load Reduction) that will be activated when the switch is closed.

**On Run Only**

Enable this if the event shall be enabled only when the engine is running. This is typical for all pressure channels.
Shutdown Override Disabled
Enable this if the event shall be triggered even if SDU is in shutdown override state. This is typical for a manual E-stop button.

Delay before Load Reduction
Set the number of seconds until load reduction.

Delay before Shutdown
Set the number of seconds until shutdown.

Initial Delay
Set the number of seconds until switch channel is activated for monitoring.

The “Initial Delay” countdown starts when all criteria (“Engine is running” and “Speed Limit”) are met.

Speed Limit Enabled
Set if Speed limit is enabled or not. The actual engine speed is set in the Speed limit [RPM] section.

Speed Limit [RPM]
- If the engine speed is above the set value, then the channel is enabled.
- If the engine speed drops 50 RPM below the set value, then the channel is disabled.

Miscellaneous
- Set input voltage warning levels.
- Enable “Allow Load Reduction Override” to override load reductions via the shutdown override switch.
- Enable “Automatic Buzzer Off” to make the SDU buzzer silence automatically after five seconds.
- “Shutdown Override Switch” and “Acknowledge Switch” configuration.

Output Functions
Configuration of relays and digital output.

Synchronize
Synchronization of DCU and SDU configuration.
Appendix A - Wiring

The diagram below shows recommended wiring including 3 different types of Switch inputs.

Types:

Type I: Short Circuit and Broken Wire detectable (Recommended)
Type II: Broken Wire detectable (Requirement for type approval)
Type III: Not able to detect any faults

Note:

ACK and SHUTDOWN OVERRIDE to be configured with the same options.
Appendix B - Front

Front side and Connectors

DCU Link | Switch input 1–4 | Shutdown Override | Acknowledge
---|---|---|---

Power Supply | MPU Input | Shutdown | Relay 1&2 | Config.

Installation Manual - SDU 404