Manual# 1100413

Installation Manual

Marine Pro.

SDU 404

Shutdown Unit

auto MASKIN

Installation Manual

for

SDU 404

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Safety/Shutdown Unit

Revision	1.1
Revised	March 21, 2016

Revision history:

Rev.	Date	Description
1.0	19.02.16	Initial Revision (based on former QIG)
1.1	21.03.16	Added Appendix A and minor updates.
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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.

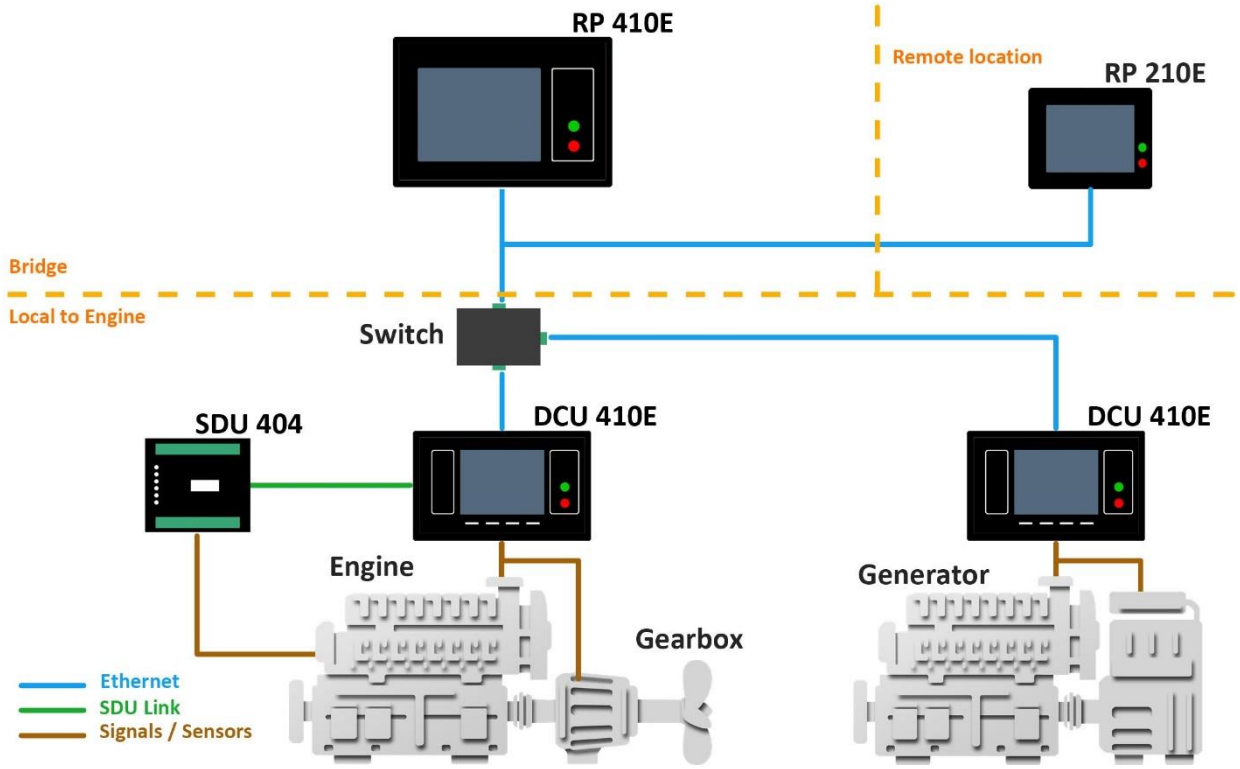
Product	Firmw.	Release
SDU 404	1.2	Oct. 2014

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.



DCU 410E Engine Control Unit

The DCU 410E 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 410/210E Remote Panel

The optional RP remote panel brings the DCU display to a remote location with no need for any configuration.

Ethernet Switch

It's recommended to always us 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 the versatile 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.

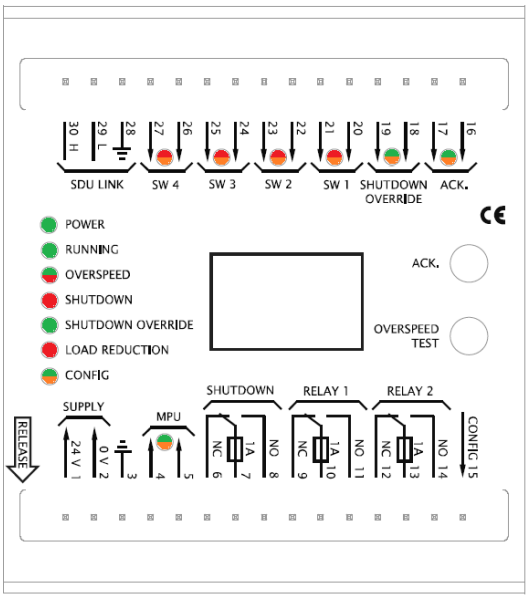
It can be installed separate from the DCU or in the same cabinet.

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:



LED	Description
Power	Lit when power supply is OK. Flashing when below the configurable "very low threshold". (Green)
Running	Lit when engine is running. (Green)
Overspeed	Unacknowledged, acknowledged or test mode (Flashing/Red/Green)
Shutdown	Unacknowledged, acknowledged. (Flashing/Red)
Shutdown Override	Lit when active. (Green)
Load Reduction	Unacknowledged, acknowledged. (Flashing/Red)
Config	Unacknowledged, acknowledged. (Flashing/Amber)
MPU	MPU connected. (Green) Unacknowledged, acknowledged fault. (Flashing/Amber)
ACK.	Active. (Green) Unacknowledged, acknowledged fault. (Flashing/Amber)
Shutdown Override (Switch)	Shutdown override active. (Green) Fault (Amber).
SW 1-4	Unacknowledged, acknowledged shutdown/load reduction (Flashing/Red). Unacknowledged, acknowledged fault. (Amber)

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 mm^2.

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 mm^2.

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

Connect the wires in the shielded communication cable as follows:

SDU 404 terminals	DCU 410/408 terminals	DCU 210/208 terminals
28 (Shield)	60 (Shield)	22 (Shield)
29 (L)	61 (L)	23 (L)
30 (H)	62 (H)	24 (H)

Note! Do not connect the cable shield at both ends.

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

The SDU Link shall be terminated with 120 ohm resistors in both ends. The DCU is 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

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

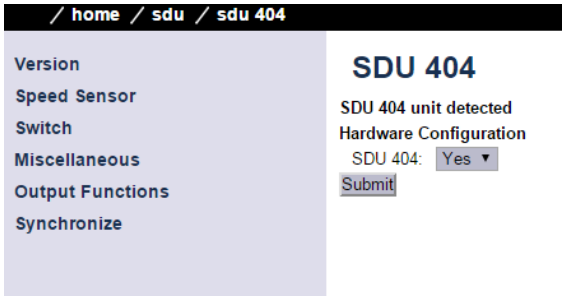
Press and hold the "Overspeed Test" button for more than two seconds to enter the overspeed test mode. See User's Manual for more details.

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

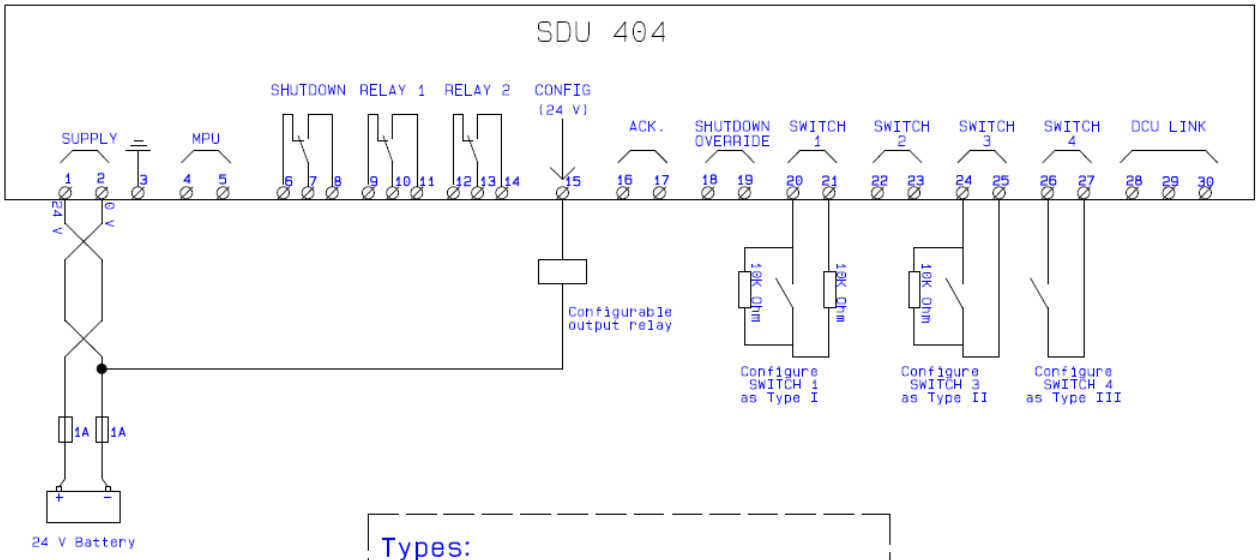
Configuration of relays and digital output.

Synchronize

Synchronization of DCU and SDU configuration.

Appendix A

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 approvals)

Type III: Not able to detect any faults

Note:

ACK. and SHUTDOWN OVERRIDE is also configurable with the same options.