User’s Manual

Marine Pro.

SDU 404

Shutdown Unit

auto MASKIN
User’s Manual

for

SDU 404

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Safety/Shutdown Unit

Revision 1.2
Revised November 30, 2017

Revision history:

<table>
<thead>
<tr>
<th>Rev.</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>05.10.2015</td>
<td>Initial Revision</td>
</tr>
<tr>
<td>1.1</td>
<td>21.03.2016</td>
<td>Aligned with the Installation Manual</td>
</tr>
<tr>
<td>1.2</td>
<td>30.11.2017</td>
<td>Corrected overspeed test shutdown to 95% of nominal speed.</td>
</tr>
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</table>

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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.

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

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 the local distributor.

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/

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## LED Overview

<table>
<thead>
<tr>
<th>LED</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power</strong></td>
<td>Lit when power supply is OK. Flashing when the voltage is below the configurable &quot;very low threshold&quot;. (Green)</td>
</tr>
<tr>
<td><strong>Running</strong></td>
<td>Lit when SDU senses the engine is running. (Green)</td>
</tr>
<tr>
<td><strong>Overspeed</strong></td>
<td>Flashing when unacknowledged overspeed, lit when acknowledged. (Red) Flashing when overspeed test is active. (Green)</td>
</tr>
<tr>
<td><strong>Shutdown</strong></td>
<td>Flashing when unacknowledged shutdown, lit when acknowledged. (Red)</td>
</tr>
<tr>
<td><strong>Shutdown Override</strong></td>
<td>Green when shutdown override switch is active. Amber when fault.</td>
</tr>
<tr>
<td><strong>Load Reduction</strong></td>
<td>Flashing when load reduction unacknowledged, lit when acknowledged. (Red)</td>
</tr>
<tr>
<td><strong>Config</strong></td>
<td>Flashing when unacknowledged fault, lit when acknowledged. (Amber)</td>
</tr>
<tr>
<td><strong>MPU</strong></td>
<td>Lit when MPU is connected. (Green) Flashing when unacknowledged failure, lit when acknowledged. (Amber)</td>
</tr>
<tr>
<td><strong>ACK.</strong></td>
<td>Lit when active. (Green) Flashing when unacknowledged fault, lit when acknowledged. (Amber)</td>
</tr>
<tr>
<td><strong>SW 1-4</strong></td>
<td>Flashing when unacknowledged (shutdown/load reduction), lit when acknowledged. (Red) Flashing when unacknowledged fault, lit when acknowledged. (Amber)</td>
</tr>
</tbody>
</table>
Shutdown Channels

Switch Channels

Switch Channels are configurable for broken wire/loop monitoring and short circuit detection.

All switch channels use a two-wire layout, where both wires from the switch must be routed to the SDU.

Broken Wire Detection
When correctly wired and configured (see installation Manual) this will be detected and indicated at the LED next to the Switch input terminals.

Short Circuit Detection
When correctly wired and configurated (see installation Manual) this will be detected and indicated at the LED next to the Switch input terminals.

Pickup Channel

When correctly wired and configurated (see installation Manual) this will indicate that the MPU is connected at the LED next to the MPU input terminals. This LED will also indicate MPU faults.
Shutdown Situations

From Overspeed
If engine speed input senses an engine speed higher than the configured max setting, then the SDU will activate the common shutdown outputs.

Shutdown Override
The Shutdown Override input does not disable the Overspeed Shutdown.

Indication
The red LED OVERSPEED will be lit.
The red LED SHUTDOWN will be lit.

Acknowledge
When the engine has stopped, the shutdown can be reset using the Acknowledge button on the SDU.

From Switch
If either of the switches indicates a shutdown, then the SDU will activate the common shutdown outputs.

Shutdown Override
Each switch channel may be configured to disregard the Shutdown Override input command.

Indication
The red LED for the corresponding switch will be lit.
The red LED SHUTDOWN will be lit.

Acknowledge
To acknowledge alarms and faults press the acknowledge button. In the case of a shutdown the shutdown state must be reset (by an extra acknowledge) when the engine has stopped (RPM < 5 RPM + 7 seconds).
## Config relays and Outputs

### Relays

<table>
<thead>
<tr>
<th>Relay</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHUTDOWN</td>
<td>Activates for any shutdown. Stays activated until engine has stopped, and the operator command the Acknowledge button.</td>
</tr>
<tr>
<td>CRANK CUTOFF</td>
<td>Activates at the configured Engine Run setpoint, typically 400 rpm. Deactivates when the SDU senses that the engine has stopped (&lt;5 RPM).</td>
</tr>
<tr>
<td>BUZZER</td>
<td>Activates for any new shutdown or fault. Deactivates when the operator command the Acknowledge button.</td>
</tr>
<tr>
<td>FAULT</td>
<td>This is the Common Fault indication. Activates for any new fault. Deactivates when all faults are acknowledged and has disappeared.</td>
</tr>
<tr>
<td>RUNNING</td>
<td>Activates at the configured Engine Run setpoint, typically 400 rpm. Deactivates when the SDU senses that the engine has stopped.</td>
</tr>
</tbody>
</table>
Buttons and other Inputs

Buttons

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledge</td>
<td>Whenever there is a flashing LED in the SHUTDOWN or FAULT section, this can be Acknowledged by the user by commanding the Acknowledge button.</td>
</tr>
<tr>
<td>Overspeed Test</td>
<td>Press and hold until the Overspeed Test LED flashes rapidly. The SDU is now in Overspeed Test mode, where the overspeed setpoint is reduced to 95% of the configured Nominal speed. Now, start the engine.</td>
</tr>
</tbody>
</table>

Note! If the Overspeed Shutdown has been disabled in the configuration, then this test will NOT generate a shutdown.

The Overspeed Test mode is deactivated by either:
- Performing the test, ending in an Overspeed Shutdown at 95% of the Nominal setpoint.
- Pressing the Overspeed Test button again.
- Automatic timeout after 5 minutes.

Shutdown Override

Connect a normally open (NO) switch, with a 10k ohm resistor across the two terminal inputs 18 and 19.

When activated by closing the switch, the SDU will disable all shutdown channels, unless those configured specifically to work also in Shutdown Override.

An example of the latter is Manual E-Stop, which shall always work.

Acknowledge

This is a remote acknowledge input channel, that work exactly as the Acknowledge button.

Connect a normally open (NO) switch, across the two terminal inputs 16 and 17.