PLUS+1™ GUIDE
Software

PLUS+1 Compliant
SASA Function Block
User Manual
About this Manual

Organization and Headings
To help you quickly find information in this manual, the material is divided into sections, topics, subtopics, and details, with descriptive headings set in red type. Section titles appear at the top of every page in large red type.

In the PDF version of this document, clicking an item underlined in blue italic type jumps you to the referenced page in the document.

Special Text Formatting
Controls and indicators are set in bold black type.

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A Table of Contents (TOC) appears on the next page. In the PDF version of this document, the TOC entries are hyperlinked.

Revision History

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<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rev A</td>
<td>April 2007</td>
<td></td>
</tr>
<tr>
<td>Rev AB</td>
<td>May 2010</td>
<td></td>
</tr>
</tbody>
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Overview

The output of an SASA (Steering Angle Sensor Absolute) function block indicates the steering angle of a Sauer-Danfoss Steering Angle Sensor, and the amount that angle has changed since angle information was last received through a CAN message.

See Connections and Signals Overview on page 5 for an overview of the SASA function block’s connections and signals.

Inputs

*SASA Function Block Inputs*

<table>
<thead>
<tr>
<th>Input</th>
<th>Type</th>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN</td>
<td>——</td>
<td>——</td>
<td>The CAN bus in the GUIDE template reports the output of a Sauer-Danfoss Steering Angle Sensor. Route a bus from the GUIDE template’s CAN input to this function block’s CAN input.</td>
</tr>
<tr>
<td>RxRate</td>
<td>U8</td>
<td>5 to 20</td>
<td>The RxRate (Prescribed Rate) signal specifies the frequency that messages are received from the angle sensor. There is the option of specifying once every 5, 10, or 20 ms.</td>
</tr>
<tr>
<td>Set_0</td>
<td>Bool</td>
<td>——</td>
<td>The Set_0 (Set-to-zero) signal specifies that the current steering angle is to now be set at 0 degrees. A set-to-zero command is transmitted to the sensor during an F to T transition of Set_0. T = 0°.</td>
</tr>
<tr>
<td>FltTim</td>
<td>——</td>
<td>LoopTime to 65535</td>
<td>The FltTim (Fault Time) signal specifies how long to wait before the CAN bus signal is considered lost and a fault is declared.</td>
</tr>
</tbody>
</table>
Outputs

SASA Function Block Outputs

<table>
<thead>
<tr>
<th>Output</th>
<th>Type</th>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>U16</td>
<td>——</td>
<td>The <strong>Status</strong> signal reports the function block's status conditions. The <strong>Status</strong> signal does not use a standard bitwise scheme. For more information about status logic, see <em>Status and Fault Logic</em> on page 6.</td>
</tr>
<tr>
<td>Fault</td>
<td>U16</td>
<td>——</td>
<td>The <strong>Fault</strong> signal reports the function block's fault conditions. The <strong>Fault</strong> signal does not use a standard bitwise scheme. For more information about fault logic, see <em>Status and Fault Logic</em> on page 6.</td>
</tr>
<tr>
<td>Diag</td>
<td>Bus</td>
<td>——</td>
<td>Use these signals for troubleshooting. The <strong>Diag</strong> (Diagnostic) bus contains the <strong>CRC_Value</strong> (Cyclic Redundancy Check Value) and the <strong>Msg_Counts</strong> (Message Counts) signals.</td>
</tr>
<tr>
<td>CRC_Value</td>
<td>U16</td>
<td>0-65535</td>
<td><strong>CRC_Value</strong> is a checksum value that is received with the CAN message from the sensor. The value is used inside the block to determine if valid data is received.</td>
</tr>
<tr>
<td>Msg_Counts</td>
<td>U8</td>
<td>0-255</td>
<td><strong>Msg_Counts</strong> is a fault-detection value. Every message from the sensor is given a running number that is increased by 1 every time a message is sent. Used to determine if messages have been lost, and how many have been lost.</td>
</tr>
<tr>
<td>Output</td>
<td>Bus</td>
<td>——</td>
<td>The <strong>Output</strong> bus contains the <strong>Angle Change</strong> and <strong>Steering Angle</strong> signals:</td>
</tr>
<tr>
<td>Angle Change</td>
<td>S32</td>
<td>-35991 to 35991</td>
<td>The angle between two CAN measurements. 1° = 100</td>
</tr>
<tr>
<td>Steering Angle</td>
<td>U16</td>
<td>0 to 35991</td>
<td>The absolute angle relative to the 0-index point. 1° = 100</td>
</tr>
</tbody>
</table>

Connections and Signals Overview

- **Input**: Set steering angle to zero
- **CAN 0**: Time between messages
- **Steering Angle**: Sensor signal
- **CRC_Value**
- **Msg_Counts**
- **Status**
- **Fault**
- **Timeout when CAN communications are lost**
- **Select, Define Member**: Angle Change, Steering Angle
Status and Fault Logic

The SASA function block does not use standard status and fault codes. The status codes indicate the calibration state of the function block.

Status Logic

<table>
<thead>
<tr>
<th>Status</th>
<th>Bit</th>
<th>Reported While</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Pending</td>
<td>1</td>
<td>The SASA is writing a parameter to memory.</td>
</tr>
</tbody>
</table>

*Position of set bit in a 16 bit status code. Bit 1 is the least significant bit.

Fault Logic

<table>
<thead>
<tr>
<th>Fault</th>
<th>Cause</th>
<th>Bit</th>
<th>Response</th>
<th>Delay</th>
<th>Latch</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRC error</td>
<td>A CRC_Value checksum value from the CAN message indicates that an error occurred during the transmission of that message.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>There is a physical layer problem. Ensure the CAN bus integrity.</td>
</tr>
<tr>
<td>Count error</td>
<td>When comparing the number of messages received with a Msg_Counts fault-detection value, it was found that two or more messages in a row had not been received.</td>
<td>2</td>
<td>Data freezes</td>
<td>No</td>
<td>No</td>
<td>Check that the controller’s OS.ExecTime is less than RxRate. (OS.ExecTime is a global parameter on all devices.)</td>
</tr>
<tr>
<td>Timeout on CAN</td>
<td>The delay in receiving CAN signals exceeds the FltTim setting.</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>There is a physical layer problem. Ensure the CAN bus integrity.</td>
</tr>
<tr>
<td>Programming error</td>
<td></td>
<td>4</td>
<td>Old settings are used</td>
<td></td>
<td></td>
<td>Check that the correct RxRate is applied.</td>
</tr>
</tbody>
</table>

*Position of set bit in a 16 bit fault code. Bit 1 is the least significant bit.
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