Hardware Manual - Operation Instructions, Safety Guidelines and Specifications

SEA 9811

ARINC-429 Interface Module

Order no.: 60000065

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Content

Getting Started

The safety ratings and specifications in this document are specific to the SEA 9811 and may differ for other components in the system. To determine the safety ratings and specification of the entire system refer to each component in the system.

Before operating the SEA 9811 module and the provided software you have to agree to the terms and conditions. If you do NOT agree you can send back the hardware and software package within a period of two weeks after delivery. In this case, S.E.A. will refund the product price and shipping costs. The terms and conditions are listed in the software manual (section Disclaimer, Limitation of Liability and User Responsibilities), which is provided on the installation medium.

Before starting to work with the SEA 9811 module please read this document and the complete software manual carefully. If there are any questions about operating the module or if any term in this manual is not understood, please contact the vendor before using the module.

Refer to the software manual for details on programming and integration of the SEA 9811 module.

Refer to the appropriate National Instruments™ documentation for details on National Instruments™ hardware.

We believe that all information in this manual is accurate. The document has been carefully reviewed for technical accuracy. In the event of technical or typographical errors, we reserve the right to make changes to subsequent editions of this document without prior notice to holders of this edition. The reader should consult the vendor if errors are suspected.

Please check the S.E.A. website: www.sea-gmbh.com for updates of the manuals.

Safety Guidelines

To protect persons against any harm and the module from damage, the operation of the SEA 9811 module is only allowed according to the rules described in this document.

Hot or Cold Surface

The metallic surface of the module might become hot or cold as well. Touching the surface may result in bodily injury.
Do not dismount the module from the chassis during operation. Wait until the module temperature has reached 20 °C.

Do not insert, remove the module from the system or connect/disconnect wires or connectors to/from the module unless power has been switched completely off. Make sure working in an ESD safe environment.

Do not open or disassemble the module or other hardware parts. Guarantee void if seal is broken!

Safety Critical Applications

The module is not failure tolerant and therefore not suitable for use in safety critical applications.

Do not use for medical applications or any live supporting apparatus.

Do not solely use for position determination, when a failure can be a danger for the environment, material or can possibly harm humans.

Hazardous Locations

The module is suitable for use in non hazardous locations only. Keep the module always away from hazardous locations and explosive areas.

Protect the module from thunderstorm and lightning strikes or other electrical hazards.

Use the module only in dry areas. Do not operate the module in bath areas, kitchens etc., where water or vapor can be in contact with the module or cables.

Hazardous Voltages

Hazardous voltages must not be connected to the module. Hazardous voltage is any voltage higher than 25 V_{RMS} AC or 60 VDC to earth ground.

Use only isolated power supplies with a nominal voltage of 12 V DC, made for use with CompactRIO™ systems.

The module must not be operated in high voltage areas.

Prerequisites

The SEA 9811 module is shipped with the following accessory:

- Printed hardware manual with operating instructions, safety guidelines and specifications.

In order to operate the module the following components are required (not shipped with the module):

- CompactRIO™ system from National Instruments™
- Power supply (7..30VDC)
- ARINC 429 receiver and/or transmitter

The SEA 9811 can currently be operated in the following CompactRIO™ systems:

- Reconfigurable Chassis
- Expansion Chassis: all types[1]

1 Tested with: NI 9159, NI cRIO-9068

Connecting the SEA 9811

SEA 9811 provides 8 receiver and one transmiter channels for communication ARINC 429 devices. All channels are mapped to a 25-pin DSUB connector.

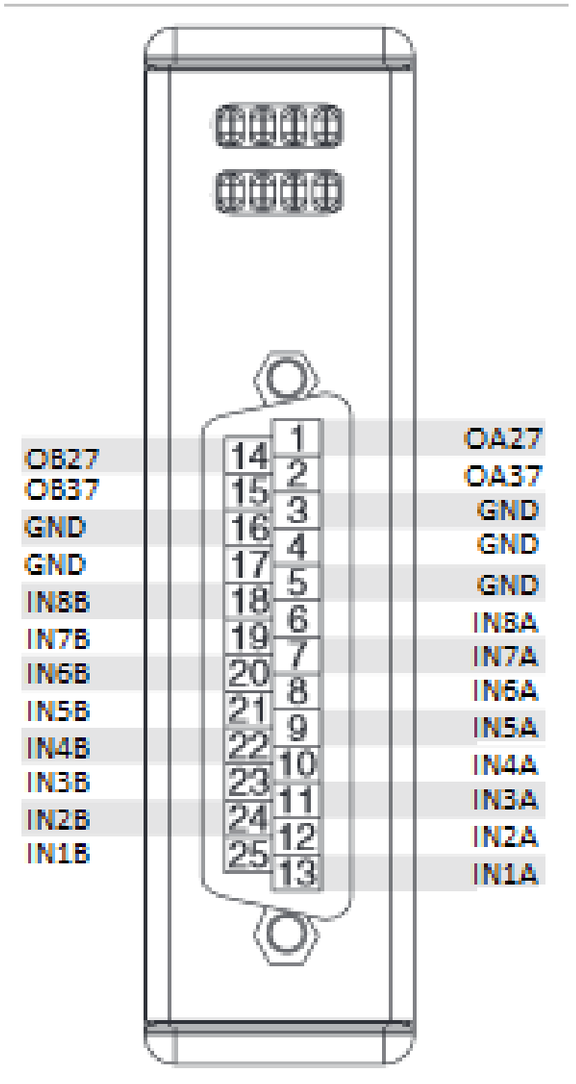

Fig. 1: Pin Assignments (DSUB)

The terminals INxA are the positive lines, the INxB are the negative lines for the ARINC bus.

The outputs OA27 (positive) and OB27 (negative) are the lines for connecting to the bus via a 27 ohm resistor. OA37 (positive) and OB37 (negative) are for connection via a 37 ohm resistor. The following figure shows the output circuit of the ARINC 429 line driver. Select the appropriate IO connector pins for the required line resistance of 27 or 37 Ohm. Refer to Fig. 2 on how to connect a ARINC 429 device to the SEA 9811.

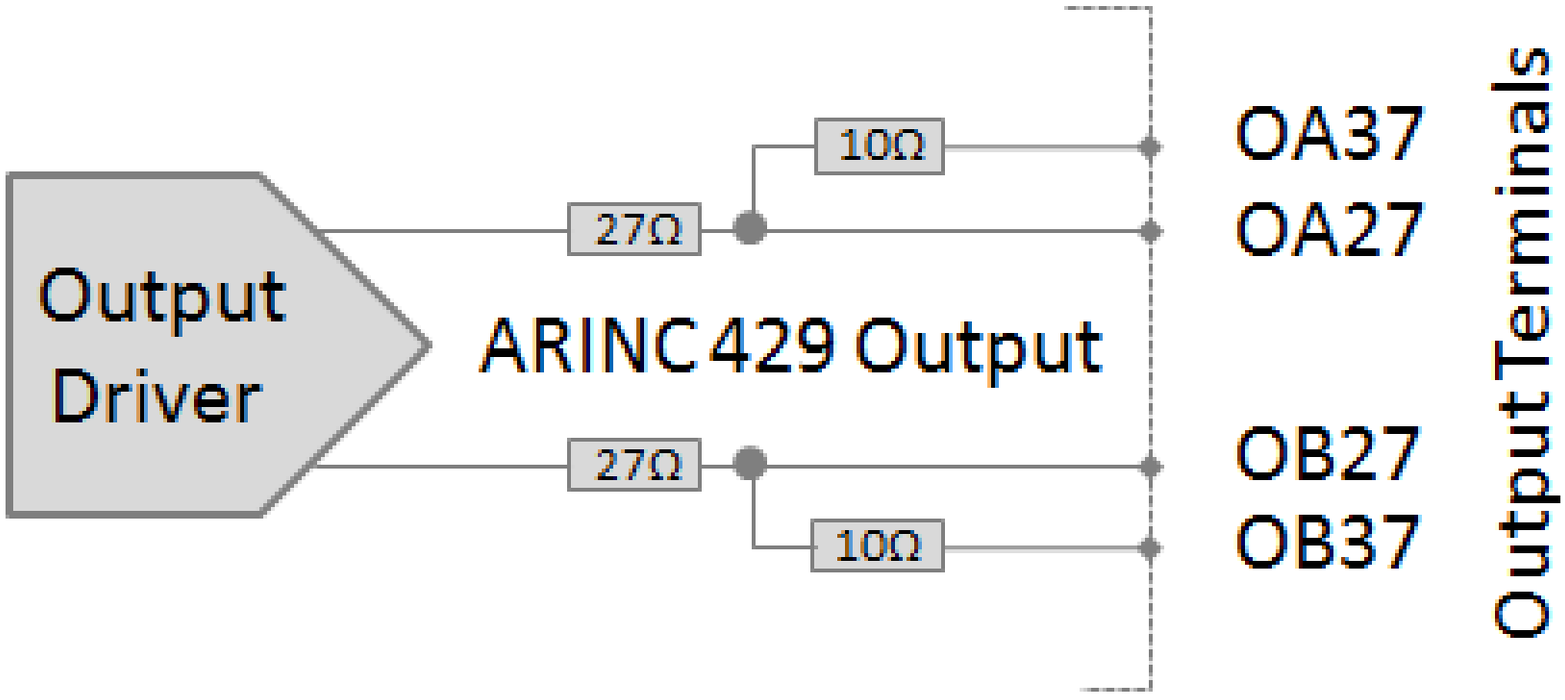

Fig. 2: SEA 9811 Output Circuit

Status LEDs

The green LEDs are blinking when ARINC telegrams are received for a specific channel. LED1 corresponds to channel 1, LED2 to channel 2 and so on. There is no LED indicator for the ARINC transmitter channel. When many telegrams are received the LEDs are staying almost all the time switched on.

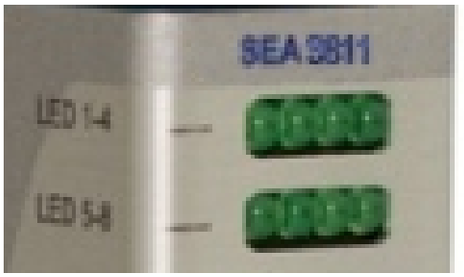

Fig. 3: Status LEDs : blinking on telegram reception

Fig. 4: Connected SEA 9811 module in the 6th slot

Sleep Mode

This module supports a low-power sleep mode. In sleep mode typically there is no communication with the module and the power consumption is minimized. The system thermal dissipation may decrease. Refer to the Specifications section for more information about power consumption and thermal dissipation. The sleep mode can be enabled by software.

Specifications

The following table shows the specifications for a nominal temperature of 20 °C unless otherwise noted.

ARINC Characteristics

Number of receiver channels	8
Number of transmitter channels	1
Receiver acquisition rate/ch	max. 2450 Labels/s
Protocol	ARINC 429

Power Requirements

Operating voltage for the backplane:

Nominal	5 VDC
Minimal	4.8 VDC
Maximal	5.2 VDC

Power consumption from chassis at 5v:

Operating current in active mode	72 mA typ.
	65 mA min. / 95 mA max.

Operating current sleep mode	1 mA typ. 1 mA min. / 3 mA max.

Physical Characteristics

Weight	175 g
Dimensions	87 x 23 x 89 mm

Environmental Conditions

The SEA 9811 module is intended for indoor use only. For outdoor use, mount the CompactRIO™ system in a suitable rated enclosure. Refer to the installation instructions for the chassis for more information about how to meet these specifications.

Operating temperature	-40 to 85 °C
Storage temperature	-40 to 85 °C
Ingress protection	IP 30 with connected power cable
Operating humidity	5 to 90 % relative humidity, non condensing

Shock and Vibration

To meet the shock and vibration specifications, the CompactRIO™ system has to be panel mounted.

Operation vibration,

random (IEC 60068-2-64) ..... 5 g_{rms}, 10 to 575 Hz, operation vibration

sinusodial (IEC 60068-2-6) ..... 5 g, 10 to 575 Hz , operation shock

(IEC 60068-2-27) ..... 15 g, 11 ms half sine,
30 g, 11 ms half sine,
50 g, 3 ms half sine,
(10 shocks at 6 orientations)

CE Compliance

The SEA 9811 module is conform with the following European Union Directives:

- Directive 89/336/EEC for conformity for EMC
- EMC (Electromagnetic Compatibility). Standards: EN 301 489-1 and EN 301 489-7

CE

The module is compliant with the following US Directives:

- EMC (Electromagnetic Compatibility). Standards: FCC47 Part 15

Maintenance

The module should only be wiped with a dry towel. It is not water resistant and should not be operated in humid environments.

The module contains no components, which have to be maintained.

The opening of the module will destroy the heat conductors and will void warranty.

Contact and Support

Address:

S.E.A. Datentechnik GmbH
Mülheimer Straße 7
53840 Troisdorf
Germany

Support:

1. web site: www.sea-gmbh.com
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