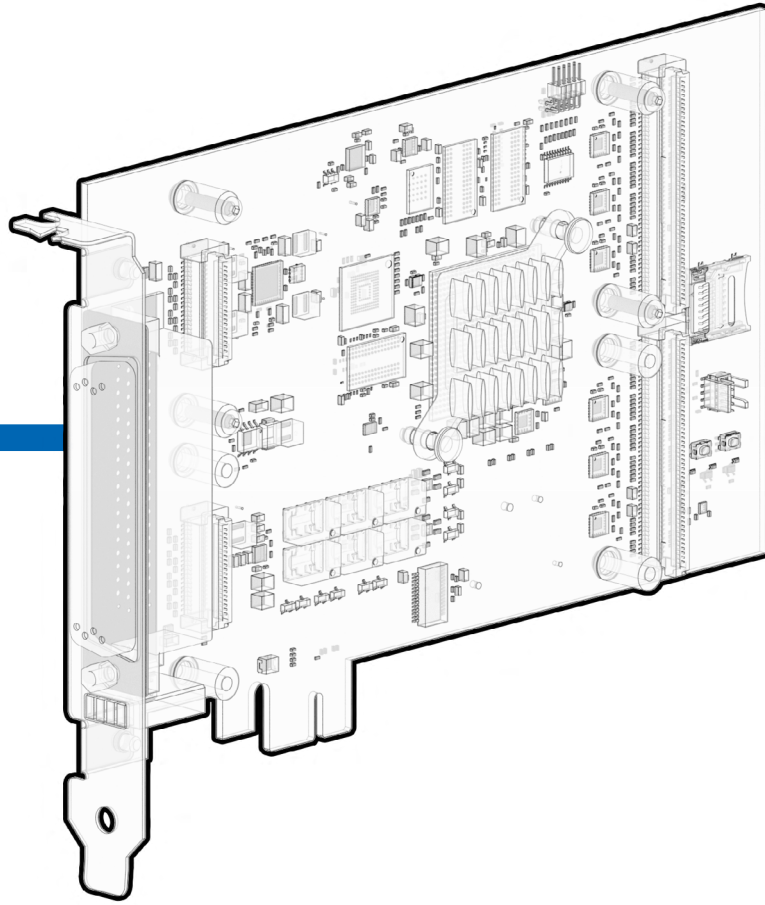




DE150300

Aviolinks®

PCIe

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1. Description

Aviolinks® PCIe is a versatile and high-performance unit designed to support a wide range of avionic protocols. With its modular architecture, the device can be configured to meet the specific application requirements.

1.1. Key Features

- The device supports up to two modules, each capable of handling one or more of the following avionic protocols:
 - MIL-STD-1553 (M1553-1): provides 2 channel dual redundant communication per module with a single or multi-function operation with selectable direct or transformer coupling interface
 - ARINC-429 (A429-1): enables data transmission with 16 shared RX/TX channels per module, meaning each channel can be configured as either Receiver (RX) or Transmitter (TX)
 - ARINC-825 (A825-1): supports bidirectional communication with 4 channels per module, offering versatility in system integration
 - Avionic Discrete (DISC-1): provides precise control of avionic discrete signals with 32 channels per module
- IRIG B time decoder: decodes IRIG B time signals up to 10 V peak to peak
 - Format: IRIG-B-122
 - Carrier wave: 1 kHz amplitude modulated sine wave
 - Input amplitude: -5 V to 5 V (10 V peak to peak)
 - Modulation ratio: 3:1
- IRIG B time encoder: encodes SPI data from FPGA as 10 V peak to peak analog output
 - Format: IRIG-B-122
 - Carrier wave: 1 kHz amplitude modulated sine wave
 - Output amplitude: -5 V to 5 V (10 V peak to peak)
 - Modulation ratio: 3:1
- Discrete I/O: offers 8 TTL level discrete input/output channels for digital control and monitoring
- PCI Express: enables data transfer and communication to the host PC. It supports Gen2 x1 link width (500MB/s).
- Scope circuitry: features two channels for capturing differential analog signals. These two channels can be switched between external signals that are connected to the DSUB-78 connector or module signals that are attached to the carrier board.
 - Input signal range: -2.5 V to 2.5 V or -15 V to +15 V
 - Sampling frequency: 20 MHz
 - ADC output: 10 bits parallel

2. Hardware Overview

2.1. Circuitry

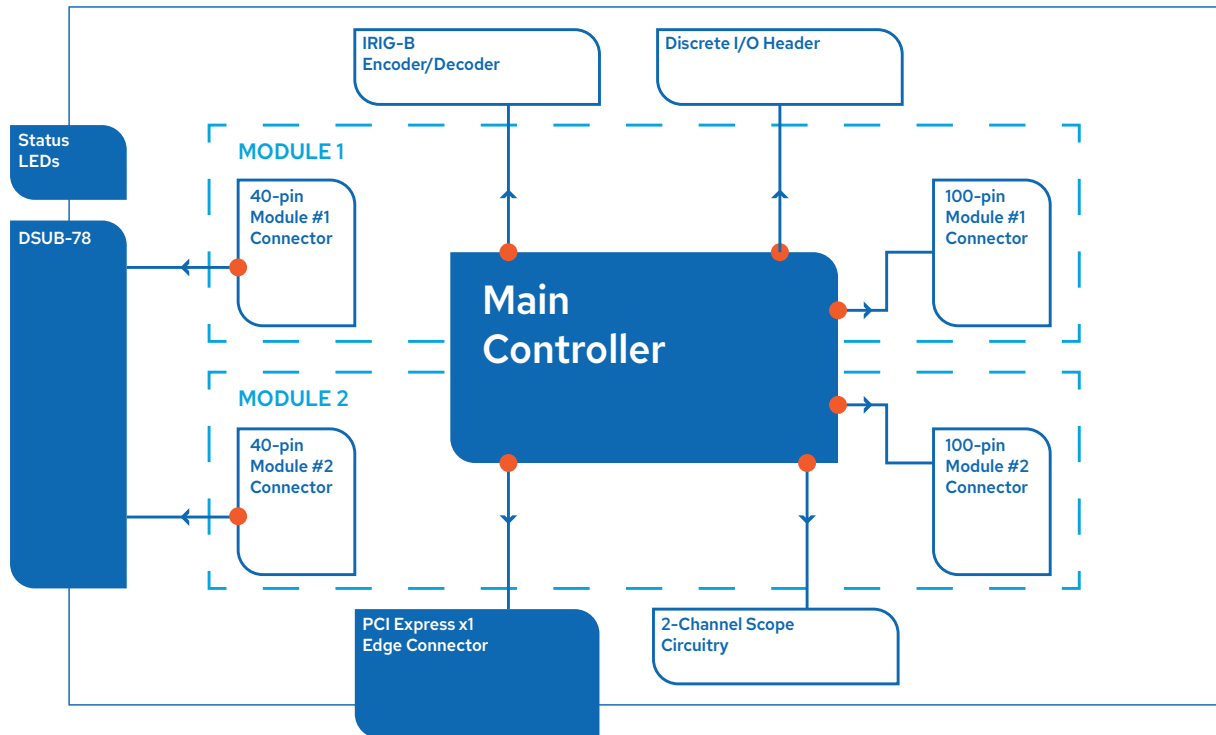


Figure 1: Block Diagram of DE150300 Aviolinks® PCIe

2.2. Hardware Specifications

Aviolinks® PCIe is designed as a converter that manages avionic communication protocols through the PCI Express interface. The managed avionic interfaces are based on a modular architecture, allowing for future expansion and better meeting user needs. For configuration and ordering information, the [configuration chapter](#) shall be referred to.

2.2.1. Electrical Specifications

Table 1: Board Electrical Specifications

Specification	Min	Typical	Max
Input Voltage	–	12 V	–
Power Consumption	–	12 V DC, 0,7 A ¹	12 V DC, 3 A

¹ Typical power consumption can vary depending on the modular configuration.

Table 2: Interface Electrical Specifications

Specification	Min	Typical	Max
IRIG-B Decoder (Input)	-5 V	–	5 V
IRIG-B Encoder (Output)	-5 V	–	5 V
Discrete I/O	–	5 V	–
Avionic Bus (DSUB-78)	-15 V	–	15 V

2.2.2. Physical Specifications

Table 3: Physical Specifications

Specification	Description	Notes
Dimensions	167.65 mm x 115.15 mm x 14.45 mm	Standard PCI Express x1 half length card dimensions
Weight	~250 g	With 2 modules
DSUB-78 (Front Panel)	PN: 09565527613 Harting	Standard DSUB-78 mating connector can be used.

2.2.3. Environmental Specifications

Table 4: Environmental Specifications

Specification	Condition	Values
Operating Humidity	Relative, non-condensing	10% - 90%
Storage Humidity	Relative, non-condensing	5% - 95%
Operating Temperature	Operational	0 °C - +40 °C
Storage Temperature	Non-operational	-40 °C - +71 °C

3. Signal Connections

3.1. DSUB-78 Connector

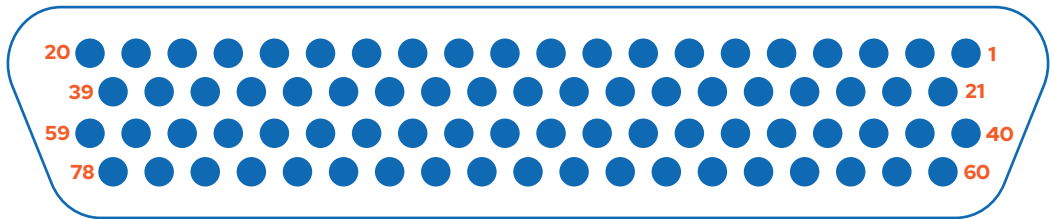


Figure 2: DE150300 Aviolinks® PCIe DSUB-78 Connector

Table 5: DSUB-78 Connector Pin Assignments

Pin	Description
1	BUS 0 positive
2	BUS 0 negative
3	BUS 1 positive
4	BUS 1 negative
5	BUS 2 positive
6	BUS 2 negative
7	BUS 3 positive
8	BUS 3 negative
9	BUS 4 positive
10	BUS 4 negative
11	BUS 5 positive
12	BUS 5 negative
13	BUS 6 positive
14	BUS 6 negative
15	BUS 7 positive
16	BUS 7 negative
17	BUS 8 positive
18	BUS 8 negative
19	BUS 9 positive
20	BUS 9 negative
21	BUS 10 positive
22	BUS 10 negative
23	GND
24	BUS 11 positive
25	BUS 11 negative
26	BUS 12 positive
27	BUS 12 negative
28	GND
29	BUS 13 positive
30	BUS 13 negative
31	BUS 14 positive
32	BUS 14 negative
33	GND
34	BUS 15 positive
35	BUS 15 negative
36	BUS 16 positive
37	BUS 16 negative
38	GND

Pin	Description
39	IRIG input
40	BUS 17 positive
41	BUS 17 negative
42	BUS 18 positive
43	BUS 18 negative
44	BUS 19 positive
45	BUS 19 negative
46	BUS 20 positive
47	BUS 20 negative
48	BUS 21 positive
49	BUS 21 negative
50	BUS 22 positive
51	BUS 22 negative
52	BUS 23 positive
53	BUS 23 negative
54	BUS 24 positive
55	BUS 24 negative
56	BUS 25 positive
57	BUS 25 negative
58	IRIG output
59	Scope channel B negative
60	GND
61	BUS 26 positive
62	BUS 26 negative
63	BUS 27 positive
64	BUS 27 negative
65	GND
66	BUS 28 positive
67	BUS 28 negative
68	BUS 29 positive
69	BUS 29 negative
70	GND
71	BUS 30 positive
72	BUS 30 negative
73	BUS 31 positive
74	BUS 31 negative
75	GND
76	Scope channel A positive
77	Scope channel A negative
78	Scope channel B positive

3.2. 10 Pin Header

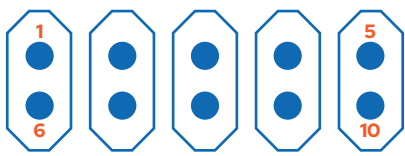


Figure 3: DE150300 Aviolinks® PCIe 10 Pin Header

Table 6: 10 Pin Header Pin Assignments

Pin	Description
1	GPIO 0
2	GPIO 1
3	GPIO 2
4	GPIO 3
5	GND
6	GPIO 4
7	GPIO 5
8	GPIO 6
9	GPIO 7
10	GND

4. Configuration

4.1. Ordering Information

An ideal device can be configured using the modular system. Up to two modules may be selected from the library, and the configuration table shall be used to customize the order. Custom modules can also be designed to meet specific requirements.

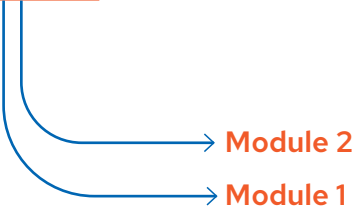
Product Code

DE150300

Module Number

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4.2. Part Number Informations

These codes shall be used to select the modules.

Table 7: Part Number Reference Table

Code	Variant	Description
0	NC	—
1	M1553-1	2 channel multifunction MIL-STD-1553
2	A429-1	16 TX/RX channels ARINC-429
3	DISC-1	32 channels avionic discrete I/O
4	A825-1	4 channels ARINC-825

4.3. Part Number Examples

DE150300-10	—	1 module of 2 channel MIL-STD-1553
DE150300-22	—	2 modules of 16 TX/RX channels ARINC-429
DE150300-34	—	1 module of 32 channel avionic discrete I/O + 1 module of 4 channels ARINC-825

4.4. Part Numbers

Table 8: Available Configurations

Part Numbers	Description
DE150300-10	Aviolinks® PCIe M1553-1/NC
DE150300-11	Aviolinks® PCIe M1553-1/M1553-1
DE150300-12	Aviolinks® PCIe M1553-1/A429-1
DE150300-13	Aviolinks® PCIe M1553-1/DISC-1
DE150300-14	Aviolinks® PCIe M1553-1/A825-1
DE150300-20	Aviolinks® PCIe A429-1/NC
DE150300-22	Aviolinks® PCIe A429-1/A429-1
DE150300-23	Aviolinks® PCIe A429-1/DISC-1
DE150300-24	Aviolinks® PCIe A429-1/A825-1
DE150300-30	Aviolinks® PCIe DISC-1/NC
DE150300-33	Aviolinks® PCIe DISC-1/DISC-1
DE150300-34	Aviolinks® PCIe DISC-1/A825-1

5. Safety Guidelines

**Caution**

The DE150300 shall not be operated in any manner not specified in this document. Misuse of the product may result in a hazard. Safety protection features may be compromised if the product is damaged. In the event of damage, the product shall be returned for repair.

6. Compatibility Guidelines

This product has been tested and found to comply with the applicable regulatory requirements and limits for electromagnetic compatibility (EMC). These requirements and limits are intended to provide reasonable protection against harmful interference when the product is operated within the specified electromagnetic environment.

This product is intended for use in industrial locations. However, harmful interference may occur in certain installations if the product is connected to peripheral devices or test objects, or if it is used in residential or commercial areas. To minimize interference with radio and television reception and to prevent unacceptable performance degradation, the product shall be installed and operated in strict accordance with the instructions specified in the product documentation.

Any changes or modifications to the product not expressly approved by DEICO may void the user's authority to operate the equipment under local regulatory rules.

**Caution**

To ensure the specified EMC performance, the product shall be operated only with shielded cables and accessories.

**Caution**

To ensure the specified EMC performance, the length of any cable attached to the front connectors shall not exceed 3 m (10 ft.).