

P R B X

POWERBOX Digital Interface

CAN and I2C communication interface for POWERBOX power supplies

PBSE10384 I2C / PBSE10384 CAN

POWERBOX Digital Communication Interface

Description

The Powerbox Digital Interface (PDI) is a digital interface board designed to convert external digital communication signals into control and monitoring signals compatible with POWERBOX power supplies. The PDI acts as a translation board, enabling remote control, monitoring, and integration of standard POWERBOX power supplies into advanced customer systems, particularly in demanding applications.

Application

- High Reliability Applications
- System monitoring
- Dynamic current control

Key Features

- Configurable communication interfaces: I2C, and CAN
- Measures output current, voltage, and temperature
- External Major Fault and Remote On/Off function
- Wide input power range: 10–80 VDC with polarity protection

Interfaces – System side

Communication: I2C, CAN

Interfaces – Power Supply Side (Input: to the PDI)

Power input: 10-80V

2x Analog inputs for current and voltage measurements

2x Analog outputs: Current and Voltage target values

1x Temperature input + one on board

3x Digital inputs: Power Good, External Major Fault, Spare

3x Digital outputs: Remote On/Off, External Relay On/Off, Spare On /off

Compatible Power Supplies

Compatible POWERBOX power supplies:

OFI1200A, OFD1200A, OFI700A, AEA Series, PCA Series, HCA Series, HFA Series, GHA Series, DCS Series, TUNS1200 Series

Environmental

Operating temperature -40°C to +100°C
(Baseplate temperature)

Operating humidity 20-95%RH (Non condensing)

Storage temperature -40°C to +85°C (short duration +125°C)

Storage humidity 20-95%RH (Non condensing)

Standards

Designed to meet IEC/EN62368-1

RoHS Yes, Directive 2011/65/EU (2015/863)

Function

The PDI comes in two different versions, one with I2C interface and one with CAN interface.

Power Supply voltage output is measured and can be controlled by setting a target value. The PDI board is powered by the connected power supply (10-80V).

Power Supply output current can be measured and be limited by setting a target limit value for power supplies where a current control pin is available.

The External Major Fault input triggers an isolated fault signal indicating error, it also triggers remote off to the connected power supply and also sets the target current and target voltage to zero.

Mechanical

Size WxHxD 38 x 25¹ x 142,5 mm

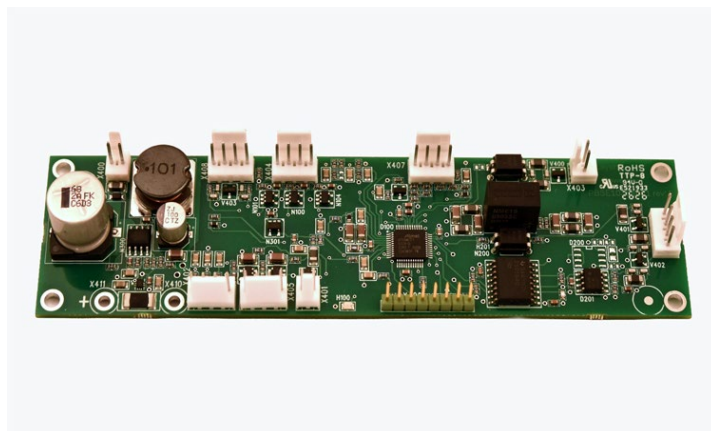
IP class IPX0

Weight 33 g typ.

Connectors Inputs: Molex 22-27-2041 x 5, Molex 22-27-2021 x 2 and 2x 2.5 mm plated holes for current sense
Outputs: Molex 22-27-2041 for communication, Molex 22-27-2021 for isolated alarm signal

Connector placement Input and Output on the opposite side

¹Board height is about 16 mm but mating connectors extend this ~4 mm and an extra 5 mm is added for cables



[illegible]

Input connectors:

Connector Number	Connector type	Connector use	Pin number	Pin use
X400	22-27-2021	Power input	1	10-80 V input to power up the board
			2	COM
X401	22-27-2021	External NTC	1	Connect this to COM via a TTS1A103F34D1TY NTC or equivalent to enable external temperature sensing.
			2	COM
X402	22-27-2041	Digital inputs	1	Power good input
			2	Fault input
			3	Spare input
			4	COM
X404	22-27-2041	Digital outputs	1	Spare output
			2	Relay output
			3	Remote on output. Polarity can be configured via communication
			4	COM
X405	22-27-2041	Reference connector	1	Voltage reference analog output
			2	Current reference analog output
			3	NC
			4	COM
X407	22-27-2041	Analog inputs	1	Current balance input, this can be used to get a very crude approximation of the output current of some power supplies
			2	Output voltage sensing 0-80 V input
			3	NC
			4	COM
X408	22-27-2041	Fan connector	1	Fan TACHO signal to monitor a connected fans RPM, gives accurate readings up to ~15000 RPM
			2	Fan PWM signal to control a PWM controlled fan
			3	COM
			4	NC
X410	2,5 mm plated hole	Shunt -	1	Shunt voltage or current connection for an onboard 5 mΩ shunt. If an external shunt is used the input voltage here be in the range of 0≤Voltage≤50 mV. If the internal 5 mΩ shunt is used current should not exceed 10 A. An INA 214 is used for amplification of the shunt voltage so voltage on these pins compared to COM should not exceed 26 V.
X411	2,5 mm plated hole	Shunt +	1	

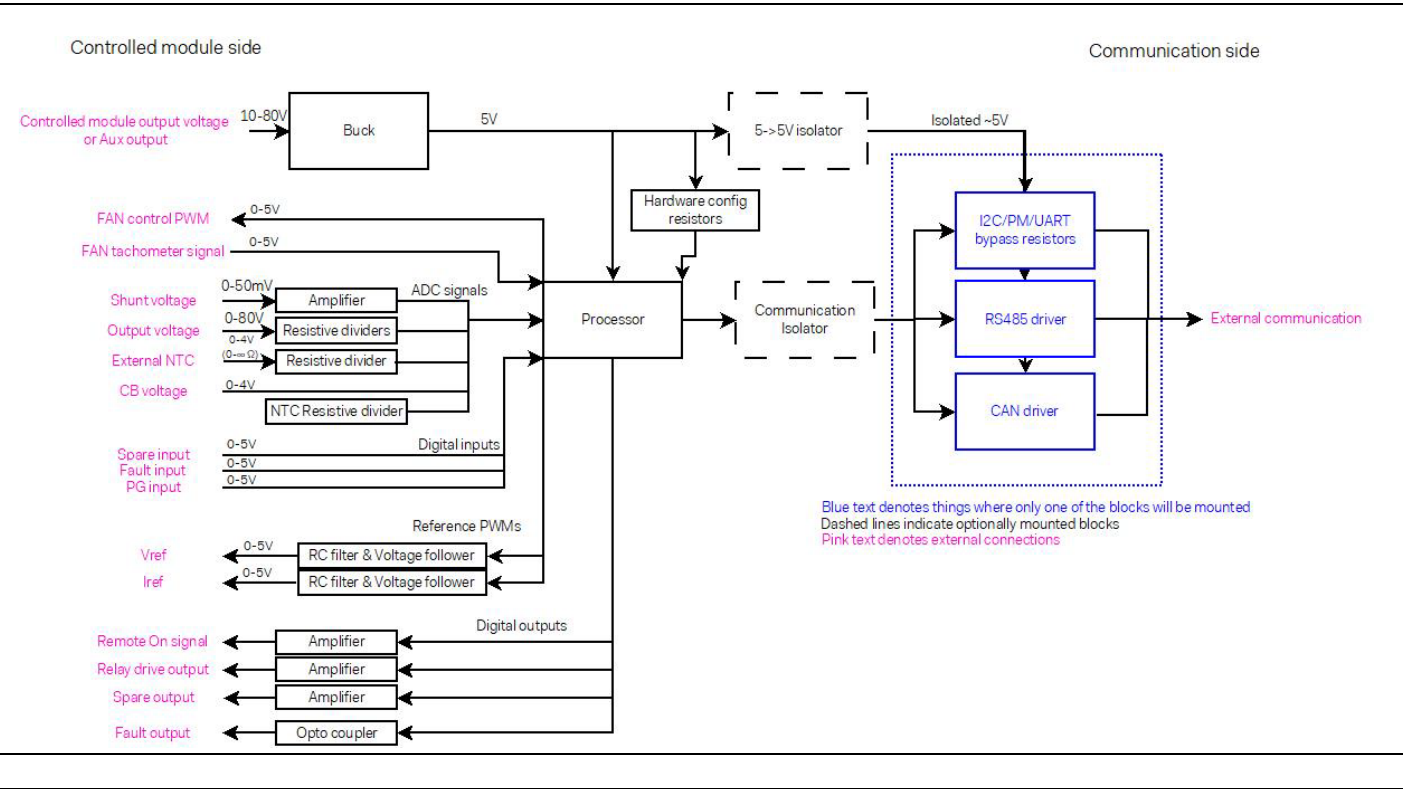
Output connectors:

X403	22-27-2021	Isolated Fault	1	This pin is pulled to FGND when a fault condition is detected
			2	FGND
X406	22-27-2041	Communication	1	CAN High or I2C Data line depending on hardware config
			2	CAN Low or I2C Clock line depending on hardware config
			3	Not used
			4	CGND Communication ground

Part Number Structure

POWERBOX Digital Interface - I2C: I2C communication interface
POWERBOX Digital Interface - CAN: CAN communication interface

Block diagram



Installation

These converters are components, intended exclusively for integration into other equipment by an industrial assembly process or by a professional competent person. Installation must strictly follow the safety regulations in respect of the enclosure, mounting, creepage and clearance distances, markings of the end-use application. Connection to the system shall be made via appropriate connection. External fuses in the wiring circuit to one or both input pins may be necessary to ensure compliance with local requirements. For the communication to work the way it is intended a calibration and configuration against the end product is needed, see the communication specifications for how to calibrate.

Designed/Built to Meet Standards and approvals

The converters are built to meet. 'Built to meet' mentioned in the different paragraphs of the datasheet means that the product is designed to meet the standard but not certified it in a laboratory. The installation is an important factor to fulfil EMI, electromagnetic immunity and emission for that reason the product shall be validated in its final application as additional filters may be needed.