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BP8 User Manual

About

The BP8 is a backplane which can host up to eight Qontrol modules, providing power, serial communications, and providing a shielded analog output. Up to 64 analog channels are presented to a shielded connector compatible with the CAB8 cable.

Contents of this document

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Description

The BP8 provides wiring and connectors to facilitate the connection of the 64 input/output channels of eight Qontrol modules to a single shielded CAB8 cable. It receives power for the connected modules and provides USB-to-RS232 conversion to enable communication with the PC. It also includes CABCHN connectors for linking multiple Qontrol backplanes together.

Power

Four power receptacles are provided:

1. Barrel for 5-V digital supply[1] (optional)
2. Barrel for analog supply
3. Test (banana) connector for positive analog supply terminal (red or yellow)
4. Test connector for negative analog supply terminal (black)

Warning: When using the barrel connectors, take care to insert the correct supply into the each connector. Exceeding 5.5 V on the digital supply may damage or destroy all connected modules.

The ratings of each power interface are listed below. The barrel connectors can be used to conveniently supply low-current applications, while the test (banana) connections should be used for more demanding applications. 4-mm test connectors are compatible with most benchtop power supplies.

Table 1: Barrel connector properties

Maximum current	5 A
Barrel diameter	6.3 mm
Pin diameter	2.1 mm & 2.5 mm
Polarity	Centre positive

Table 2: Test connector properties

Maximum current	24 A
Pin diameter	4 mm

CAB8 parallel connection

The CAB8 cable provides a shielded parallel connection for 64 analog signals. It comprises 68 conductors, with four conductors reserved. If designing a custom interposer for your own application, leave these four pins floating. A pinout diagram of the CAB8 connector (BP8 side) is shown below.

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[1] Only the following modules use the digital supply: Q8iv, Q8b.

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AMP-TE 5787170-7 or similar

2-56 thread

R	2	3	6	7	10	11	14	15	18	19	22	23	26	27	30	31	34	35	38	39	42	43	46	47	50	51	54	55	58	59	62	63	R
R	0	1	4	5	8	9	12	13	16	17	20	21	24	25	28	29	32	33	36	37	40	41	44	45	48	49	52	53	56	57	60	61	R

Output channel number   Reserved
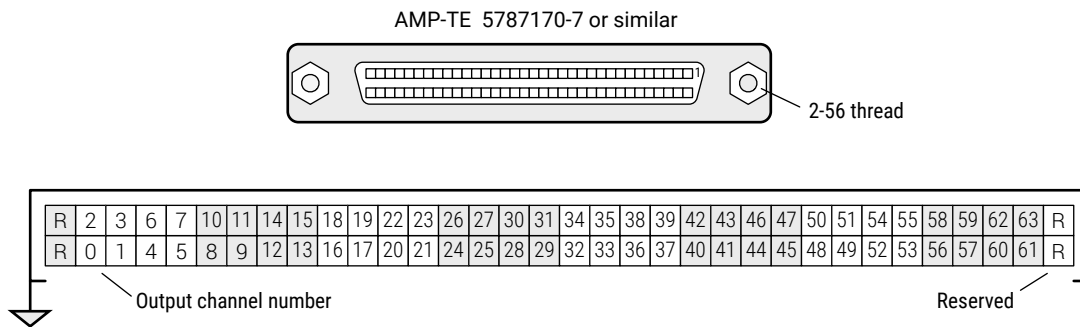
Communications

A standard mini-USB port is provided to communicate with the modules in the backplane. This port converts to and from the internal RS-232 bus using genuine FTDI parts[2]. Communicate with the first module by using these virtual COM port settings:

Baud rate	115200
Bits per symbol	8
Stop bits	1
Flow control	None

Test the connection with a universal command like "ID?". For more information on the communications protocol of each module, consult that module's documentation.

Chain interface

The chain interface allows the user to connect multiple backplanes together to make communications and power distribution easy. Qontrol offers the CABCHN cable to join two backplanes, such as the BP8, together at the input and output CABCHN ports. A pinout of the input and output ports is shown below.

Warning: When chaining multiple backplanes together, pay attention to the maximum current handling limits of the power connectors in the chain, particularly the first one.

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[2] Drivers for all major operating systems can be found online at ftdichip.com/drivers/vcp-drivers/.

Output from first backplane
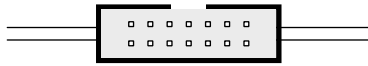
Wurth 61201421621 or similar

13	11	9	7	5	3	1
AVDD	AVDD	DVDD	ERR	ACT	RX	TX
AVSS	AVSS	DVSS			RTR	
14	12	10	8	6	4	2

Input to second backplane
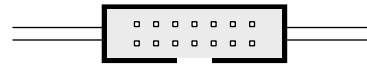
Wurth 61201421621 or similar

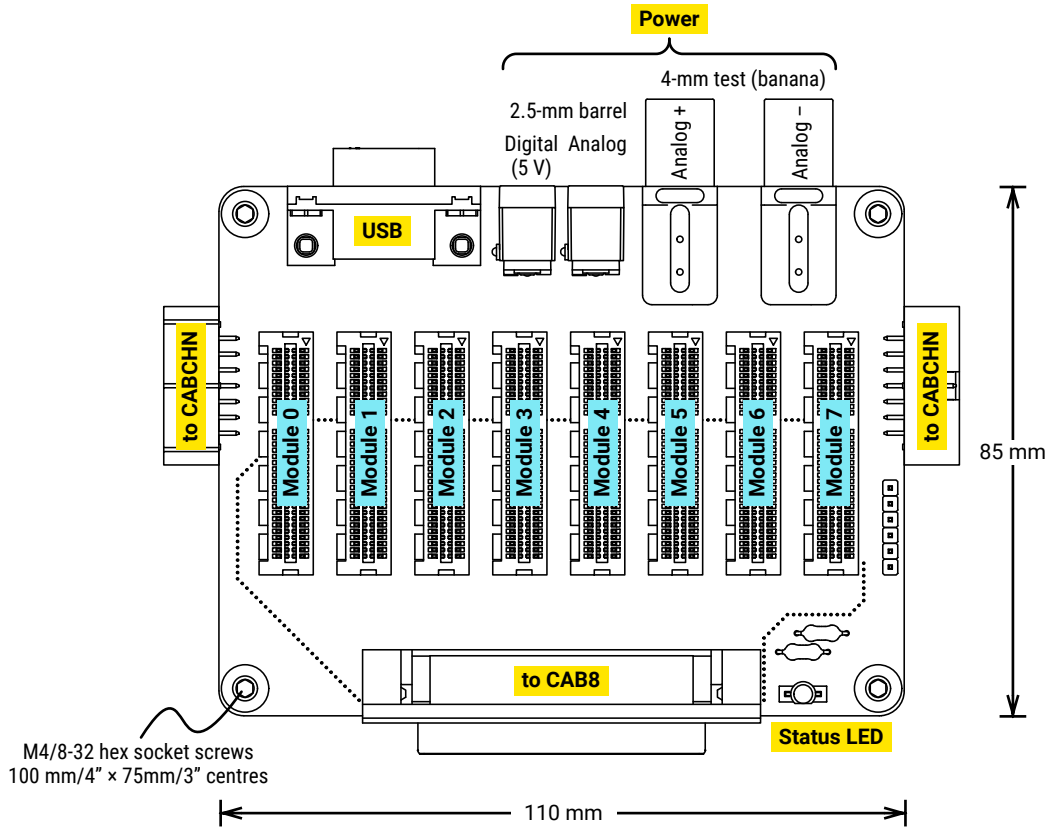| 2	4	6	8	10	12	14
	CTS			DVSS	AVSS	AVSS
TX	RX	ACT	ERR	DVDD	AVDD	AVDD
1	3	5	7	9	11	13

Indicator LED

The BP8 includes a bi-colour LED indicator. This backplane indicator is simply an OR of the "device active" (green) and "error" (red) indicator signals of any connected modules—no logic is done on the backplane itself.

Populating the backplane

Insert the first module into Slot 0 of the backplane. The inserted modules must form a *continuous chain* from the first slot, to allow the modules to communicate with each other. If your application calls for some slots to remain empty, Qontrol offers the BLANK8 blank module which you can insert instead to achieve this effect.

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Mechanical

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Notes and disclaimer

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