Specifications

All specifications are subject to change without notice.
Typical for 25 °C unless otherwise specified.
Specifications in *italic text* are guaranteed by design.

Output specifications

Table 1. Output specifications

Number of relays		24
Relay configuration		2 banks of 8 and 2 banks of 4
Contact configuration		24 Form C (SPDT) Normally Open, Normally Closed and Common available at screw terminals
Contact rating		*5 A @ 240 VAC or 28 VDC resistive*
Contact resistance		100 mΩ max (initial value)
Operate time		*10 ms max*
Release time		*5 ms max*
Vibration		*10 Hz to 55 Hz (amplitude 1.5 mm)*
Shock		*10 G (11 ms)*
Dielectric isolation (between relay open contact)		*300 VAC, 50/60 Hz (1 minute)*
Dielectric isolation (between PCB output lines)		*500 VAC, 50/60 Hz (1 minute)*
Life expectancy		*10 million mechanical operations min*
Power on state	S2 = pull-up	Energized. NO in contact with Common
	S2 = pull-down	Not energized. NC in contact to Common
Relay control logic polarity		User-configurable per bank via switch S1 for invert or non-invert (default). Switch settings for polarity can be read back via software through the USB bus. Switch settings do not affect the power on condition. ▪ Non-invert mode: When 0 is written or read back via the USB bus, relays are not energized. ▪ Invert mode: When 0 is written or read back via the USB bus, relays are energized.
Pull-up / pull-down		User-configurable per bank via switch S2 for pull-down (default) or pull-up. Switch settings can be read back via software. ▪ Pull-down will put the relays in non-energized mode on power up. ▪ Pull-up will put the relays in energized mode on power up.

Power

Table 2. Power specifications

Parameter	Conditions	Specification
USB +5 V input voltage range		4.75 V min. to 5.25 V max.
USB +5 V supply current	All modes of operation	10 mA max
External power supply (required)	CB-PWR-9V3A	9 V ±10% @ 3 A
Voltage supervisor limits - PWR LED	V_{ext} < 6.0 V, V_{ext} > 12.5 V	PWR LED = Off (power fault)
	6.0 V < V_{ext} < 12.5 V	PWR LED = On
External power consumption	All relays on, 100 mA downstream hub power	1.5 A typ, 1.8 A max
	All relays off, 100 mA downstream hub power	230 mA typ, 270 mA max

External power input

Table 3. External power input specifications

Parameter	Conditions	Specification
External power input		+6.0 VDC to 12.5 VDC (9 VDC power supply included).
Voltage supervisor limits - PWR LED (Note 1)	6.0 V > V_{ext} or V_{ext} > 12.5 V	PWR LED = Off (power fault)
	6.0 V < V_{ext} < 12.5 V	PWR LED = On
External power supply (included)	CB-PWR-9V3A	+9 V ±10%, @ 3 A

Note 1: The USB-ERB24 monitors the external +9 V power supply voltage with a voltage supervisory circuit. If this power supply exceeds its specified limit, the PWR LED turns off indicating a power fault condition.

External power output

Table 4. External power output specifications

Parameter	Conditions	Specification
External power output - current range		4.0 A max.
External power output (Note 2)	Voltage drop between power input and daisy chain power output	0.5 V max
Compatible cable(s) for daisy chain	C-MAPWR-x	x = 2 , 3 or 6 feet

Note 2: The daisy chain power output option allows multiple MCC USB products to be powered from a single external power source in a daisy chain fashion. The voltage drop between the device power supply input and the daisy chain output is 0.5 V max. Users must plan for this drop to ensure the last module in the chain will receive at least 6.0 VDC.

USB specifications

Table 5. USB specifications

USB "B" connector	Input
USB device type	USB 2.0 (full-speed)
Device compatibility	USB 1.1, USB 2.0 (hardware revision G and later are also compatible with USB 3.0; see Note 1 for information on how to determine the hardware revision)
USB "A" connector	*Downstream hub output port*
USB hub type	*Supports USB 2.0 high-speed, full-speed and low-speed operating points*
	Self-powered, 100 mA max downstream VBUS capability
Compatible products	*MCC USB Series devices*
USB cable type (upstream and downstream)	*A-B cable, UL type AWM 2527 or equivalent. (min 24 AWG VBUS/GND, min 28 AWG D+/D-)*
USB cable length	3 meters max.

Note 1: The board revision may be determined from the part number label on the housing that states "193773X-01L," where X is the board revision.

Relay contact pull-up/down option

Table 6. Relay pull-up/pull-down specifications

R35, R36, R41, R43, R45, R47, R49, R51, R87, R89, R91, R93, R96, R98, R100, R102, R103, R105, R107, R109, R112, R114, R116, R118	Relays NO contact pull-up (to USB +5 V) / pull-down, user installed.
R37, R40, R42,R44, R46, R48, R50, R52, R88, R90, R92, R94, R95, R97, R99, R101, R104, R106, R108, R110, R111, R113, R115, R117	Relays NC contact pull-up (to USB +5 V) / pull-down, user installed

Mechanical

Table 7. Mechanical specifications

Board dimensions (L × W × H)	431.8 × 121 × 20.3 mm (17.0 × 4.8 × 0.8 in.)
Enclosure dimensions (L × W × H)	482.6 × 125.7 × 58.9 mm (19.00 × 4.95 × 2.32 in.)

Environmental

Table 8. Environmental specifications

Operating temperature range	0 to 70 °C
Storage temperature range	-40 to 100 °C
Humidity	0 to 95% non-condensing

Main connector

Table 9. Main connector specifications

Connector type	Screw terminal
Wire gauge range	12 to 22 AWG

Screw terminal pin out

Table 10. Screw terminal pin out

Pin	**Signal Name**
1-NC	Relay 1 Normally Closed contact
1-C	Relay 1 Common contact
1-NO	Relay 1 Normally Open contact
2-NC	Relay 2 Normally Closed contact
2-C	Relay 2 Common contact
2-NO	Relay 2 Normally Open contact
3-NC	Relay 3 Normally Closed contact
3-C	Relay 3 Common contact
3-NO	Relay 3 Normally Open contact
4-NC	Relay 4 Normally Closed contact
4-C	Relay 4 Common contact
4-NO	Relay 4 Normally Open contact
5-NC	Relay 5 Normally Closed contact
5-C	Relay 5 Common contact
5-NO	Relay 5 Normally Open contact
6-NC	Relay 6 Normally Closed contact
6-C	Relay 6 Common contact
6-NO	Relay 6 Normally Open contact
7-NC	Relay 7 Normally Closed contact
7-C	Relay 7 Common contact
7-NO	Relay 7 Normally Open contact
8-NC	Relay 8 Normally Closed contact
8-C	Relay 8 Common contact
8-NO	Relay 8 Normally Open contact
9-NC	Relay 9 Normally Closed contact
9-C	Relay 9 Common contact
9-NO	Relay 9 Normally Open contact
10-NC	Relay 10 Normally Closed contact
10-C	Relay 10 Common contact
10-NO	Relay 10 Normally Open contact
11-NC	Relay 11 Normally Closed contact
11-C	Relay 11 Common contact
11-NO	Relay 11 Normally Open contact
12-NC	Relay 12 Normally Closed contact
12-C	Relay 12 Common contact
12-NO	Relay 12 Normally Open contact
13-NC	Relay 13 Normally Closed contact
13-C	Relay 13 Common contact

Pin	Signal Name
13-NO	Relay 13 Normally Open contact
14-NC	Relay 14 Normally Closed contact
14-C	Relay 14 Common contact
14-NO	Relay 14 Normally Open contact
15-NC	Relay 15 Normally Closed contact
15-C	Relay 15 Common contact
15-NO	Relay 15 Normally Open contact
16-NC	Relay 16 Normally Closed contact
16-C	Relay 16 Common contact
16-NO	Relay 16 Normally Open contact
17-NC	Relay 17 Normally Closed contact
17-C	Relay 17 Common contact
17-NO	Relay 17 Normally Open contact
18-NC	Relay 18 Normally Closed contact
18-C	Relay 18 Common contact
18-NO	Relay 18 Normally Open contact
19-NC	Relay 19 Normally Closed contact
19-C	Relay 19 Common contact
19-NO	Relay 19 Normally Open contact
20-NC	Relay 20 Normally Closed contact
20-C	Relay 20 Common contact
20-NO	Relay 20 Normally Open contact
21-NC	Relay 21 Normally Closed contact
21-C	Relay 21 Common contact
21-NO	Relay 21 Normally Open contact
22-NC	Relay 22 Normally Closed contact
22-C	Relay 22 Common contact
22-NO	Relay 22 Normally Open contact
23-NC	Relay 23 Normally Closed contact
23-C	Relay 23 Common contact
23-NO	Relay 23 Normally Open contact
24-NC	Relay 24 Normally Closed contact
24-C	Relay 24 Common contact
24-NO	Relay 24 Normally Open contact