Specifications

USB-ERB08

Document Revision 1.3, July, 2006

Specifications

Typical for 25 °C unless otherwise specified.

Specifications in *italic text* are guaranteed by design.

Output specifications

Table 1. Output specifications

Number of relays		8
Relay configuration		2 banks of 4
Contact configuration		8 Form C (SPDT) Normally Open, Normally Closed and Common available at screw terminals
Contact rating		*6 A @ 240 VAC or 28 VDC resistive*
Contact resistance		100 milliohms max (initial value)
Operate time		*10 milliseconds max*
Release time		*5 milliseconds max*
Vibration		*10 to 55 Hz (amplitude 1.5 mm)*
Shock		*10 G (11 milliseconds)*
Dielectric isolation (between relay open contact)		*300 VAC, 50/60 Hz (1 minute)*
Dielectric isolation (between PCB output lines)		*500VAC, 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 (controls relay power on state)		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)	MCC p/n CB-PWR-9	9 V ±10% @ 1 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	750 mA typ, 850 mA max
	All relays off, 100 mA downstream hub power	170 mA typ, 200 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 > Vext or Vext > 12.5 V	PWR LED = Off (power fault)
	6.0 V < Vext < 12.5 V	PWR LED = On
External power adapter (included)	MCC p/n CB-PWR-9	+9 V ±10%, @ 1 A

Note 1: The USB-ERB08 monitors the external +9 V power supply voltage with a voltage supervisory circuit. If this power supply exceeds its specified limit, the PWR LED will turn 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 Measurement Computing USB boards to be powered from a single external power source in a daisy chain fashion. The voltage drop between the module 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
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.

Relay contact pull-up/down option

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

R1, R3, R5, R7, R10, R12, R14, R16	Relays NO contact pull-up (to USB +5V) / pull-down
R2, R4, R6, R8, R9, R11, R13, R15	Relays NC contact pull-up (to USB +5V) / pull-down

Mechanical

Table 7. Mechanical specifications

Card dimensions	203.2 mm (L) x 121 mm (W) x 20.0 mm (H)
	8.0" (L) x 4.8" (W) x 0.8" (H)
Enclosure dimensions	241.3 mm (L) x 125.7 mm (W) x 58.9 mm (H)
	9.50" (L) x 4.95" (W)x 2.32" (H)

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

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