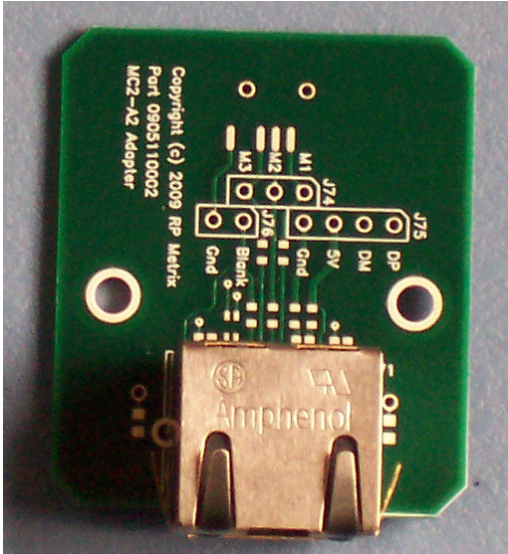


Motor Controller MC2 Adapter A2	MC2_A2
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Single-channel Microdrive Motor Controller Adapter for Miniature Microdrive Neural Recording Systems

- Power and Control from ND1MC2 Motor Controller
- 1 motor drive channel
- Solder pads and tie points for 3-wire motor cable
- Alternate 3-pin header for 3-wire motor cable
- Expansion headers for controller ground reference, 5VDC, and blanking signal
- Power and activity LEDs



Ordering Information

Configuration	Model Number
Motor Controller MC2 Adapter A2	MC2_A2

Absolute Maximum Ratings

Characteristic	Symbol	Min	Typ	Max	Unit
Motor Circuit Current	I_{MOT}	0		500	mA
Motor Circuit Voltage	V_{MOT}	2.4		4.6	V
Output Short-Circuit to Ground Duration	t_{SC}			∞	sec
Operating Temperature	T_A	0		70	°C
Storage Temperature	T_S	-40		85	°C
USB Host VBus	V_{VBUS}	-0.3	5.0	5.5	V
USB Host D+, D-	V_{USBD}	-0.5		5.25	V
Blanking Output Current	I_{BL}	-20		20	mA

Specifications

At $T_A = +25^\circ\text{C}$, $V_{DC} = 5\text{V}$, unless otherwise noted.

Characteristic	Symbol	Min	Typ	Max	Unit
Input DC Supply Voltage (in operation)	V_{DC}	4.5	5.0	5.5	V
Operating Supply Current	I_S		50	100	mA
Blanking High Level Output Voltage	V_{OH}		2.4		V
Blanking Low Level Output Voltage	V_{OL}		0.4		V

Description

The Motor Controller MC2 Adapter A2 is a printed circuit board assembly module that connects an RP Metrix MC2 or MC2+ Motor Controller to the motor within an ND1HS1 or ND1HS2 Single-Drive Neural Headstage. The MC2 motor controller connects to the adapter via the RJ-45 **Controller connector (J71)**. The adapter routes the motor drive signals from the MC2 through internal circuits to the 3-pin **Motor connector (J74)**. Solder pads near J74 can also be used for motor connections. The MC2 motor activation signal energizes the blanking signal in the 2-pin **Blanking connector (J76)**. A solder pad near the J76 ground pin can be used for a ground connection to the motor controller. A 4-pin **Expansion connector (J75)** provides access to the motor controller ground, power supply, and an embedded data signaling path.

The A2 adapter has two LED indicators mounted at the Controller connector:

- Green indicates the adapter is powered by the MC2
- Yellow indicates the motor drive signals are active.

The Controller connector mates to a standard Ethernet style 8-wire RJ-45 cable. The motor cable carries signals as described in the MC2 datasheet (ND1MC2.pdf):

- 3 Motor drive signals
- 1 Motor activation signal
- 5V DC power
- Motor controller ground
- USB 1.2 compatible differential pair (for future use)

Two isolated 0.125" holes are provided for mounting the PCB.

Two grounded 0.035" holes are provided for attaching a strain relief thread around motor wires soldered to the pads near J74. The thread may be glued to the PCB.

I/O Information

MC2A2-J71 (RJ-45 Jack) 8-Pin Controller Interface Connector

Pin #	Signal	Input/Output
1	USBA1 VBus (5V DC)	Input
2	USBA1 Ground	-----
3	Motor Drive 1	Input
4	Motor Drive 2	Input
5	Motor Drive 3	Input
6	Motor Active Indicator	Input
7	USBA1 D+	Input/Output
8	USBA1 D-	Input/Output

MC2A2-J74 (Male 0.1 pitch header) 3-Pin Motor Connector

Pin #	Signal	Input/Output
1	Motor Drive 1	Output
2	Motor Drive 2	Output
3	Motor Drive 3	Output

MC2A2-J75 (Male 0.1 pitch header) 4-Pin Expansion Connector

Pin #	Signal	Input/Output
1	USBA1 D+	Input/Output
2	USBA1 D-	Input/Output
3	USBA1 VBus (5V DC)	Output
4	USBA1 Ground	-----

MC2A2-J76 (Male 0.1 pitch header) 2-Pin Expansion Connector

Pin #	Signal	Input/Output
1	Motor Active Indicator	Output
2	USBA1 Ground	-----

Grounding

The Controller connector accepts a shielded cable connector. The shield is connected to ground via a 10 Meg Ohm resistor in parallel with a 4.7 nF capacitor.