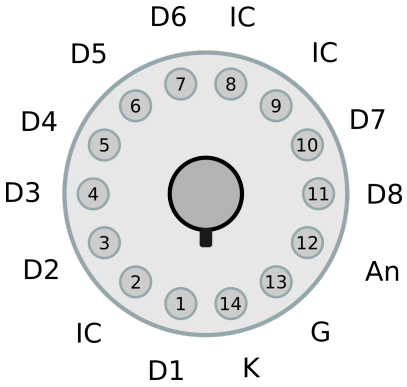
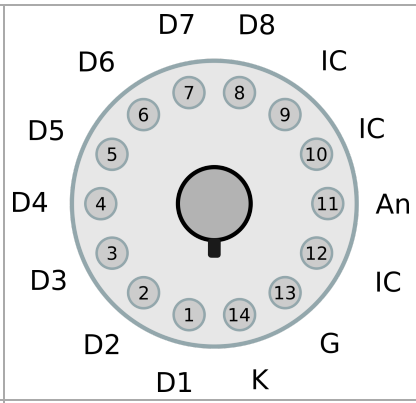
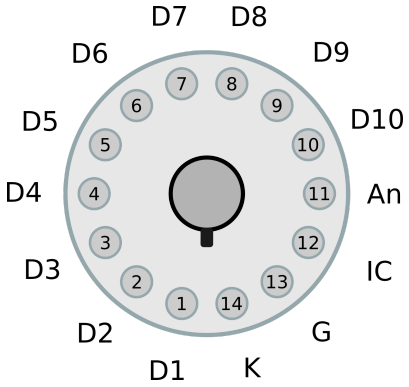
eMorpho Pinouts

Plug-on MCA
Top, side,
bottom view.

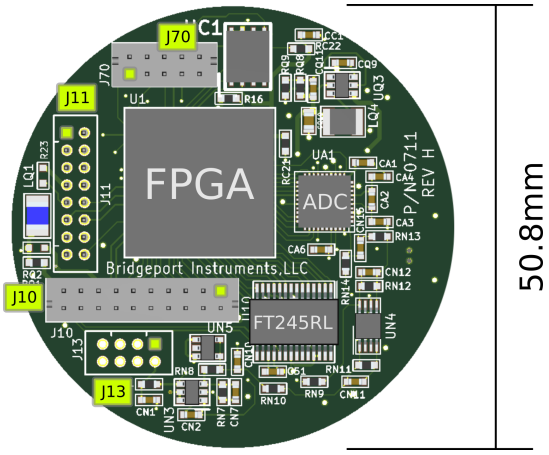
8-pin GPIO Connector, Switchcraft EN3P8MXPKG		
Pin	***Function***	
Pin	***SEL=GND***	***SEL=3.3V or N/C***
1	TMS	S0
2	TDO	S2
3	TDI	S4
4	TCK	S6
5	Vref=3.3V	S7
6	VD50	
7	GND	
8	SEL	

SEL has an internal 10kΩ pull-up resistor to 3.3V. When the device is not powered via USB, it can be powered via VD50 and GND. The voltage on VD50 is +5V nominal.

Three common PMT pinouts		
		
R6231, R6233	R1306, R1307	10-stage
P81T, N81T, P81L, N81L	P80T, N80T, P80L, N80L	P10T, N10T, P10L, N10L

Common PMT pinouts; For each pinout we show a typical PMT and the high voltage divider options.

eMorphoPCB connectors



eMorpho PCB, MCA only, no HV.

Connector J70, DF11-12		
#	***Name***	***Description***
1	VD33	3.3V, Vref for JTAG
2	TCK	JTAG clock
3	GND	Ground
4	TDI	JTAG Data In
5	TDO	JTAG Data Out
6	TMS	JTAG Module Select
7	C_CLK	Config Clock
8	C_CSB	Config Chip Select #
9	C_MOSI	Config MOSI
10	C_MISO	Config MISO

Pinout of the FPGA programming connector; A # indicates "active low".

Connector J10, DF11-20	
#	***Name***
1, 2, 3, 5, 6, 7, 8, 9, 11, 12, 13, 14, 16	S0 to S12
4, 10	GND, Ground
15	Solder option for external input or output power
17	5V USB power input
19	USB Data −
20	USB Data +

Pinout of the FPGA GPIO connector

Connector J13, DF11-8	
#	***Name***
1	VD33, 3.3V out
2	Anode
3	S11
5, 6	S10, S12
4	Ground
7	V50; +5V from USB bus
8	Vctrl for HV-generator

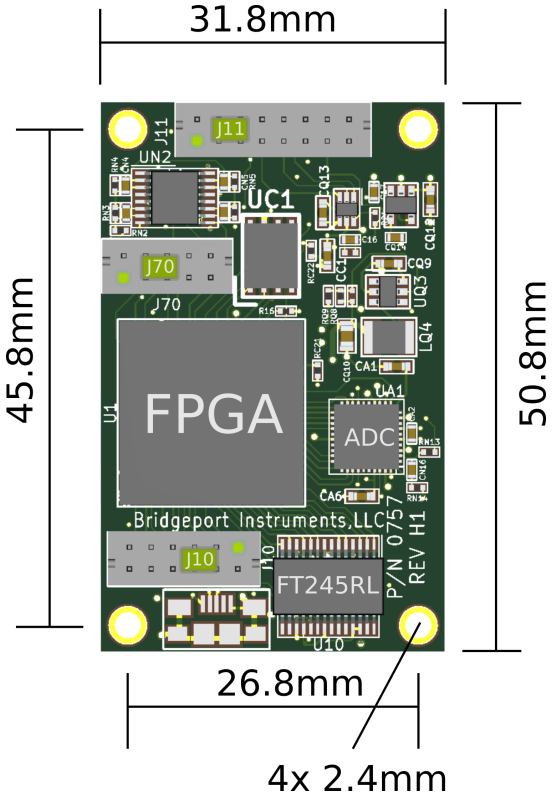
Pinout of the secondary detector connector

eMorpho PCB connectors

Connector J11, DF11-16		
#	***Name***	***Description***
1, 7, 8, 13, 15	GND	Ground
2	An	PMT Anode
3	HV_DATA	Serial data for HV-DAC
4	VD33	3.3V supply for high voltage generator.
5	HV_CLK	Serial clock for HV-DAC
6	HV_CSB	Chip-select # for HV-DAC
9	Vctrl	Analog high voltage control
10	TC77-DATA	Serial data from TC77 temperature sensor
11	TC77-CLK	Serial clock for TC77
12	TC77-CSB	Chip-select # for TC77
14	S13	FPGA GPIO 13 or XCLK
16	S14	FPGA GPIO 14 or clock output

Pinout of the primary detector connector

slimMorpho PCB connectors



slimMorpho PCB, MCA only, no HV.

Connector J11, DF11-16		
#	***Name***	***Description***
1	USB-DM;	USB Data −
2	+5V	5V USB power input
3	USB-DP;	USB Data +
4, 5, 11, 12	GND	Ground
6	An	PMT Anode
7	HV_DATA	Serial data for HV-DAC
8	+3.3V	Output to power high voltage generator.
9	HV_CLK	Serial clock for HV-DAC
10	HV_CSB	Chip-select # for HV-DAC
13	Vctrl	Analog high voltage control
14	TC77-DATA	Serial data from TC77 temperature sensor
15	TC77-CLK	Serial clock for TC77
16	TC77-CSB	Chip-select # for TC77

Pinout of the detector and USB connector

Connector J70, DF11-12		
#	***Name***	***Description***
1	VD33	3.3V, Vref for JTAG
2	TCK	JTAG clock
3	GND	Ground
4	TDI	JTAG Data In
5	TDO	JTAG Data Out
6	TMS	JTAG Module Select
7	C_CLK	Config Clock
8	C_CSB	Config Chip Select #
9	C_MOSI	Config MOSI
10	C_MISO	Config MISO

Pinout of the FPGA programming connector; A # indicates "active low".

Connector J10, DF11-12	
#	***Name***
1	V33; 3.3V out
2, 3, 4, 5, 6, 7, 8, 9, 10, 11	S0 to S9
12	GND, Ground

Pinout of the FPGA GPIO connector