Chapter 2 Interface Modules

UIM100C Universal Interface Module

HLT100C ***UIM100C***

The UIM100C Universal Interface Module is the interface between the MP150/100 and external devices. Typically, the UIM100C is used to input pre-amplified signals (usually greater than +/– 0.1 volt peak-peak) and/or digital signals to the MP150/100 acquisition unit. Other signals (e.g., those from electrodes or transducers) connect to various signal-conditioning modules.

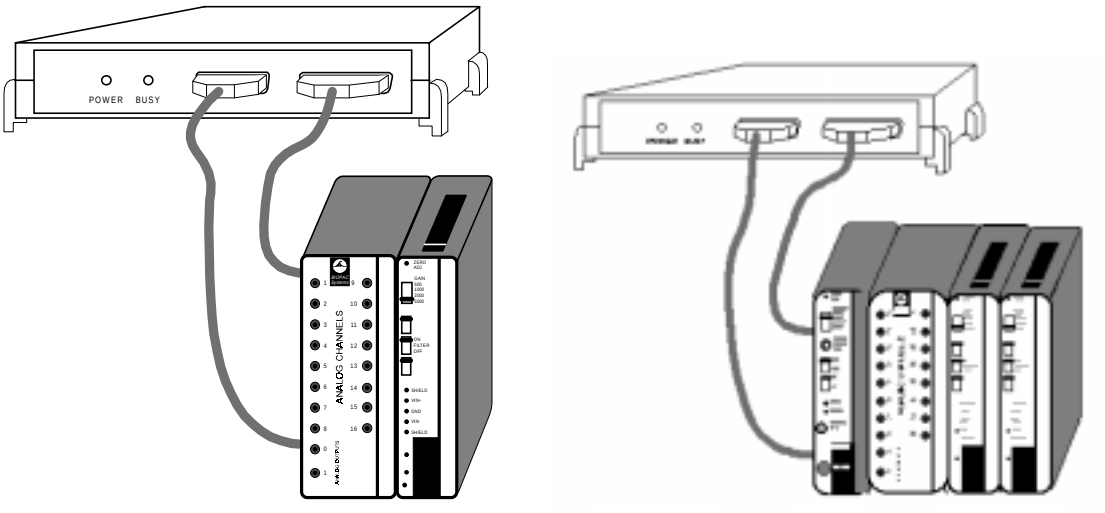
The Universal Interface Module (UIM100C) is designed to serve as a general-purpose interface to most types of laboratory equipment. The UIM100C consists of sixteen 3.5 mm mini-phone jack connectors for analog inputs, two 3.5 mm mini-phone jack connectors for analog outputs, and screw terminals for the 16 digital lines, external trigger, and supply voltages.

The UIM100C is typically used alone to connect polygraph and chart recorder analog outputs to the MP System. BIOPAC Systems, Inc. offers a series of cables that permit the UIM100C to connect directly to a number of standard analog signal connectors. Most chart recorders or polygraphs have analog signal outputs, which can be connected directly to the UIM100C.

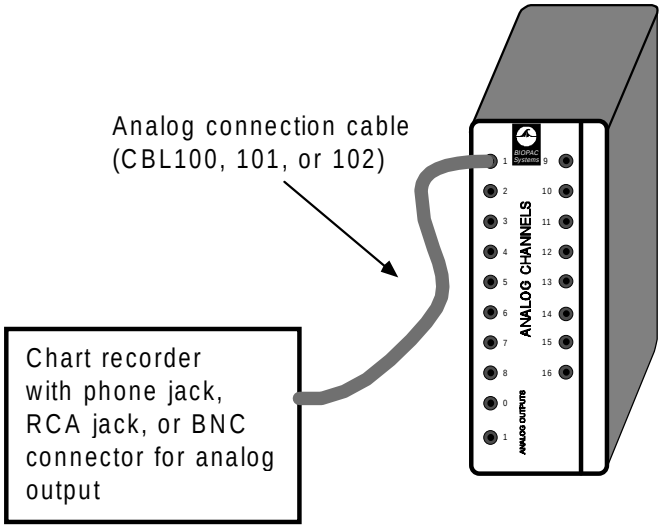
The UIM100C allows access to 16 analog inputs and 2 analog outputs on one side, and 16 digital input/output lines, an external trigger, and supply voltages on the other side. The UIM100C is designed to be compatible with a variety of different input devices, including the BIOPAC series of signal conditioning amplifiers (such as the ECG100C).

Connections between the UIM100C and the MP150/100 acquisition unit are made via two cables: one for analog signals (with a 37-pin connector) and one for digital signals (with a 25-pin connector). Use the 0.6-meter cables included with your system to connect the UIM100C to the acquisition unit.

When using the Universal Interface Module (UIM100C) with other 100-Series modules, the UIM100C is usually the first module cascaded in the chain. If using the STM100C, OXY100C or HLT100C, the module must be plugged in on the **left** of the UIM100C. Up to seventeen modules (including the UIM100C) can be snapped together, as illustrated in the following diagrams:



MP100 to UIM100C and amplifier moduleSTM100C and UIM100C and amplifier modules



Typical UIM100C to polygraph interface

When using the UIM100C, be careful not to short the "analog output" terminals together, and not to short across any of the connectors on the "Digital" (back) side of the module.

IMPORTANT USAGE NOTE

Mains powered external laboratory equipment should be connected to an MP System through signal isolators when the system also connects to electrodes attached to humans.

To couple external equipment to an MP System, use:

- For **analog** signals — **INISO** or **OUTISO** isolator (with **HLT100C**)
- For **digital** signals — **STP100** (with **UIM100C**)

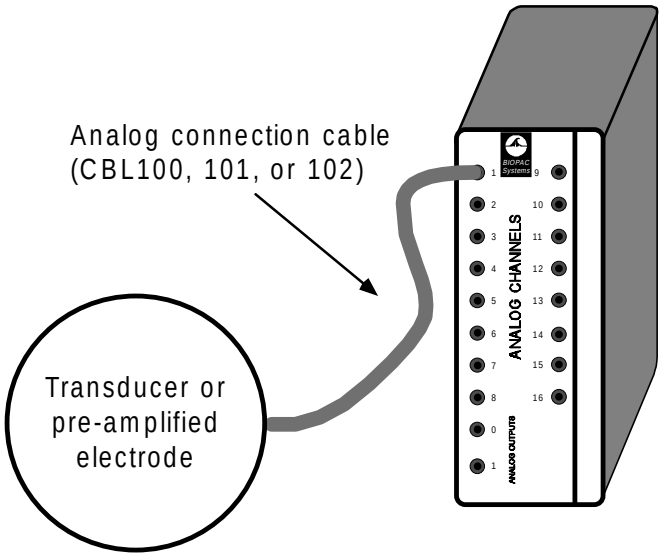
Contact BIOPAC for details.

Analog connections

As noted, the UIM100C requires cables equipped with standard 3.5mm mini-phone plugs to connect to analog signal sources. This type of connector is commonly available with many different mating ends. BIOPAC Systems, Inc. carries several different types, including BNC and phone plugs. Since the MP150/100 analog inputs are single-ended, the tip of the mini-phone plug is the input and the base (shield) of the mini-phone plug is the ground (or common).

NOTE: Make sure the cable that you route into the UIM100C is a **mono** 3.5 mm phone plug.

To connect to existing equipment (such as polygraphs or chart recorders), run a cable from the analog output terminal of the external device to the UIM100C. Since there are so many different devices that can connect to the MP150/100 it's impossible to cover them all.

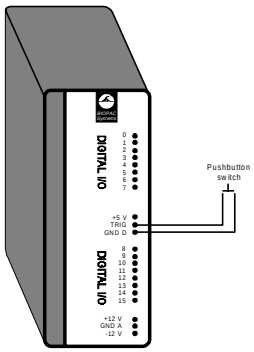


UIM100C connected to external analog signal source

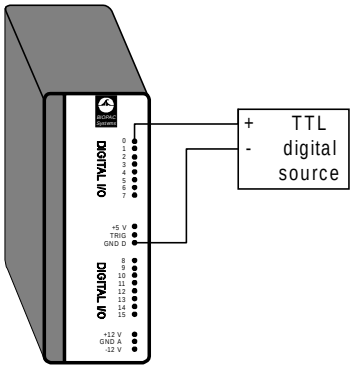
Please contact a BIOPAC Systems, Inc. applications engineer if you are not sure how to connect the MP System to your device or if you need a special cable.

Digital connections

A digital signal has only two voltage levels: 0 and +5 volts. Zero volts is a binary "0" and +5 volts is a binary "1." A **positive edge** is a 0 to 1 transition and a **negative edge** is a 1 to 0 transition. The MP150/100 digital I/O lines have internal pull-up resistors so that unconnected inputs will read "1."



Trigger connected to UIM100C

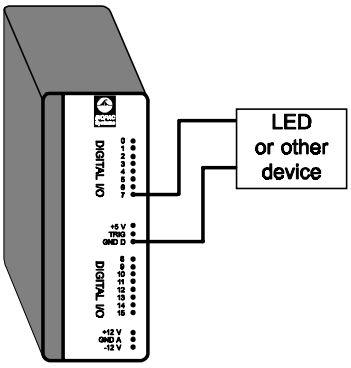


MP unit to digital source connection

The UIM100C allows access to 16 digital input/output lines through screw terminals which can accept either pin plugs or bare wires, as shown above. Be careful not to short the +5, +12V and –12V terminals together or to the GND A or GND D output terminal, or you may damage the MP150/100.

The 16 digital lines are divided into two blocks, I/O 0 through 7 and I/O 8 through 15. Each of these blocks can be programmed as either inputs or outputs. Do not connect a digital input source to a block that is programmed as an output.

It is also possible to connect an output device (such as an LED) to the digital side of the UIM100C. Leeds and similar devices can be connected so that they are "on" either when a signal output from the UIM100C reads 0 Volts or when a +5 Volt signal is being output. To connect an LED so that it defaults to "off" (i.e., the digital I/O reads 0), attach one lead of the output device to the GND D terminal on the UIM100C and connect the other lead to one of the digital I/O lines (I/O 7, for example). When configured this way, the device will be "off" when I/O 7 reads 0, and "on" when I/O 7 reads a digital "1"(i.e., +5 Volts). When connecting to an LED, be sure to use a current-limiting resistor (typically 330Ω) in series with the LED. Alternatively, you can connect one of the device leads to the +5V terminal on the UIM100C and leave the other lead connected to the digital line (e.g., I/O 7). With this setup, the device will be on whenever the I/O line (in this case digital I/O 7) reads 0, and on whenever the I/O reads a digital "1" (i.e., +5 Volts)



UIM100C Specifications

Analog I/O:	16 channels (front panel) – 3.5mm phone jacks
D/A Outputs:	2 channels (front panel) – 3.5mm phone jacks
Digital I/O:	16 channels (back panel) – screw terminals
External Trigger:	1 channel (back panel) – screw terminal
Isolated Power:	±12V, +5V @ 100 ma (back panel) – screw terminals
Weight:	520 grams
Dimensions:	7cm (wide) x 11cm (deep) x 19cm (high)