TCI SERIES TRANSDUCER CONNECTOR INTERFACES

TCI interface options

TCI Series transducer connector interfaces (TCIs) adapt a variety of transducer types to the DA100C module (TCIPPG Series connect directly to the PPG100C amplifier). Probes and transducers normally used with Grass, Beckman, World Precision Instruments and Lafayette Instrument’s equipment can be used directly with the DA100C when used with the appropriate transducer connector interface. The front of the TCI contains the appropriate connector while the rear has seven 2 mm pin jacks which plug directly into the DA100C.

TCIs are available for the transducer brands listed below. If no existing connector matches the required equipment, BIOPAC will build a special TCI for users, or users can use the TCIKITC to build their own. Please call or write BIOPAC with specific needs.

TCI100 Grass/Astromed transducers – 6 pin
TCI101 Beckman transducers – 5 pin
TCI102 World Precision Instrument transducers – 8 pin
TCI103 Lafayette Instrument transducers – 9 pin
TCI104 Honeywell transducers – 6 pin
TCI105 Modular phone jack connector – 4 pin (also used to interface NIBP100A and NIBP100D)
TCI106 Beckman transducers – 12 pin
TCI107 Nihon Koden transducers – 5 pin
TCI108 Narco transducers – 7 pin
TCI109 Fukuda transducers – 8 pin
TCI110 Gould transducers – 12 pin: Discontinued → use Fogg Cable and an available BIOPAC TCI
TCI111A Liquid metal transducers – 1.5 mm Touchproof male plugs (two)
TCI112 Hokanson transducers – 4 pin
TCI113 Hugo-Sachs/Harvard Apparatus – 6 pin
TCI114 BIOPAC SS Series Transducers – 9 pin
TCI115 Interface XLR Microphone

TCIPPG1 PPG100C amplifier to Geer Photo-electric (IR) plethysmogram transducer – 7 pin
TCIPPG2 PPG100C amplifier to TSD204 VPG vaginal plethysmogram transducer
TCIPPG3 PPG100C amplifier to Nonin DSUB9 – 9 pin

TCIKIT/C Build a customized adapter
TCI100 GRASS TRANSDUCER
INTERFACE

Pin | Signal  
---|--------  
1  | VREF2 (Set to -1 V)  
2  | VIN-  
3  | VIN+  
4  | VREF1 (Set to +1 V)  
6  | GND  
Connector | ITT Cannon WK-F-32S  
Typical VREF | ±1 V  

TCI101 BECKMAN TRANSDUCER
INTERFACE

Pin | Signal  
---|--------  
A  | VIN-  
B  | VIN+  
C  | VREF1 (Set to +1 V)  
D  | VREF2 (Set to -1 V)  
E  | GND  
Connector | ITT Cannon CA-3102-E-14S-5S  
Typical VREF | ±1 V  

TCI102 WPI TRANSDUCER
INTERFACE

Pin | Signal  
---|--------  
1  | VREF1 (Set to +5 V)  
2  | VIN+  
3  | VIN-  
4  | VREF2 (Set to -5 V)  
Connector | CUI Stack SDS-80J  
Typical VREF | ±5 V
### TCI103 LAFAYETTE TRANSDUCER INTERFACE

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>VREF2 (Set to -5 V)</td>
</tr>
<tr>
<td>E</td>
<td>GROUND</td>
</tr>
<tr>
<td>H</td>
<td>VIN+</td>
</tr>
<tr>
<td>K</td>
<td>VREF1 (Set to +5 V)</td>
</tr>
<tr>
<td></td>
<td>Connector: Amphenol 12F-013</td>
</tr>
<tr>
<td></td>
<td>Typical VREF ± 5 V</td>
</tr>
</tbody>
</table>

### TCI104 HONEYWELL TRANSDUCER INTERFACE

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VREF2 (Set to -1 V)</td>
</tr>
<tr>
<td>2</td>
<td>VIN-</td>
</tr>
<tr>
<td>3</td>
<td>VIN+</td>
</tr>
<tr>
<td>4</td>
<td>VREF1 (Set to +1 V)</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
</tr>
<tr>
<td></td>
<td>Connector: ITT Cannon WK-F-32S</td>
</tr>
<tr>
<td></td>
<td>Typical VREF ±1 V</td>
</tr>
</tbody>
</table>

### TCI105 PHONE PLUG (RJ-11) TRANSDUCER INTERFACE

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VREF1 (Set to +3 V)</td>
</tr>
<tr>
<td>2</td>
<td>VIN+</td>
</tr>
<tr>
<td>3</td>
<td>VIN–</td>
</tr>
<tr>
<td>4</td>
<td>VREF2 (Set to -3 V)</td>
</tr>
<tr>
<td></td>
<td>Connector: RJ-11 Phone plug</td>
</tr>
<tr>
<td></td>
<td>Typical VREF ±2 V DC</td>
</tr>
</tbody>
</table>
TCI106 BECKMAN (12-PIN) TRANSUDCER INTERFACE

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>VIN+</td>
</tr>
<tr>
<td>B</td>
<td>VIN–</td>
</tr>
<tr>
<td>C</td>
<td>VREF2 (-1 V)</td>
</tr>
<tr>
<td>D</td>
<td>VREF1 (+1 V)</td>
</tr>
<tr>
<td>E</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Connector: Amphenol 165-12

Typical VREF: ±1 V

TCI107 NIHON KOHDEN TRANSUDCER INTERFACE

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>VIN+</td>
</tr>
<tr>
<td>3</td>
<td>VREF1 (+1 V)</td>
</tr>
<tr>
<td>4</td>
<td>VREF2 (-1 V)</td>
</tr>
<tr>
<td>5</td>
<td>VIN–</td>
</tr>
</tbody>
</table>

Connector: JAE SRC-02A13-5S

Typical VREF: ±1 V

TCI108 NARCO (7-PIN) TRANSUDCER INTERFACE

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VIN+</td>
</tr>
<tr>
<td>2</td>
<td>VIN–</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
</tr>
<tr>
<td>5</td>
<td>(connect 1,600-ohm resistor between pins 5 and 7)</td>
</tr>
<tr>
<td>6</td>
<td>VREF1 (+1 V)</td>
</tr>
<tr>
<td>7</td>
<td>VREF2 (-1 V)</td>
</tr>
</tbody>
</table>

Connector: Amphenol 703-91T-3478-009

Typical VREF: ±1 V
TCI109 FUKUDA TRANSDUCER INTERFACE

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VIN+</td>
</tr>
<tr>
<td>3</td>
<td>VIN-</td>
</tr>
<tr>
<td>6</td>
<td>VREF2 (-1 V)</td>
</tr>
<tr>
<td>7</td>
<td>VREF1 (+1 V)</td>
</tr>
</tbody>
</table>

Connector: Hirshmann MAS 8100

Typical VREF ±1 V

TCI110 GOULD TRANSDUCER INTERFACE

Discontinued – see options online

TCI111A LIQUID METAL TRANSDUCER INTERFACE

Connector: XDCR

Connector Type: 1.5 mm Touchproof male plugs (accepts 1.5 mm Touchproof female socket XDCRs)

The TCI111A comes with an attached 3 meter cable that terminates in two Touchproof 1.5 mm male plugs for connecting to two 1.5 mm Touchproof 1.5 mm female sockets for Mercury (old style) or Indium Gallium liquid metal strain gauges.

TCI112 HOKANSON TRANSDUCER INTERFACE

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Iex+</td>
</tr>
<tr>
<td>2</td>
<td>VIN+</td>
</tr>
<tr>
<td>3</td>
<td>VIN-</td>
</tr>
<tr>
<td>4</td>
<td>Iex-</td>
</tr>
</tbody>
</table>

Connector: RJ-11 Phone plug

Typical Iex: 5 mA
TCI113 HUGO SACHS/HARVARD APPARATUS INTERFACE

TCI114 BIOPAC SS SERIES INTERFACE

TCI115 INTERFACE XLR MICROPHONE

TCIPPG1 PPG—GEER TRANSDUCER INTERFACE

TCIPPG2—VPG

TCIPPG3—NONIN 9-PIN INTERFACE

TCI115 INTERFACE XLR MICROPHONE

TCI113 HUGO SACHS/HARVARD APPARATUS INTERFACE

TCI114 BIOPAC SS SERIES INTERFACE

TCI115 INTERFACE XLR MICROPHONE

TCIPPG1 PPG—GEER TRANSDUCER INTERFACE

TCIPPG2—VPG

TCIPPG3—NONIN 9-PIN INTERFACE

TCI113 HUGO SACHS/HARVARD APPARATUS INTERFACE

TCI114 BIOPAC SS SERIES INTERFACE

TCI115 INTERFACE XLR MICROPHONE

TCIPPG1 PPG—GEER TRANSDUCER INTERFACE

TCIPPG2—VPG

TCIPPG3—NONIN 9-PIN INTERFACE

TCI113 HUGO SACHS/HARVARD APPARATUS INTERFACE

TCI114 BIOPAC SS SERIES INTERFACE

TCI115 INTERFACE XLR MICROPHONE

TCIPPG1 PPG—GEER TRANSDUCER INTERFACE

TCIPPG2—VPG

TCIPPG3—NONIN 9-PIN INTERFACE

TCI113 HUGO SACHS/HARVARD APPARATUS INTERFACE

TCI114 BIOPAC SS SERIES INTERFACE

TCI115 INTERFACE XLR MICROPHONE

TCIPPG1 PPG—GEER TRANSDUCER INTERFACE

TCIPPG2—VPG

TCIPPG3—NONIN 9-PIN INTERFACE

TCI113 HUGO SACHS/HARVARD APPARATUS INTERFACE

TCI114 BIOPAC SS SERIES INTERFACE

TCI115 INTERFACE XLR MICROPHONE

TCIPPG1 PPG—GEER TRANSDUCER INTERFACE

TCIPPG2—VPG

TCIPPG3—NONIN 9-PIN INTERFACE

TCI113 HUGO SACHS/HARVARD APPARATUS INTERFACE

TCI114 BIOPAC SS SERIES INTERFACE

TCI115 INTERFACE XLR MICROPHONE

TCIPPG1 PPG—GEER TRANSDUCER INTERFACE

TCIPPG2—VPG

TCIPPG3—NONIN 9-PIN INTERFACE

TCI113 HUGO SACHS/HARVARD APPARATUS INTERFACE

TCI114 BIOPAC SS SERIES INTERFACE

TCI115 INTERFACE XLR MICROPHONE

TCIPPG1 PPG—GEER TRANSDUCER INTERFACE

TCIPPG2—VPG

TCIPPG3—NONIN 9-PIN INTERFACE
TCIKIT AND TCIKITC CUSTOM INTERFACE KITS

Build custom transducer connector interfaces for DA100C amplifier modules.

- **TCIKIT** do-it-yourself kit includes housing, PC board with 7 attached PIN plugs (2 mm) and instructions. The kit comes partially assembled. Mount a connector to the housing and solder wires to the pins.

- **TCIKITC** is used to connect non-BIOPAC electrodes and transducers directly to BIOPAC biopotential or transducer amplifier modules.

The TCI case has two connector holes on the front, 0.44” and 0.75” in diameter. These sizes should accommodate most connectors. The aluminum label is intended to cover up the unused hole. Color-coded wires have been soldered to each of the seven DA100C input pins. They are connected as shown above.

**ADAPTING THE TCI**

The following instructions are for adapting the TCI for any particular connection. A “Bulkhead Mount” connector is the best type of connector to use.

1. Remove four screws from back of TCI so that the TCI PC board and case are separate.
2. Remove four connector-mounting screws from TCI case and set aside.
3. Check to see that the connector fits the TCI case. If not, the smaller (0.44”) hole can be enlarged using a hole enlarging drill bit.
4. Clip off unused wires from the TCI PC board. Be very careful not to clip the ones that will be used.
5. Note that most connectors must be mounted from the outside of the case. This means that the wires should first be routed through the appropriate hole, and then soldered to the connector.
6. Solder the appropriate wires to the connector.

   **CAUTION!** When soldering wires or components on the TCI PC board, be very careful not to desolder the pre-aligned pin plugs—albeit might not be possible to get them straight if they are inadvertently desoldered.

7. Bolt the connector to the case using the supplied 4-40 screws and nuts.
8. Bolt the TCI PC board to the TCI case.
9. Cover unused hole with supplied label.