



PRECISION INSTRUMENTS & SYSTEMS

USER'S MANUAL
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PARALLEL
BUS
TRANSDUCER

CODE _____

SN _____

RANGE _____

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PARALLEL BUS TRANSDUCER KITS

A PCS 400 can be configured to communicate directly with the Mensor Model 15500 Parallel Bus Transducer (referred to as PBT, external transducer or Bus Transducer). There are two kits available: one to interface the PCS 400 with up to four PBTs, and another to connect from five to eight PBTs.

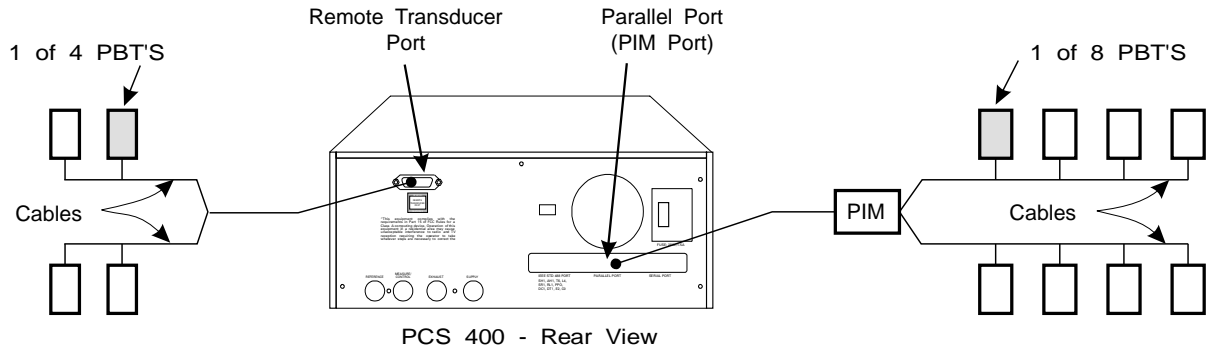


Figure 1 - Kit Configuration for Multiple PBT'S

The Model 15500 Parallel Bus Transducer is an external, high accuracy pressure measurement module. The transducer is essentially identical to the PCS 400 internal transducers except for the metal circuit board housing and the bus connector. The circuit board housing can be installed with the 25 pin D-sub bus connector facing either end of the PBT. Each PBT has a battery backed RAM chip which stores the transducer's serial number, temperature compensation coefficients, and calibration data.



Figure 2 - Parallel Bus Transducer

PBT ADDRESS

Each Bus Transducer within a group connected to either port of a PCS 400 must have a unique device address from 0 to 7. The address is set by a jumper on the top circuit board of each PBT as shown below in figure 3. The jumper is normally set to an appropriate address at the factory. However, it can be changed by placing the jumper on another pair of pins from W0 to W7 for address 0 through 7, respectively.

Depending on which port the transducer is connected to, the PCS 400 will convert the device address to another address as explained under 1a and 1b on page 4 in this supplement.

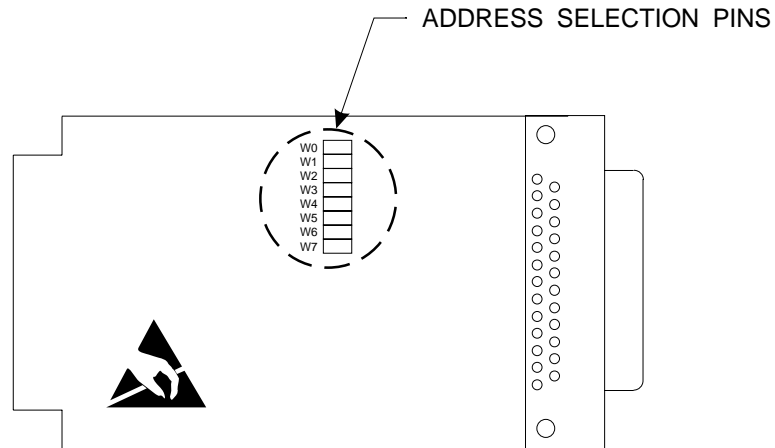
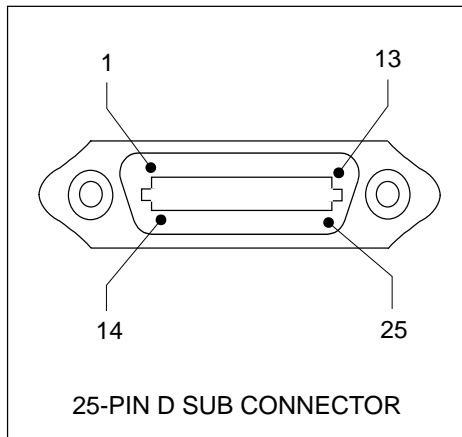


Figure 3 - PBT Address Selection Circuit Board

PBT CONNECTIONS

The Bus Transducer connector is a standard female 25 pin D-sub connector. The transducer operates over a modified Centronics parallel bus. The PBT bus differs from a standard Centronics bus in that the PBT bus supplies 12 volt DC power through pins 13 and 25 of the bus cable. The PBT port pinouts are shown below:



PIN	FUNCTION
1	SCLK
2	UNIT SEL A0
3	UNIT SEL A1
4	UNIT SEL A2
5	RAM/CAL SEL
6	A/D SEL
7	SENSOR WR
8	RAM DATA IN
9	NOT USED
10	DRDY
11	P-A/D & RAM DATA
12	T-A/D DATA
13	+12 VDC
14	GND
15	GND
16	GND
17	GND
18	GND
19	GND
20	GND
21	GND
22	GND
23	GND
24	GND
25	+12 VDC

Figure 4 - Transducer Port Pinouts

Always have the PCS 400 power OFF when connecting external devices. Parallel Bus Transducers can operate with up to 50 feet (total) of interconnecting cable. Standard ribbon cable and special Y-junction connectors available from Mensor, can be used to link the transducers, or they can be "daisy-chained" using standard parallel cables with 25-pin D-sub connectors.

The text of 1a on the following page is specific to the kit that adds from one to four PBTs, and the text of 1b covers the kit that adds from five to eight PBTs to a PCS 400. These kits add the necessary components to the PCS 400 for full MEASURE mode operation of the external transducers. In addition, the PBTs can be connected to the MEASURE/CONTROL port to use the external transducer in the CONTROL mode providing the full scale range of the PBT is not greater than the primary range of the PCS 400.

1a – ONE TO FOUR PBTs

A PCS 400 modified for use with up to four PBTs will have a 25 pin connector on the rear panel labeled REMOTE TRANSDUCER PORT (see figure 1). This port is a standard Centronics parallel port except for the power wiring. The pin-outs for this rear panel bus connector are the same as those shown in figure 4.

When a PCS 400 is powered up with this kit it recognizes each external transducer connected to the REMOTE TRANSDUCER PORT at their device address. The PCS 400 then adds 8 to the device address so that any of up to four bus transducers connected to this port are addressed by the host as transducer 08 through 15 (0 + 8 through 7 + 8). To read one of these PBTs, change the active transducer setting on the PCS 400 to the appropriate PBT address using the LIMITS/ACTIVE TRANSDUCER menu selections.

1b – FIVE TO EIGHT PBTs

Using more than four PBTs with a PCS 400 requires a Mensor Power Interface Module (PIM), PN 0014354001, to provide the necessary power to the external transducers. The PIM plugs directly into the Parallel Port on the rear of the PCS 400, and the external transducers then plug into the PIM.

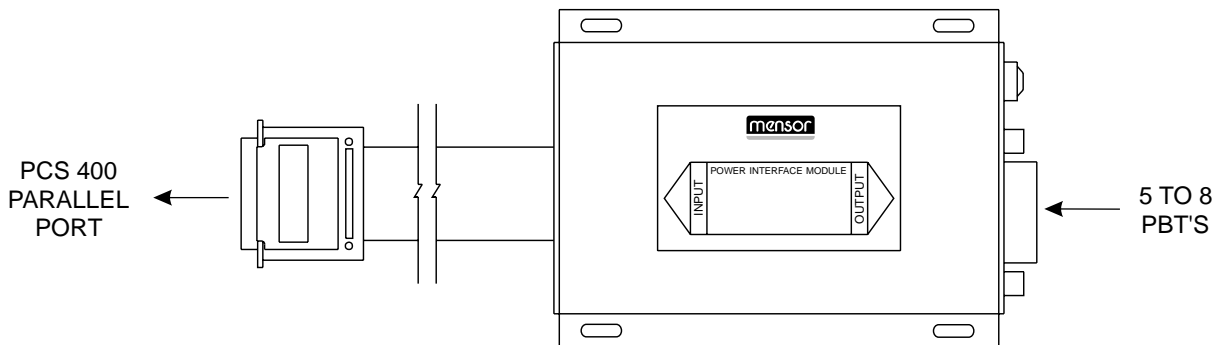


Figure 5 - Power Interface Module (PIM)

The procedure for setting up the PBTs and the PIM is as follows:

1. The PIM has a built-in ribbon cable approximately four feet long. Connect this cable to the PARALLEL PORT on the rear of the PCS 400 (see figure 1).

CAUTION: A PCS 400 WHICH HAS BEEN MODIFIED TO ACCEPT FROM ONE TO FOUR EXTERNAL TRANSDUCERS WILL HAVE AN EXTRA REAR PANEL CONNECTOR LABELED 'REMOTE TRANSDUCER PORT'. DO NOT CONNECT THE POWER INTERFACE MODULE TO THIS PORT. CONNECT THE PIM TO THE PARALLEL PORT, ONLY (SEE FIGURE 1).

2. Connect from five to eight remote transducers to the 25 pin connector built into the opposite end of the PIM. Use the cables and 25 pin T-adapters provided. The T-adapters can be connected in any configuration that appears suitable. A star configuration at the PIM, or daisy chaining at each transducer, or a combination of both, are acceptable. However, limit the total cable length to a maximum of 50 feet.
3. Connect the PIM power cord to an AC power source of 95 to 230 volts at 50/60 hertz.

4. Power up the host PCS 400 only after all connections and power are completed at the PIM. If power is not applied to the PIM first the PCS 400 will not recognize the remote transducers.
5. The PCS 400 will add 16 to the device address of each transducer it recognizes on the PARALLEL PORT so that the transducer addresses become 16 through 23 (0 + 16 through 7 + 16).
6. To read one of these PBTs, change the active transducer setting on the PCS 400 to the appropriate PBT address using the LIMITS/ACTIVE TRANSDUCER menu selections.

SPECIFICATIONS

The specifications for the Parallel Bus Transducer are the same as those shown in the Specifications section of the PCS 400 manual PN 0014141001, where applicable, with the exceptions as given below.

PBT

- Size: 2.5" wide x 3.3" high x 4.56" deep
(6.35 cm x 8.38 cm x 11.58 cm).
- Weight: 1.9 pounds (0.86 kg).
- Power: Requires 9 to 15 VDC (12V nominal) @ 120 mA.
- Warm-up: Approximately 30 minutes.

Transducer Volume (cubic Centimeters):

Table 1 – Transducer Volume

	Pressure Chamber	Reference Chamber
Gauge Unit	0.6 cc	<20 cc
Absolute Unit	0.6 cc	N/A

Mounting: The PBT may be mounted either vertical or horizontal. There are four 6-32 UNF threaded holes in the base, three 8-32 UNF threaded holes on the pressure port side, and two 8-32 UNF threaded holes on the rear from which to mount the transducer. See figure 6 for mounting hole patterns. The PBT cover can be reversed such that the bus connector (*) can be on either end.

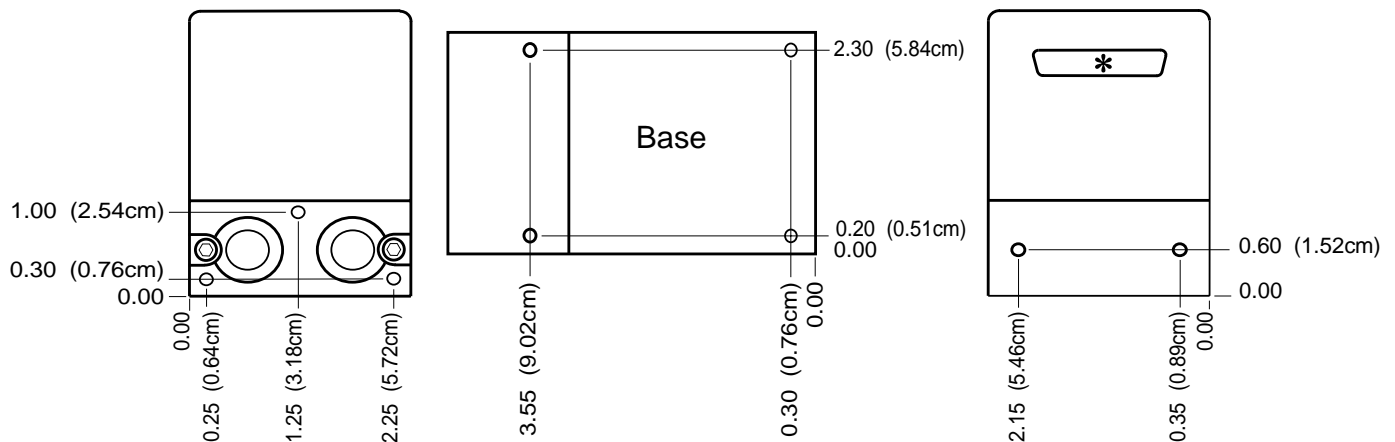


Figure 6 - PBT Mounting

PIM

- Size: 5.1" wide x 2.7" high x 6.90" deep
(12.95 cm x 6.86 cm x 17.53 cm).
- Weight: 2.0 pounds (0.91 kg).
- Power: 84–264 VAC, 50 W maximum.
- Outputs: The PIM provides TTL level signals with pinouts compatible with a standard IBM-PC Centronics printer port output.

WARNING: DO NOT CONNECT THE MENSOR BUS TRANSDUCER DIRECTLY INTO A STANDARD IBM-PC CENTRONICS PARALLEL PRINTER PORT. DAMAGE TO THE COMPUTER COULD RESULT! CONNECT THE MENSOR PARALLEL BUS TRANSDUCER TO THE POWER INTERFACE MODULE OR A SPECIALLY EQUIPPED PCS 400, ONLY.

- Mounting: It is not necessary to secure the PIM, however, four slotted holes are provided in the base flanges for a secure mounting if desired. Orientation is not a consideration as the module may be mounted in any attitude.

1c – HIGH PRESSURE PBT

The standard maximum range for external Parallel Bus Transducers is 1000 psi. However, ranges of up to 10,000 psi (hydraulic) are available. Anyone interested in these higher ranges can contact Mensor for details and specifications.

User's Notes:

A large grid area for user notes, consisting of a 20x20 grid of small squares. The grid is composed of 20 columns and 20 rows of small squares, providing a space for handwritten notes or calculations.