PM-101-CE: PentaMetric Internet Interface Instructions
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The PentaMetric "Internet Interface": is a TCP server that allows access to all data from the PentaMetric Input Unit (PM-5000-U), and also allows the programmed data settings to be entered. It is designed to be accessed through a "Windows" computer into which the **PMComm2** program (or later version) has been installed. This is available as a download from our web site: www.bogartengineering.com. **It also will only work with the PentaMetric Input unit with version 2.0 or higher.** The version number can be determined by removing the lid of the Input unit, and looking for the chip that is labeled: "PentInput ver x.y" You must have a version where the "x.y" is "2.0" or greater. A previous version can be upgraded by calling us.

In order to use the PentaMetric Internet Interface, a number of TCP/IP settings need to be set into the unit first. This section below explains how to configure the Interface to use it on your network.

Physical connections: The "Internet Interface" is installed by connecting the 4 communication wires from the PM-5000-U "input unit" (or PM-100_C display unit) to the green, 4 terminal connector on the interface. They must be connected in proper order, as indicated by the: +,-,3,4 as indicated on the label on the lid (and also the green circuit boards for all PentaMetric devices). It is necessary to remove the lid from the box to do this. The 4 wires must be connected in the proper order. (+ to +, - to -, etc.) . Accidentally shorting the "+" and "-" wires while the input unit is connected can damage the input unit—so it is advisable to first remove the 4 terminal plug at the input unit while connecting the wires to the Internet Interface, then check that the connections are correct before plugging the 4 terminal plug into the input unit. The Ethernet connector can be connected to a TCP/IP enabled network.

To set up the interface:
1. Remove the four screws holding the lid on the Interface Unit. On the circuit board of the Interface Unit there are two jumpers, the Defaults Jumper (labeled "J3") and the Password Change Jumper (labeled "J5"). Make sure that both jumpers are in the position closest to the Ethernet jack of the Interface Unit (i.e. the little black plastic piece on each jumper should cover the two pins closest to the Ethernet connector out of each row of three).

2. At this point, there are two ways to get access to the Internet configuration settings of the Interface:
       If you have a network with a DHCP server, you can just connect the Interface Unit to the network directly. Use a standard ("straight through") Ethernet cable to plug the Interface Unit into a router, switch, or hub on your network.
       If you have a network that does not have a DHCP server, or you do not want to connect the Interface Unit to the rest of your network while you are configuring it, you must connect it

directly to a PC with an Ethernet port. To connect the Interface Unit directly to a PC, you need a crossover type Ethernet cable.

   Note: When the Interface Unit is connected directly to a PC using a crossover cable, it will use an IP address of 169.254.1.1 if it does not detect a DHCP server. In this case it also starts its own DHCP server, which is only designed to give an IP address to one device (the PC), which will get an address 169.254.0.2

3. Open the **PMComm** program referred to in first paragraph above (version PMComm829 or higher) and click "Options". On the communications tab, select "Network Port" for the communications type, and choose the "Connect with this NetBIOS name" option. In the box, type the default NETBios name, which is "**PENTAMETRIC1**". In the "Pentametric will listen on Port Number" box, type in the default port of **1701**. Click the "Test" button to make sure the computer can connect to the Interface Unit, then click OK.

4. Click the "Connect" button, then click "Program the PentaMetric." From there, choose the "Network TCP/IP Settings" option. First click the "Set to Default Values" button (**this is necessary**), and then type in the correct addresses and options. If you do not know how to set these settings, ask your network administrator for this information.

NOTE: The password functionality has not been implemented in this beta-test unit. The following step 5 is for future reference only.
5. If you want to set a password, type a password of up to 16 characters in the "Password" box. All characters found on an English keyboard, including spaces, are valid, and the password is case sensitive.

6. Once the configuration settings are correct, click "OK" and then "Done" to exit the programming menu. Click the "Disconnect" button on the main screen of the PMComm program. **IMPORTANT**: **For the new settings to take effect, the Defaults Jumper, labeled "J3" on the Interface Unit, must be moved to the position away from the Ethernet jack**.

NOTE: The password functionality has not been implemented in this beta-test unit. The following step 8 is for future reference only.
8. If you wish to protect the password from being changed if anyone else gets access to PMComm, move the Password Jumper, labeled "J5" on the Interface Unit, to the position away from the Ethernet jack.

   A note about the password: Unless the password is being changed, the password is only sent over the network in a hashed form. However, when the password is being changed, it is sent in "cleartext."   This means that anyone monitoring your connection could potentially see your password as it is being changed.

9. The process for making the PentaMetric accessible from outside your network varies considerably depending on the configuration of your network.

IMPORTANT: The Internet settings are stored in the PentaMetric Input Unit, not the Interface Unit. This means and Interface Unit will always use the settings that are programmed into the Input Unit that it is currently connected to. However, the hardware MAC (Media Access Control) address is stored in the interface unit.

TROUBLESHOOTING:

If PMComm does not connect to the PentaMetric, check the following things:

1. On the Interface Unit circuit board, there is a green LED labeled "D4". If this LED is not lit, the Interface Unit cannot communicate with the Input Unit. Check the wiring from the battery system to the Input Unit and the wiring between the Input Unit and the Interface Unit. If the "3" and "4" communications lines to the interface are reversed it will not work. At the 4 pin green connector on the PM-101-CE when wired to the input unit, using a multimeter measure DC voltage from the two pins labeled "-" and "+" which should be about 8.8Volts in the correct polarity. Then put the multimeter on "AC" volts and measure volts from "-" to 3 and then "-" to 4. The ac (communications) volts should be, at both places about 2 volts AC. Between + and – there should be about 4 volts AC. If you do not see this do the same where the wires come from at the connector on the PM-5000-U input unit to discover a possible wiring error.

2. On the front of the Ethernet connector, there are two LEDs. The left (green) LED indicates that an Ethernet cable is connected correctly between the Interface Unit and another device on the network. If the light is not lit, check that you have used the correct type of cable (crossover or straight-through). Although the Interface Unit will work with either type of cable if the network device it is connected to has auto-crossover ("Auto MDIX") capabilities, it must be connected with the right kind of cable if the other device does not have auto-crossover capabilities.

3. Try "pinging" the Interface Unit. On Windows, open up the Command Prompt by clicking Start, then Run, and typing "cmd" (without the quotes) and pressing enter. Then type "ping pentametric1" and press enter. You should get lines that start with "Reply from" if communications is working. Alternately, if you plugged the Interface Unit directly into the computer, you can also try "ping 169.254.1.1". If you get an error message instead, there is a problem with your computer network or the Interface Unit.

4. If pinging the device works, but the "Connect" and "Test" buttons in PMComm do not, double-check the settings in PMComm, and ensure the jumper labeled "J3" on the Interface Unit circuit board is connecting the two pins closest to the Ethernet connector.

5. If you are still having a problem, consult your network administrator (if you have one) or contact Bogart Engineering. **www.bogartengineering.com**