Chapter 4

uM260 MICRO MONITOR INSTALLATION

This section of the *uM260 Micro Monitor Installation Manual* describes the requirements and procedures for installing the monitor in the central office or CEV location and making sure device wiring and cabling requirements have been fulfilled. If you have not yet completed all of the procedures described in Chapter 2 of this manual, please do so before proceeding.

Unpacking Equipment

1. Carefully unpack the uM260's shipping carton and check the contents for damage.

   Note: System Studies Incorporated is not responsible for damages sustained during shipment or unpacking. If it is apparent that the equipment has been damaged in transit, please notify the shipping agent before you proceed with the instructions in this section of the manual.

2. Verify that all of the required components have been shipped. The enclosed packing slip indicates the quantity and type of components included in the shipment.

MONITOR COMPONENTS

The modem version of the uM260 Micro Monitor (P/N 9800-6260M) includes the following components:

- uM260 chassis equipped with controller/processor board
- RJ-11 to RJ-11 telephone line cable (6 feet)
- Mounting brackets (2)
  - ✓ machine screws (4)—for attaching brackets to chassis
  - ✓ wood screws and washers (4 ea.)—for wall mounting

The LAN version of the uM260 Micro Monitor (P/N 9800-6260L) includes the following:

- uM260 chassis with controller/processor board
- Mounting brackets (2)
  - ✓ machine screws (4)—for attaching brackets to chassis
  - ✓ wood screws and washers (4 ea.)—for wall mounting
- DB-9 Male/Female Serial Cable (6 feet)—for PC or laptop to Micro Monitor connection. Used to configure the uM260's controller for LAN communications.

3. If any of the components listed above for the type of uM260 monitor you have ordered are not included in the shipment, please notify System Studies Incorporated at (800) 247-8255 or (831) 475-5777.

To complete the uM260 installation, you will also need:

- One (1) dedicated connector block (P/N 9800-6055) and one (1) 25-pair connector cable with male/male Amphenol connectors (P/N 9800-6017-X). The "X" designation represents cable length required for your installation.

— OR —

- One (1) 21-Pair Termination Adapter (P/N 9010-0062). Please note that the termination adapter plugs directly into the uM260 and does not require a separate connector cable.

Setting Up the uM260 Monitor

The uM260 Micro Monitor is a small, self-contained chassis that does not need to be opened for installation or operation. Depending upon the desired installation location, the unit can be placed on a suitable and accessible horizontal surface, installed on a wall using the brackets and screws provided, or mounted to an equipment rack (see kit options below).

INSTALLATION KIT OPTIONS

The uM260 Micro Monitor is also sold in various kit configurations for small office cable pressurization system monitoring applications and for installation in a CEV huts or remote air dryer cabinets. Also available is a rack-mountable panel kit with Termination Adapter enclosure for copper cable theft monitoring applications.

Cable Pressurization System Monitoring

- uM260 Rack Mount Panel Kit (P/N 9900-0260). This kit consists of a 23-inch wide by 3.5-inch high steel panel with a cutout for a uM260 Micro Monitor (purchased separately). An addition cutout on the panel provides the means of routing power and connector cables from the back of the rack assembly to the panel face (for forward-mounted uM260 power and cable connections). Also included with the kit are the necessary rack mounting bolts and washers.

- Small Office Monitoring Kits:
  - for previously unmonitored offices: P/N 9900-6263M/L-X/Y
    (M=modem version, L=LAN version; X=0-19 SCFH, Y=0-47.5 SCFH)

  - for offices currently being monitored by a now-discontinued System Studies Dial-a-Ducer: P/N 9900-6265M/L (M=modem version, L=LAN version).

- Remote Dryer Monitoring Kit: P/N 9800-4849-W/X/Y/Z (W=0-9.5 SCFH, X=0-19 SCFH, Y=0-47.5 SCFH, Z=0-95 SCFH). This kit includes a rugged waterproof case containing a uM260 monitor, a 6-pair Termination Adapter, a 115V AC to -48V DC power supply, a backup battery, and a Flow Measurement Assembly—all the components required to monitor air pressure and air flow at the installation. It also provides the ability to detect and alarm on AC power failures. The backup battery sustains monitoring functionality for up to two hours if AC power fails.

Copper Cable Theft Monitoring

- Copper Theft Termination Kit (P/N 9900-6260). This kit consists of a 23-inch wide by 3.5-inch high steel panel with cutouts for a uM260 Micro Monitor (purchased separately) and a 21-Pair Termination Adapter, which is installed in a protective enclosure (supplied). The top of the enclosure can be removed to provide access to the Termination Adapter for wiring. The kit also includes a 3-inch connecting cable equipped with one 25-pair male and one 25-pair female Amphenol connectors , a nylon cable tie with fastener for securing the cabling in place, and mounting accessories.

For information regarding these kits, please refer to the System Studies website (*www.airtalk.com*), or call (800) 247-8255.

Required uM260 Installation Tools

Some or all of the following tools may be required during the installation of the uM260:

- Medium straight-blade screwdriver (if mounting unit to a panel, equipment rack or vertical wood surface)
- Small straight-blade screwdriver (for securing power connection and conductor pairs into the Termination Adapter's locking jaws)
- Wire strippers
- Wire wrap tool for securing tip and ring jumpers to the dedicated connector block, if used with the uM260 monitor.

Before installing the uM260 monitor, make sure you have a copy of the central office work order that was prepared for the installation. If applicable, this work order identifies the equipment rack number and designated position for the uM260 chassis, the fuse bay and fuse number required for the power connection, the phone line assigned for use with the monitor, and the connector block bay number and position.

Note: Also make sure, if you are installing the LAN version of the uM260 monitor, that you obtain the necessary IP address, port designation, gateway and subnet information. Consult your IT personnel for assistance, if necessary.

Once this information has been obtained, you can install the uM260 monitor at its designated location. If mounting the monitor to a panel or wall surface, use the brackets, bolts and screws provided.

Power Supply Hookup

The following instructions pertain specifically to a central office installation. However, similar procedures would apply when installing a Micro Monitor in a SLC hut or other environmental enclosure.

1. The central office installation work order specifies what fuse panel to use for supplying CO battery to the uM260 monitor. Make sure that you use only CO talk battery. This type of DC

power filters any spikes that may occur when the central office batteries are being charged with AC power.

2. Check the continuity of the power leads from the central office battery fuse panel to the uM260. You must be able to identify the -48 volt power lead and the +48 volt return.

Power Module Location

3. Find and remove the black power connection block on the back of the monitor. This small rectangular block is located next to the cable connector near the center of the unit (see Photo 4-1). It is recommended that you remove the power connection block from its connector before attempting to wire it. This simplifies the process of connecting the three conductor wires. To remove the block, pull it straight out from the back of the chassis.

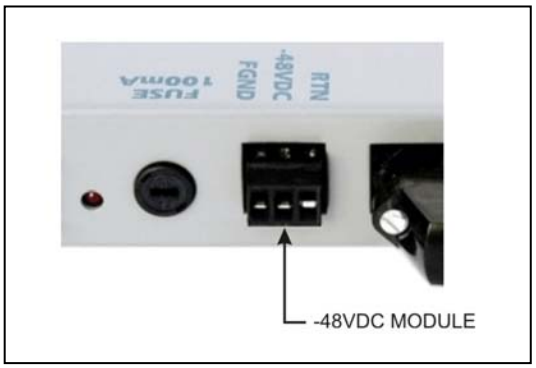

Photo 4-1: Power Module Location

Wiring Conductors

4. Using a small, straight-blade screwdriver, unscrew the terminal jaws on the power connection block. The terminal jaws, which are used to lock the conductors in place, are shown enlarged in Figure 4-1. When turned counterclockwise, the adjustment screws on the top of the block open the jaws so that the power and return leads can be inserted.

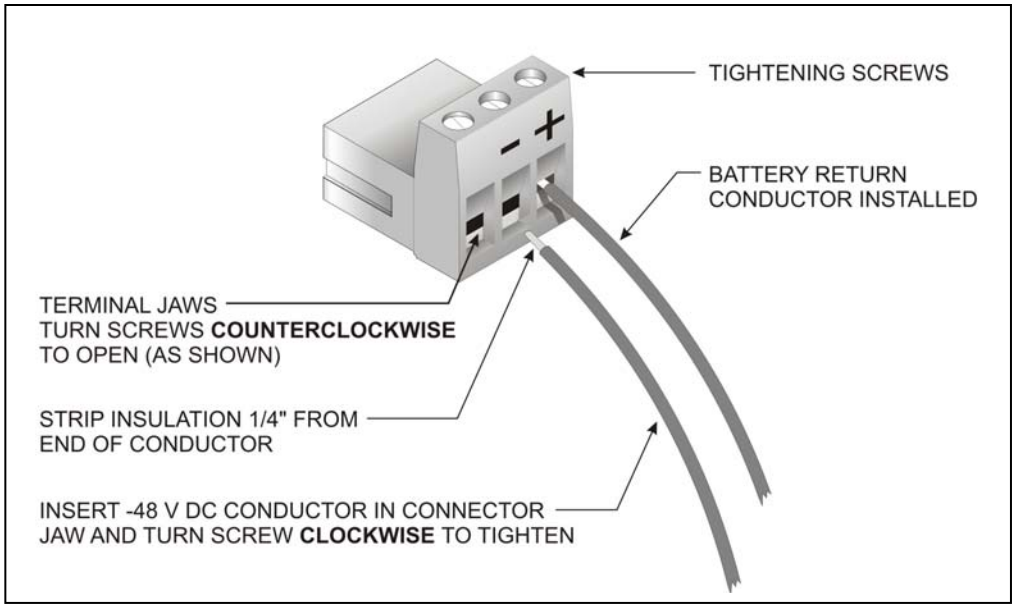

Figure 3-1: uM260 Power Connector Wiring

Note: Make sure that the jaws are opened all the way (so they are no longer visible) before you insert the ends of the conductors.

5. Identify the conductor that provides the -48 volt power supply from the CO battery. Insert this lead into the CENTER terminal jaw and tighten the appropriate adjustment screw (by

turning it clockwise) to ensure a proper connection. As you tighten the screw, the jaw will push the conductors toward the side of the block with the adjustment screw.

6. Insert the +48 volt return conductor in the terminal jaw to the right of the power lead. Both of these connections are also shown in FIGURE 4-1.

7. The uM260 Micro Monitor is equipped with a 12 inch by ¼ inch frame ground strap that is secured to the chassis on one end using a #10 terminal and lock washers (PHOTO 4-2). Connect the free end of the frame ground to a CO earth ground bus bar on the equipment rack.

PHOTO 4-2: UM260 MICRO MONITOR WITH GROUND STRAP

WARNING: A good frame ground or earth ground must be established, or the uM260 monitor will not operate properly. Make sure that the wire used for grounding can be manually traced back to an acceptable earth ground. Do not merely assume that established grounding procedures are satisfactory.

8. Plug the power connection block back into the slot at the back of the monitor, making sure you replace it in its proper position.

9. After the power connection block has been securely fastened in the monitor, flip the power supply switch (located on the back of the monitor) to the "On" position. In a few seconds the uM260's power supply LED will light, indicating that the unit is properly powered.

Connecting Monitoring Device Pairs

For purposes of explanation, it is assumed that the desired Cable Section Locator (CSL) devices have already been installed and that the assigned monitoring pairs used have been carefully identified and routed—using jumpers, if necessary—to the designated place in the office or CEV location where the uM260 is being installed. The next step would be to wire the devices to the connector block or termination adapter.

The information below addresses the two device pair wiring options available for the uM260 Micro Monitor: the direct plug-in termination adapter and the larger capacity connector block. The

preferred method is to use the 21-Pair Termination Adapter that has been specifically designed by System Studies Incorporated for use with the Micro Monitor.

TERMINATION ADAPTER

The 21-pair adapter (P/N 9010-0062) accommodates the full monitoring capacity of the Micro Monitor. It contains four rows of locking terminal jaws for the single contact control relay, four binary device pairs, and 16 resistive or current loop transducers that can be monitored by the uM260 (FIGURE 3-2). The Termination Adapter contains an Amphenol connector which can be directly inserted into the Micro Monitor, eliminating the need for a connector cable.

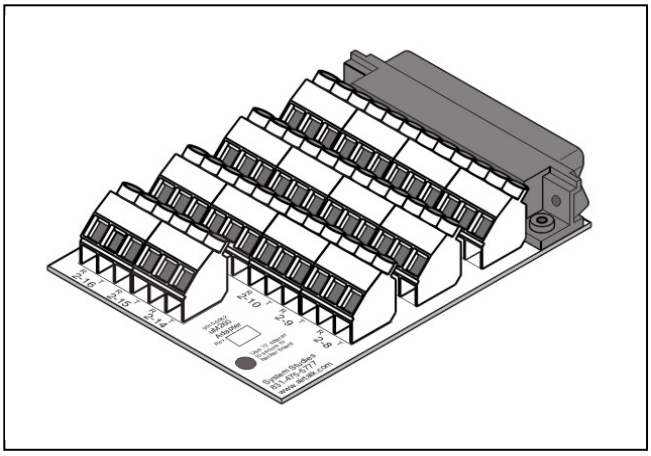

FIGURE 4-2: TERMINATION ADAPTER

Note: The adapter's 16 transducer pair termination points are also used to terminate monitoring pairs for the CopperWATCH application. In installations where both a Detection Pair and a Verification Pair will be used (recommended), this would provide capability for monitoring eight individual cables. The total will be doubled for installations that use only one monitoring pair per cable.

100-PAIR CONNECTOR BLOCK

Before the introduction of the Termination Adapters, all uM260 installations required the use of a separate 50- or 100-pair connector block for terminating device pairs. PHOTO 4-3 shows the 100-pair block supplied by System Studies (P/N 9800-6055). Using this connector block with the uM260 also requires one 25-pair cable with a male Amphenol connector on each end (P/N 9800-6017-X).

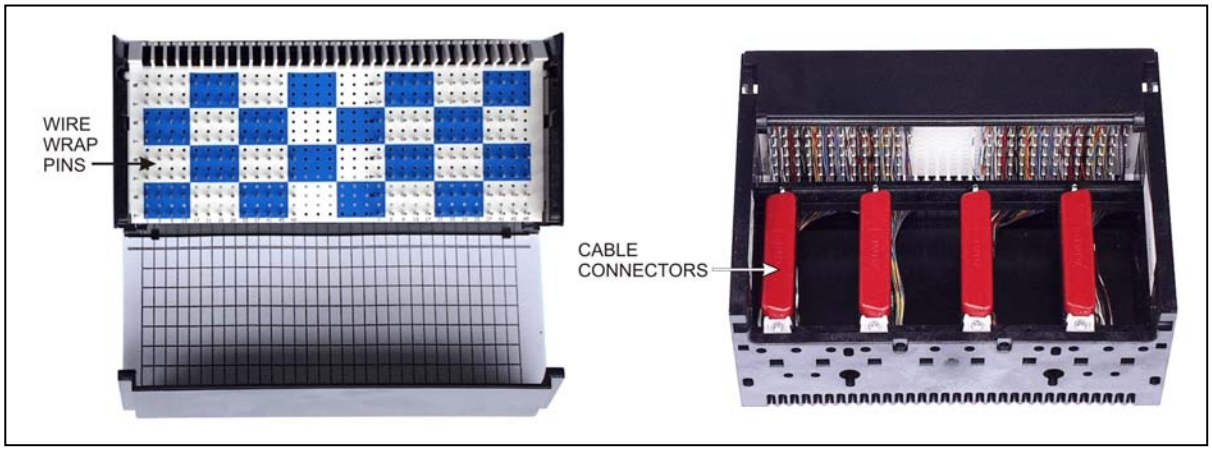

PHOTO 4-3: DEDICATED CONNECTOR BLOCK

USING A TERMINATION ADAPTER

The wiring schematic shown below in FIGURE 4-3 identifies the proper termination locations for devices on the 21-pair Termination Adapter (P/N 9010-0062). There are three and a half rows of locking terminals. The row closest to the Amphenol connector is used for the control relay pair, the three binary device pairs, and the first transducer pair. The remaining rows are used for the other transducer pairs. To help during the wiring process, the adapter is clearly marked with Device # designations and conductor tip (T) and ring (R) lettering.

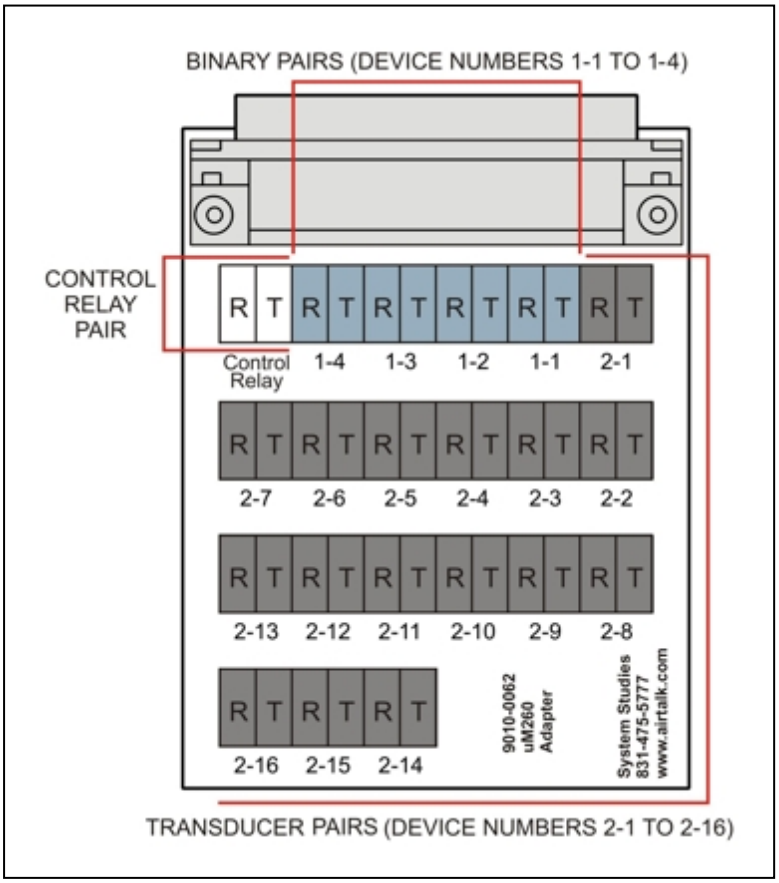

FIGURE 4-3: 21-PAIR TERMINATION ADAPTER WIRING (TERMINAL JAWS OMITTED FOR CLARITY)

The illustration above shows where the PressureMAP-monitored device pairs need to be terminated. Notice that the first row, closest to the Amphenol connector, is used for the control relay, the four binary device pairs and the first transducer pair. The remaining three rows of locking jaw connections are used for the remaining 15 transducer pairs.

When using this adapter with CopperWATCH, only the terminal pairs reserved for the transducers (marked 2-1 though 2-16) can be used to terminate the monitoring pairs. In applications where two pairs are used to monitor a cable (Detection and Verification), there is an additional wiring requirement. The Detection Pairs are typically wired to the odd numbered jaws (2-1, 2-3, 2-5, etc.). The Verification Pairs are wired to the even numbered pairs (2-2, 2-4, 2-6, etc.).

Before you perform the device wiring procedure described below, you should refer to the PressureMAP or CopperWATCH Data Entry Forms that were used to compile and organize the

monitoring data (Examples 3-1 and 3-2 in the previous chapter). The information on these forms helps to ensure that the appropriate PressureMAP-monitored devices or CopperWATCH Cable Section Locators are each assigned a unique uM260 *Device #*, which corresponds to the wiring requirements explained above.

Procedure for PressureMAP-Monitored uM260:

1. Remove approximately one half inch of insulation from the ends of each conductor pair to be wired.

2. Locate the control relay pair, if applicable, and insert the conductor ends into the designated locking jaws located on the row closest to the Amphenol connector (refer to Figure 4-3 above).

3. Secure the conductors in place by tightening the locking jaw screws with a small flat blade screwdriver.

4. Locate the first assigned binary device pair, if applicable. Identify the correct location for this pair on the Termination Adapter. Notice the "R" and "T" designations printed on the adapter. The Ring conductor goes into the slot on the left, and the Tip goes into the locking jaw on the right.

5. Insert both the Tip and Ring conductors, and secure them in place using the screwdriver.

6. Repeat steps 4 and 5 for each additional assigned binary device pair that will be wired to the uM260 monitor. Make sure to use the correct terminal slots.

7. Repeat the wiring process for all analog device pairs (pressure, flow and resistive contact alarm devices). Notice the right to left numbering sequence on the Termination Adapter.

8. When you have finished the wiring the device pairs, insert the Termination Adapter's male connector into the female Amphenol connector slot at the rear of the uM260.

At this point the physical process of installing the uM260 has been completed. You will need to notify the person responsible for performing the required data entry that the unit is in place and awaiting testing.

Procedure for CopperWATCH-Monitored uM260:

1. Remove approximately one half inch of insulation from the ends of each conductor pair to be wired.

2. Locate the assigned conductor pair(s) for the first monitored cable. Determine which pair is assigned for the Detection Pair and which is assigned for the Verification Pair. (Detection Pairs are wired to even numbered slots, Verification Pairs are wired to odd numbered slots.)

3. Insert the Tip and Ring conductors into the terminal's locking jaws. Notice the "R" and "T" designations printed on the adapter. The Ring conductor goes into the slot on the left, and the Tip goes into the locking jaw on the right.

4. Secure the conductors in place by tightening the locking jaw screws with a small flat blade screwdriver.

5. Insert the next monitoring pair, if applicable, into the appropriate jaw locations on the second row of the adapter, making sure the conductors are firmly seated.

6. Repeat steps 2-4 for each additional assigned monitoring pair that will be wired to the uM260 monitor.

7. When you have finished the wiring process, insert the Termination Adapter's male connector into the female Amphenol connector slot at the rear of the uM260. Once the unit is powered up, data entry has been completed, and communications between CopperWATCH and the uM260 have been established and tested, the uM260 should be ready for operation.

USING A DEDICATED CONNECTOR BLOCK

The option to use a dedicated connector block to terminate device pairs for the uM260 installation requires a bit more work and expense, but it is a proven wiring alternative if a Termination Adapter is not available for the installation.

Mounting the Connector Block

Unlike the Termination Adapter, which plugs directly into the uM260 monitor, the dedicated connector block must be mounted in the designated equipment bay as described below:

1. Determine the location(s) of the designated equipment bays from the central office work order.

2. Arrange to obtain a suitable mounting bracket for the connector blocks. System Studies supplies a mounting bar for this purpose (P/N 9800-6090), intended for use with the P/N 9800-6055 dedicated connector block. The connector block is equipped with a variety of slots for easy installation (FIGURE 4-5).

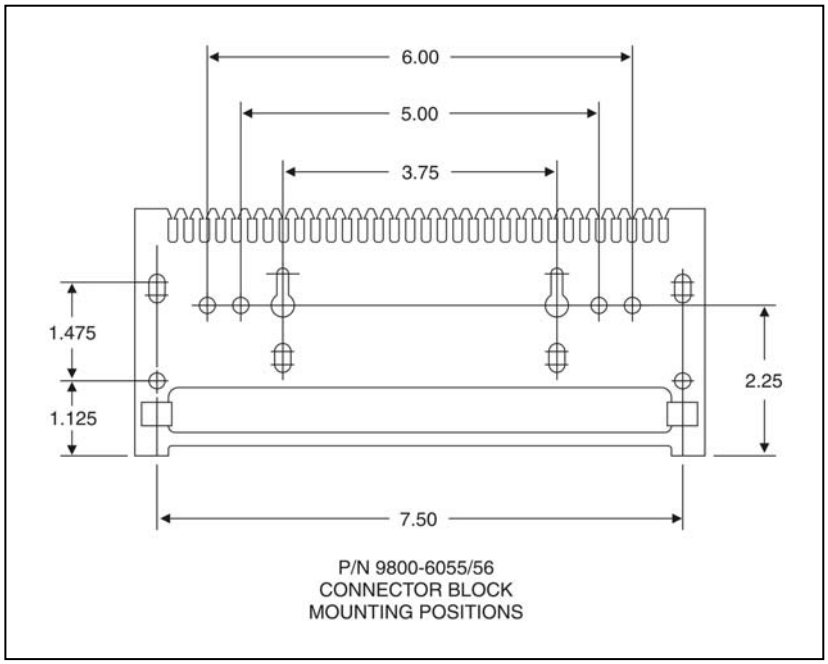

FIGURE 4-5: CONNECTOR BLOCK MOUNTING POSITIONS

3. Bolt any mounting brackets that are not already in place into the designated equipment bays.

4. Before you bolt the block into the bracket, make sure that there is sufficient room below the block to insert the connector cable. If there is adequate access to the block, proceed to bolt the block onto the equipment bay bracket using the nuts and bolts provided.

With the connector block in place and the Micro Monitor chassis installed, the last physical installation procedure is to wire the block and make the cable connection to the uM260 as described below.

Block Wiring Description

The standard dedicated connector block (P/N 9800-6055) used for the uM260 installation provides wire wrap pins for terminating up to 100 devices on dedicated pairs. Since the uM260 has been designed to monitor a maximum of 21 devices in a cable pressurization system and 16 monitoring pairs in a cable theft monitoring application, only a portion of the block will actually be used for the installation. Nonetheless, in order to use a connector cable between the block and the monitor, it is important that the correct pins are used for the installation.

The two examples below illustrate how pairs are wired to the connector block when the uM260 is used with PressureMAP (FIGURE 4-6) and with CopperWATCH (FIGURE 4-7).

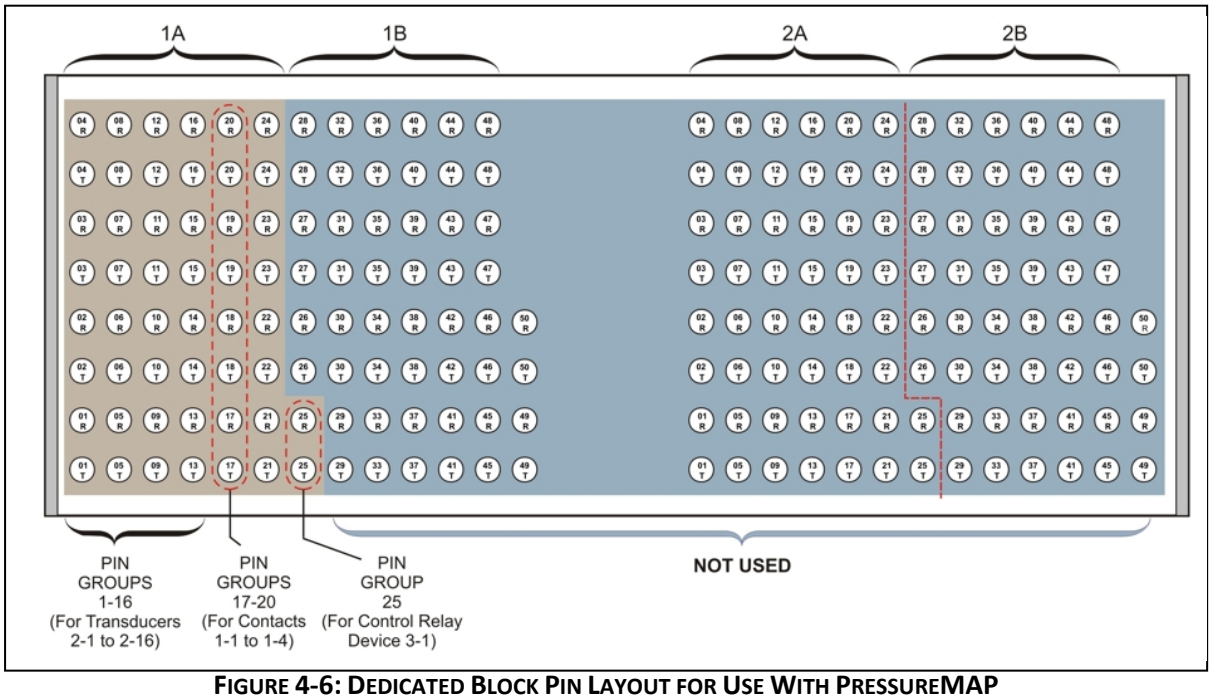

FIGURE 4-6: DEDICATED BLOCK PIN LAYOUT FOR USE WITH PRESSUREMAP

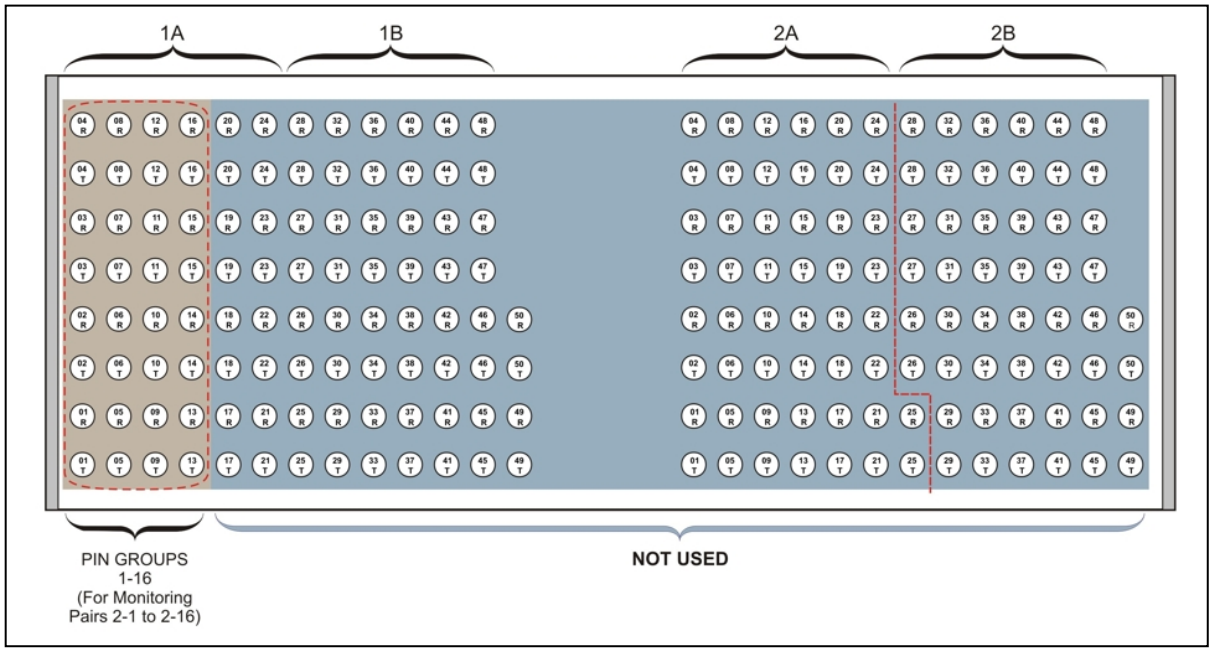

FIGURE 4-7: : DEDICATED BLOCK PIN LAYOUT FOR USE WITH COPPERWATCH

Block Pin / Cable Connector Arrangement

The face of the block (the side with the wire wrap pins) is divided into two main groups, each consisting of 100 wire wrap pins. Pins are numbered on the block in ascending order, beginning in the lower left corner. The first vertical row of pins in each group starts with the Tip 01 pin, followed by the Ring 01 pin, the Tip 02 pin, the Ring 02 pin, etc. There are eight pins (four tip and ring pairs) in each vertical row. The last row of pins in each half section of the block contains only four pins, two each for the 49th and 50th device pairs.

Located on the bottom the block are four 25-pair cable connectors, each of which is internally wired to a group of 50 pins (25 pairs). The first group of 50 pins on the left is wired to connector 1A, and the second group is wired to connector 1B. This arrangement is repeated on the right side, using connectors 2A and 2B (FIGURE 4-8).

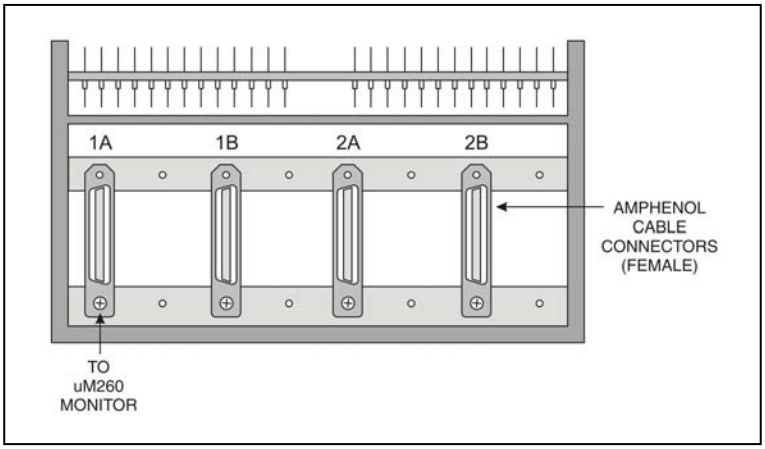

FIGURE 4-8: DEDICATED BLOCK CABLE CONNECTOR POSITIONS

Recommended Pin Group

To simplify the installation process for the Micro Monitor, it is recommended that you use the first group of pins (those associated with connector 1A) for your monitoring pairs. Please refer to the illustrations in FIGURES 4-6 and 4-7 to identify what pairs need to be wired to which group of pins. It is important not to deviate from the schematic when wiring device pairs to the block.

Note: As a general rule, device numbering for the uM260 Micro Monitor does NOT correspond to the pin numbering designations on the block. When the uM260 is used in stand-alone mode or with PressureMAP, pin groups 1–16 are assigned Access #s 2-1 to 2-16 (analog devices); pin groups 17–20 are assigned Access #s 1-1 to 1-4 (binary devices); and pin group 25 is designated as Access # 3-1 (control relay). For CopperWATCH only Pin groups 1-16 will be used.

WIRING AND CABLE REQUIREMENTS

There are only a few requirements for wiring monitoring device pairs to the uM260 monitor via the System Studies dedicated connector block. These requirements are described below:

Circuit Connections

1. One pair of jumper wires is required for each device. In central office installations, jumpers from the central office frames will be used to wire device pairs from the field to the dedicated connector block. Refer to Figure 1-1 in Section 1 of this manual for an illustration of a typical central office installation.

2. As recommended above, the first group of 50 pins on the left side of the connector block is typically used to wire device and monitoring pairs for the Micro Monitor. In order to match monitoring device termination points with database mapping requirements, device pairs must be wired in the following manner:

3. Place one end of a 25-pair cable equipped with two male-to-male Amphenol connectors into connector slot 1A on the bottom of the dedicated connector block.

   Note: Make sure you have identified the correct slot before you insert the cable connector. All of the connectors on the P/N 9800-6055 block are equipped with lock-in barbs to provide a positive and permanent cable connection. Once a cable has been inserted into the block's female Amphenol connector, it cannot easily be removed.

4. Route the other end of the connector cable to the uM260 monitor and attach it to the monitor's 25-pair connector. Make sure the cable is securely fastened.

This completes the wiring and cabling requirements between the uM260 and dedicated connector block. Once the monitor has been installed, communications have been established, and the device wiring has been completed, you can create or update the unit's database via CopperWATCH as described in Section 3 of the *CopperWATCH Installation & Operations Manual*.