

Chapter 4

INTRODUCTION

The information in this section of the manual describes how to wire a device termination block and make the necessary cable connections to the 289H-M LSS relay card. Detailed wiring examples are provided for both of the standard wire wrap 289H connector blocks provided by System Studies: the P/N 9800-6055 Dedicated Block, and the P/N 9800-6056, Subscriber Block. These illustrations help to explain where jumpers are terminated on the blocks and how they are routed from the block's internally wired cable connectors to the appropriate connectors on the 289H-M relay card.

ACCESS NUMBER DESCRIPTION

PressureMAP/PressureWEB identifies each device in a 289H-M-monitored office using a five digit access number. The access number represents a device pair's position (or address) relative to other devices wired to the 289H-M monitor. The first three digits of the number designate the position (slot) in the chassis where the relay card is located. This part of the access number is more applicable to the full size 289H LSS monitor because the larger monitor has the capacity for 16 relay card slots. Since the 289H-M has only one relay card, all access numbers assigned to the 289H-M will begin with 001. The last two digits of the number represent the pins (Tip and Ring) on the connector block where the device circuit is connected, as well as the corresponding 289H pair select relay used to provide the device reading.

When devices are properly wired to the 289H-M, as described in this section, access numbering is sequential: 001-01 to 001-25 for a subscriber relay card and 001-50 for a dedicated relay card. When PressureMAP calls the 289H-M to obtain data for a device with an access number of 001-21, for example, it checks the 21st relay on the card.

SUBSCRIBER BLOCK DESCRIPTION

The 289H subscriber connector block (P/N 9800-6056) provides termination pins for 50 devices on subscriber pairs. The face of the block (the side with the wire wrap pins) is divided into two main groups of pins (FIGURE 4-1), each to accommodate a total of 25 monitoring devices. Either the left or the right group can be used to terminate subscriber devices wired to the 289H-M; however, the left group is recommended for a 289H-M installation, and the documentation reflects this preference. Each main section of pins is further divided in half, with the top four horizontal rows of pins used to connect jumpers from the field (Facility) and the bottom four used to connect jumpers from the central office (Equipment).

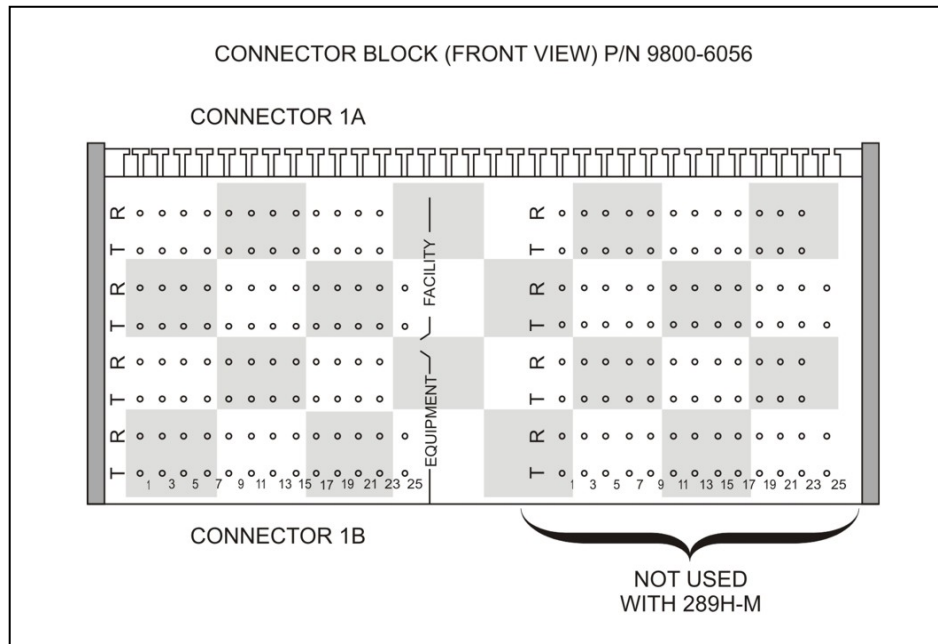


FIGURE 4-1: STANDARD SUBSCRIBER CONNECTOR BLOCK

Pin numbering begins in the lower left corner of each group. The first two vertically positioned pins are designated Tip 01 and Ring 01. The next two above them are Tip 02 and Ring 02. These pins are used to wire jumpers from the CO equipment. Directly above the Ring 02 pin are the corresponding Tip 01, Ring 01, Tip 02 and Ring 02 pins that are used for the field (Facility) jumpers.

The information below provides more specific information on how the subscriber block is used to terminate field monitoring devices on subscriber pairs.

Wiring and Cabling Requirements

There are several requirements for wiring subscriber circuits to the 289H connector block 9800-6056:

1. Two pairs of jumper wires are required for each device: one is used to jumper the device pair from the field (Facility) at central office vertical frame to the 289H block; the other pair is used to complete the connection from the block to the central office (Equipment). Each pair of jumpers must be physically wired to the block. Refer to FIGURE 1-2 in Section 1 of this manual for an illustration of a typical central office installation.

In the unlikely event of having to wire monitoring devices which use a combination of dedicated and subscriber circuits, you would use this subscriber connector block for all the wiring. The dedicated pairs would be wired to the assigned pins in the field (Facility) section of the block. They do not require jumpers on the corresponding Equipment pins.

2. Only one section of the connector block (typically the left section) is used to wire devices to the 289H-M. The pins in the other section of the block are not used.

3. Device circuits (jumpers) from the central office (Equipment) MUST be wired to the tip and ring pins located on the BOTTOM of the block (refer to FIGURE 4-2.)
4. Field (Facility) device circuits MUST be wired to the connector block pins on the TOP of the block.
5. The 25-pair connector cable that has one male end and one female end must be identified BEFORE you place any cables into the block's locking connector slots. You will need to connect the male end of this cable to the block's "B" connector. If you insert this cable into connector slot "A" and complete the connection to the 289H relay card, the device numbering sequence will be disrupted and monitoring will be inaccurate.
6. Cable connector 1A is internally wired to the pins in the top section of the block face. Connector 1A (containing Facility device pairs 1-25) MUST be cabled to the RIGHT connector of the subscriber relay card (as viewed from the back of this chassis.)

Standard System Studies 25-pair, male to male cables are used to make these connections.

7. Cable connector 1B, located on the block underneath the wire wrap pins, is internally wired to the horizontal rows of pins on the bottom of the block face. Connector 1B (containing the CO Equipment circuits 1-25) MUST be cabled to the LEFT connector of the subscriber relay card (FIGURE 4-2).

System Studies also provides a 25-pair cable with a female Amphenol connector on one end and a male Amphenol connector on the other end. This cables is used ONLY to connect subscriber circuits from the block's "B" connectors to the Equipment connector of the 289H-M's subscriber relay board.

Note: With the exception of the auxiliary connectors used on the P/N 9800-6056 subscriber block, all connectors 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.

8. When properly installed, cables will be run from connectors 1A and 1B at the block to the subscriber relay card located at the bottom of the 289H-M.

Using the Auxiliary Connectors

The subscriber block has four female auxiliary connectors that are wired in parallel with the primary connectors. These auxiliary connectors make it possible to disconnect subscriber device pairs from the 289H monitor without interrupting service to the customer.

By placing a 25-pair male-to-male cable between auxiliary connectors, you can bypass the 289H monitor without interrupting service to the subscriber (FIGURE 4-3). Because the auxiliary connectors do not have locking barbs, as do the primary connectors, a cable can be easily connected and disconnected when necessary. Please note that System Studies sells a 2-foot male-to-male cable (P/N 9800-6017-2) specifically for this purpose.

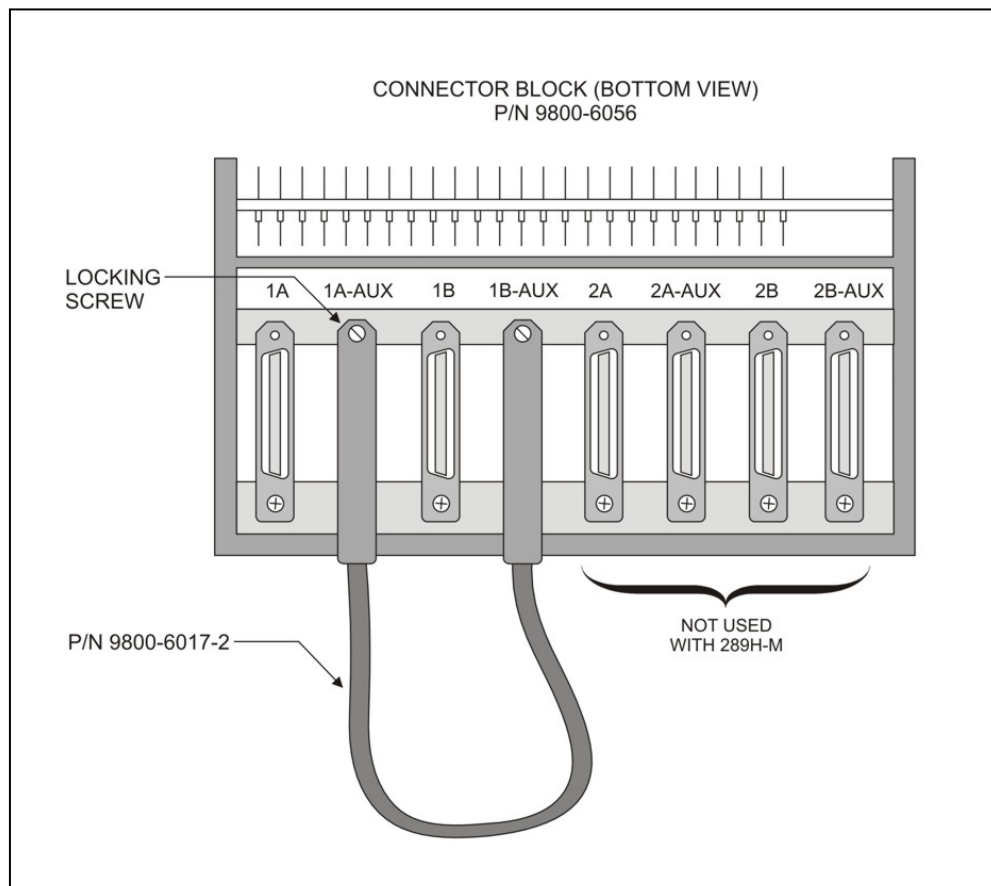


FIGURE 4-3: STANDARD SUBSCRIBER BLOCK SHOWING AUXILIARY CABLING

Wiring Procedures

Once you understand how the 289H-M subscriber connector block should be wired, the process is relatively simple and straightforward. The procedures below describe what needs to be done to wire the connector block:

1. If you are cutting over an existing monitor, you may want to print a PressureMAP 2X Device Log report to help identify module designations for the old monitor. (Information on accessing PressureMAP Device Logs can be found in Section 2 of the *PressureMAP System Data Entry Manual*.)

2. Procure new jumper wires for the 289H-M block connections.
3. Make sure you have a suitable wire wrap tool to make the connections to the 289H subscriber connector block.
4. Make sure that power is turned off to the 289H LSS before you make the required cable connections. Set the power switch on the utility board to the OFF position. Refer to FIGURE 3-2 in Section 3 of this manual.
5. Insert the proper connector cables into the bottom of the 289H connector block(s). See “Wiring and Cabling Requirements” on the preceding pages for information on which cables should be inserted into which Amphenol connectors.
6. Insert the other ends of the cables into the appropriate 289H-M relay board connector slots. (Refer again to the “Wiring and Cabling Requirements” and FIGURE 4-2 for information on properly connecting cables to the 289H-M subscriber relay card.)
7. Install a short male-to-male cable between the 1A-AUX and 1B-AUX connectors (assuming this is the side of the block being used). This will prevent any disruption of subscriber service during the cutover.
8. Re-lead new jumper wires from the central office frames to the connector block equipment bays for each device wired to the system. Four jumper wires will be required for each subscriber device: two for the connection from the block to the central office (Equipment) and two for the connection from the block to the field (Facility).
9. Using the PressureMAP Device Log and the wire wrap tool, individually wire the jumper pairs to the left side of the new 289H-M subscriber block. Make sure that you have properly identified each device pair at the frame and have confirmed its new pin location before you wire the conductors to the block. (Refer to FIGURE 4-1 for a close up view of the pin arrangement on the subscriber block. It may be helpful to refer to this drawing when wiring the block.)
10. Once you have physically wired the Equipment and Facility pairs to the block, you can remove the jumpers for these devices from the central office frames to the old monitor. At this point, the pairs from the field are wired through the 289H-M connector block to the central office switch. They will not actually be cut over to the 289H-M chassis until you have removed the cable between the 1A-AUX and 1B-AUX connectors.
11. After all of the jumpers for the monitored devices have been wired, remove the 289H-M’s cover and turn the main power switch on the Utility Card to the ON position. (Refer to FIGURE 3-2 in Section 3 of this manual for a description of the 289H-M Utility Card.) A “power on” LED, located to the left of the power switch, indicates that power is being supplied. Replace and secure the cover.
12. Remove the cable between the 1A-AUX and 1B-AUX connectors at the bottom of the subscriber connector block. This completes the cutover process for the monitoring devices.

Wiring Dedicated Devices to Subscriber Blocks

The instructions on the preceding pages describe the procedures for wiring subscriber circuits to a subscriber block. If you have an office with a majority of subscriber device circuits and only a few random dedicated device pairs, you can wire all of the devices onto a subscriber block. In this application, the dedicated pairs need to be terminated on the assigned pins in the UPPER (Facility) section of the subscriber block (FIGURE 4-1). The access number(s) assigned during the conversion process will indicate which pin numbers should be used for wiring dedicated pairs on the subscriber block.

Please note that in order to ensure proper operation of the 289H-M monitor, all incoming transducer pairs must be protected by central office primary voltage and current protection blocks.

CONNECTING 289H-M MONITOR TO SPARTON DEDICATED BLOCK

With the development of the Sparton Dedicated Replacement Card (SPDR), System Studies has greatly simplified the process of cutting over a working Sparton monitor to a 289H-M LSS. The SPDR card (P/N 9800-6116) connects directly to one of the designated cables at the Sparton dedicated block.

For customers who prefer to use a standard 50-pair dedicated relay card in the 289H-M monitor, it is still possible to cut over dedicated device pairs in an existing Sparton monitor without having to re-wire all of the devices. This is accomplished by using a System Studies-designed Sparton A, B or C cable. Instructions for connecting the cable are provided in the subsection following the SPDR setup procedures below.

Setting Up the SPDR Relay Card

The Sparton Dedicated Replacement Card contains relays for up to 36 dedicated Sparton pairs and connects directly to the Sparton block's A, B or C cable—inputs 1-36, 37-72 and 73-108 respectively. The SPDR card has a dipswitch that must be configured as A, B, or C, to match the Sparton block being cut over. In the 289H-M monitor, the on-card dipswitch is preset for A configuration to translate the Sparton A cable's pinout for 289H monitoring.

Note: If the Sparton dedicated block being cut over is not the A block (inputs 1-36), you will need to change the SPDR's configuration settings to match the block being used. This requires removing the cover from the 289H-M chassis and setting the dipswitch as described beginning with step 2 below.

The following procedures explain how to connect the System Studies 289H LSS to the Sparton block's cables and set the relay cards' configuration.

1. Locate the cable between the Sparton monitor and Sparton connector block. Remove the (male) end that connects to the Sparton's module connector (J1) and attach it to the female connector on the SPDR relay card.

If the cable that you have connected is the A cable (inputs 1-36), you are ready to go on to the Startup Procedures in the next chapter. If you need to change the card configuration, proceed to step 2.

- Loosen the cover screws on the front of the monitor and remove the cover by sliding it toward you. The top card in the chassis is the Utility Card. Locate the power switch in the front right corner (see FIGURE 3-2). Make sure that the power switch on this card is in the OFF position.
- The SPDR relay card is the bottom card in the chassis. Locate the configuration dipswitch module in the front right corner.

Switch 1 is the left switch (away from the edge of the card), and Switch 2 is the right switch (closer to the edge of the card). Set the card's dipswitches for the appropriate Sparton cable pinout (see FIGURE 4-4).

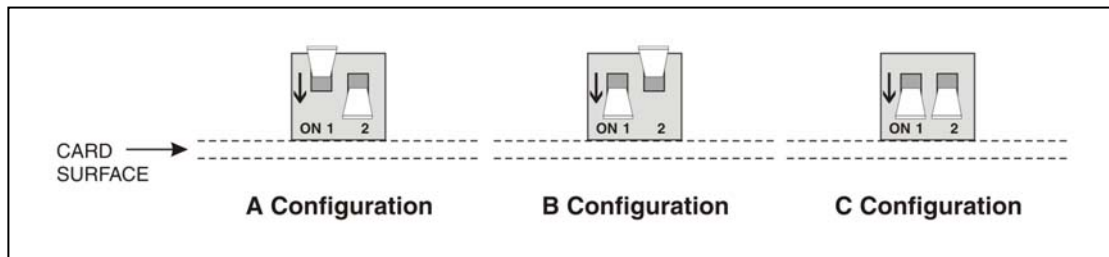


FIGURE 4-4: CONFIGURATION DIPSWITCH SETTINGS FOR SPDR

- ❖ **Card A:**
 - 1 = up (OFF), away from card surface
 - 2 = down (ON), toward card surface
 - ❖ **Card B:**
 - 1 = down (ON), toward card surface
 - 2 = up (OFF), away from card surface
 - ❖ **Card C:**
 - 1 = down (ON), toward card surface
 - 2 = down (ON), toward card surface
- Once the SPDR card has been connected and configured, turn the main power switch on the Utility Card to the ON position. (FIGURE 1-6 in Section 1 of this manual shows the 289H Utility Card layout.) A “power on” LED, located above the power switch, indicates whether power is being supplied.
 - Check the configuration indicator lights on the SPDR (located to the right of the dipswitch module) to verify that the card has been set for the correct configuration.
- Note:** If the SPDR card's configuration is incorrect, first turn the power switch on the Utility Card to the OFF position. Make the necessary dipswitch configuration change and power the card back on. This ensures that the new configuration is initialized in the 289H-M's memory.

Using Sparton Adapter Cabling

System Studies has designed a special cable that allows you to use an existing Sparton dedicated block with a 289H-M monitor that contains a dedicated relay card. This cable is approximately five feet in length and is equipped with three connectors—two that lead to the 289H-M LSS dedicated relay card and one that connects to the end of the cable that was originally plugged into the back of the Sparton chassis.

This cable, Part No. 9800-6020, connects Sparton input numbers 1-36 to the two cable connectors on the back of the 289H-M and to the monitor end of the existing Sparton connector block cable. With this cabling arrangement, the 289H-M will monitor a maximum of 36 devices. This special cabling arrangement eliminates any rewiring (FIGURE 4-5).

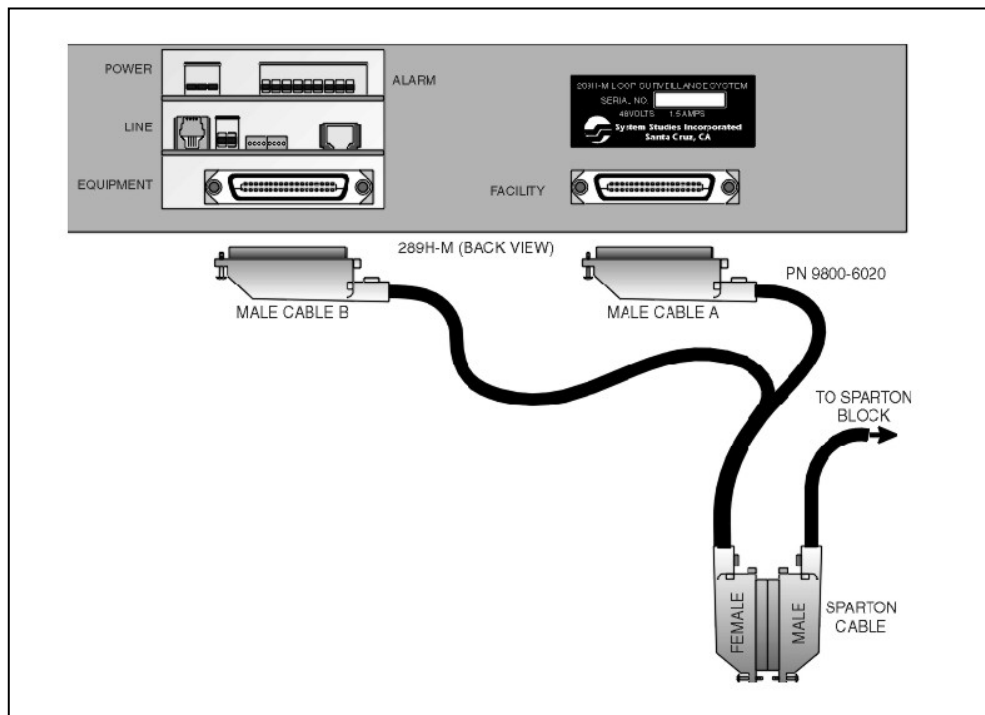


FIGURE 4-5: SPARTON TO 289H LSS CABLE

Please note that System Studies supplies two additional Sparton cables that can be used with the full size 289H LSS monitor when cutting over a Sparton office with up to 108 devices on dedicated pairs. As explained above for the 289H-M application, the Sparton A Cable (P/N 9800-6020) is used to connect Sparton inputs 1-36; Sparton B Cable (P/N 9800-6058) connects inputs 37-72; and the Sparton C Cable (P/N 9800-6059) connects inputs 73-108. The distinct wiring patterns in each of these cables is repeated in succession for cutovers that require more than three cables. For example, you would use another Cable A for the wiring of inputs 109-145, a second Cable B for inputs 146-182, etc.

DEDICATED BLOCK DESCRIPTION

The standard dedicated connector block supplied by System Studies (P/N 9800-6055) will accommodate 100 devices on either dedicated or addressable monitoring pairs. Because the highest number of dedicated devices that a 289H-M LSS can read is 50, only one side of the block will be used (FIGURE 4-6). We recommended in this documentation that you use only the left side of the connector block; however, if wired and cabled correctly, the right side of the block works equally well.

Notice in FIGURE 4-6 that the pins on this block are arranged 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 on the block contains only four pins, two each for the 49th and 50th device pairs.

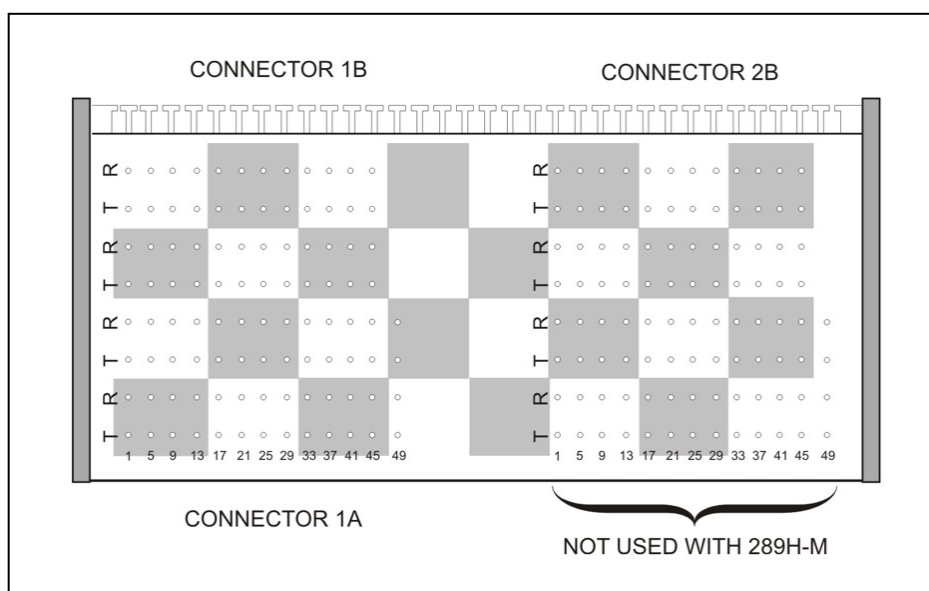


FIGURE 4-6: DEDICATED CARD

Wiring and Cabling Requirements

There are a number of requirements for wiring dedicated circuits to the 289H-M dedicated connector block:

1. One pair of jumper wires is required for each device. Jumpers from the central office frames will be used to wire device pairs from the field to the dedicated connector block. Refer to FIGURE 2-1 in Section 1 of this manual for an illustration of a typical central office installation.
2. Cable connectors 1A and 1B, located at the bottom of the block, are internally wired to the pins in the left section of the block. Connector 1A (containing device pairs 1-25) **MUST** be cabled to the **RIGHT** connector of the dedicated relay card (as seen from the back of the 289H-M monitor). Connector 1B (containing device pairs 26-50) **MUST** be cabled to the **LEFT** connector of the card (FIGURE 4-7).

System Studies provides standard 25-pair, 50-pin cables of varying lengths with male Amphenol connectors on both ends to make the connection between the block and the 289H-M relay board in the chassis (refer to FIGURE 1-9 in the Overview section).

Note: The connectors on the P/N 9800-6055 block are equipped with lock-in barb 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.

3. When properly installed, cables will be run from connectors 1A and 1B at the block to the dedicated relay card in the 289H-M.

Wiring Procedures

Once you understand how the dedicated connector block should be wired and cabled to the 289H-M LSS, the cutover process is relatively simple. The procedures below describe what needs to be done to complete the cutover:

1. Log onto PressureMAP and print a 2X Device Log report for the existing office to help identify module designations for the old monitor. (Information on accessing PressureMAP Device Logs can be found in Section 2 of the *PressureMAP System Data Entry Manual*.)
2. Procure new jumper wires for the 289H-M block connections.
3. Make sure you have a suitable wire wrap tool to make the connections to the 289H-M dedicated connector block.
4. Make sure that power is turned OFF to the 289H-M LSS before you make the required cable connections. If a red LED is visible through the opening on the top right front of the monitor, this indicates that the power is on. Loosen the cover screws and remove the cover by sliding it toward you. The top card in the chassis is the Utility Tone Card. Set the power switch on this card to the OFF position. Refer to FIGURE 3-2 in Section 3 of this manual.
5. Insert the proper connector cables (25 pair male) into the bottom of the 289H-M connector block. Refer to "Wiring and Cabling Requirements" on the preceding pages for information on which cables should be inserted into which Amphenol connectors.)
6. Insert the other ends of the cables into the 289H-M dedicated Card connector slots. Refer again to the preceding two subsections of this manual for information on proper cable connections.
7. Re-lead new jumper wires from the central office frames to the connector block equipment bays for each device wired to the system. Two jumper wires will be required for each monitoring device on a dedicated conductor pair.
8. Individually wire the jumper pairs for each monitoring device to the left side of the new 289H dedicated block. Make sure that you have properly identified each device pair at the frame and have confirmed its new pin location before you wire the conductors to the block. The PressureMAP 2x Device Log report will help you to determine device and access numbering.

Refer to FIGURE 4-6 for a close-up view of the pin arrangement on the dedicated block. It may be helpful to refer to this drawing when wiring the block.

9. Once you have physically wired the jumper pairs to the 9800-6055 block, you can remove the jumpers for these devices from the central office frames to the old monitor.
10. When all of the device circuits have been wired, remove the 289H-M's cover and turn the main power switch, located on the Utility Tone Card, to the ON position. A "power on" LED, located above the power switch indicates that power is being supplied.

Please note that in order to ensure proper operation of the 289H-M monitor, all incoming transducer pairs must be protected by central office primary voltage and current protection blocks.

SYSTEM CALIBRATION

With the devices cut over to the new 289H monitor, and with the PressureMAP database for the office established using the conversion utility, the system can now be placed in operation. It is important to note that the 289H LSS does not require any external calibration. It automatically calibrates its measurement circuit against built-in, precision, stable resistances before each relay card is accessed. The calibration process compensates for changes in supply voltage and system conditions. Calibration constants are routinely supplied to PressureMAP for each relay card before the data points for the card are accessed.

