



cincinnati time systems

## Model 2000 Remote RS-485 Multi-drop Installation Instructions (2400 Baud Modem)

### Description

Figure 1 shows how all of the system components are connected on a typical Remote RS-485 Network setup. The Network can have up to 32 Terminals with a total cable run of 5,000 feet. (5,000 ft. run is dependent upon wire specifications and Terminal power supply location). See Appendix A for recommended cable specifications. (Note: Figures are not to scale).

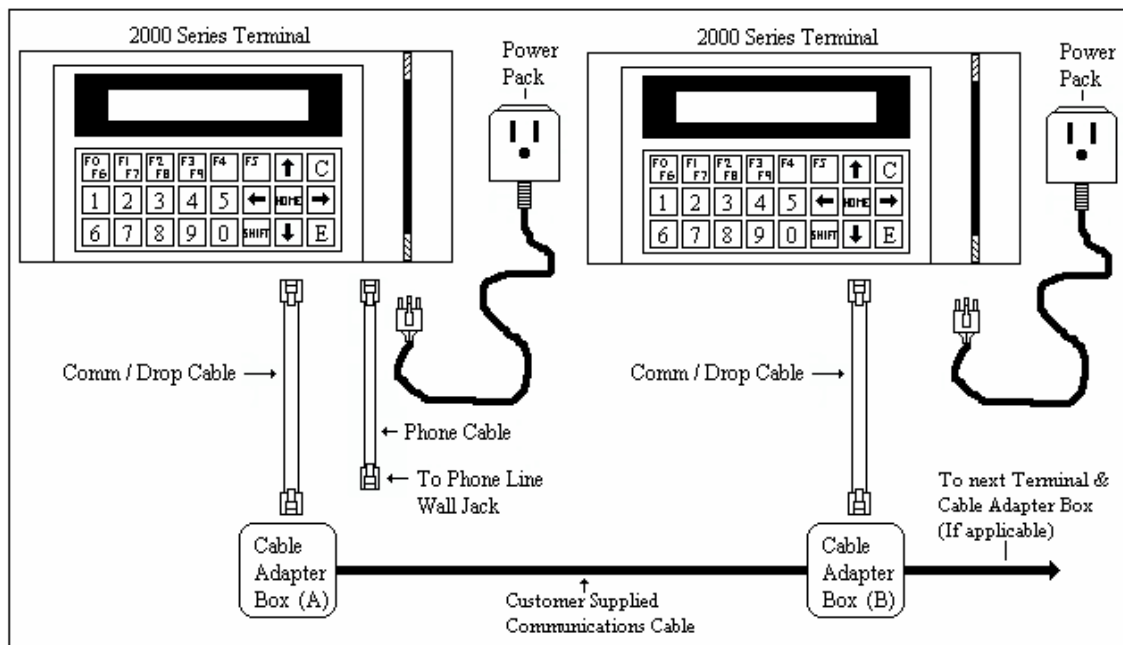


Figure 1

### Installing the Terminal(s)

- It is recommended to have a dedicated analog phone line installed prior to the installation of the Remote Terminals. The mounting site, which has the Terminal with the Modem Snap Module in it, should have a phone jack installed below the Terminal.
- As you install the system, refer to Figure 1 in addition to the other figures mentioned below.

### STEP 1

Determine a mounting site for the Terminals. Run the communications cable from the first Terminal's mounting site, which would be the Terminal with the Modem Module in it, to the next Terminal's mounting site. If there is another Terminal to be installed, then run another length of communications cable from the previous Terminal's mounting site to

the next mounting site, etc. (total cable length is not to exceed 5,000 feet). In all areas, make sure that the cable is within 10 feet of where each Terminal is to be mounted.

## STEP 2

The Terminal's Wall Mount Base can be attached to any flat surface that is in good condition. Care should be taken to place it in a location where the Terminal will not be bumped. The base of the Terminal should be about 4 feet (48 inches) from the surface of the floor in an area where lighting will not cause glare on the Terminal's display (Figure 2). A 120 VAC outlet should be located within 5 feet of the Terminal

## STEP 3

Using the keys provided, unlock the Terminal and separate it from the Wall Mount Base. Remove any Snap Modules that are installed in the Base and put them aside for now. Locate the 4 mounting holes on the inside of the Base to mark the wall for the locations of the screws. Make sure the Wall Mount Base is level. Remove the Base from the wall and prepare the wall (if necessary); for example, drill pilot holes or tap holes. Place the Base on the wall and mount it using appropriate screws and anchors to secure it to the wall (Figure 2). Repeat this step for each Terminal to be installed.

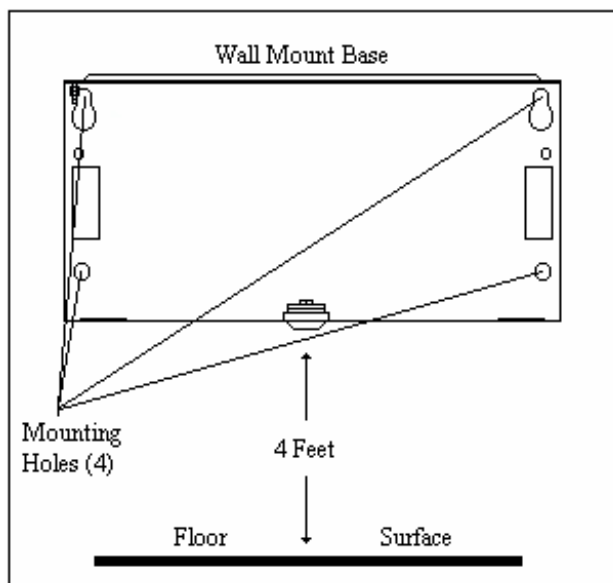


Figure 2

## STEP 4

For each Terminal to be installed, mount a Cable Adapter Box next to the communication cable at the Terminal's mounting site and remove the top cover. Cable Adapter Box should be within 10 feet of the Terminal. (The Cable Adapter Box can be mounted inside the Wall Mount Base to the far left of the Base ensuring enough room for the Snap Modules to be re-installed later).

## STEP 5

Strip back the outer covering on the communication cables about 2 inches. For twisted pair cable, select 1 twisted pair from however many there are and strip them back about 1/2 inch. For non-twisted pair cable, select 5 color wires from however many there are (Note: The same color wires must be used at every Terminal location) and strip them back about 1/2 inch. For either type of cable, connect and screw the wires down into to both Cable Adapter Box (A) and Cable Adapter Box (B) using the Cable Installation diagram (Figure 3). It does not matter what color wire is selected to screw down into the Cable Adapter's screw terminals, as long as the same color wire is connected to same number screw terminal at each Adapter (Figure 3). For twisted pair cable, repeat this step for each one of the remaining twisted pairs by following the Cable Installation Diagram (Figure 3). (Note: If there are only 3 twisted pairs in the cable, then the 3<sup>rd</sup> pair

would be connected to the #6 screw terminal). Connect the Drain wire from the communication cable at all Cable Adapters to screw terminal 1. (Depending on the environment, the drain wire at Cable Adapter (A) may need to be tied to an Earth Ground).

**STEP 5 (cont'd)**

For each additional Terminal to be installed, connect and screw the wires down from the communication cable from the previous Cable Adapter to the next Cable Adapter by using the Cable Installation diagram (Figure 3). (For example, for a third Terminal to be installed, the communication cable would be wired from the second Terminal's Cable Adapter (B) to the third Terminal's Cable Adapter (C) etc. (Figure 1)). All Drain wires should be tied together at each Terminal's Cable Adapter to screw terminal 1. Close the covers on all Cable Adapters when the wiring is done.

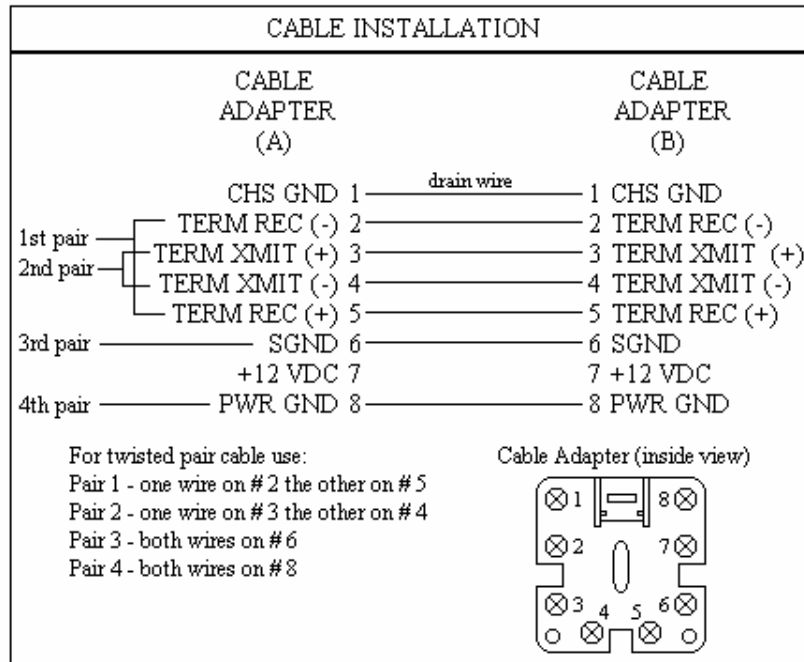


Figure 3

**STEP 6**

Locate a desired Cable Access knockout on the Mounting Base. Feed one end of the Comm / Drop cable, DC Plug for the power pack, one end of the Phone cable (if this is the Terminal with the Modem Snap Module in it), and any wires for the Relay (if applicable) through a knockout. Do not make any connections inside the Terminal yet. Plug the other end of the Comm / Drop cable into the modular jack on Cable Adapter Box (A) (Figure 4). Plug the other end of the Phone cable into the phone line wall jack (if applicable) (Figure 4). Repeat this step for each additional Terminal and its Cable Adapter Box.

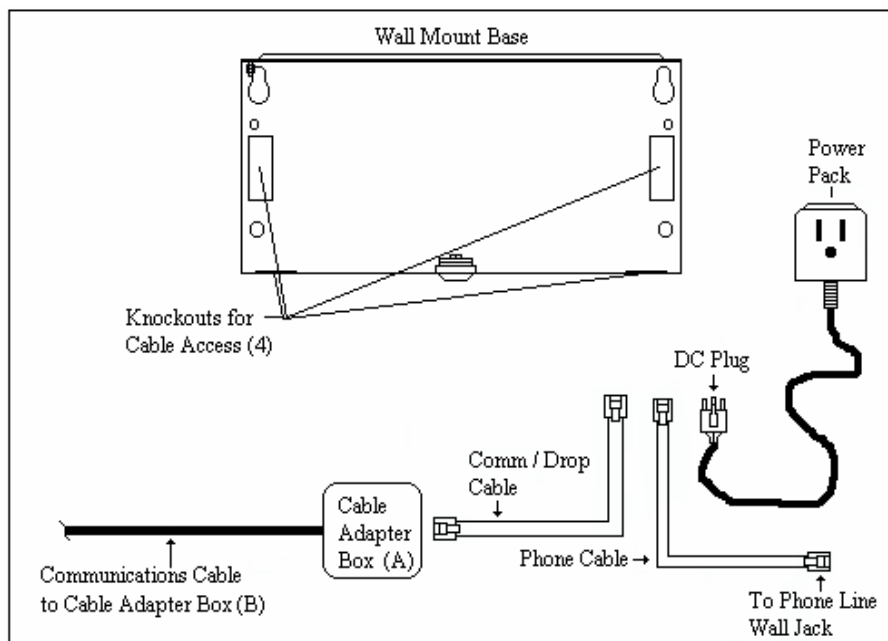


Figure 4

STEP 7

Depending on the configuration of the Terminal that was ordered, there are 1 or 2 Snap Modules to be re-installed into the Wall Mount Base. Starting from the right side of the Base, insert the Modem or RS-485 Snap Module. If a UPS Battery Module was ordered, then insert it to the left of the Modem or RS-485 Module (Figure 5). Repeat this step for each Terminal.

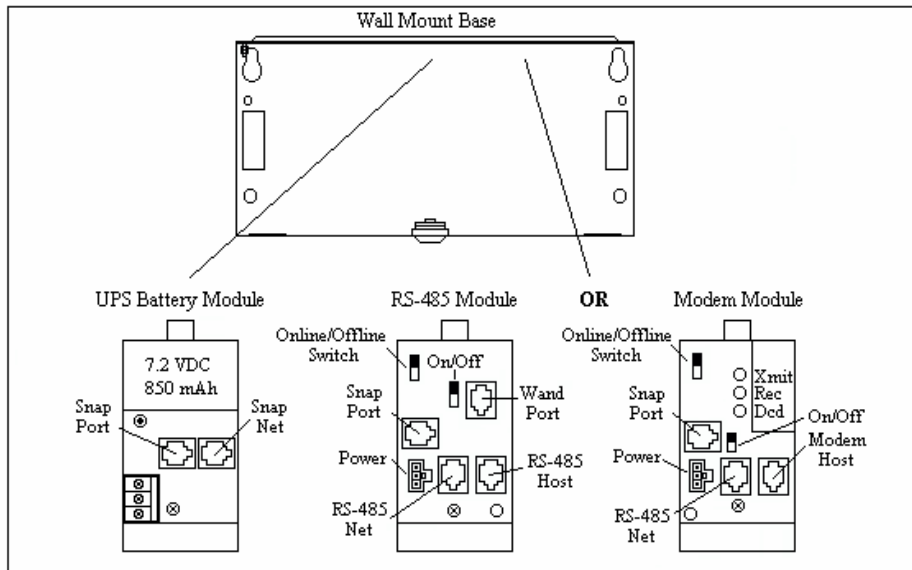


Figure 5

STEP 8

The diagram below shows how all of the Snap Modules connect to each other and to the Terminal. Depending on the configuration of the Terminal that was ordered, follow the diagram below on connecting the Modem Snap Module or RS-485 Snap Module and optional UPS Battery Module to the Terminal. (For example, if only a Modem or RS-485 Snap Module was ordered, then plug the Comm / Drop cable end, from the Cable Adapter, to the RS-485 Net port or RS-485 Host port. Then connect one end of the 8 conductor Comm / Power cable to the Snap Port on the Modem or RS-485 Module and the other end into the Snap Term port on the Series 2000 Terminal. For the Terminal with the Modem Module in it, plug one end of the phone cable into the wall jack and the other end into the Modem Host port on the Modem Module (Figure 6)). Repeat this step for each Terminal.

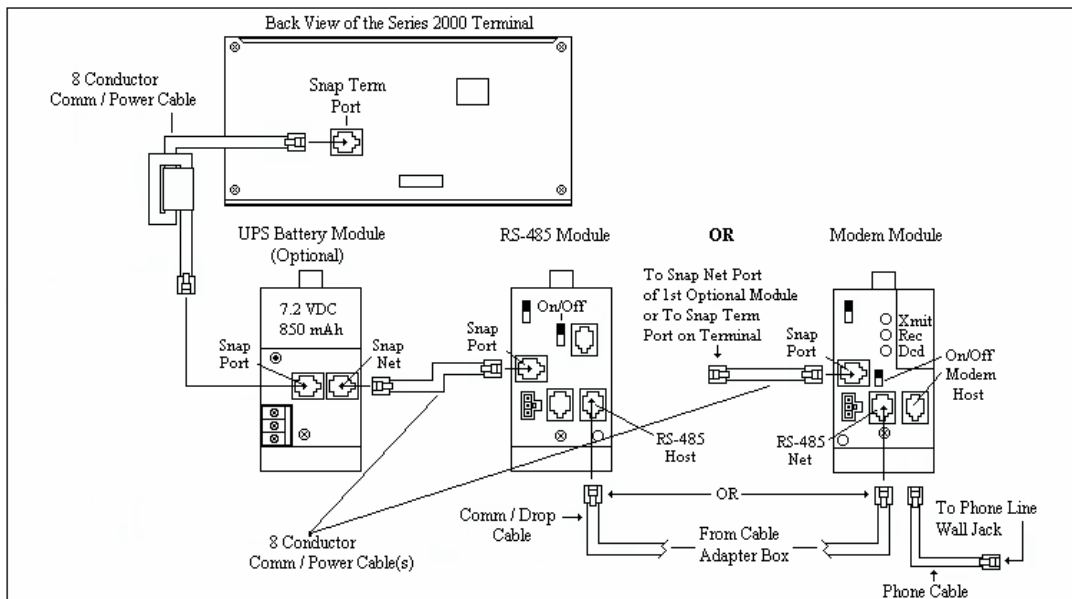


Figure 6

STEP 9

If the configuration of the Terminal includes a UPS Battery Module and the Relay is to be used, follow the Relay Connection Chart on Figure 7 on how to connect the wires to either ring bells or for door access. If the bells or door access strike needs more amperage than the Relay can handle, then call ADI Support Dept. for additional options. Repeat this step for any other Terminals that need to have connections made to the UPS Battery Module's Relay.

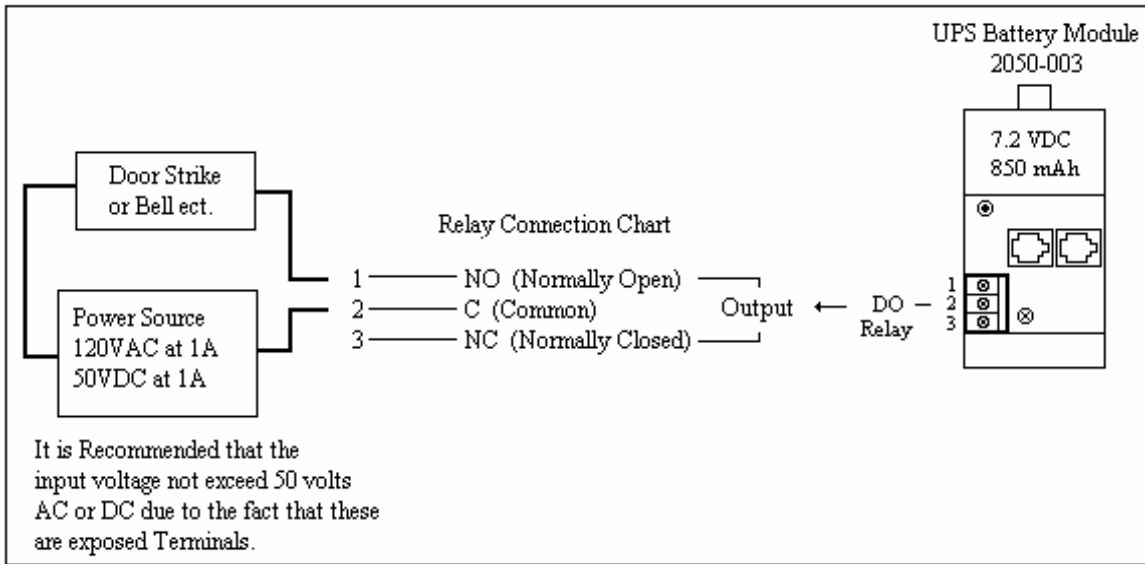


Figure 7

\* NOTE: Repeat Steps 10-18 (where applicable) for each additional Terminal.

STEP 10

On the Modem or RS-485 Module, move either the Online / Offline switch to the "Offline" position or move the Use / Test switch to the "Test" position and move the On / Off switch to the "ON" position (Figure 8). Plug the DC Plug from the power pack into the Power connector on the Modem or RS-485 Module (Figure 8).

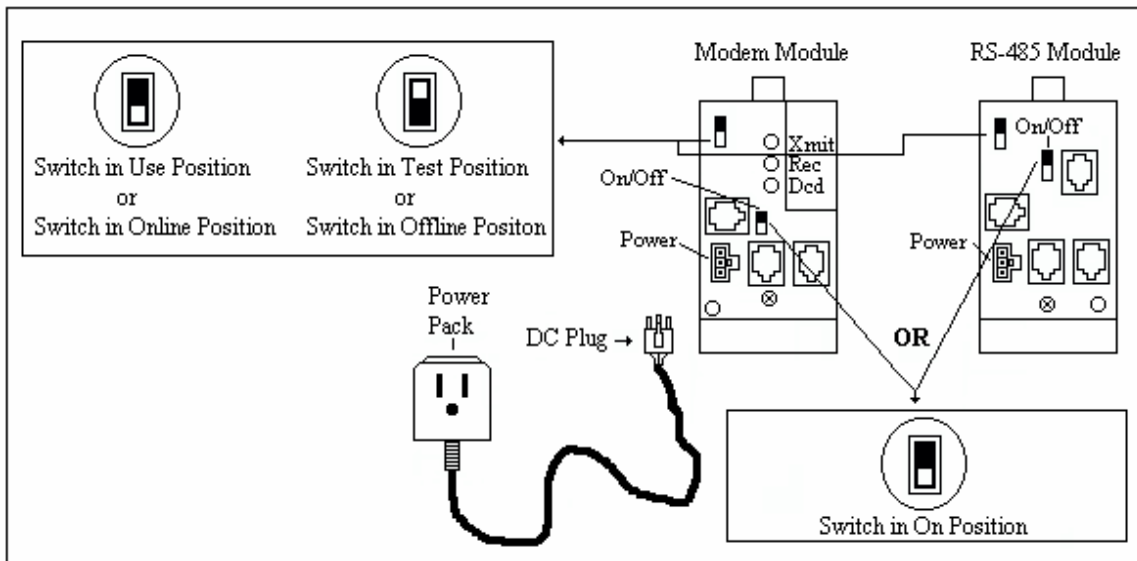


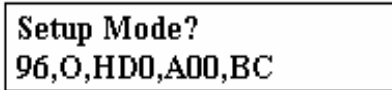
Figure 8

STEP 11

Place the Terminal over the Wall Mount Base and use the key to lock it in place.

#### STEP 12

Plug the Terminal's Power Pack into a 120 VAC outlet (Figure 1). The Terminal will run a series of self-tests and prompt "Setup Mode?" on the top line of the display. The bottom line of the display shows the Baud Rate, Parity, Host Delay, Terminal Address, and the type of Reader (Figure 9).

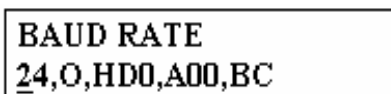


Setup Mode?  
96,O,HD0,A00,BC

Figure 9

#### STEP 13

Press the "E" key once on the Terminal and the prompt "BAUD RATE" appears on the top line of the display. The bottom line of the display will have an underline under the current setting. For Remote Multi-drop installations using a Modem Module, all Terminal baud rates must be set to 2400. If the baud rate is not already set to 2400, press either the up or down arrow keys on the Terminal until it reads "24" then press the right arrow key on the Terminal (Figure 10).

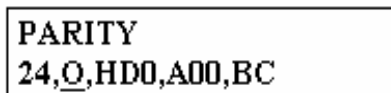


BAUD RATE  
24,O,HD0,A00,BC

Figure 10

#### STEP 14

The prompt on the top line of the display should now read "PARITY" (Figure 11). The bottom line of the display will have an underline under the current setting. The default Parity setting is "ODD". If it is not "ODD", press either the up or down arrow keys on the Terminal until it reads "O" then press the right arrow key on the Terminal.

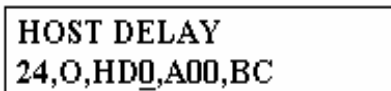


PARITY  
24,O,HD0,A00,BC

Figure 11

#### STEP 15

The prompt on the top line of the display should now read "HOST DELAY" (Figure 12). The bottom line of the display will have an underline under the current setting. The default Host Delay is "0". If it is not "0", press either the up or down arrow keys on the Terminal until it reads "0" then press the right arrow key on the Terminal.

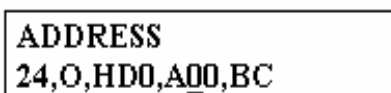


HOST DELAY  
24,O,HD0,A00,BC

Figure 12

#### STEP 16

The prompt on the top line of the display should now read "ADDRESS" (Figure 13). The bottom line of the display will have an underline under the current setting. The default Address is "00". Press the up arrow key on the Terminal until it reads "01". (For additional Terminals, set the next one to an Address of "02", third Terminal to "03" etc.). Press the right arrow key on the Terminal.



ADDRESS  
24,O,HD0,A00,BC

Figure 13

## STEP 17

The prompt on the top line of the display should now read “READER” (Figure 14). The bottom line of the display will have an underline under the current setting. If the Reader type is not correct, press the up or down arrow keys on the Terminal until it reads the correct type of Reader. (For example, Figure 14 below shows that the Reader is set to “BC” which is for a Barcode Reader. If the Terminal has a Magnetic Stripe Track II Reader, then the setting on the Terminal would be set for “M2”, for a Biometric Reader, the setting on the Terminal would be set for “BIO”). Press the “HOME” key on the Terminal and the top line of the display will again read “Setup Mode” with the correct settings on the bottom line.

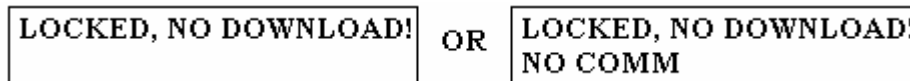


```
READER
24,O,H00,A00,BC
```

Figure 14

## STEP 18

Use the key to open up the Terminal from the Wall Mount Base. On the Modem Module or RS-485 Module, move either the Online / Offline switch back to the “Online” position or move the Use / Test switch back to the “Use” position (Figure 8). The Terminal will go through another series of self-tests, (initialize the Modem for that one Terminal) and depending on the version of the flash program in the Terminal, the prompt “LOCKED, NO DOWNLOAD!” will be displayed on the top line of the display and “NO COMM” may be displayed on the bottom line (Figure 15). Place the Terminal back over the Wall Mount Base and use the key to lock it in place.



```
LOCKED, NO DOWNLOAD!
NO COMM
```

Figure 15

\* This completes the Remote Multi-drop Installation of the Model 2000 Terminal. The rest of the Terminal programming will be done on the PC in the Time & Attendance software.

# APPENDIX A

## CABLE SPECIFICATIONS

**Note:** Described below is one of the Manufacturers recommended specifications for RS-485 communication cable. Please check local building electrical codes before selecting a cable.

**Description:** The cable selected must contain a minimum of 3 twisted pairs (6 conductors) of 24 gauge solid or stranded (7/32) wire, surrounded with an outer foil shield, drain wire and PVC jacket.

### ADI's Recommended Cable Specifications:

The following is a description of communications cable that ADI carries in inventory. For ordering and pricing information contact ADI at (401) 438-5500.

Category 5 cable with 4 twisted pairs (8 conductors), 24 gauge stranded (7/32) wire, with shield, drain wire and PCV jacket.

### Electrical and Electromagnetic Noise:

Caution must be exercised in locating cables near electrical power equipment and lighting fixtures that might cause electrical interference. Examples of electrical and electromagnetic noise sources are:

- Fluorescent, neon and incandescent lighting fixtures.
- Power distribution members, including wiring, transformers, generators, etc.
- Motors that drive machinery such as air conditioners, elevators, escalators, large blowers and machine tools.
- Radio and television transmitters.
- Signal generators, intercommunication systems and security signal systems.
- Arc welders, electrical discharge machines and related equipment.

### Preventing Electrical and Electromagnetic Noise:

Interference between cable and typical sources of electrical interference apply generally to long parallel runs. Good rules to follow for noise prevention are:

- Do not install the cable in conduit with A/C power lines.
- Do not install the cable near (within 3 feet) high inductance devices such as motors, generators, etc.
- Do not install the cable within 3 feet of A/C power lines or fluorescent light fixtures.