

CASI-RUSCO...*Security Solutions for the 21st Century*

Model 351 Time Display Installation Guide



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Introduction

This manual is an installation guide for the CASI-RUSCO Model 351 Time Display.

The Time Display is NOT a badge reader. It is designed to work with a badge reader. The badge is presented to the accompanying badge reader. Upon a valid badge read, the LED time on the Time Display blinks except when used with the Micro/5-E.

The Time Display is designed to mount on a standard U.S. dual gang box. The unit will work with Micro/2s, Micro/4s, and Micro/5s.

Product Features

The CASI-RUSCO Time Display offers these features:

- State-of-the-art architecture.
- Indoor use only.
- Standard 12V operation.
- An LED time display.
- Rugged molded ABS construction with integral backplate.
- Field changeable DIP switches which allow the Time Display to operate with the Micro/5-PX and the Micro/5-PXN or as the Model 300 which operated with the Micro/2, Micro/4, Micro/5-E, and Micro/5-P.
- RS-485 multidrop serial communications of up to 16 Time Displays from port 3 of the Micro/5 Power/Communications board using the Communications Adapter.
- 4,000 foot range with RS-485 with 2 lines servicing 8 Time Displays per line.

Installation Overview

The following is the general sequence of steps to follow in installing the Model 351 Time Display. Each step is explained in further detail in the sections that follow:

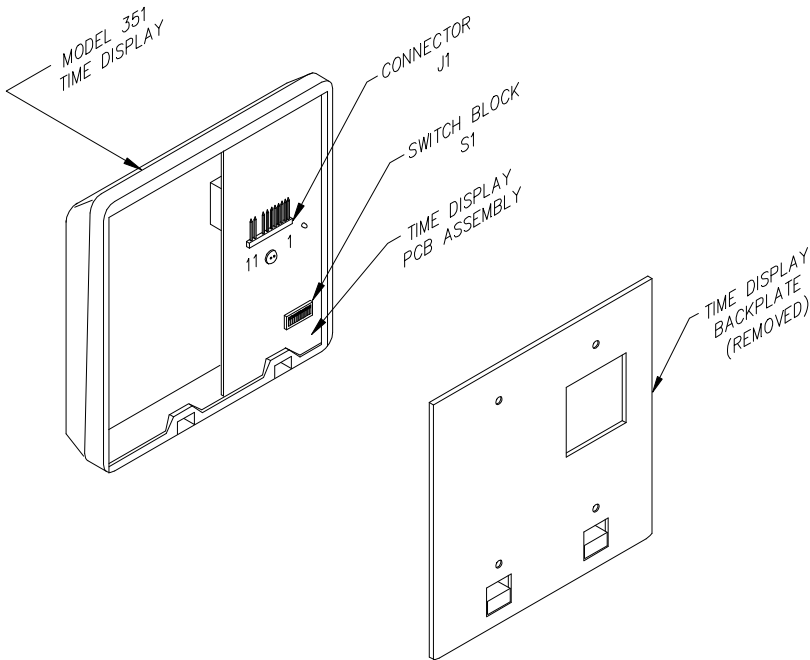
1. Install Time Display mounting. Refer to “Mounting the Time Display” on page 11.
2. Set the switches. Refer to “Setting the Switches” on page 4.
3. Connect the Time Display. Refer to “Connecting the Time Display” on page 8.
4. Mount the reader. Refer to “Mounting the Time Display” on page 11.
5. If using with a Micro/5-PX or Micro/5-PXN, connect the Display Communications Adapter. Refer to “Connecting the Display Communications Adapter” on page 14.
6. Test the Time Display. Refer to “Testing the Display” on page 16.
7. If necessary, refer to the section “Troubleshooting Guide” on page 18.

Setting the Switches

One bank of eight DIP switches located on the back of the Time Display are used to select the address, operating mode, and baud rate.

CAUTION: Power should be removed from the reader while switch settings are changed.

FIGURE 1: Model 351 Time Display, Connector, and DIP Switch Locations



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Setting the Address

The table below gives the switch settings for addressing the Time Display unit. Applies to the Micro/5-PX or Micro 5-PXN only.

TABLE 1: Address Switch Settings

Address	Switch 1	Switch 2	Switch 3	Switch 4
0	ON	ON	ON	ON
1	OFF	ON	ON	ON
2	ON	OFF	ON	ON
3	OFF	OFF	ON	ON
4	ON	ON	OFF	ON
5	OFF	ON	OFF	ON
6	ON	OFF	OFF	ON
7	OFF	OFF	OFF	ON
8	ON	ON	ON	OFF
9	OFF	ON	ON	OFF
10	ON	OFF	ON	OFF
11	OFF	OFF	ON	OFF
12	ON	ON	OFF	OFF
13	OFF	ON	OFF	OFF
14	ON	OFF	OFF	OFF
15	OFF	OFF	OFF	OFF

Selecting the Operating Mode

The table below shows the DIP switch settings for the two operating modes.

TABLE 2: Operating Mode DIP Switch Settings

Operating Mode	Switch 5
Micro/5-PX or Micro/5-PXN	ON
Other	OFF

Selecting the Baud Rate

The table below shows the DIP switch settings for the baud rate. Applies to the Micro/5-PX or Micro/5-PXN only.

NOTE: All Micro Power/Communication boards MUST be set to 9600 in a micro string and cannot use 19,200.

TABLE 3: Baud Rate DIP Switch Settings

Baud Rate	Switch 6
1200	OFF
9600	ON

Setting the Beeper

The table below shows the DIP switch settings for enabling or disabling the beeper.

TABLE 4: Beeper DIP Switch Settings

Beeper	Switch 7
Disabled	ON
Enabled	OFF

Indicating the Last Time Display in an RS-485 Line

The table below shows the DIP switch setting to indicate the last Time Display in an RS-485 line. Applies to the Micro/5-PX or Micro/5-PXN only.

TABLE 5: End of RS-485 Line DIP Switch Settings

Line	Switch 8
Terminated	ON
Unterminated	OFF

Connecting the Time Display

The table below shows the pinouts for connecting the Time Display to the microcontroller. Connector J1, pin 1 is to the right as you view the connector from behind the Time Display. See Figure 1, “Model 351 Time Display, Connector, and DIP Switch Locations,” on page 4.

TABLE 6: Pinouts

Connector J1 Pin #	Signal	Pig-Tail Wire Color
1	+12VDC	Red
2	Ground	Black
3	Not Used	Blue
4	Display Disable	Brown
5	Display Data	Orange
6	Clock	Green
7	RS-485 TX+	White
8	RS-485 TX-	Violet
9	Keying Pin	
10	RS-485 RX+	Yellow
11	RS-485 RX-	Grey

There are two different methods for connecting the Time Display. The method is based upon the type of micro that connects with the Time Display. The wiring diagrams listed below begin on the next page. Refer to the appropriate diagram which is based on the type of micro used.

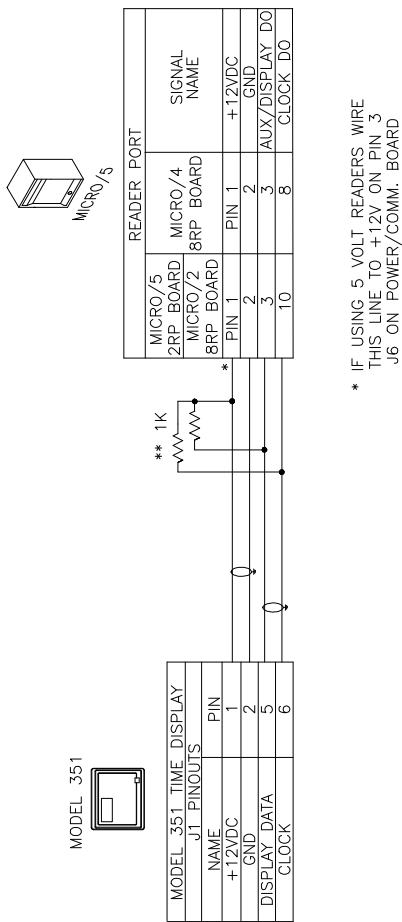
Figure 2, “Wiring Diagram, Model 351 to Micro/2, Micro/4, Micro/5-E, or Micro/5-P,” on page 9.

NOTE 1: When using the Time Display with the Micro/5-P, the Micro/5-E, the Micro/2, or the Micro/4, the supervised feature on a supervised reader is not available.

NOTE 2: Set 2RP board SW1 DIP switches 1 through 4 to Magstripe - F/2F Mode.

Figure 3, “Wiring Diagram, Model 351 to Micro/5-PX or Micro/5-PXN,” on page 10.

FIGURE 2: Wiring Diagram, Model 351 to Micro/2, Micro/4, Micro/5-E, or Micro/5-P

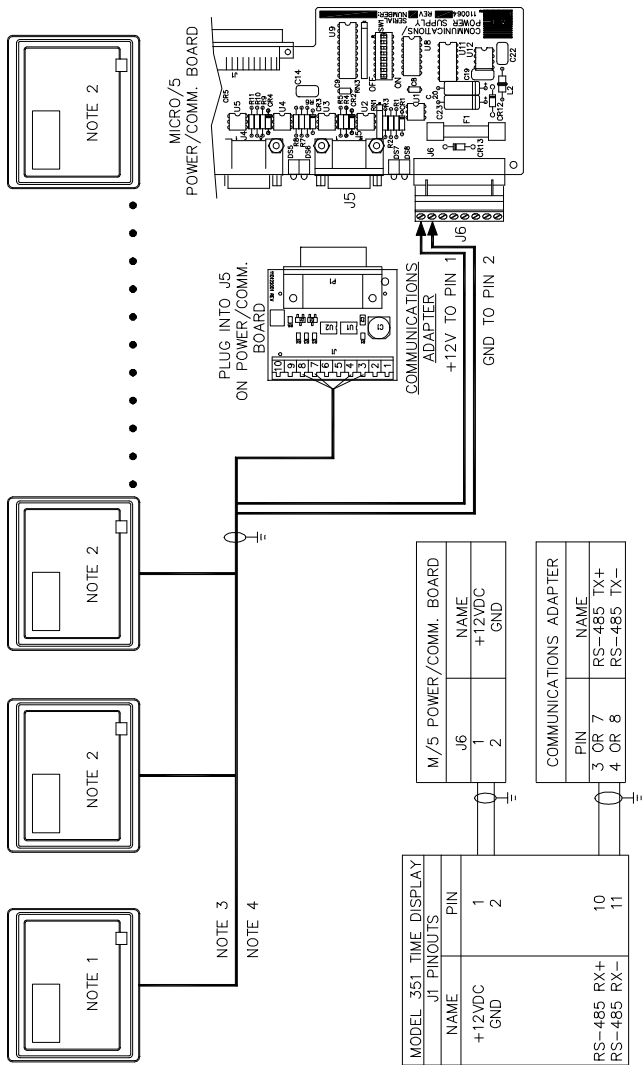


NOTES :

1. MAXIMUM CABLE LENGTH FROM MICRO/2 IS 400 FEET. MAXIMUM CABLE LENGTH FROM MICRO/5 2RP BOARD IS 200 FEET.
- ** 1K OHM LINE TERMINATING RESISTORS ARE REQUIRED

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FIGURE 3: Wiring Diagram, Model 351 to Micro/5-PX or Micro/5-PXN



1. LAST TIME DISPLAY MUST HAVE SWITCH 8 TURNED ON.
2. SWITCH 8 MUST BE TURNED OFF.
3. MAXIMUM CABLE LENGTH = 4,000 FEET
4. EACH MODEL 351 TIME DISPLAY REQUIRES 0.06 AMPS
USE 20 GAUGE WIRE TO INSURE THAT
A MINIMUM OF +10.0 VOLTS IS AVAILABLE AT
PIN 1 IN THE MODEL 351.

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Mounting the Time Display

The Time Display comes with a backplate suitable for mounting directly onto standard U.S. electrical dual gang boxes. The Time Display may also be mounted directly onto a hollow wall.

The figures listed below begin on the next page. Refer to the appropriate figure for the type of mounting used.

Figure 4, “Model 351 Time Display - Gang Box Mounting,” on page 12.

Figure 5, “Model 351 Time Display - Direct Wall Mounting,” on page 13.

FIGURE 4: Model 351 Time Display - Gang Box Mounting

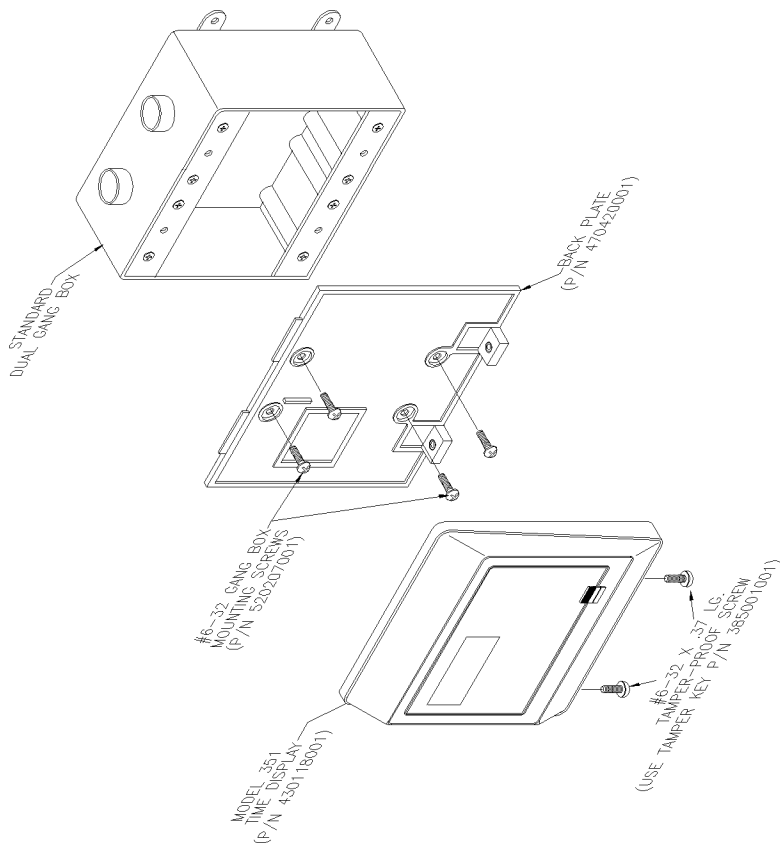
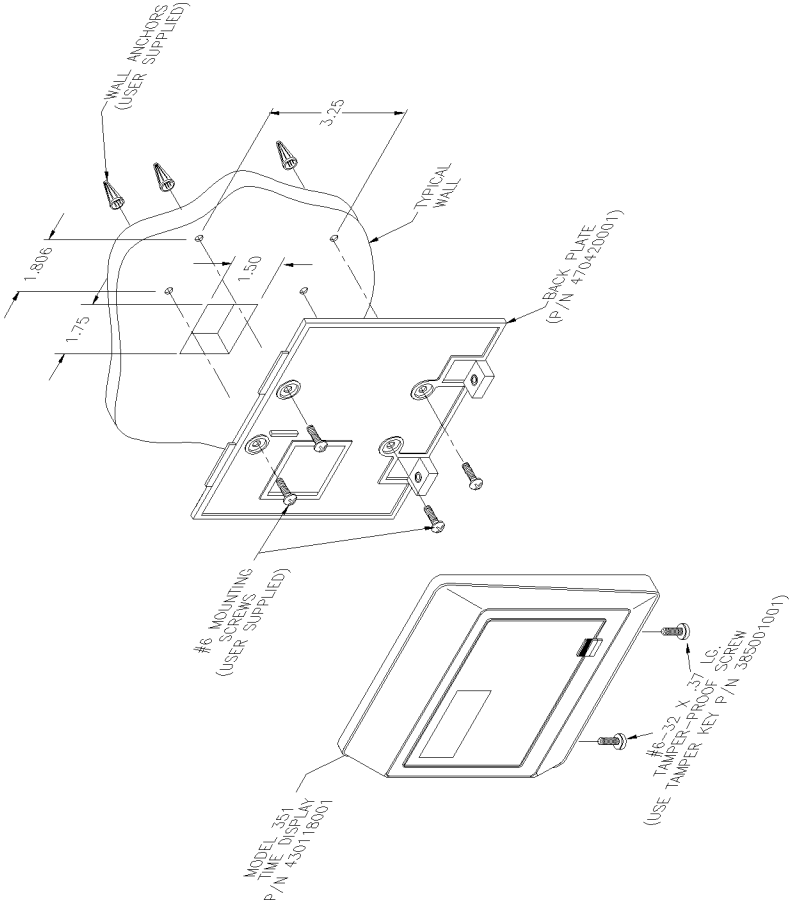


FIGURE 5: Model 351 Time Display - Direct Wall Mounting



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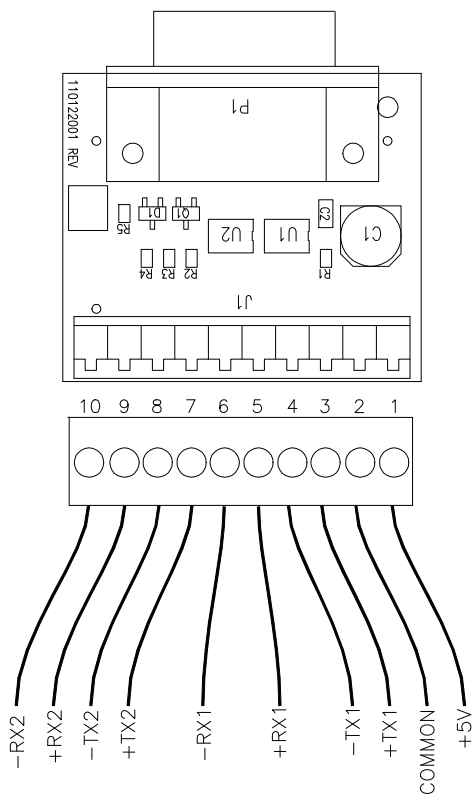
Connecting the Display Communications Adapter

If you are using the Time Display with the Micro/5-PX or Micro/5-PXN, you will also need the Display Communications Adapter. This adapter connects to J5 on the Power/Communications board of the Micro/5-PX or Micro/5-PXN. The adapter supports 2 strings each consisting of up to 8 Model 351 Time Displays up to 4,000 feet per string.

TABLE 7: Connector Pinouts

Pin	Signal Name
1	+5VDC (Output Only)
2	Common
3	+TX1
4	-TX1
5	+RX1
6	-RX1
7	+TX2
8	-TX2
9	+RX2
10	-RX2

FIGURE 6: Model 351 Communications Adapter



SUPPORTS 2 STRINGS OF MODEL 351
TIME DISPLAYS UP TO 4,000 FEET OF CABLE
PER STRING.

MOUNTING :
PLUGS INTO J5 ON POWER/COMM.
BOARD IN MICRO/5.

Testing the Display

The operating mode selected will determine how the Time Display is tested. For Micro/5-PX or Micro/5-PXN mode, refer to the section below. For Other mode, refer to page 17.

Micro/5-PX or Micro/5-PXN Operating Mode

Follow the steps below to verify that the Time Display is working correctly.

1. Check all cabling and electrical connections from the Time Display to the microcontroller. Refer to the wiring diagrams on page 9 and 10.
2. Verify that the microcontroller is properly configured. Refer to the appropriate CASI-RUSCO microcontroller manual.
3. Verify that the reader is set to T&A on the host.
4. Verify that the Time Display switches are properly set for the addressing, operating mode, baud rate, and RS-485 termination. See “Setting the Switches” on page 4.
5. Apply power to the Time Display and verify that the digital clock on the front of the Time Display turns on. You may want to use a multimeter to test the voltage at the reader’s pigtail connector J1, using ground (pin 2) as a reference. The power pin (pin 1) should read approximately 12V.
6. Check that the proper version of firmware is installed in the microcontroller. Refer to the appropriate microcontroller manual.
7. The digital clock on the Time Display will show **88.88** with the . blinking if the Time Display is working but there are no input signals. The digital clock will be updated to show the micro’s time in less than 1 minute.
8. Select a known good test badge. Be sure the badge is properly entered in the host system and the micro badge data format matches the reader associated with the Time Display.
9. Check that the door is secure. Present the badge to or swipe the badge through the associated reader. The valid access indication will vary depending on the reader. Check your reader manual for more information. Likewise, the digital clock on the Time Display blinks to

.... and the beeper sounds for approximately 1 second, if you have the beeper enabled.

10. If the reader is used with a keypad, enter a PIN. Refer to the host manual for instructions on entering the PIN. Observe that the green LED turns on indicating a valid access has been granted by the host.
11. Open the door. This verifies that the door strike operates correctly.

Other Operating Mode

Follow the steps below to verify that the Time Display is working correctly.

1. Check all cabling and electrical connections from the Time Display to the microcontroller. Refer to the wiring diagrams on page 9 and 10.
2. Verify that the microcontroller is properly configured. Refer to the appropriate CASI-RUSCO microcontroller manual.
3. Verify that the reader is set to T&A on the host.
4. Verify that the Time Display switches are properly set for the addressing, operating mode, baud rate, and RS-485 termination. See “Setting the Switches” on page 4.
5. Apply power to the Time Display and verify that the digital clock on the front of the Time Display turns on. You may want to use a multimeter to test the voltage at the reader’s pigtail connector J1, using ground (pin 2) as a reference. The power pin (pin 1) should read approximately 12V.
6. Check that the proper version of firmware is installed in the microcontroller. Refer to the appropriate microcontroller manual.
7. The digital clock on the Time Display will show **88.88** if the Time Display is working but there are no input signals. The digital clock will be updated to show the micro’s time in less than 1 second.
8. Select a known good test badge. Be sure the badge is properly entered in the host system and the micro badge data format matches the reader associated with the Time Display.
9. Check that the door is secure. Present the badge to or swipe the badge through the associated reader. The valid access indication will vary depending on the reader. Check your reader manual for more information. Likewise, the digital clock on the Time Display blinks to

.... and the beeper sounds for approximately 1 second, if you have the beeper enabled.

10. If the reader is used with a keypad, enter a PIN. Refer to the host manual for instructions on entering the PIN. Observe that the green LED turns on indicating a valid access has been granted by the host.
11. Open the door. This verifies that the door strike operates correctly.

Troubleshooting Guide

If the operation of a component is in doubt, substitute a known good component and retry the system. Always verify wiring against wiring diagrams before powering up the system.

All LEDs are on and the beeper is on (if enabled): Usually an indication that the Time Display's voltage is too low. This may be caused by having the wrong reader voltage selected at the microcontroller or too long a cable between the Time Display and the microcontroller.

1. Measure the reader supply voltage at the microcontroller. It should read between 10 and 15VDC. If the voltage is correct, continue to step 2 below. If the voltage is incorrect, refer to the appropriate microcontroller manual and correct the voltage.
2. If the problem is still present, while in low power mode, measure the voltage between J1 pin 1 (power) and J1 pin 2 (ground). This voltage should be greater than 8VDC and less than or equal to the reader supply voltage. If the voltage is too low, correct the wiring. If the voltage is correct, replace the reader.

None of the LEDs are on: Check the power as in steps 1 and 2 above.

The digital clock on the Time Display stays at 88.88 and the decimal point flashes:

- The wrong operating mode is set on switch 5.
- If the display is connected to a Micro/5-PX or Micro/5-PXN via the Communications Adapter, then carefully observe the LED next to the connector on the Time Display. If the LED is always ON, then the communications wires are crossed. Normally, the LED should only flash briefly every 30 seconds. Verify that the baud rate is set for 9600 (switch 6 should be ON).

The digital clock stays at . . . (all decimal points on): If the Time Display is connected to a Micro/2, a Micro/5-2, or a Micro/5-E, then the associated reader is offline after the DO has been enabled.

Technical Specifications

Operating Temperature Range: -35° C to +66° C (-31° F to 151° F)

Humidity Range: 0% to 95%

Index of Protection: IP55

Physical Dimensions: 4.75 in (H) x 5.500 in (W) x 0.90 in (D)

121mm (H) x 140mm (W) x 23mm (D)

Parts List:

- Model 351 Time Display (dual gang)
- Optional Tamper Key Tool
- Plastic Backplate
- Reader Cable
- Communications Adapter (Optional)

Required if the Time Display will be working with the Power/Communications board of a Micro/5-PX or Micro/5-PXN. Also includes screwdriver.

Refer to the CASI-RUSCO Product Catalog for part numbers and ordering information.

Maximum Cabling Distance: The maximum cable distance between the Time Display and the microcontroller is influenced by a number of factors including wire gauge.

NOTE: The Time Display will work well with unshielded cable in most environments. No company, including CASI-RUSCO, can guarantee that data will be reliably transmitted over long distances on unshielded cable in every installation.

Power Supply: Nominal 12VDC, 60mA

Color: Light Grey

Pinouts: The reader is supplied with a ten wire pig-tail. On one end is a keyed connector that mates with the J1 connector on the back of the Time Display. The other ends are stripped ready for connection to the field wiring using a terminal block or in line splice connectors.

Functional Specifications

Product Operation: The Time Display works in conjunction with a badge reader. When a valid badge is presented to the badge reader, the digital clock on the associated Time Display unit will blink and the beeper will sound. The time the valid badge was read is then sent from the Time Display back to the micro and then stored with that badge transaction.

Application: Intended for areas requiring a moderately high level of security for controlled access.

Compatibility: Interfaces to all CASI-RUSCO systems.

Reader Technology Types: The Time Display Model 351 will work in conjunction with the following:

Picture Perfect using Micro/5-PX or Micro/5-PXN

- All reader types supported

Entry Perfect and **Secure Perfect** using Micro/5-E

- Only 2RP Boards supported
- Only non-supervised readers supported

Mounting: The reader can be mounted directly onto a standard U.S. electrical dual gang box. The reader can also be mounted directly onto a hollow wall. See “Mounting the Time Display” on page 11 for additional details.

Indicators: An LED time display is incorporated into the reader.

- **LED time display:** Blinks off briefly to indicate a valid badge read from the associated reader.
- **Red LED:** Located on the back of the Time Display. In Micro/5-PX or Micro/5-PXN mode, this LED blinks to indicate RS-485 communication between the Time Display and the micro. In Other mode, this LED remains on.
- **Beeper:** In Micro/5-PX or Micro/5-PXN mode, sounds briefly to indicate that a valid badge has been read by the associated reader and sent to the micro. The beeper stays on for the Door unlock time duration for a maximum of 10 seconds.

NOTES

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