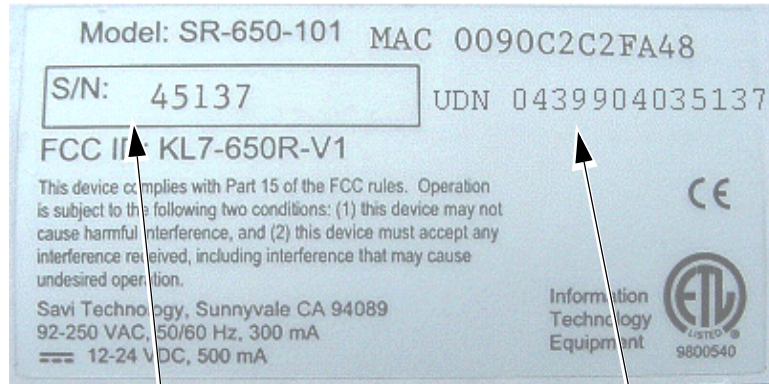# Identifying the Savi Fixed Reader in SmartChain Site Manager

You must identify the reader in SmartChain Site Manager before you can add and configure the reader. You can obtain the identification information from the label on the reader.

Figure 3-1   Label on the Savi Fixed Reader SR-650-101

Reader serial number

The first five digits of the UDN are unique, followed by the format of: YYMMNNNN. YY is the year, MM is the month, and NNNN is the last four digits of the reader serial number

For Ethernet networks, you use the unique device number (UDN) to identify the reader. For SaviNet (RS-485) networks, you use the serial number (also referred to as the SaviNet device number) to identify the Savi Fixed Reader SR-650-101. You can also obtain the reader's serial number from the LED display when you apply power to the reader.

Adding and Configuring the Reader in SmartChain Site Manager

To add a device to the network, you can use auto-discovery or add a reader manually. Whenever possible, Savi recommends using auto-discovery to add a device.

Discovering a Reader Using an Ethernet Connection

A Savi Fixed Reader SR-650-101 that is plugged into an Ethernet broadcasts discovery packets. When you start a SmartChain Site Manager that is connected to the Ethernet, it recognizes these broadcasts and responds to the reader that a SmartChain Site Manager at a given IP address is available for connection. The Savi Fixed Reader SR-650-101 must reside on the same subnet mask as the SmartChain Site Manager to be managed properly.

When a DHCP server is connected to the same network as the SmartChain Site Manager and Savi Fixed Reader SR-650-101, the reader initiates a DHCP operation to obtain a valid IP address to replace its default IP address (10.7.19.11). If you are installing multiple readers, it is a good idea to connect one reader to the network at a time to avoid IP address conflicts.

When a BOOTP domain server is connected to the same network as the SmartChain Site Manager and Savi Fixed Reader SR-650-101, the BOOTP server automatically assigns an IP address to the reader. The following four parameters must be changed in SmartChain Site Manager to set up the BOOTP server.

Name (Key)	Type	Range	Default	Description
Bootp	Integer	0 or 1	0	Determines whether BOOTP server is enabled or not 0 = No 1 = Yes
BootpIpAddress	String		0.0.0.0	Beginning IP address for BOOTP IP address assignments. The BOOTP server begins assigning IP addresses with this address and increments by one for each additional address to be assigned
BootpSubnetMask	String		255.255.128.0	Subnet mask to be assigned to devices that are also assigned an IP address through the BOOTP server
BootpGatewayIP	String		0.0.0.0	IP address of the default gateway to be assigned to devices that are also assigned an IP address through the BOOTP server

To change the parameters for the BOOTP server:

1. Change the value of BootP from 0 to 1.

This activates the BOOTP server.

2. Obtain an IP address or group of IP addresses from your Network Administrator to change the value(s) of the BootpIpAddress(es) for your reader(s).

3. Set the subnet mask and gateway IP.

Discovering a Reader Using a SaviNet Connection (RS-485)

If you are adding the reader to an RS-485 network where SmartChain Site Manager is already running, you must force the discovery process.

1. On the Windows desktop, click the **Site Manager Console** icon.

2. In the Network area of the console, right-click a protocol and select **Discover All**.

3. Select **Refresh** to see the new readers.

Note: You can also initiate discovery from the Network Management window. Click Network Management on the toolbar, right-click, and select Discover All.

Note: If you connect your RS-485 to RS-232 converter into a serial port on SmartChain Site Manager that is not COM1, you must change the value of the `SaviNet\PortNumber` parameter to the appropriate COM port and then restart SmartChain Site Manager.

Adding a Reader Manually Using an Ethernet Connection

You can manually add a Savi Fixed Reader SR-650-101 that is plugged into an Ethernet by assigning a static IP address. SmartChain Site Manager must have a TCP/IP subnet that is compatible with the reader's default IP address (10.7.19.11). The reader should be connected to SmartChain Site Manager through a hub, switch, or cross-over cable.

1. On the Windows desktop, click the **Site Manager Console** icon.

2. In the Network area of the console, right-click a protocol and select **Add Device**.

3. Fill in the device properties.

Setting the Host IP and Synchronizing Time

You use the Network Manager to set the host IP and synchronize time between the Savi Fixed Reader SR-650-101 and SmartChain Site Manager.

To set the host IP and time synchronization parameters:

1. On the desktop, click the **Site Manager Console** icon.

2. Click the **Network Management** button.

3. Select the device you want to configure.

4. Click **Actions > Configure**.

Note: If the device was detected by auto-discovery, be sure to change the local IP address.

Configuring the Reader with Savi Retriever Using a SaviNet Connection (RS-485)

A Savi Fixed Reader SR-650-101 that is connected to a Savi Retriever through SaviNet connection (RS-485) requires updating the network. Use the Network Menu commands to check or update the network.

Figure 3-2   Savi Retriever main window
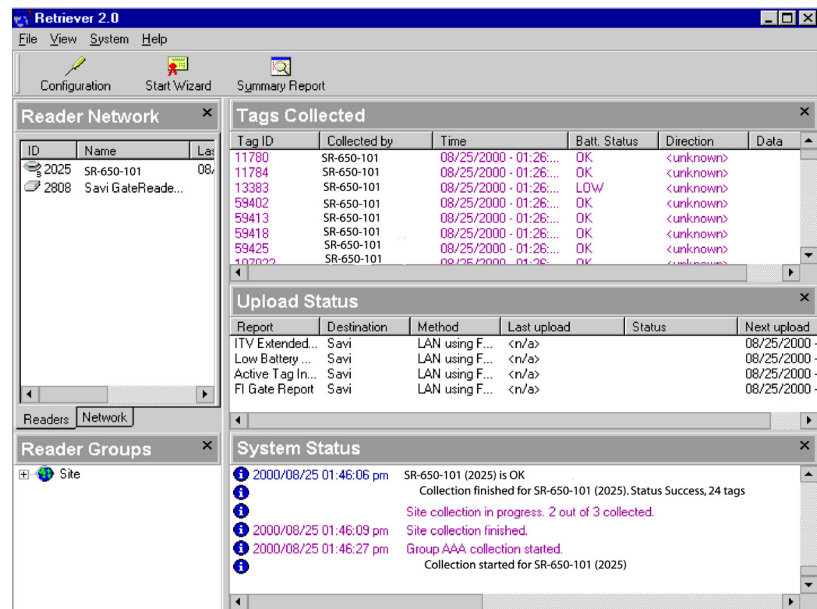
1. To open this window, right-click the icon of the host computer in the Reader Network area.

2. Click **Check Status** to verify the computer status.

3. Click **Verify Networks** to verify the operation of the network.

4. Click **Update Networks** to find new readers and update the network.

   The results of these commands appear in the System Status area.

Note: The update network event happens automatically only when you first install the system. After that, make sure you update the network whenever you attach a new Savi Fixed Reader SR-650-101.

Verifying Reader Communication

To confirm that a Savi Fixed Reader SR-650-101 is installed and functioning correctly, you must verify that the reader can:

◆ Communicate with the SmartChain Site Manager (verifies that the reader is detected on the network)

◆ Collect tags in the collection area

Once the Savi fixed reader is installed, refer to the *Guide to SmartChain Site Manager* for information about testing the operation of the reader.

Installing the Savi Fixed Reader

Installing the Savi Fixed Reader SR-650-101 is a two-step process. In sequential order, you must:

1. Position the reader to enable the most efficient communication range.

2. Mount the reader on the mounting bracket.

Positioning the Savi Fixed Reader

The Savi Fixed Reader SR-650-101 is designed to operate in a wide variety of environments. The reader is housed in a rugged, weatherproof enclosure.

In ideal conditions (large, open, and unobstructed areas), the Savi Fixed Reader SR-650-101 can collect tags up to 300 feet (91.44 meters) away. However, a variety of factors can limit the Savi fixed reader collection range, including:

◆ Obstructions such as multiple walls, chained areas, solid-core doors, and enclosures

◆ RF interference from other equipment such as computers, walkie-talkies, cellular phones, elevators, electrical motors, or other RF-emitting devices

◆ Savi Fixed Reader SR-650-101 mounting height of at least 20 feet (6.1 meters)

◆ Metal or RF-absorbent surface on the tracked item

◆ Tag location relative to the Savi fixed reader, such as behind a metal obstruction (as illustrated in Figure 4-1) or stacked under multiple layers

Some of these factors may be beyond your control. The goal when positioning the Savi Fixed Reader SR-650-101 is to optimize advantages and reduce limitations to make the collection range as efficient as possible.

Figure 4-1   Impediment limiting the Savi Fixed Reader SR-650-101 collection range

Savi fixed reader
mounted near a
ceiling

Metal wall

Area of
limited
collection
ability
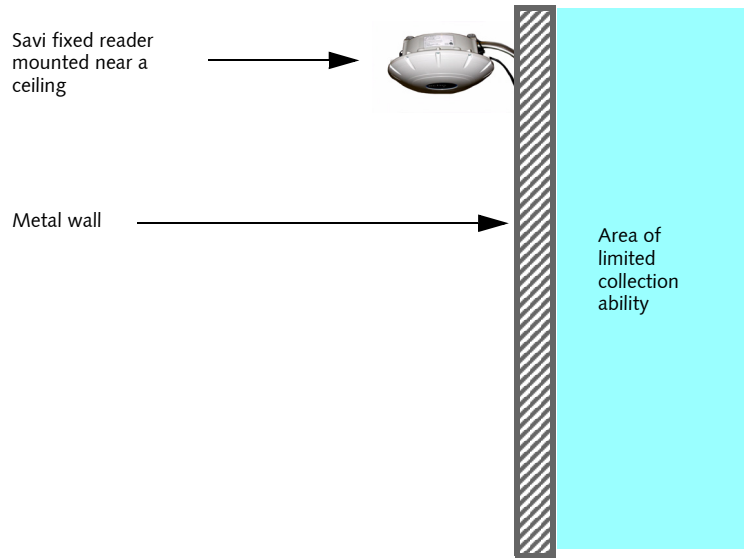
If the location forces you to use a less-than-ideal position for the reader, the collection range could be reduced, requiring additional readers.

Note: If you must mount a Savi fixed reader on a wall, the collection range may not extend to the opposite side of the wall. You may need a second Savi fixed reader to monitor the area behind the wall.

The collection range of the equipment depends on surrounding obstructions that may shield tags from receiving reader signals or cause reflections into locations outside the line of sight. As a first step, it is best to identify reader installation locations using a line of sight model to any assets equipped with tags. You may need to experiment to cover the desired area.

To optimize performance:

◆ Locate the reader at least 20 feet (6.1 meters) above the ground.

◆ Avoid installations within 6 feet (2 meters) of metal surfaces, such as temporary buildings or large steel doors.

Caution: The reader must be mounted in a horizontal plane with its dome directed downward, as shown in Figure 4-1. Other orientations will distort the field patterns and make performance unpredictable. Maintain the horizontal orientation when using the wall mount kit, tripod, or other mounting hardware.

Mounting the Savi Fixed Reader

You can mount the Savi Fixed Reader SR-650-101 using any of the associated mounting hardware available from Savi Technology.

The mounting kit available from Savi Technology includes hardware to mount a Savi fixed reader on a pole (wooden, metal, or concrete), I-beam, wall, or a tripod. Refer to the instructions included with the mounting kit for proper installation.

RFID hardware can be physically attached in any position or location. If your installation requires a special attachment, Savi can develop and manufacture a custom fixture.

If you have problems communicating with the Savi fixed reader during or after the installation, refer to Chapter 5, "Reader Sustainment and Maintenance," for troubleshooting procedures.

Reader Sustainment and Maintenance

With minimal care, a Savi Fixed Reader SR-650-101 should perform flawlessly. However, if a problem with a Savi fixed reader occurs, the procedures in this chapter should help you solve it.

Warning: Changes or modifications to the equipment that are not expressly approved by Savi Technology could void the warranty and the authority to operate the equipment.

Using the equipment in a manner not specified by the manufacturer might impair the protection that the equipment provides.

Savi Technology is not responsible for radio/TV interference caused by using unauthorized cable or by making unauthorized changes to this equipment.

Repair and Maintenance

The DB-9 connector on the Savi Fixed Reader SR-650-101 provides RS-232 serial access for Savi software maintenance tools that are used in manufacturing or for diagnostic purposes. The RS-232 connection is not for network connectivity.

To directly connect the Savi Fixed Reader SR-650-101 to the host computer using the RS-232 port and a DB-9 serial cable:

1. Plug the cable's female connector into the reader's DB-9 input socket.

2. Connect the other end of the cable to a host computer.

Troubleshooting

The table in this section lists problems that could occur with the Savi Fixed Reader SR-650-101 and potential solutions.

In the unlikely event that a Savi fixed reader fails or problems occur that simple troubleshooting cannot solve, Savi Customer Support may recommend that the reader be returned to Savi Technology.

Problem	Solution
No power (indicator light is not blinking)	✦ Confirm that power is available by checking circuit breakers, power switches, or safety switches. ✦ If AC-powered, verify the presence and voltage of the power by connecting a test unit to the power source. Check the AC fuses. ✦ If DC-powered or solar powered, verify that the external supply is supplying 12 to 24 VDC. ✦ Verify that the power cable is securely plugged into the power source and the Fixed Reader input. ✦ Try a different power source. ✦ Replace the power cable.
Network cables damaged or disconnected	✦ Verify that the network cable is securely plugged into the Fixed Reader. ✦ Verify that the network cable is securely plugged into the SR-650-101. ✦ Check cables for physical damage.
ID needs confirmation	✦ Reset the power (by disconnecting and then reconnecting the live power source) to view the Fixed Reader serial number, which flashes in sequence after the reader is reset. See "Applying Power to the Savi Fixed Reader" on page 25 ✦ Compare the Fixed Reader serial number to the ID used in the management software and on the printed label.
Unknown	✦ Turn power off and then back on. ✦ Call Savi Customer Support.

Using Telnet to Connect to a Savi Fixed Reader

In this appendix, you configure your PC's IP address and use Microsoft Telnet client to connect the host computer to the Savi Fixed Reader SR-650-101. Typically, you use SmartChain Site Manager auto-discovery to connect to the reader.

Setting Up the Savi Fixed Reader

The Savi Fixed Reader SR-650-101 has an integrated network interface.

Note: Note that if you connect multiple readers to the same network, they will all have the same default IP address of 10.7.19.11 and may create network conflicts.

Once the hardware is installed, you set the IP address for the Savi Fixed Reader SR-650-101, ping the reader to verify its connection, and configure the Savi Fixed Reader SR-650-101 parameters.

Configuring Your PC's IP Address

To set up the proper IP addresses, you must first configure the host computer to communicate with the Savi Fixed Reader SR-650-101.

To specify the IP address:

1. At the host computer desktop, select **Start > Settings > Control Panel**.

Figure A-1   Control Panel window
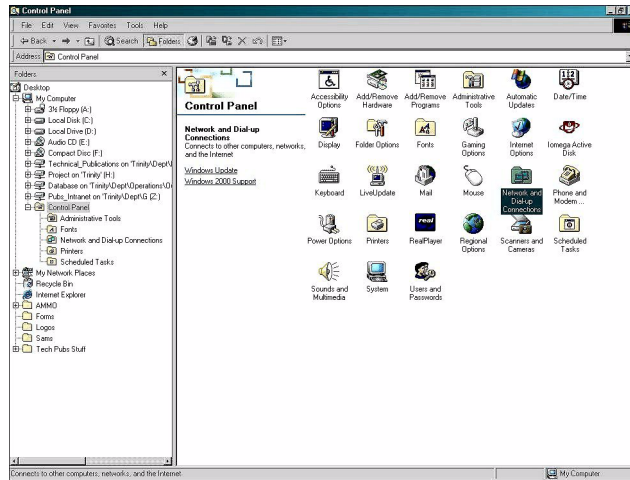
2. Double-click the **Network and Dial-Up Connections** icon.

Figure A-2   Network and Dial-Up Connections window
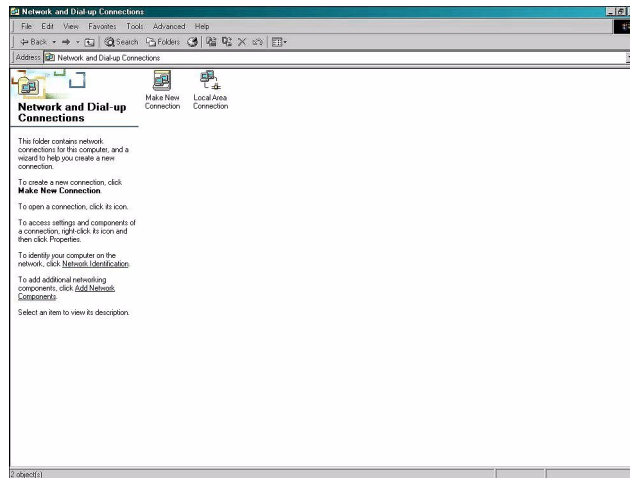
3. Double-click the **Local Area Connection** icon.

Figure A-3   Local Area Connection Status window
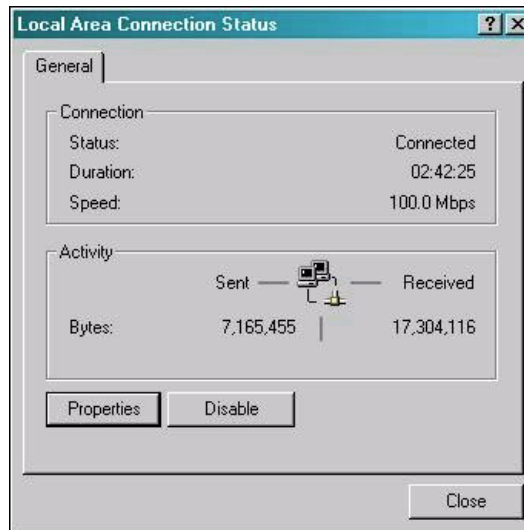
4. Click **Properties**.

Figure A-4   Local Area Connection Properties window
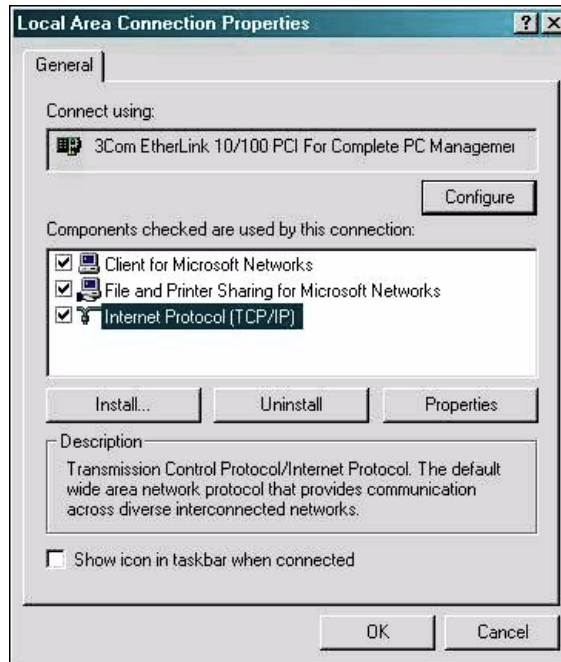
5. Double-click **Internet Protocol (TCP/IP).**

Figure A-5   Internet Protocol TCP/IP Properties window
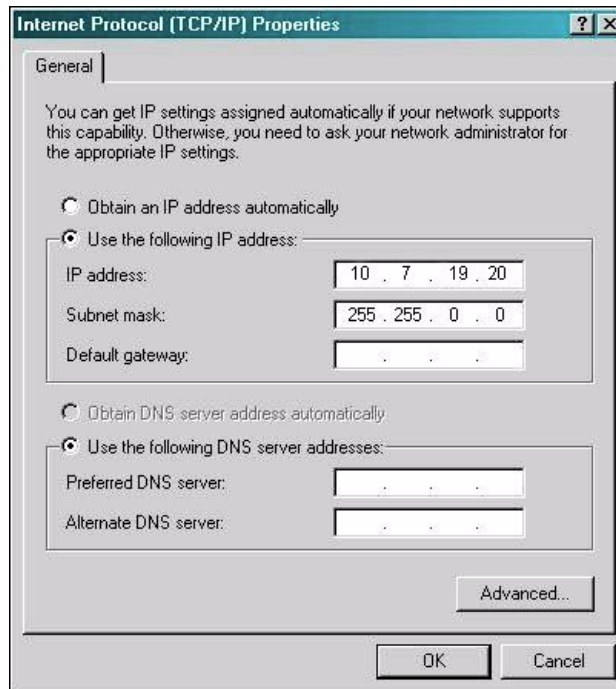
6. Make the necessary changes to the **IP address** and **Subnet mask** addresses and click **OK**.

   The default IP address for the Savi Fixed Reader SR-650-101 is 10.7.19.11. You can set the host IP address to 10.7.19.20, the Subnet mask to 255.255.0.0, and leave all others blank.

7. Close all windows and return to the desktop.

Pinging the Savi Fixed Reader

You need to check the network connection from your computer to the Savi Fixed Reader SR-650-101. You can either use an Ethernet cross connect cable from your PC's Ethernet port to the Ethernet cable from the Savi Fixed Reader SR-650-101 (with a coupler) or connect both your PC and the Savi Fixed Reader SR-650-101 to a live local area network. You use the command prompt to ping the reader.

To ping the reader:
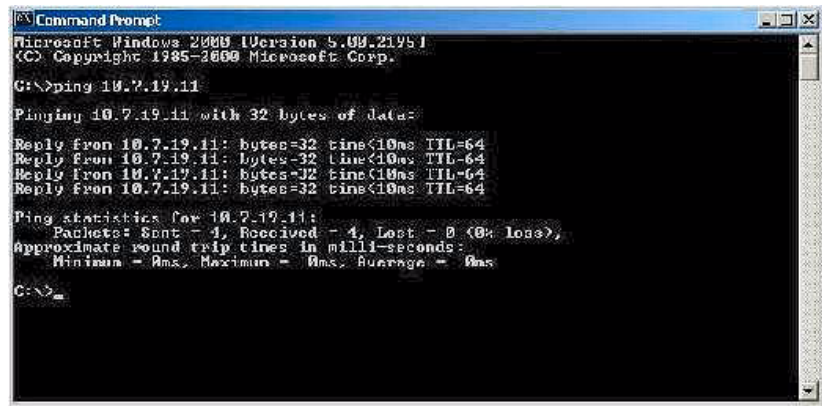
1. At the host computer desktop, select **Start > Programs > Accessories > Command Prompt** to open a DOS session.

Figure A-6   Command Prompt window
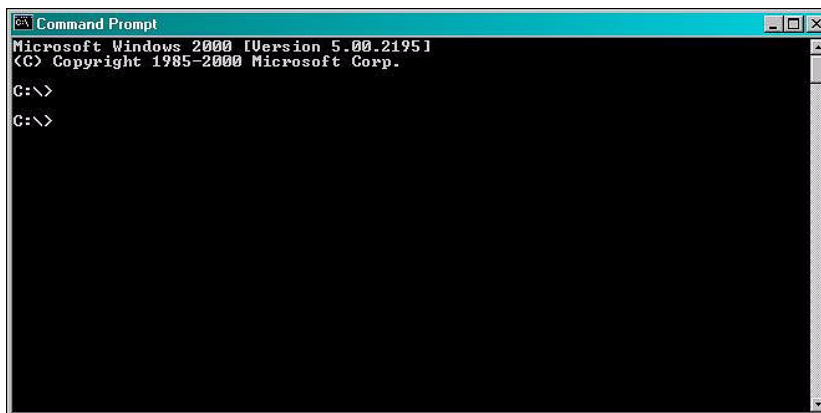
2. Type ping 10.7.19.11 (this is the default IP address of the reader) and press **Enter**.

Pinging proceeds until it completes all cycles.

Figure A-7   Command Prompt window with completed ping

3. Upon successfully pinging the reader, close the Command Prompt window and begin Savi Fixed Reader SR-650-101 configuration.

Configuring the Savi Fixed Reader

In this section you use Microsoft Telnet Client to connect to the reader and set up the reader parameters. Telnet Client software allows a computer to connect to a remote Telnet server and run applications on that server.

To connect to the reader and set up the parameters:

1. At the host computer desktop, select **Start > Programs > Accessories > Command Prompt** to open a DOS session.

2. At the **C:** prompt, type telnet and press **Enter** to open a Telnet session**.**

Figure A-8   Telnet Client window
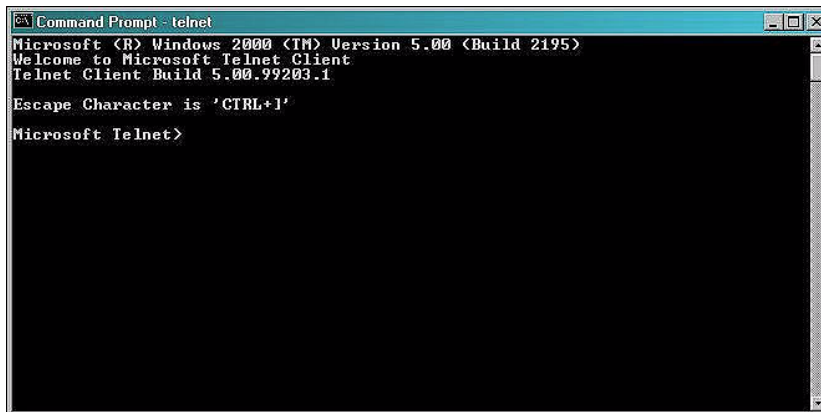
3. At the first prompt, type set LOCAL_ECHO and press **Enter** to enable the echo so you can verify key entries.

4. At the second prompt, type open 10.7.19.11 10011 (this is the CADTP port number) and press **Enter** to connect to the reader.

Figure A-9   Telnet connection commands
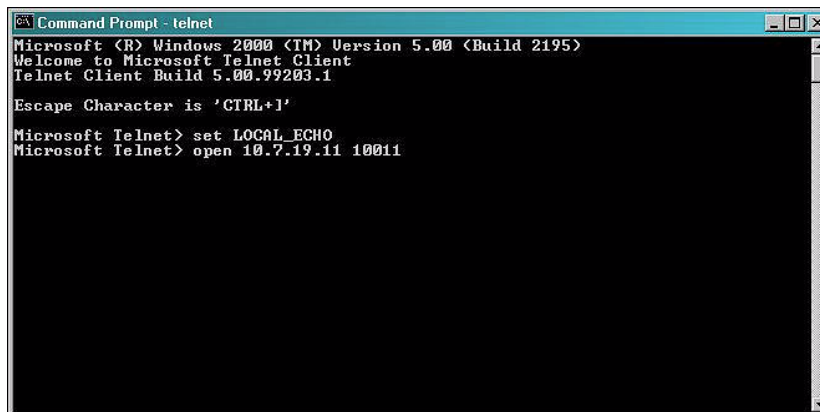
You see a blank Command Prompt - telnet window if the telnet connection is successful.
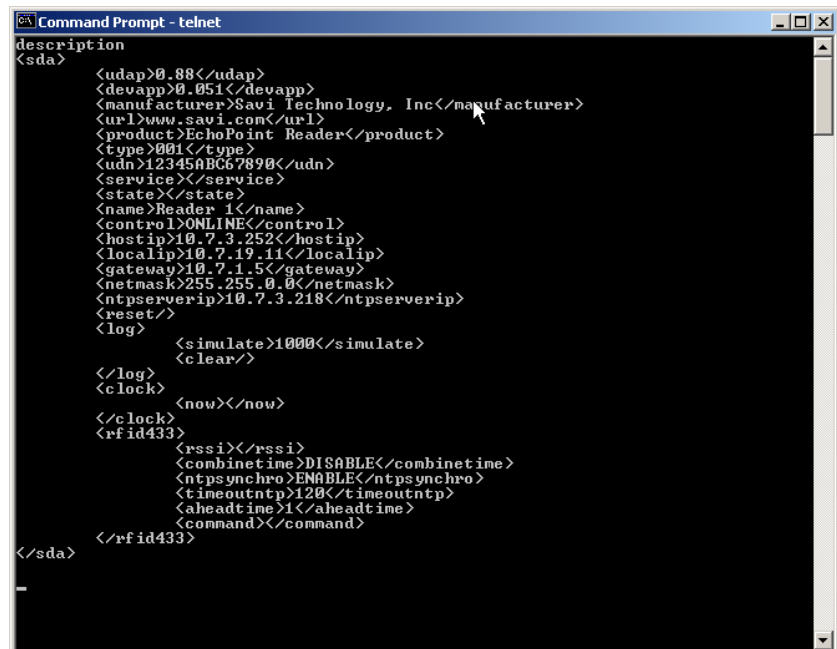
Now you can run commands to modify the properties of the reader.

To view existing reader properties:

1. At the cursor, type description and press **Enter**.

The current properties of the reader appear. Not all properties can be modified.

Figure A-10   Description of reader properties

2. At the cursor, type udap? and press **Enter** to display the UDAP firmware's value.

The property udap is a read-only property; you cannot modify it.

Figure A-11   Telnet UDAP value display

3. Type rssi? and press **Enter** to display the reader's residual signal strength indicator values.

4. Type diags and press **Enter** to record the MAC address, temperature, and battery voltage.

To assign a new local IP address to the reader and modify gateway and netmask addresses:

1. At the cursor, type localip=10.7.20.118 (or whatever valid IP address you want to assign) and press **Enter** to set the reader IP address.

Figure A-12   Telnet local IP address display
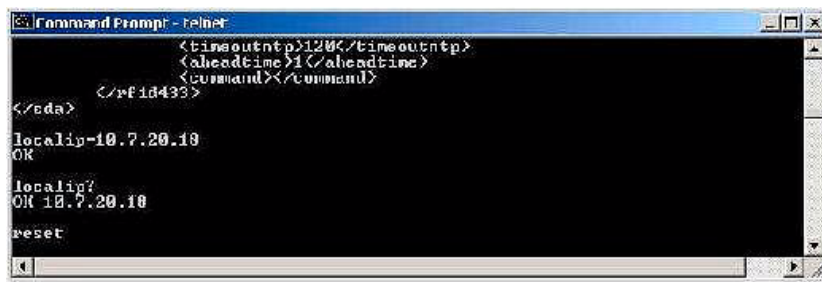
2. Type reset and press **Enter** to cause the IP address to take effect.

   Now you can use Telnet to connect to the reader at the new IP address.

3. Type gateway=10.100.4.1 (or whatever valid IP address you want to assign) and press **Enter** to set the reader gateway IP address.

Figure A-13   Telnet Gateway IP address display
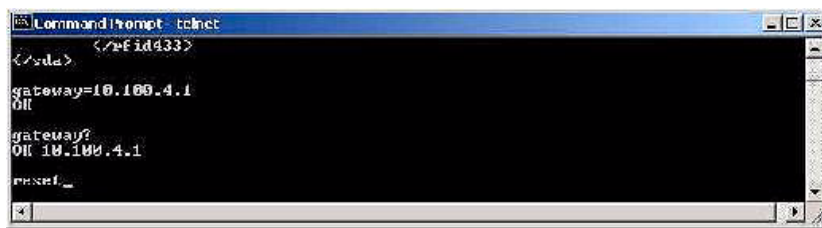
4. Type reset and press **Enter** to make the gateway IP address take effect.

5. Type hostip=10.7.20.18 (or whatever valid IP address you want to assign to the SmartChain Site Manager) and press **Enter** to set the reader host IP address. This will point the Savi Fixed Reader SR-650-101 to the SmartChain Site Manager's IP address.

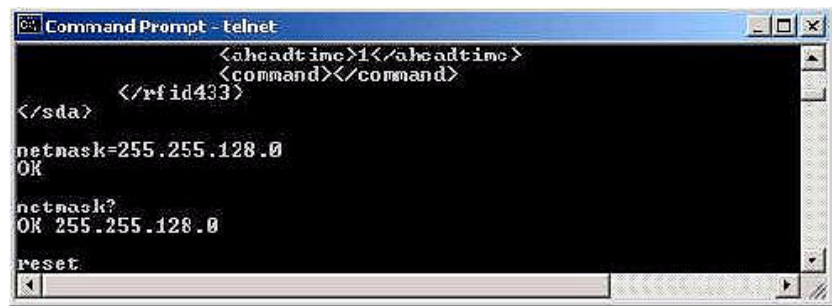*Figure A-14   Telnet Host IP address display*

6. Type reset and press **Enter** to apply the host IP address.

   The host is the computer to which the reader sends the event data.

7. Type netmask=255.255.128.0 (or whatever valid mask you want to assign) and press **Enter** to set the reader network mask as depicted in Figure A-15.
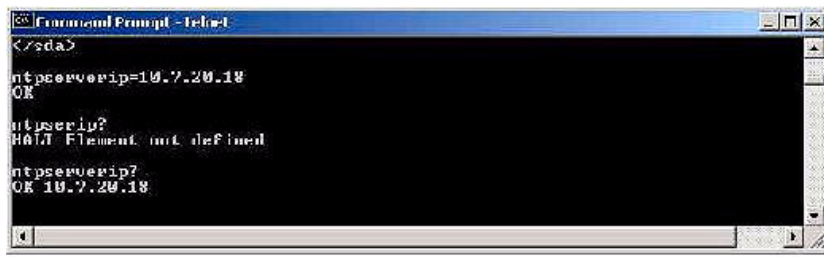
Figure A-15   Telnet network mask display

8. Type reset and press **Enter** to make the netmask take effect.

9. Type ntpserverip=10.7.20.18 (or whatever valid NTP address you want to assign) and press **Enter** to set the NTP server IP address that the reader will listen to.
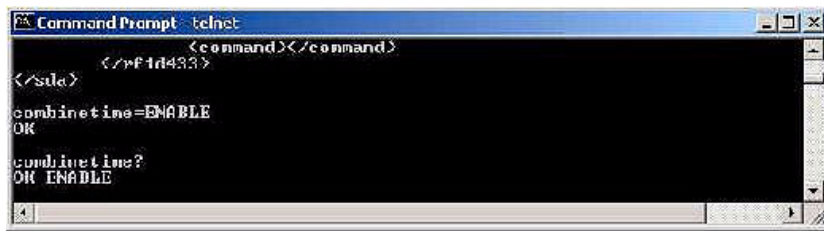
Figure A-16   Telnet NTP server IP address display

To set reader parameters:

1. Type combinetime=ENABLE (or type combinetime=DISABLE), and press **Enter** to enable (or disable) the time of event data from the reader to combine with the time of the tag received from the Signpost.

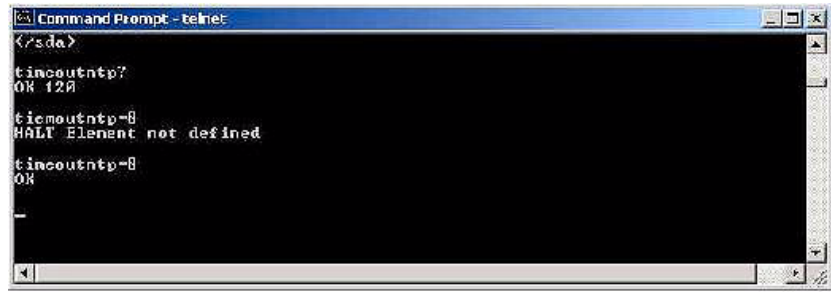Figure A-17   Telnet combine time command

2. Type ntpsynchro=ENABLE (or type ntpsynchro=DISABLE), and press **Enter** to enable (or disable) the reader time and date to synchronize with the NTP server.

Figure A-18   Telnet NTP server synchronization command

3. Type timeoutntp=8 (unit: minutes) and press **Enter** to set the period (in minutes) for which, if the reader has not received time information, it will assume it has lost time synchronization with the NTP server.

Figure A-19   Telnet NTP server time out command

4. Type aheadtime=2 (unit: seconds) and press **Enter** to set the time (in seconds) of the reader ahead of the synchronized NTP server time.

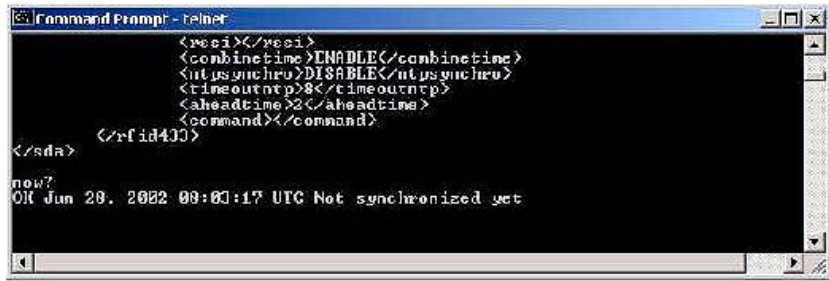*Figure A-20   Telnet reader ahead time command*

5. Type now? and press **Enter** to display the current time.

If the reader is not set to synchronize with an NTP server, then you can also set the time with this command.

Figure A-21   Telnet time command

6. Type simulate=10 and press **Enter** to generate 10 simulated events.

   If you have a daemon listening to the event on the host computer, it will receive the events.

Figure A-22   Telnet simulate command

7. Type reset and press **Enter** to reset the Savi Fixed Reader SR-650-101 with all the new parameters.

Installing and Removing Heat Shrink Tubing

Although Savi products are rated for use in severe environments, power and network connectors on Savi Readers and RF links that are subject to repeated installation and removal can erode. Savi recommends using heat shrink tubing to minimize deterioration. Follow these steps to safely install and remove heat shrink tubing to protect cables and connectors from rain and harsh weather conditions.

Warning: Installing heat shrink tubing requires using a hair dryer with nozzle temperatures in excess of 257°F (125°C). Exercise care during installation to prevent serious burns.

Removing heat shrink tubing requires using an object with a sharp edge, such as a box cutter or pocketknife. Handle the sharp object with care to prevent potential cuts.

Caution: When installing heat shrink tubing, connectors can be damaged under temperatures in excess of 500°F (260°C). Use the lowest heat setting possible; the minimum temperature at which the heat shrink tubing will contract is 257°F (125°C). Use hair dryers with small nozzles and aim the direct air flow to the heat shrink only.

When removing heat shrink tubing, take notice to not cut too deeply as cutting the cable or damaging the connector will require replacing the entire cord assembly.

Installing Heat Shrink Tubing

1. Place the heat shrink over the cable, and then mate the connectors.

    The connectors are fully mated when the detent is engaged.

2. Position the heat shrink tubing so it is not completely against the reader's connector panel and covering the entire connector shell but is .25 of an inch (6.35 mm) from the connector panel.

3. Use a hair dryer to shrink the heat shrink tubing.

    Heat shrink tubing conforms to the connector shell when fully shrunk.

Removing Heat Shrink Tubing

1. Disconnect power from the unit prior to removing heat shrink tubing.

    The heat shrink tubing must be at room temperature before removal.

2. Using a box cutter or pocketknife, carefully score the heat shrink tubing along its full length. Score the heat shrink tubing only deep enough to peel the tubing off the cable.

3. Lift a scored corner and peel back the heat shrink tubing. Use a small pair of long-nosed pliers for assistance, if necessary.