

Savi Fixed Reader SR-650-101 Installation Guide

Version 1.0



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Documentation for Savi Fixed Reader SR-650-101, version 1.0

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Introduction

You can use the Savi® Fixed Reader SR-650-101 to scan, detect, and collect tag information. The SR-650-101 Reader is designed to communicate with all models of SaviTags, and forward the collected data to the SmartChain™ Site Manager or Client Tools host platforms. You can network multiple readers to cover large facilities.

Working with Savi Signposts, SR-650-101 Readers provide a complete RFID solution for real-time, end-to-end visibility of goods and critical assets moving through the supply chain.

Figure 1-1 Savi Fixed Reader SR-650



Features

- ◆ Long-range, omnidirectional communication enables effective monitoring of thousands of tagged items over a 100-meter radius—ideal for yards, terminals, and warehouses.
- ◆ Ethernet network connectivity supports wired and wireless installations, allowing multiple readers to be easily networked together.
- ◆ Universal Data Appliance Protocol (UDAPT™) network protocol provides interoperability with other data collection devices, including bar code scanners and other RFID readers.
- ◆ Seamless interface to Savi SmartChain® platform and applications through the SmartChain Site Manager.
- ◆ Rugged, weatherproof packaging for indoor and outdoor use.

Reader Description

The Savi Fixed Reader SR-650-101 has an omnidirectional read pattern with an adjustable range of up to 300 feet (91.44 meters), and can be networked to provide cellular coverage of a nearly unlimited area. Its power source can be 92 to 250 VAC or 12 to 24 VDC. A portable tripod mount, a solar power unit, or a cable for powering the reader from a vehicle are all available for use with the SR-650-101 Reader.

The Savi Fixed Reader SR-650-101 operates at 433.92 MHz.

Tag Communication

The Savi Fixed Reader SR-650-101 can transmit control commands and data over a UHF link to SaviTags. In return, the SaviTags transmit status information, recognition codes, and data over the UHF link to the reader, depending on the commands the tag received.

Specifications

The Savi Fixed Reader SR-650-101 can be mounted in permanent or semipermanent sites, as well as in a mobile vehicle. SR-650-101 Readers are designed for indoor or outdoor use.

Specification	Description
Tag compatibility	All Savi RFID tags
UHF transceiver (uplink and downlink)	Long-range, omni directional RF communication enables effective monitoring of thousands of tagged items over a 100-meter radius
UHF operation	UHF receiver for receiving the following information from tags: status information, tag alarm messages, beacons, UHF-initiated collection command responses or Signpost initiated wakeup responses. Capable of receiving recognition codes and data over a UHF link to ST-41x, ST-645, and ST-65x tags UHF transmitter capable of transmitting control commands and data over a UHF link to ST-41x, ST-645, and ST-65x tags
Architecture	Single UHF board with two channels
Frequency	433.92 MHz
UHF Antennas	Internal: Orthogonal (Omni) Dual Loop Antennas
Modulation	FSK, deviation +/- 35KHz for receive, +/- 50KHz for transmit
Data rate	27.8Kbps
Data coding	Manchester
Communication range	Typical transmit range is approximately 328 feet or 100 meters line of sight from the reader to ST-65x and ST-41x tags. Typical transmit range is approximately 100 feet line of sight from the reader to ST-645 tag Typical receive range is approximately 328 feet or 100 meters line of sight from all Savi tags
Rx Signal Strength Indicator (RSSI)	Supported

Specification	Description
Maximum transmit power	0.1mW -7 dBm after antenna gain 1 dBm before antenna gain
UHF air protocol	BCS Commands, EBCS Commands (refer to Convergence RFID Air Protocol document) EchoPoint Air Protocol 2.1 (refer to EchoPoint Air Protocol document) ♦ Two-way UHF commands ♦ Seal extension commands
Memory	
Non-volatile	On board non-volatile memory of 512Kbytes for interim tag data
Power	
AC Source	Universal Power Supply 92-250 VAC, 50/60 Hz, 100 mA max
DC Source	12-24 VDC, 500 mA average (internally regulated)
Physical Enclosure	
Size	30 cm (12 in.) diameter x 14 cm (5.5 in.)
Weight	1.9 kg (4.2 lbs)
Color	Charcoal gray
Case material	Polypropylene with UV inhibitors
Type	Rugged, weatherproof packaging for indoor and outdoor use. Sealed to IP42, protection against objects larger than 1mm (.04 inches) in diameter and protection from water falling as much as 15 degrees from vertical
Markings	SR-650-101 Reader: ♦ Savi name ♦ Model Number ♦ Serial ID (HRI and bar code) ♦ Compliance label ♦ HERO Label

Specification	Description
Interfaces	
Network interface	◆ UDAP protocol over Ethernet 10Base-T. ◆ Reader network supports wireless connectivity to host computer via external 802.11b communications
Interfaces	◆ Captive cable with RS232C interface and DB-9 female connector ◆ RS-485 ◆ RJ-45 10 Base-T Ethernet interface
RS232	SMP Serial Communication Protocol
◆ Data rate	19.2 Kbps
◆ Flow control	CTS, half duplex communication
◆ Data format	8 data bits, none parity, 1 stop bit
◆ RS232 signals	TXD, RXD, DTR, CTS
RS485	SMP Serial Communication Protocol
◆ Data rate	38.4 Kbps
◆ Data format	8 data bits, none parity, 1 stop bit
◆ RS485 signals	2 wire differential
Indicators	
LED displays	Standard seven-segment LED display
Accessories	
Mounting	Savi Mounting Kit SRA-1001 (not included) Savi Heavy Duty Mounting Kit SRA-1024 (not included)
Environment	
Temperature	-32°C to +60°C operating -40°C to +70°C storage
Humidity	100% condensing
Shock and Vibration	
Vibration	MIL STD 810E Method 514.4, Category 10
Shock	MIL STD 810E Method 514.4, Category 10

Specification	Description
Regulatory Requirements	
Radiated emission (intentional)	U.S. emission standards as contained in FCC Part 15 Canada RSS210 European Community emission standards as contained in EN 300 220 (433 MHz)
Electromagnetic Immunity	ESD compliance Exposed to 8 kV air discharge or 4 kV contact discharge in accordance with EN 301 489-1
Radiated emission (unintentional)	U.S. emissions standards as contained in FCC Part 15 Medical Device EMC, IEC 60601-1-2 European Community emission standards as contained in EN 301 489-1
Safety approval	U.S UL 1950 European EN 60950 Hazardous Location: Europe–EN50020
Ordnance safety	HERO rated for 24" minimum safe separation distance
Markings	Savi Logo Product model and serial number Safety (ETL/CE) EMC Compliance (FCC/CE/IC) Ordnance/HERO

Models and Options

Savi Readers are supplied with cables necessary for operation. Available accessories include a solar power unit, a vehicle power cable, AC power adapter and cables, spare batteries, a battery charger, and mounting hardware. Contact your Savi Technical Service representative for information about ordering additional equipment or accessories.

The table shows the Savi Fixed Reader models and options. All product options are based on a common hardware and software platform with a universal power supply. The difference between the product options is the

type of power plug with which the unit is shipped. All models operate at 433.92 MHz.

Table 1-1 Savi Fixed Reader SR-650-101 Reader models

Model	Description	Power/Plug
SR-650-101	Savi Fixed Reader SR-650-101	92-250 VAC 50/60 Hz, U.S. Plug
SR-650-101-2	Savi Fixed Reader SR-650-101	92-250 VAC 50/60 Hz, European Plug
SR-650-101-3	Savi Fixed Reader SR-650-101	92-250 VAC 50/60 Hz, Japan Plug
SR-650-101-6	Savi Fixed Reader SR-650-101	92-250 VAC 50/60 Hz, Type 2 Plug
SR-650-101-7	Savi Fixed Reader SR-650-101	92-250 VAC 50/60 Hz, U.K. Plug
SR-650-101-8	Savi Fixed Reader SR-650-101	92-250 VAC 50/60 Hz, China Plug
SR-650-101-D	Savi Fixed Reader SR-650-101	12 VDC Pigtail wires
SR-650-101-T	Savi Fixed Reader SR-650-101	Solar DC Input, Transportable

Contacting Customer Support

If you cannot find the information you need in this guide, contact Savi Customer Support.

- ◆ Call 1-888-994-SAVI (North America only) or 1-408-743-8888 between 9 a.m. and 5 p.m. Pacific time.
- ◆ Send email to help@savi.com.
- ◆ Check www.savi.com/support for information.

When you contact Savi Customer Support by telephone or email, have the following information available:

- ◆ Site location
- ◆ Incident description
- ◆ Estimated severity level of the incident
- ◆ Model number and version
- ◆ Serial number
- ◆ Computer type (Gateway, Dell, etc.) and model
- ◆ Operating system and service pack level
- ◆ Network protocol

Savi Fixed Reader SR-650-101 Installation

Installing the Savi Fixed Reader SR-650-101 is a four-step process.

- ◆ First, consult a site plan to determine the reader's installation location.
- ◆ Second, position the reader to enable the most efficient communication range.
- ◆ Third, connect power cables and network cables, and supply power.
- ◆ Finally, verify network communication between the reader and the computer.

Planning a Site

To plan a site you must conduct a site survey and plan the RFID network configuration. Once the site plan is in place, refer to it to determine where to install Savi Readers. Follow the directions in this manual to ensure proper installation of each Savi Fixed Reader SR-650-101.

Positioning Savi Fixed Readers

Savi Fixed Readers are designed to operate in a wide variety of environments. They are housed in rugged, weatherproof enclosures. In ideal conditions (large, open, and unobstructed areas), Savi Readers can collect tags up to 300 feet (91.44 meters) away.

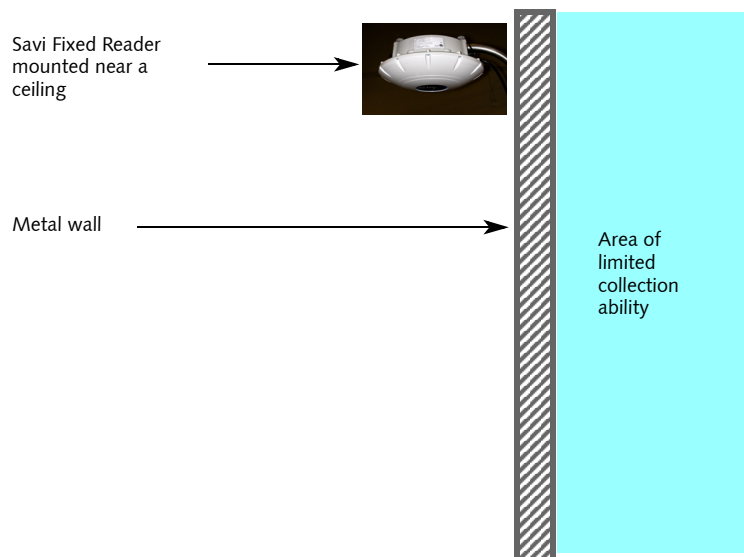
An area can contain factors that limit the Savi Reader collection range, including:

- ◆ Asymmetrical shape to the collection area
- ◆ 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 less than 15–30 feet (4.572–9.144 meters)
- ◆ Metal or RF-absorbent surface on the tracked item
- ◆ Tag location relative to the Savi Reader, such as behind a metal obstruction (as illustrated in Figure 2-1) 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 2-1 Impediment limiting the Savi Fixed Reader SR-650-101 collection range



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 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 approximately 15 to 30 feet 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 downwards, as shown in Figure 2-1. 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. However, you might want to be sure that the reader is operational and verified on the network before mounting it in any hard-to-reach position.

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 3, “Maintenance,” for troubleshooting procedures.

Connecting Power Cables to the Savi Fixed Reader

Note: While the Savi Fixed Reader SR-650-101 is rated for use in severe environments, the power and network connector seals may deteriorate with repeated installation and removal. Therefore, Savi recommends the use of heat shrink tubing (Savi part number 680-02423-001) for units subject to outdoor use.

When connecting the Savi Fixed Reader's power cable, be sure to check any relevant configuration or wiring diagrams beforehand.

The power source can be 12 to 24 VDC or 92 to 250 VAC. The socket-outlet should be installed near the equipment and should be easily accessible. The Savi Fixed Reader SR-650-101 does not require adjustment or modification for different power sources. An appropriate power cable is supplied, based on the requirements specified when the order was placed.

You can also power the Savi Fixed Reader SR-650-101 from a Savi Solar Power Module or by vehicle power. A fixed-length, molded cable is supplied with the Solar Power Module. You can purchase the Vehicle Power Cable as an accessory item.

The appropriate power cable for the AC power source should be included with the reader.

To connect the power cable to the reader:

1. If installing the Savi Fixed Reader SR-650-101 in an outdoor location, slide heat shrink tubing onto the power cable before connecting the cable to the reader. Follow the instructions included with the heat shrink kit to apply the tubing to the cable.
2. On the Savi Fixed Reader, plug the cable's female connector into the power input socket. See Figure 2-2.
 - a. Turn the connector to align its notch on the side nearest the Savi Fixed Reader's dome.
 - b. Firmly push the locking ring forward and rotate it clockwise to lock the connector.

Figure 2-2 Power Connector



Connecting the Network Cables

Before you connect the Savi Fixed Reader's network cables, check any relevant configuration or wiring diagrams.

Note: While the Savi Fixed Reader SR-650-101 is rated for use in severe environments, the power and network connector seals may deteriorate with repeated installation and removal. Savi recommends the use of heat shrink tubing (Savi part number 680-02423-001) for units subject to outdoor use.

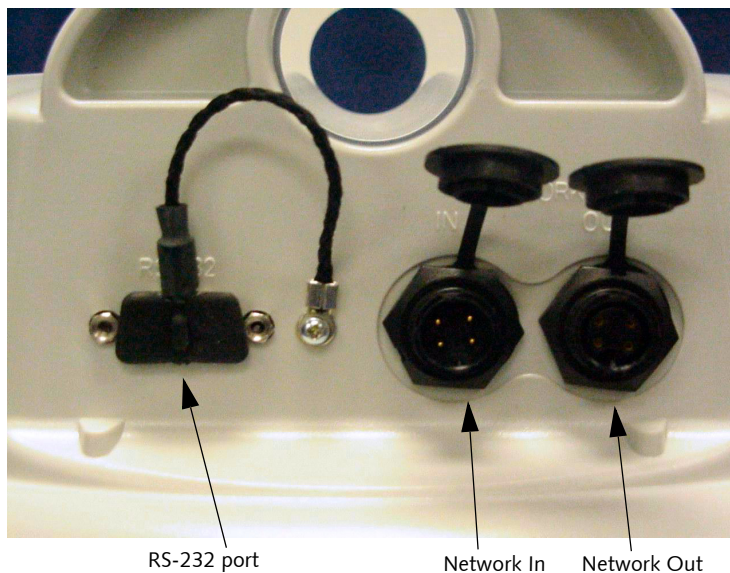
Ethernet Connection

You can connect the Savi Fixed Reader SR-650-101 directly to a network hub via the built-in Ethernet connection. The Readers are the source of RFID tag read and service events. SmartChain Site Manager records, stores, and forwards these events to Savi SmartChain application software. SmartChain Site Manager also sends commands for reader management or control logic. The readers communicate with SmartChain Site Manager using Universal Data Appliance Protocol (UDAP).

SmartChain Site Manager and applications are available separately from Savi Technology.

Connect the RJ-45 connector of the Ethernet cable from the SR-650-101 Reader to the Ethernet hub.

Figure 2-3 Network connector and RS-232 ports



Applying Power to the Savi Fixed Reader

After connecting power and network cables, apply power to the Savi Fixed Reader by connecting the male connector end of the power cable to the appropriate power source, such as the Savi Solar Power Module or an AC outlet.

Figure 2-4 Savi Fixed Reader SR-650-101 LED display panel



To confirm that power is present in the Reader:

1. Observe the indicators and the seven-segment display on the LED display panel. The power indicator should be illuminated whenever power is present.
 - a. During the initial power-on sequence, the Savi Fixed Reader displays its identification number (ID) in the LED display as a sequence of five digits.

Savi Fixed Reader ID number 1234 displays the numbers 0, then 1, then 2, then 3, and then 4 in sequence during the initialization process.

- b. After the ID display, two indicators flash at different rates. One is the center bar of the segmented display and the other is a small indicator within the segmented display. If the indicators fail to flash, the Savi Fixed Reader is non-operational.
2. If at any time you are not sure that the Savi Fixed Reader is operating properly, reset the reader by disconnecting and then reconnecting the power source.

After resetting the Savi Fixed Reader SR-650-101, it should repeat the power-on sequence described above.

The Savi Fixed Reader is now ready for you to verify communication functions.

Note: The Savi Fixed Reader SR-650-101 has a watchdog sensor that automatically resets the reader if power fluctuations or other interruptions occur that might affect the reader's performance.

Setting Up the Savi Fixed Reader SR-650-101

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

Note: Keep in mind 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.

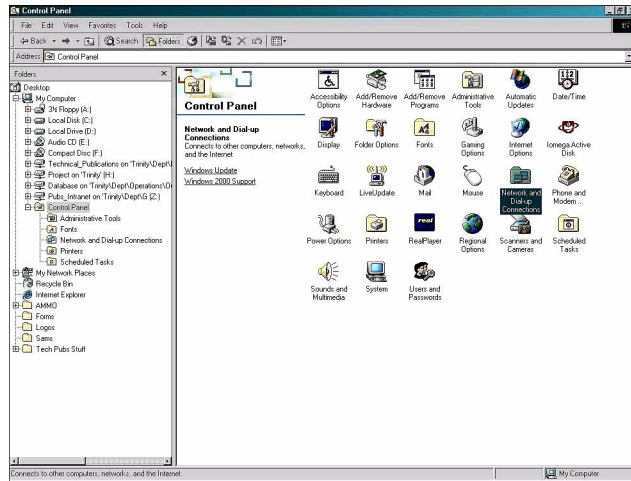
Configuring Your PC's IP Address

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

To specify the IP Address:

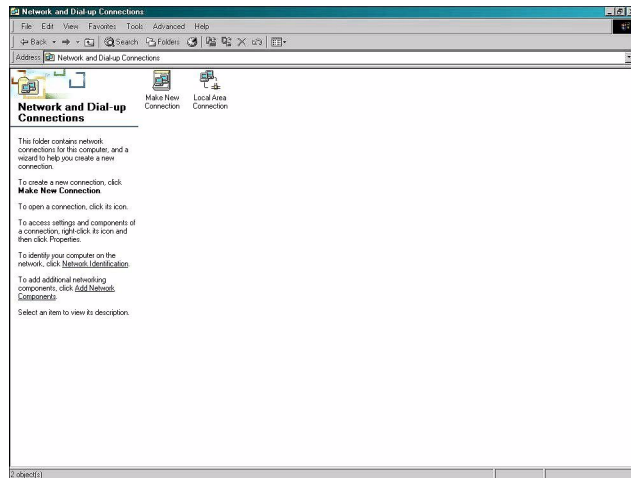
1. At the host computer desktop, select **Start > Settings > Control Panel**.

Figure 2-5 Control Panel window



2. Double-click the **Network and Dial-Up Connections** icon to display the Network and Dial-Up Connections window.

Figure 2-6 Network and Dial-Up Connections window

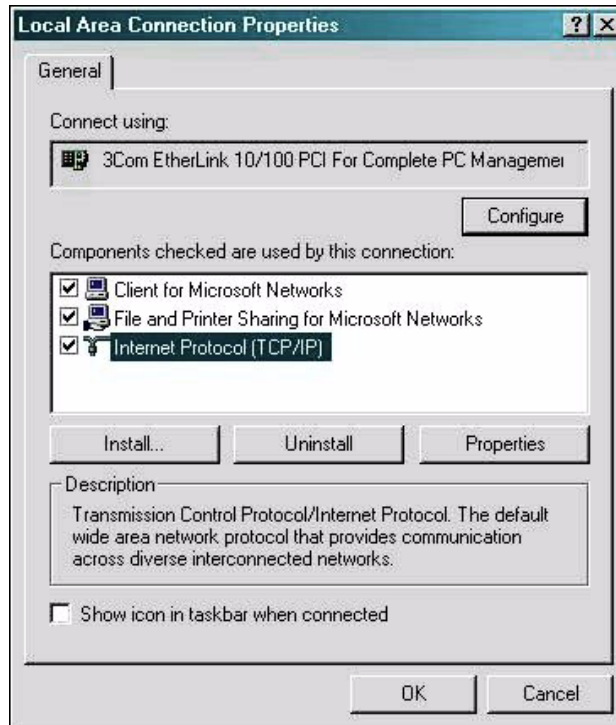


3. Double-click the **Local Area Connection** icon.
The Local Area Connection Status window appears.

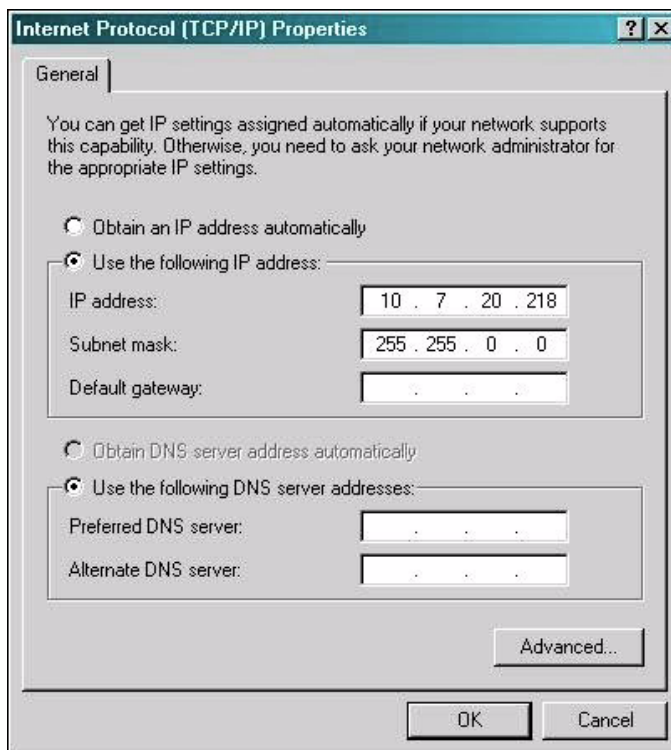
Figure 2-7 Local Area Connection Status window



4. Click **Properties** to display the Local Area Connection Properties window.

Figure 2-8 Local Area Connection Properties window

5. Double-click **Internet Protocol (TCP/IP)**.

Figure 2-9 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 as 10.7.20.218, 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 SR-650-101

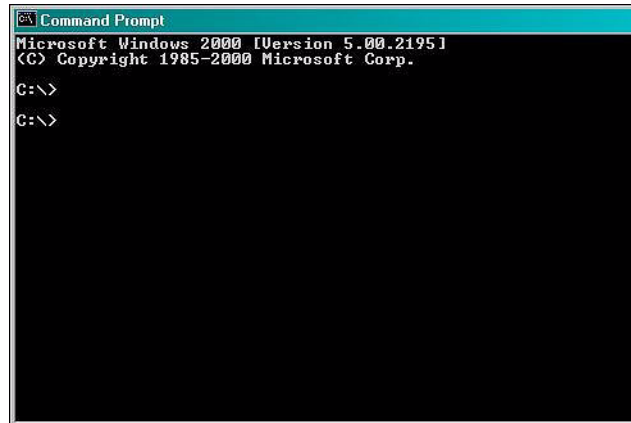
You need to check the network connection from your computer to the Savi Fixed Reader SR-650-101. You can either use an Ethernet cross connect cable from your PC's Ethernet port to the Ethernet cable from the Savi Fixed Reader SR-650-101 (with a coupler) or connect both your PC and the

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:

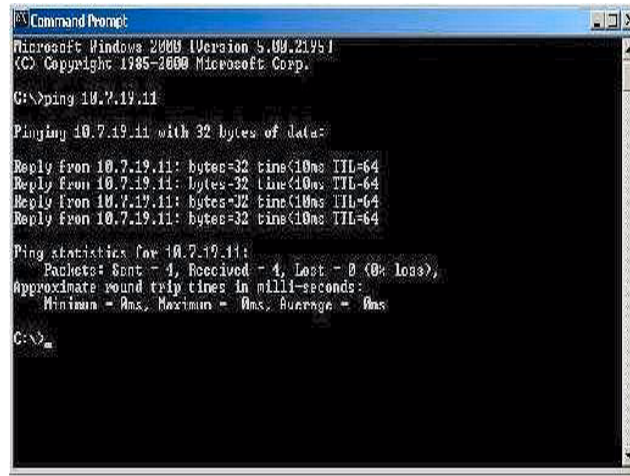
1. At the host computer desktop, select **Start > Programs > Accessories > Command Prompt** to open a DOS session.

Figure 2-10 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 2-11 Command Prompt window with completed ping

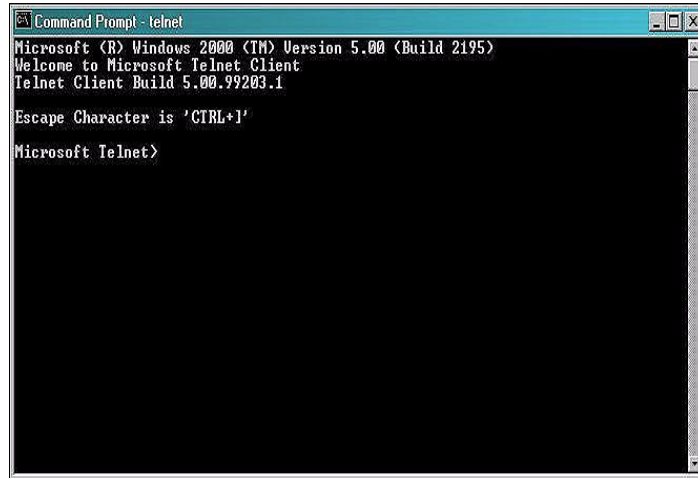
3. Upon successfully pinging the reader, close the Command Prompt window and begin the Savi Fixed Reader SR-650-101 setup process.

Configuring the Savi Fixed Reader SR-650-01 Parameters

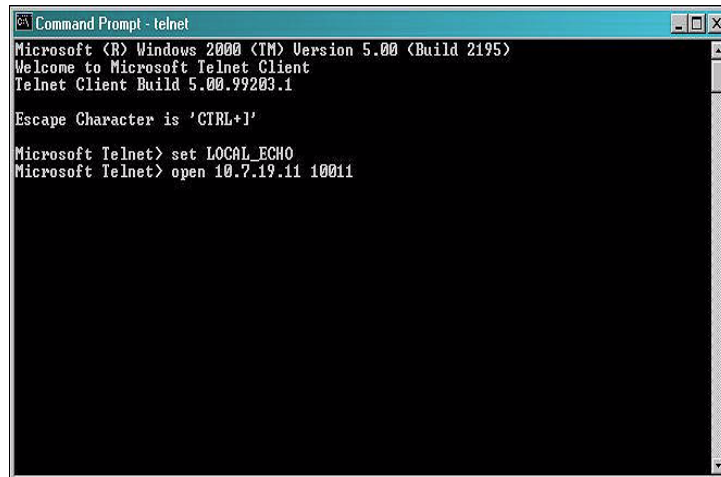
In this section you use Microsoft Telnet Client to connect to the reader and set up the reader parameters. Telnet Client software allows a computer to connect to a remote Telnet server and run applications on that server.

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 2-12 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** and press **Enter** to connect to the reader.

Figure 2-13 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 that you can view or modify. Not all properties can be modified.

Figure 2-14 Description of reader properties

```

Command Prompt: telnet
description
<sda>
  <udp>4.00</udp>
  <devapp>0.051</devapp>
  <manufacturer>Savi Technology, Inc</manufacturer>
  <url>www.savi.com</url>
  <product>EchoPoint Reader</product>
  <type>R01</type>
  <udn>M23450B067890</udn>
  <earring></earring>
  <state></state>
  <name>Reader_1</name>
  <control>ONLINE</control>
  <hostip>10.7.3.252</hostip>
  <localip>10.7.19.11</localip>
  <gateway>10.7.1.5</gateway>
  <netmask>255.255.0.0</netmask>
  <ntpserverip>10.7.3.218</ntpserverip>
  <reset></reset>
  <log>
    <simulate>1000</simulate>
    <hear></hear>
  </log>
  <clock>
    <now></now>
  </clock>
  <rfid433>
    <rss1></rss1>
    <combination>DISABLE</combination>
    <rfpsync>true</rfpsync>
    <timeoutntp>120</timeoutntp>
    <aheadtime>1</aheadtime>
    <command></command>
  </rfid433>
</sda>

```

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

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

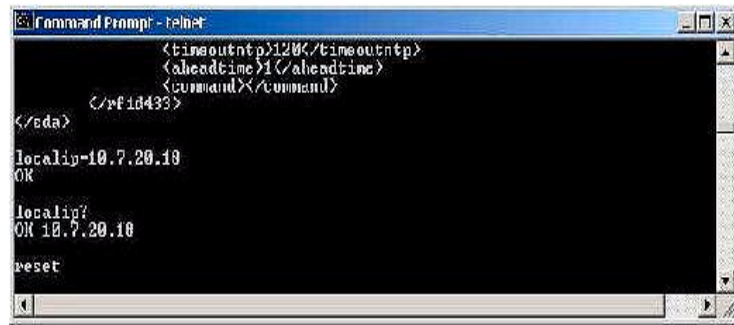
Figure 2-15 Telnet UDAP value display



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 to the input one.

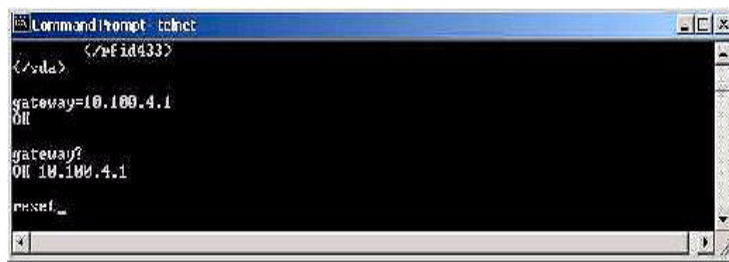
Figure 2-16 Telnet local IP address display



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 to the input one.

Figure 2-17 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 to the input one. This will point the Savi Fixed Reader SR-650-101 to the Site Manager's IP address.

Figure 2-18 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 to the input one as depicted in Figure 2-19.

Figure 2-19 Telnet network mask display



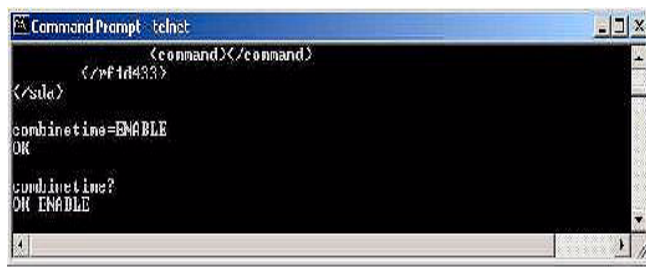
8. Type **reset** and press **Enter** to make the netmask take effect.
9. Type **ntpserverip=10.7.20.18** (or whatever valid NTP address you want to assign) and press **Enter** to set the NTP server IP address that the reader will listen to.

Figure 2-20 Telnet NTP server IP address display

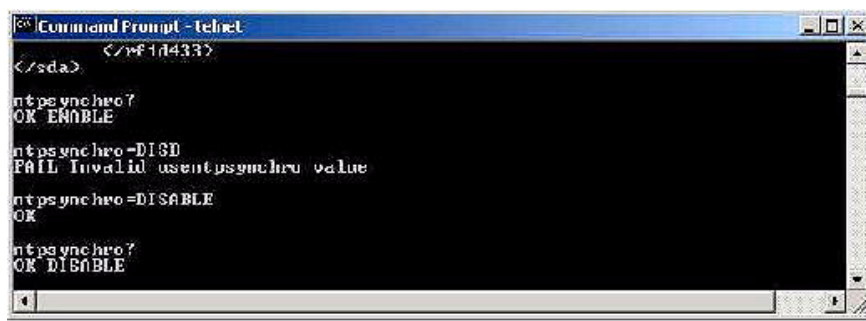


To set reader parameters:

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

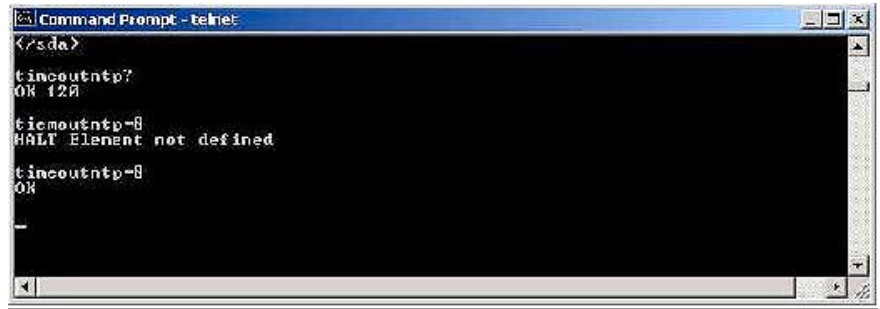
Figure 2-21 Telnet combine tme command

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

Figure 2-22 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 2-23 Telnet NTP server time out command



```

Command Prompt - telnet
</sda>
timeoutntp?
OK 120

timeoutntp=8
HALT Element not defined

timeoutntp=8
OK

```

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

Figure 2-24 Telnet reader ahead time command



```

Command Prompt - telnet
<aheadtime>1</aheadtime>
<command></command>

</sda> </rfid400>

aheadtime?
OK 1

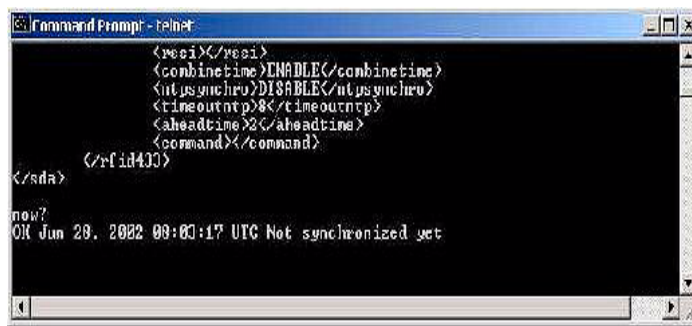
aheadtime=2
OK

```

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 2-25 Telnet time command

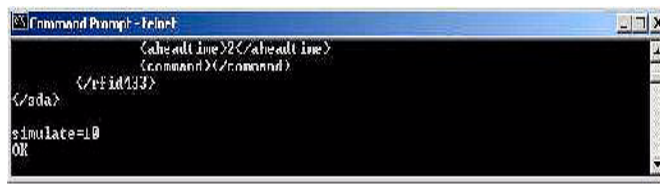


```
Command Prompt - Telnet
<res></res>
<combine>DISABLE</combine>
<ntpsynchro>DISABLE</ntpsynchro>
<timeoutntp>8</timeoutntp>
<aheadtime>2</aheadtime>
<command></command>
</sda>
now?
OK Jun 29, 2002 09:03:17 UTC Not synchronized yet
```

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 2-26 Telnet simulate command



```
Command Prompt - Telnet
<aheadtime>2</aheadtime>
<command></command>
</sda>
simulate=10
OK
```

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

Verifying Reader Communication

To confirm that an Savi Fixed Reader SR-650-101 is installed and functioning correctly, it is necessary to verify that the reader:

- ◆ Can communicate with the SmartChain Site Manager (verifies that the reader is detected on the network)
- ◆ Can collect tags in the collection area

Once the Savi Fixed Reader is installed, refer to the *Guide to SmartChain Site Manager* for instructions on testing the operation of the reader.

Maintenance

With minimal care, a Savi Fixed Reader SR-650-101 should perform flawlessly. However, in the event that a problem with a Savi Fixed Reader occurs, the procedures in this chapter should help you troubleshoot 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 Savi Fixed Reader SR-650-101 is designed to be maintenance-free. It is manufactured with the highest-quality components and is thoroughly tested before delivery.

Troubleshooting

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

In the unlikely event that a Savi Fixed Reader fails or problems occur that simple troubleshooting cannot solve, Savi Technical 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 any 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 19 ◆ 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 Technical Support.

Technical Support

If your Savi Fixed Reader SR-650-101 presents a problem that neither this manual nor troubleshooting tips can help you solve, you can contact Savi Technical Support in either of two ways:

- ◆ Telephone 1-888-994-SAVI (7284) between 8:00 a.m. and 5:00 p.m., Pacific Time
- ◆ Or send e-mail to **help@savi.com** at any time

Whether you contact Savi by telephone or e-mail, please have the exact sequence of operations (if possible) that caused the problem and the following information available:

- ◆ Site location
- ◆ Incident description
- ◆ Estimated severity level of the incident
- ◆ Model number and version
- ◆ Serial number
- ◆ Computer type (Gateway, Dell, etc.) and model
- ◆ Operating system and service pack level
- ◆ Network protocol

