9150
Wireless Gateway

User Manual

May 2, 2002 Part No. 80440.F

Wi Fi™
The Standard for Wireless Fidelity.

ISO 9001 Certified
Quality Management System

PSION TEKLOGIX

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APPROVALS AND SAFETY SUMMARY

DECLARATION OF CONFORMITY

Product:	**9150 Wireless Gateway**
Application of Council Directives:	EMC Directive:89/336/EEC Low Voltage Directive:73/23/EEC
Conformity Declared to Standards:	EN 55022: 1994; Class B; ETS 300 328: 1996 EN 50082-1:1997; ETS 300 683:1997; EN 55024:1998 EN 61000-4-2; ±4kV CD; ±8kV AD EN 61000-4-3; 3V/m, 80-1000 MHz, 80% AM(1kHz) EN 61000-4-4; ±1kV Signal lines; ±2kV Power lines EN 61000-4-5; ±2kV Comm.; ±1kV Differ., ±1kV on I/O lines EN 61000-4-6; $3V_{RMS}$, 150kHz-80MHz, 1kHz 80% AM EN 61000-4-11; AC Mains Ports EN 60950: 1992 + A1 + A2 + A3 + A4 + A11
Manufacturer:	PSION TEKLOGIX INC. 2100 Meadowvale Blvd. Mississauga, Ontario; Canada L5N 7J9
Year of Manufacture:	1998
Manufacturer's Address in the European Community:	PSION TEKLOGIX S.A. La Duranne 135 Rue Rene Descartes; BP 421000 13591 Aix-En-Provence Cedex 3; France
Type of Equipment:	Information Technology Equipment
Equipment Class:	Commercial and Light Industrial
Manufacturer:	Hector Perez Director of Engineering Psion Teklogix Inc. Ontario
Legal Representative in Europe:	Dominique Binckly Vice President International Sales Psion Teklogix S.A. France

DECLARATION OF CONFORMITY

Product:	**9150DC Wireless Gateway**
Application of Council Directives:	EMC Directive:89/336/EEC Low Voltage Directive:73/23/EEC
Conformity Declared to Standards:	EN 55022: 1998; Class B EN 55024: 1998 EN 61000-4-2; ±4kV CD; ±8kV AD EN 61000-4-3; 3V/m, 80-1000 MHz, 80% AM (1kHz) EN 61000-4-4; 0.5kV on DC lines; 0.5kV on I/O EN 61000-4-5; ±0.5kV on DC lines; ±1kV on I/O lines EN 61000-4-6; 3Vrms, 0.15-80 MHz; 1kHz 80% AM
Manufacturer:	PSION TEKLOGIX INC. 2100 Meadowvale Blvd. Mississauga, Ontario; Canada L5N 7J9
Year of Manufacture:	2001
Manufacturer's Address in the European Community:	PSION TEKLOGIX S.A. La Duranne 135 Rue Rene Descartes BP 421000 13591 Aix-En-Provence Cedex 3; France
Type of Equipment:	Information Technology Equipment
Equipment Class:	Commercial and Light Industrial
Manufacturer:	Hector Perez Director of Engineering Psion Teklogix Inc. Ontario
Legal Representative in Europe:	Dominique Binckly Vice President International Sales Psion Teklogix S.A. France

DECLARATION OF CONFORMITY

Product:	**9100 PowerBaseT**
Application of Council Directives:	EMC Directive:89/336/EEC Low Voltage Directive:73/23/EEC
Conformity Declared to Standards:	EN 55022: 1998; Class B EN 55024: 1998 EN 61000-4-2; ±4kV CD; ±8kV AD EN 61000-4-3; 3V/m, 80-1000 MHz, 80% AM (1kHz) EN 61000-4-4; 1kV on AC lines; 0.5kV on I/O EN 61000-4-5; ±2kV Com/±1kV Diff on AC; ±1kV on I/O EN 61000-4-6; 3Vrms, 0.15-80 MHz; 1kHz 80% AM EN 61000-4-11; Voltage dips and interruptions on AC EN 61000-3-2; Harmonic current emissions EN 61000-3-3; Voltage fluctuation and flicker on AC line
Manufacturer:	PSION TEKLOGIX INC. 2100 Meadowvale Blvd. Mississauga, Ontario; Canada L5N 7J9
Year of Manufacture:	2001
Manufacturer's Address in the European Community:	PSION TEKLOGIX S.A. La Duranne 135 Rue Rene Descartes BP 421000 13591 Aix-En-Provence Cedex 3; France
Type of Equipment:	Information Technology Equipment
Equipment Class:	Commercial and Light Industrial
Manufacturer:	Hector Perez Director of Engineering Psion Teklogix Inc. Ontario
Legal Representative in Europe:	Dominique Binckly Vice President International Sales Psion Teklogix S.A. France

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user is required to correct the interference at personal expense.

RF Exposure

Warning: ***To satisfy FCC RF exposure requirements for base station transmitting devices, a separation distance should be maintained between the antenna of this device and persons during device operation, as shown in the table below. To ensure compliance, operations at closer than this distance is not recommended.***

Antenna Type	Antenna Gain	Minimum Separation
1/2 Wave	2 dBi	20 cm
Mobile Station	2 dBi	20cm
Mobile Mark	12 dBi	15 ft. (4.6 m) high and 10 ft. (3 m) away

Changes or modifications not expressly approved by Psion Teklogix Inc. can void the user's authority to operate the equipment.

An unshielded plug or cable may cause radiation interference. All peripheral devices must be used with properly shielded interface cables and external filters as required. The shield must be connected directly to the chassis of the peripheral device.

Important Safety Instructions

This safety information is for the protection of both operating and service personnel.

Do Not Operate In An Explosive Atmosphere

Operating Teklogix equipment where explosive gas is present may result in an explosion.

Do Not Remove Covers Or Open Enclosures

To avoid injury, the equipment covers and enclosures should only be removed by qualified service personnel. Do not operate the equipment without the covers and enclosures properly installed.

Do Not Hold Antenna

To avoid discomfort due to the local heating effect of radio frequency energy, do not touch the antenna when a 9150 is transmitting.

Connection to Outdoor Antenna

Outdoor antenna to be earthed in accordance with International Standard EN 50083-1 (1993), “Cabled Distribution Systems for Television and Sound Signals - Safety Requirements”.

Anschluß an Antennennanlagen

Außenantennennanlagen müssen nach nationalen oder internationalen Normen (z.B. EN50083-1(1993) geerdet werden.

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1.1 About This Manual

This manual contains information about the installation, basic operation, and configuration of the 9150 Wireless Gateway.

Chapter 1: Introduction
describes the 9150 and the radio protocols it supports.

Chapter 2: Installation Requirements
describes the physical installation of the Teklogix 9150 Wireless Gateway and 9100 PowerBaseT, and how to connect to the 9150 for configuration/diagnostics.

Chapter 3: 9150 Main Configuration
describes the web page options available from the main configuration menus.

Chapter 4: Access Point Configuration
describes the configuration for a 9150 used as an access point device between wired and wireless networks.

Chapter 5: Base Station Configuration
describes the configuration for a 9150 used as a base station or remote radio module (RRM) linked to a network controller.

Chapter 6: Mini-Controller Configuration
describes the configuration for a 9150 used as a mini-controller.

Chapter 7: 9100 Monitoring/Diagnostics
describes the fault monitoring, diagnostics and status reporting procedures for the 9100 PowerBaseT.

Chapter 8: Specifications
outlines the performance specifications for the 9150T, 9150DC and 9100.

Appendix A: Support Services And Worldwide Offices
presents information for technical support, contacts and the Psion Teklogix worldwide web address.

Appendix B: Port Pinouts And Cable Diagrams
includes pinouts and diagrams of the ports and cables for the 9150.

Appendix C: MAC Bridge Protocol Filters and OUIs
presents tables of values for Ethernet II and DSAP/SSAP types, and OUI.

1.2 Text Conventions

Note: *Notes highlight additional helpful information.*

Important: ***These statements provide particularly important instructions or additional information that is critical to the operation of the computer and other equipment.***

Warning: ***These statements provide important information that may prevent injury, damage to the equipment, or loss of data.***

1.3 About The 9150

The 9150 Wireless Gateway is designed to support a wide variety of system configurations. Using the IEEE 802.11b Wireless LAN Standard, the 9150 is capable of operating as a transparent bridge (access point) between wireless and wired networks. This allows wireless clients to access the network and also move seamlessly between the 9150s in the network. The 9150 can also operate as a Teklogix base station, remote radio module (RRM) or a mini-controller, and become part of a mapRF system.

Because the 9150 provides Ethernet connectivity, it can be added to an existing LAN. The 9150T provides the high-performance of 100Mb/s Fast Ethernet LANs, as well as 10Mb/s. The 9150DC edition incorporates most of the features of the high-performance 9150T, but is DC-powered, eliminating the need for AC wiring. For detailed information on LAN connectivity, please refer to page 19.

The 9150 supports Type II PCMCIA cards so that multiple radio interfaces are possible. The 9150 also has dual-radio functionality. It can support several combinations of radio types to function as both a mini-controller and base station, access point and base station, or access point and mini-controller. For details, see “Radio Options” on page 7.

The 9150 Flash memory holds the boot code, configuration parameters and firmware. The 9150 Configuration program allows various parameter settings to be changed, added or deleted. The Flash can be reconfigured remotely via the network using a standard HTML Web Browser such as Netscape or MS Internet Explorer (for instructions, see Chapter 3: “9150 Main Configuration”).

Figure 1.1 The 9150 Wireless Gateway - Front View

Figure 1.2 The 9150T Wireless Gateway - Bottom View

Figure 1.3 The 9150DC Wireless Gateway - Bottom View

1.3.1 Access Point Functions

As an access point connected to a wired network, the 9150 Wireless Gateway forms a communication link between Teklogix RF terminals or wireless access point clients and a Teklogix Network Controller or a host computer. It communicates over an IEEE 802.11b RF data link with terminals, and over a cable with the network controller or a host computer. The 9150 can be connected to the network through an Ethernet connection. The diagram in Figure 4.1 on page 61 illustrates a 9150 access point connection between a Teklogix 9400 Network Controller on Ethernet and IEEE 802.11 wireless devices.

Two 9150 Wireless Gateways can be used as an 802.11b bridge connecting two separate wired networks. Another feature is that the 9150 can be used as an 802.11b wireless access point to extend coverage area or for locations difficult to wire (see Figure 1.4 on page 10). For information on the 9150 as an access point, see “IEEE 802.11b Protocol” on page 8 and Chapter 4: “Access Point Configuration”.

1.3.2 Base Station Functions

As a base station or Remote Radio Module (RRM) connected to a wired network, the 9150 provides a link between the local area network and the wireless network consisting of Teklogix mobile terminals, and wireless base stations such as the 9150 Wireless Gateway. The 9150 and 9400 Network Controller (or host using a Teklogix Software Development Kit) communicate using the 9010 proprietary protocol with TCP/IP over Ethernet connectivity. Wlan protocol enables the wired 9150 to communicate with 9150s without cable attachments (see Figure 5.1 on page 100).

For information on configuring the 9150 as a base station or RRM, see Chapter 5: “Base Station Configuration”. For Wlan, see “Wlan Protocol” on page 11.

1.3.3 Mini-Controller Functions

The 9150 is equipped with some emulation capabilities, allowing it to act as a mini-controller. When a 9150 is configured as a mini-controller, Teklogix terminals can emulate an ANSI, 5250 or 3274 terminal via a 9150 rather than through a 9400 Network Controller.

To configure the 9150 as a mini-controller, see Chapter 6: “Mini-Controller Configuration”. For a generalized system diagram, see Figure 6.1 on page 142.

1.4 Radio Options

The 9150 supports 802.11b WLAN CF card USI radio Model CF-B-AG-02.

1.5 Radio Protocols

RF protocols allow terminals to communicate with a base station by sharing the use of a radio channel in an efficient way. Teklogix systems use one of three types of RF protocols: the Teklogix Adaptive Polling/Contention protocol, the Teklogix Wireless LAN (Wlan) protocol, or the non-proprietary IEEE 802.11b protocol. When used as a base station, the 9150 uses either the Adaptive Polling/Contention protocol or the Wlan protocol. These protocols *cannot* be mixed on a single system. When used as an access point device, the 9150 employs the IEEE 802.11b protocol. The protocols are described in the following sections.

1.5.1 IEEE 802.11b Protocol

The IEEE 802.11b protocol is an OSI standard for Wireless Local Area Networks (WLANs). With this standard, any IEEE 802.11b radio can communicate with any other similarly-equipped device. However, IEEE 802.11b does not provide a standard for a total WLAN system. IEEE 802.11b solely standardizes two communications layers: Physical (PHY) and Medium Access Control (MAC). Three different PHY layer media are covered: 2.4 GHz Direct Sequence Spread Spectrum radio, 2.4 GHz Frequency Hopping Spread Spectrum radio, and infrared. Each station in a WLAN system has its own unique MAC address.

Important: ***Equipment using one physical medium (e.g. Frequency Hopping versus Direct Sequence) will not interoperate with equipment using a different physical medium.***

IEEE 802.11b uses 2.4 GHz radios of relatively low power. The range is limited to no more than a hundred feet or so, depending on the conditions, and is usually restricted to “line of sight” operation. Therefore, most wireless networks need more than one coverage area, with terminals moving between the areas. To integrate those areas, systems using IEEE 802.11b protocol for their wireless networks require an IEEE 802.11b-equipped *bridge* device (or *access point*), such as the 9150 Wireless Gateway.

Using bridging software, the 9150 Wireless Gateway enables communication between any wireless IEEE 802.11b-equipped stations and LAN stations operating on Ethernet. The 9150 itself is resident on the LAN and functions as a MAC bridge, providing transparent integration between the stations on the wireless and wired networks.

Each terminal is associated with one 9150. A frame from an RF terminal is sent to the 9150 that the terminal is associated with. The terminal puts a destination MAC address in the frame, which specifies a hardware address on the wired LAN side. Because the receiving 9150 is connected to an Ethernet network, it encapsulates the data in an Ethernet frame, including the destination MAC address specified by the terminal. The 9150 then sends the frame onto the physical network; the frame is picked up by whichever device is at the destination hardware address.

When sending frames from the LAN side, the sending device puts the MAC address of the terminal in the frame header. Whichever 9150 has that terminal associated with it, takes the frame and passes it over the RF to the terminal. By passing frames in this way, the 9150 is acting as a MAC bridge.

1.5.1.1 Inter-Access Point Protocol (IAPP)

The Inter-Access Point Protocol (IAPP) is an extension to the IEEE 802.11b protocol. IAPP facilitates roaming of mobile stations across different Basic Service Sets (see ***Note*** below) and specifies how access points communicate with each other.

Note: *A Basic Service Set (BSS) is a set of stations (terminals) controlled by a single coordination function, in this case by the 9150 Wireless Gateway functioning as an access point within the terminals' radio coverage area.*

In a multiple-9150 system, IAPP informs the other 9150 Wireless Gateways when a new 9150 becomes active, and enables the awareness of the 9150s of each other. With IAPP, an IEEE 802.11b system can operate on one or more channels, with terminals moving between the 9150s. Although each terminal is associated with one 9150, it can re-associate with another 9150 to maintain uninterrupted communications. The newly-associated 9150 will receive the terminal's data frames and pass them onto the LAN. Returning frames are no longer accepted by the original 9150, which has disassociated from that terminal. The returning frames are now accepted by the newly-associated 9150 and passed over the RF to the terminal.

1.5.1.2 Psion Teklogix' 802.IQ Protocol

802.IQ is a Psion Teklogix proprietary optimized protocol that enables terminals to operate on a wireless LAN in a network that supports both TCP/IP and 802.IQ protocol simultaneously. 802.IQ protocol is available in two versions: 802.IQv1 and 802.IQv2. The 9150 can support both versions of the protocol at the same time (terminals must use only one).

802.IQv1 protocol is a wireless LAN routing scheme that provides greater performance in an 802.11b wireless network than is possible with TCP/IP routing. The 9150 bridges the 802.IQv1 wireless and TCP/IP wired networks. A terminal can communicate with the 9150 access point using either TCP/IP or 802.IQv1 protocol, which makes possible a system with dual-operability.

802.IQv2 protocol is an enhanced version of the 802.IQv1 protocol that transports packets over the UDP layer. It provides all the 802.IQv1 functionality, with the added features of software upgrade capability over RF, the ability to add third-party access points between controllers and terminals, and integration into the mapRF system if desired.

For detailed information on configuring the 9150 as an 802.IQv1 access point, see "802.IQ Version 1 Configuration Menu" on page 64. For information on configuring the 9150 as an 802.IQv2 mini-controller, see "802.IQ V2 Features Menu" on page 192. Please see Figure 1.4 on page 10 for a generalized system diagram.

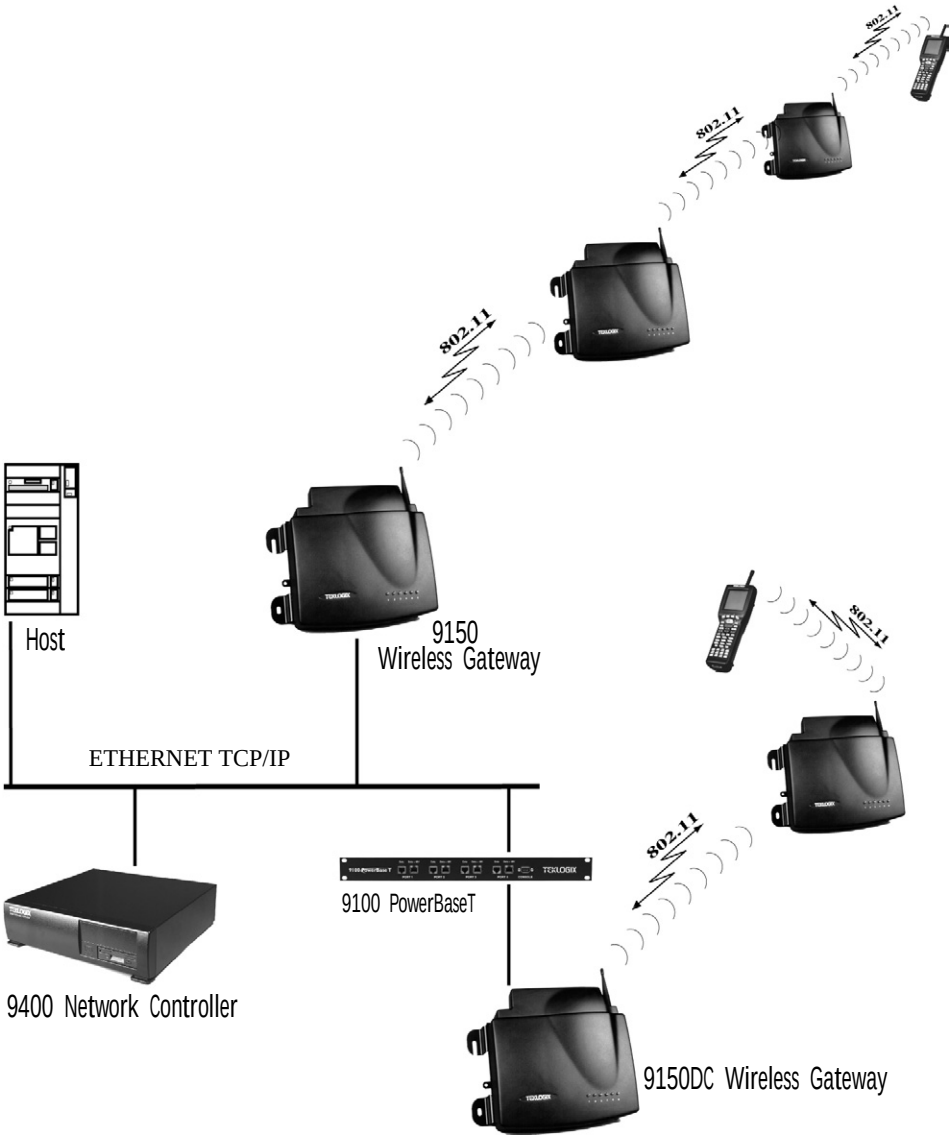

Figure 1.4 9150 Wireless Gateway: Wireless Access Point Configuration

Only one base station or terminal may transmit at one time. When the channel is clear, a combination of preset priorities and random choices determines who “goes next”. Even if two transmitters attempt to send at the same time, message acknowledgements and retransmissions prevent any data from being lost.

Terminals moving through the Wlan communicate with the base stations that provide the best communication path to a wired base station. If multiple channels are used, the terminal looks for a better channel only if it cannot find an acceptable path back on its current channel.

For detailed information on configuring the 9150 as a base station, please see Chapter 5: “Base Station Configuration”. For a generalized system diagram, see Figure 1.5.

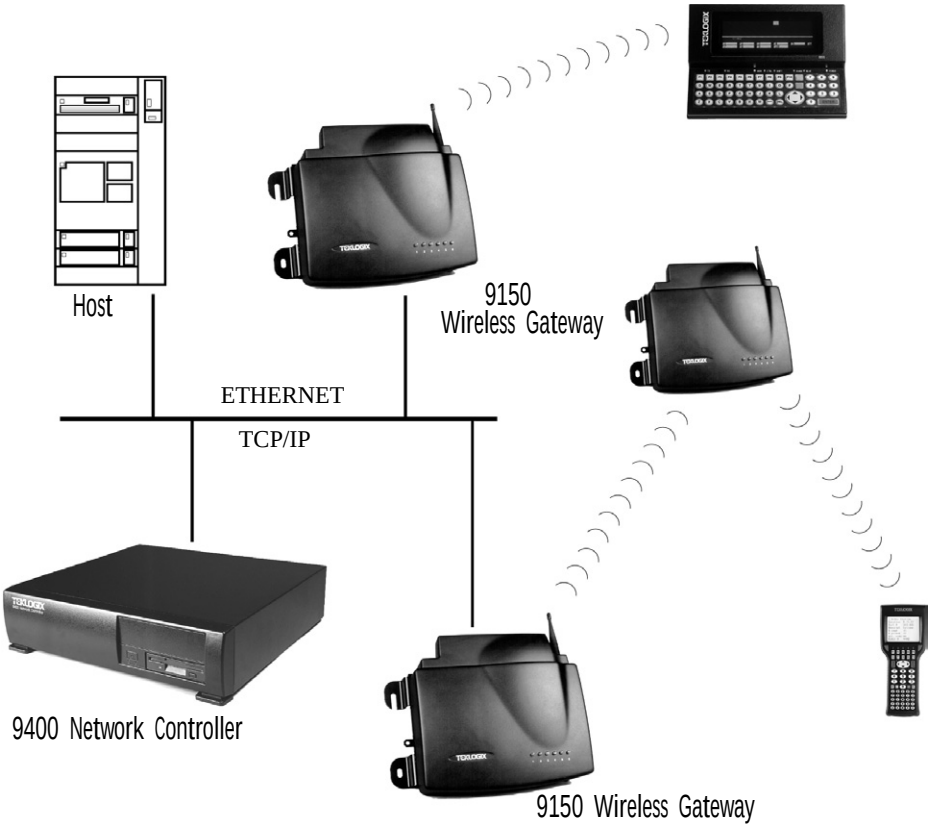

Figure 1.5 9150 Base Station/RRM Configuration

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Warning: ***The 9150 must be installed by qualified Psion Teklogix personnel.***

2.1 Choosing The Right Location

Typically, Psion Teklogix conducts a site survey in the plant and then recommends the preferred locations for the 9150s. These locations provide good radio coverage, minimize the distance to the host computer or network controller, and meet the environmental requirements.

2.1.1 Environment

2.1.1.1 9150 Wireless Gateway

The 9150 should be located in a well-ventilated area and should be protected from extreme temperature fluctuations (i.e. direct heater output, shipping doors or direct sunlight). If a protective cover is required, it must have enough ventilation to maintain the 9150's surface at or near room temperature.

Refer to Chapter 8: "Specifications" for a more detailed description of environmental requirements. Keep in mind that the long term stability of this equipment will be enhanced if the environmental conditions are less severe than those listed in this manual.

The 9150 should be situated away from the path of vehicles and free from water or dust spray. The 9150 should only be mounted in the upright position, as shown in Figure 2.1 on page 16. This orientation minimizes the risk of water entering the 9150, should the unit accidentally be sprayed.

The 9150 is attached to a vertical surface using four fasteners on the rear plate (type of fasteners are dependent on mounting surface). The top two holes in the rear plate are slots, allowing the unit to be hung in position before the remaining bolts are installed, thus easing installation. The bolts used for installation are SAE 1/4-20.

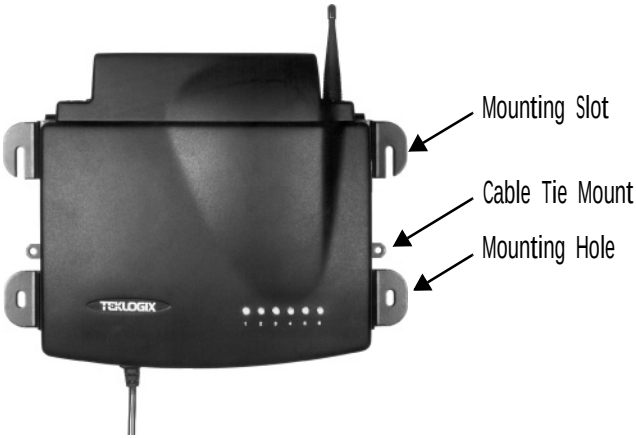

Figure 2.1 9150 Installation Position

2.1.1.2 9100 PowerBaseT

The 9100 PowerBaseT is a 19-inch rack-mounted device intended for installation in the same environment as your hub or switch. For detailed information on the 9100, please refer to page 22.

2.1.2 Maintenance

The 9150 has no internal option switches and does not require physical access; all configuration settings are done remotely (see Chapter 3: “9150 Main Configuration”). Environmental and radio communication considerations do still apply.

2.1.3 Power And Antenna Cables

2.1.3.1 Power

To prevent accidental disconnection and stress on the 9150, antenna and power cables should be secured within 30 cm of the unit. Secure the cables with ties to the cable tie mounts on the 9150 (see Figur e2.1 on page 16). A single phase power outlet (range 100 to 240 VAC rated 1.0A minimum) should be installed within one metre (3.1 feet) of the 9150. The 9150 automatically adjusts to input within that power range. The power cable is removable and is available in the power type specific to your location.

To eliminate the need for AC wiring, the 9150DC Wireless Gateway is powered over its Ethernet connection. For detailed information, please see page 20.

Warning: ***To avoid electric shock, the power cord protective grounding conductor must always be connected to ground.***

2.1.3.2 Antennas

Warning: This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Warning: ***Equipment requires professional installation of antennas.***

List of antennas: 1. Centurion EXE-2400-SMRP
2. Mobile Mark IMAG5-2400 3. Cushcraft S2403BP12NF
4. Larsen FB45T2400 5. Cushcraft Patch Antenna S2307AMP10SM or S2307MP10SMF

The maximum output power from the radio transmitter is 36 mW

Warning: ***Never operate the 9150 without a suitable antenna or a dummy load.***

Connection to Outdoor Antenna: Outdoor antenna to be earthed in accordance with International Standard EN 50083-1 (1993), "Cabled Distribution Systems forTelevision and Sound Signals - Safety Requirements". The antenna must be installed by a qualified service person and installed according to local electrical installation codes. The antenna should be located such that it is always at least 15 ft (4.6 m) high and 10 ft (3 m) from the user and other people working in the area.

Warning: ***For RF safety considerations, users are not allowed to approach close to the antenna.***

Psion Teklogix supplies the coaxial cable required to connect the 9150 to the antenna. When determining the location of the antenna, the coverage requirements of the antenna are considered in conjunction with the environmental requirements of the 9150.

The coaxial cable must be routed and secured using wire anchors and/or coaxial nail clips. A few extra inches of cable are required near the antenna and the 9150 to make disconnection easier.

2.2 Connecting To External Devices

This section contains general guidelines for connecting the 9150 to external devices such as network controllers, base stations, host computers, PCs and video display terminals.

2.2.1 Ports

Figure 2.2 below shows the locations of the port and power connectors on the base of the 9150T [100BaseT Ethernet]; for the 9150DC, see Figure 2.3 on page 21). The port pinouts are described in Appendix B: “Port Pinouts And Cable Diagrams”.

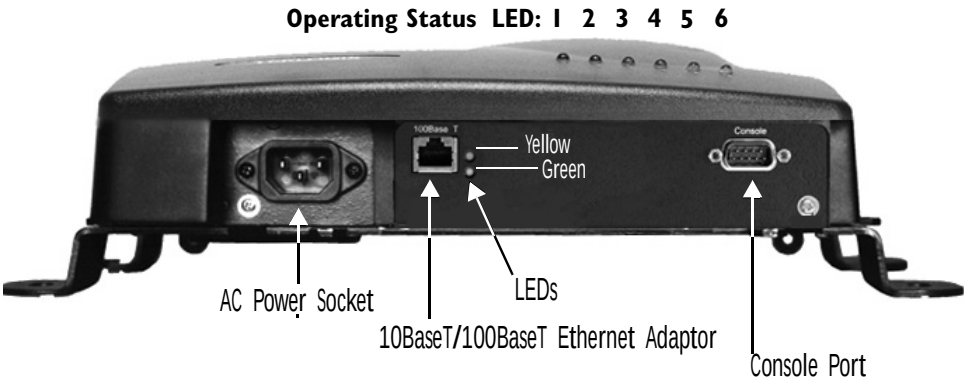

Figure 2.2 9150T Ethernet LED Locations*

**Note: The location of the LEDs is the same on the 9150DC (see Figu re2.3 on page 21).*

2.2.2 LAN Installation: Overview

Because the 9150 provides Ethernet connectivity, it can be added to an existing LAN. Generally, LAN installations are handled with the help of the network administrators, as they are familiar with their network and its configuration.

Once the 9150 is installed, connected and powered on, the system administrator can access the unit to check the configuration and to assign the 9150 its unique IP address. This may be done through the Console port or through the network (see “Connecting

A Video Display Terminal" on page 26 and "Changing The Configuration With A Web Browser" on page 26). Subsequent changes in the network, such as the addition of stations or users, would also require that the 9150 configuration be changed.

Important: ***Once the 9150 is configured and rebooted the first time, the DHCP or Bootp option should be disabled—unless the 9150 obtains its IP address from a server, or the system administrator intends to update the software through bootp. For detailed information, see "Network Interface Configuration Protocol" on page 52.***

2.2.3 LAN Installation: Ethernet

2.2.3.1 9150T Wireless Gateway

The 9150T is a high-performance controller that supports 100Mb/s Fast Ethernet LANs, as well as 10Mb/s, with both full and half duplex operation.
It comes equipped with:

- 10BaseT/100BaseT card (using a category-5 twisted pair cable, an RJ-45 connector, running at a rate of 10 or 100Mb/s).

Note: *The 9150T does not support any connection type other than Ethernet 10BaseT and 100BaseT.*

See Figure 2.2 on page 19 for the connector locations. Since these ports are auto-selecting, jumper or configuration settings are not required. The maximum packet size supported over the network is **1500 bytes**. This parameter is not set at the 9150, but should be set at the host. For a description of port pinouts, please refer to Appendix B: "Port Pinouts And Cable Diagrams".

2.2.3.2 9150DC Wireless Gateway

The 9150DC incorporates most of the features of the 9150T. However, while the 9150T is AC-powered, the 9150DC Wireless Gateway is DC-powered, eliminating the need for AC wiring. The 9150DC is powered through a Category 5 ethernet cable that carries power and data signals simultaneously.

The 9150DC is connected to the 9100 PowerBaseT, a remote power module that inserts 48VDC power on the spare conductors of the ethernet cable to the 9150DC (for detailed information on the 9100, see page 22; for a system diagram, see

Figure 2.5 on page 23). Inside the 9150DC, a DC/DC converter is used to step down the +48 V provided by the 9100 to the +5 V required to power up the main components of the gateway.

The 9150DC may also be powered via the Auxiliary Supply (48 VDC) power jack, which is adjacent to the ethernet RJ-45 connector (see Figure 2.3). For a description of RJ-45 port pinouts, refer to Appendix B: “Port Pinouts And Cable Diagrams”.

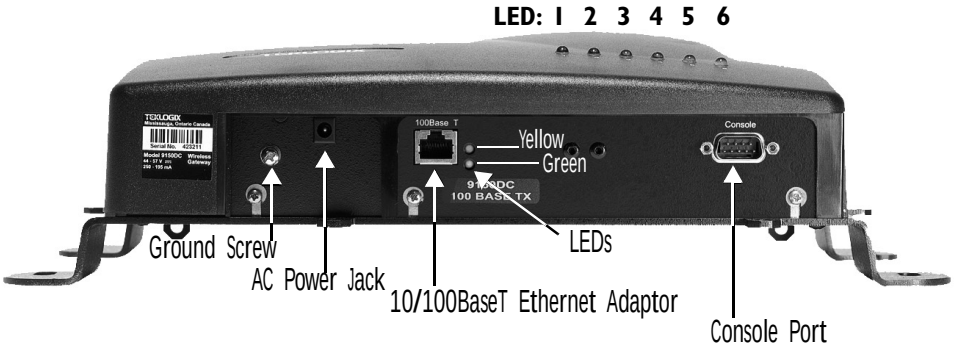

Figure 2.3 The 9150DC Wireless Gateway

Notes: *The 9150DC does not support any connection type other than Ethernet 10BaseT and 100BaseT.*

The 9150DC supports dual 802.11 radios, but does not support Narrow Band or TekLAN 902 MHz radios.

2.2.3.3 Ethernet Cabling

The maximum cable segment length allowed between repeaters for both the 9150T and 9150DC (10BaseT/100BaseT Ethernet cabling) is 100 m.

Note: *For the 9150DC (see “Important” note on page 22), this cable length is measured from hub to 9150, including mid-span insertion of the 9100 PowerBaseT.*

Important: ***For Main Logic Board (MLB) P/N 30183-301 Rev F only: When connecting the RJ-45 Ethernet cable to the 9150T (AC power version), ensure that the snap-on ferrite for cables (P/N 97776) is placed on the cable as closely as possible to the RJ-45 jack. To determine which version of the MLB is resident in your 9150, please contact Psion Teklogix Support Services (see page A-1).***

2.2.3.4 9100 PowerBaseT Mid-Span Power Supply

Overview

The 9100 PowerBaseT module is designed to provide power over Ethernet and may be referred to as a “mid-span power supply” in that it intercepts the Ethernet cables between a hub/switch and the DC-powered 9150DC, as illustrated in Figur e2.5 on page 23. The 9100 has an internal, universal AC/48VDC power supply and routes DC power to each of its independent Data + 48V output Ports, following successful detection of a suitable powered device (a 9150DC). The Resistor Detection method is employed for this purpose, following application of power to the 9100, or connection of a powered device to a powered-on Port. The 9100 determines whether each connected device needs to be powered or not by determining if there is a signature resistor in the powered device between the 4/5 and 7/8 “spare” wire pairs. Subsequent disconnection of such a device is also detected. There are four identical, independent resistor/transistor networks, one for each output port. 48VDC is supplied via the unused pairs of a standard Ethernet Category 5 cable, while the Ethernet data lines (4 of the 8 conductors in the cable) are passed through the 9100 to the 9150DC. The 9150DC can accept power via either the unused pairs, or via the data pairs of a 10/100BaseT system connected to a suitable Power Over Ethernet switch/hub.

Important: ***The 9100 does not contain any transceivers (the data signals are passed through) and is therefore subject to the 100 m cable length limitation (including the cable from the hub/switch to the 9100 PowerBaseT and any subsequent length added to the 9150DC).***

The 9100 PowerBaseT provides power for up to four 9150DCs (13 Watts per channel maximum), connected by twisted pair cables up to 100 m in length. See page 206 for power specifications.

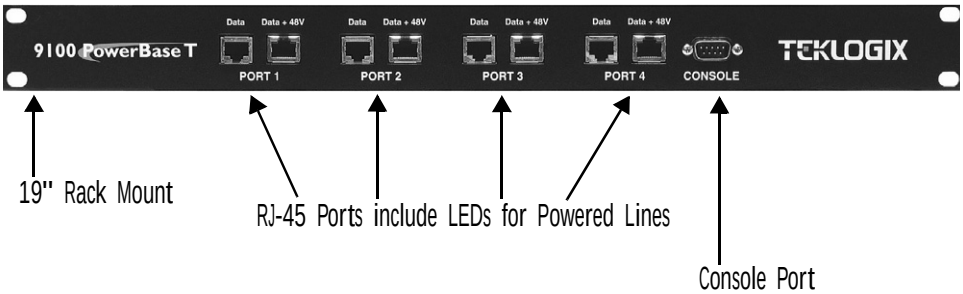

Figure 2.4 The 9100 PowerBaseT

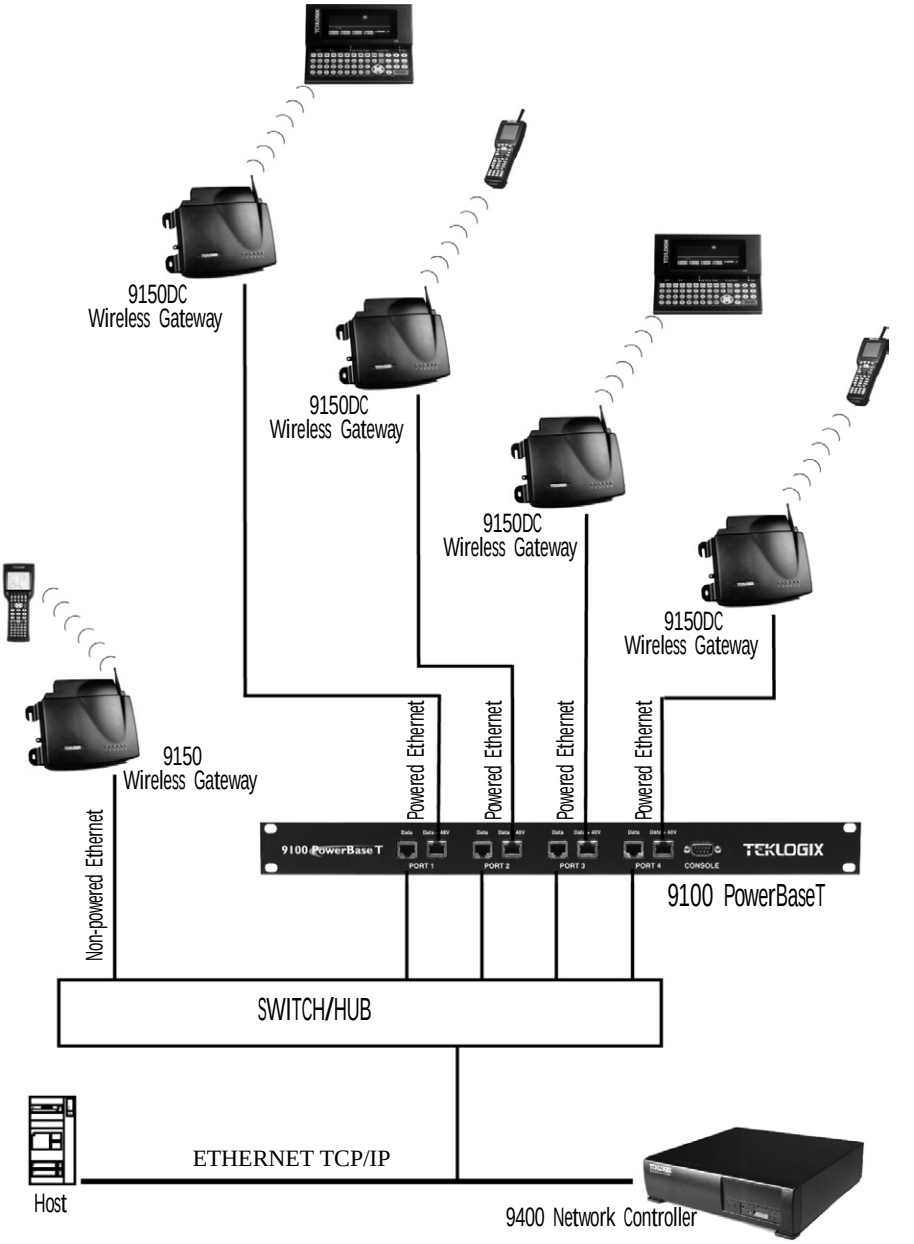

Figure 2.5 9100 PowerBaseT System Architecture

Functions

The 9100 PowerBaseT delivers 13 Watts per port for a total of 52 Watts. Power supplied to each of the four Ethernet ports is protected from over-voltage and current limiting within the power supply by the 9100's microcontroller. Its primary functions are:

1. Resistor Detection (described in Overview on page 22).
2. Fault Monitoring (page 197).
3. Power Monitoring (page 198).
4. Diagnostics and Status Reporting (page 198).

Status Indicators

The LEDs present at each port on the front panel of the 9100 (Figure 2.4 on page 22) indicate the status of the 9100 and the individual ports, as determined by the microcontroller. Table 2.1 below shows the LED state meanings.

Note: *Once a fault/abnormal condition is detected, the LED indicators will continue to blink until the condition has been corrected, with or without manual intervention.*

Status	Notes	Yellow LED	Green LED
Normal	Device present and powered	On	On
Normal / Fault	Device not connected / not detected	Off	On
Fault	Undercurrent fault (device disconnected)	Slow blink	On
Fault	Overcurrent fault	Fast blink	On
Fault	9100 main power supply fault	Fast blink (all ports)	Fast blink (all ports)
Test Mode	Port in test mode (enabled via console)	Fast blink	Fast blink
Test Mode	Port disabled (via console)	Off	Slow blink

Table 2.1 LED Indicator States

2.2.4 Status Indicators (LEDs)

2.2.4.1 9150T and 9150DC

The high-performance 9150T (see page 20 for details) and DC-powered 9150DC (see page 20 for details) both have six status indicators on the front of the enclosure, and an additional two status indicators on the base of the enclosure next to the RJ-45 connector port, as shown in Figure 2.2 on page 19. The numbered and coloured LEDs on the front of the unit indicate the operating status for each port, as described in Table 2.2. The coloured LEDs beside the RJ-45 port indicate the operating status of the resident 10BaseT/100BaseT card, as described in Table 2.3 on page 26.

LED Number	Name	Function	Colour
1	Ethernet link	Link indicator for 10BaseT/100BaseT: ON = good link; OFF = no link	yellow
2	Ethernet activity	Ethernet LAN activity (Rx/Tx)	green
3	PC Card A status[1]	PC Card A activity (Rx/Tx)	yellow
4	PC Card B status[1]	PC Card B activity (Rx/Tx)	green
5	SLIM[2]	SLIM card activity	yellow
6	Power	LED flashing = BIST[3] running/error detected LED On solid = BIST[3] Passed LED Off = no power to unit	green

[1]*When a TekLAN 902 MHz radio is installed, the PC Card status LEDs blink only when data is received from or transmitted to a terminal. When a TRX7370 narrow band radio is installed, these LEDs blink for all received and transmitted data traffic. (Note: the 9150DC only supports 802.11 radios.)*

[2]*LED #5 shows no activity, since the 9150T and 9150DC do not support serial connectivity.*

[3]*Built-in Self-Test.*

Table 2.2 9150T And 9150DC LED Functions: Front Enclosure

LED Colour	Status	Function
Green	ON	100BaseT speed selected
Green	OFF	10BaseT speed selected
Yellow	ON	Full duplex operation selected. (10BaseT or 100BaseT)
Yellow	OFF	Half duplex operation selected. (10BaseT or 100BaseT)

Table 2.3 9150T And 9150DC Ethernet LED Functions: Base Of Enclosure

2.2.5 Connecting A Video Display Terminal

An ANSI compatible video display terminal (e.g., DEC VT220 or higher), or a PC running terminal emulation, is used for diagnostic purposes and to configure the IP address for the first time before the 9150 can be accessed using a Web Browser (see "Configuring The IP Address" on page 29).

The terminal is connected to the port labelled "Console" on the 9150 (see Figure 2.2 on page 19). This port is normally set to operate at 19,200 baud, 8 bits, 1 stop bit, no parity. To comply with Part 15 of the FCC rules for a Class B computing device, only the cable supplied (Part no. 19387) should be used.

2.3 Changing The Configuration With A Web Browser

The 9150 Flash memory can be reconfigured remotely via the network using a standard HTML Web Browser such as Netscape Navigator (version 4.05 or later) or MS Internet Explorer (version 4.0 or later). See Chapter 3: "9150 Main Configuration" for instructions on changing the parameters and general configuration settings.

For configuration information on setting up the 9150 as an *access point device*, refer to Chapter 4: "Access Point Configuration".

For configuration information on setting up the 9150 as a *base station*, refer to Chapter 5: "Base Station Configuration".

For configuration information on setting up the 9150 as a *mini-controller*, refer to Chapter 6: "Mini-Controller Configuration".

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3.1 Configuration Main Menu

The 9150 Flash memory can be reconfigured remotely via the network using a standard HTML Web Browser such as Netscape Navigator (version 4.05 or later) or MS Internet Explorer (version 4.0 or later).

Note: *To ensure that the 9150 configuration screens appear properly when using Netscape Navigator, in your browser go to Edit/Preferences/ Appearance/Colors. Make sure that the box for "Always use my colors, overriding document" is* ***NOT*** *checked.*

The 9150 Configuration program allows various configuration parameter settings to be changed, added or deleted.

Important: ***The 9150 must be warm rebooted after parameter changes are made, including configuring the IP address (see below), in order for the changes to take effect. For details, see "Reboot Unit" on page 58.***

3.2 Configuring The IP Address

Before the configuration menus can be accessed using your Web Browser, the 9150 must be assigned an IP address using a PC console connection. Virtually any PC can be connected to the console port of the 9150, provided that the PC has a terminal communication program such as the Windows® HyperTerminal® utility or Procomm® Plus for Windows. These programs emulate an ANSI terminal such as VT220 or higher. Cable no. 19387 should be used to connect the PC to the 9150. Make sure the communications settings on your PC are set to 8 bits, 1 stop, no parity, and that the baud rate of the serial port matches that of the 9150 console port (19,200 baud).

After the PC is attached and turned on, press the <RETURN> key several times until the ">" prompt appears. The commands used to configure IP addresses are described here. For the command to flash upgrade the 9150 software using TFTP, please refer to page 53.

If your system uses a DHCP or BOOTP server to assign IP addresses, make sure that the appropriate option is **enabled** (see "Network Interface Configuration Protocol" on page 52). Once enabled, and the 9150 is rebooted, you will be able to access the 9150 configuration menus through the Web Browser, using the IP address identified

in the server's address table. If you do not use a server, make sure that the DHCP or BOOTP option is **disabled** and continue with the configuration commands to manually assign an IP address.

Important: ***When your configuration is completed, the changes should be saved to flash by entering the following command (commands are case-sensitive):***

```
>cfg commitCache
```

To display the bootp setting:

```
>cfg get system.dobootp
```

To enable bootp:

```
>cfg put system.dobootp 1
```

To disable bootp:

```
>cfg put system.dobootp 0
```

To display the default IP address:

```
>cfg get interface.1.defaultipaddress
```

To configure the default IP address (xxx.xxx.xxx.xxx represents the IP address):

```
>cfg put interface.1.defaultipaddress xxx.xxx.xxx.xxx
```

To display the default gateway:

```
>cfg get system.defaultgateway
```

To configure the default gateway:

```
>cfg put system.defaultgateway xxx.xxx.xxx.xxx
```

To display the default subnetmask:

```
>cfg get interface.1.defaultsubnetmask
```

To configure the default subnetmask:

```
>cfg put interface.1.defaultsubnetmask xxx.xxx.xxx.xxx
```

3.3 Accessing The Menus

When the Web Browser is pointed to the 9150's IP address, a name and password dialog box appears. The password is comprised of alphanumeric characters and is case-sensitive. If you change the password (see "Users" on page 39), set all 9150s to the same password, and write it down in a secure place.

A default user name "user" and the password "123456" are created on 9150 system startup *if no users are already configured*. You can use the default to enter the Configuration Main Menu for the first time. For security, change this default name and password immediately after entering the configuration menus. Should you accidentally delete your user names, re-booting the 9150 will re-create the default name and password so that you can get back in to the unit.

After the password is accepted, the Configuration Main Menu appears. The 9150 software automatically detects the system information of the unit, and most of the parameters have already been properly configured for each site.

Warning: ***Parameters should not be altered without a clear understanding of how they operate. Parameters that are incorrectly set can increase response time or cause communication difficulties.***

- To highlight and move through the different options, use the <TAB> key or mouse pointer.
- To view and select the items in the listboxes, either press the <UP> or <DOWN> arrow keys or click on the arrow at the side of the menu and highlight the item.
- To enter the related configuration sub-menu dialog box, highlight "Configure" and either press <ENTER> or click on the "Configure" button.
- Where string entry parameters are given in the menus, changes are keyed in. Numerical parameters can be entered as hexadecimal values. Precede hexadecimal values with "0x".
- To leave a menu page, select either the <OK> or <Cancel> button at the bottom of the page. Selecting <OK> will save your changes and exit the page, while selecting <Cancel> will exit the page without saving the changes.

Important: ***Do not use the Web Browser's <Back> button to leave a page.***

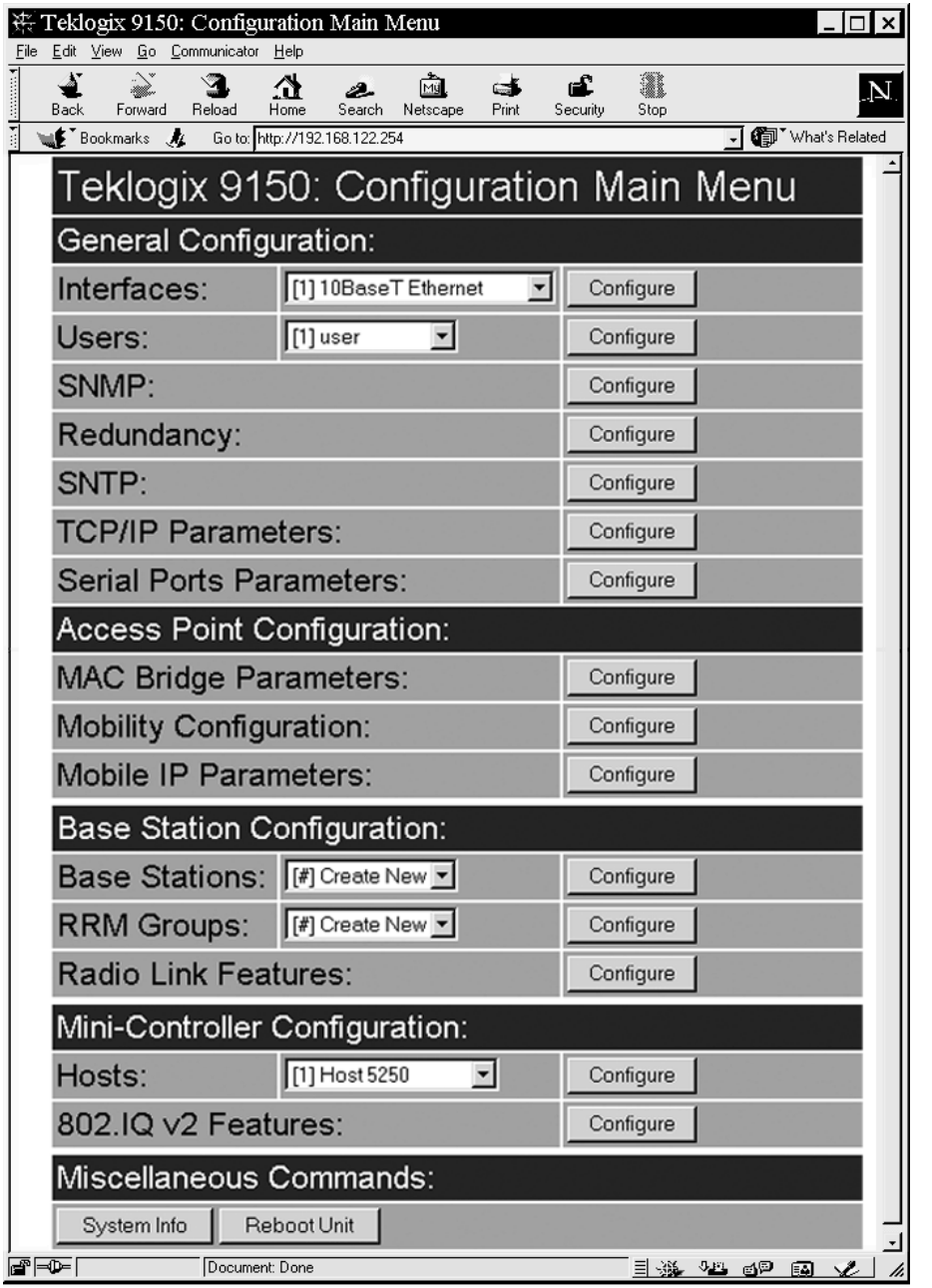


Figure 3.1 9150 Configuration Main Menu: View From Browser

3.4 General Configuration Menu Options

The *General Configuration* menu on the *Configuration Main Menu* page presents five options of sub-menus: *Interfaces*, *Users*, *SNMP*, *TCP/IP Parameters*, and *Serial Ports Parameters*.

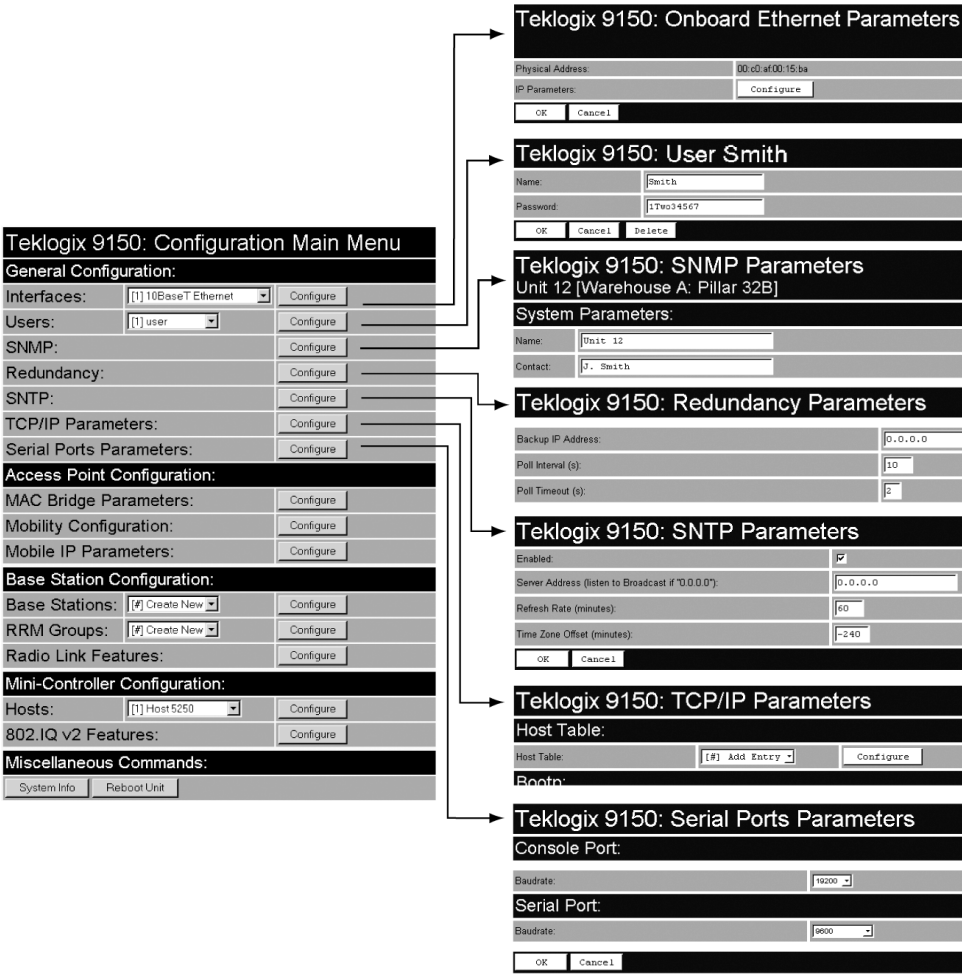
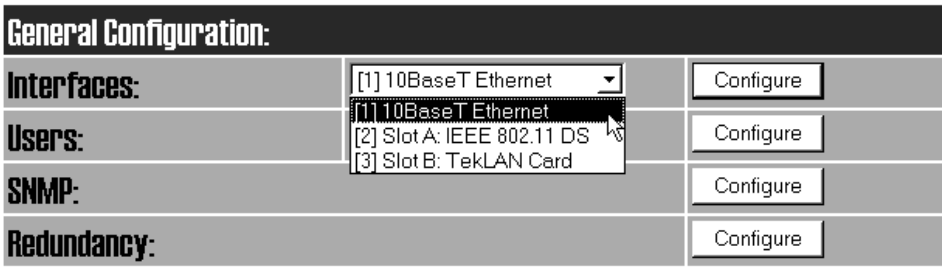


Figure 3.2 Overview Of General Configuration Menus

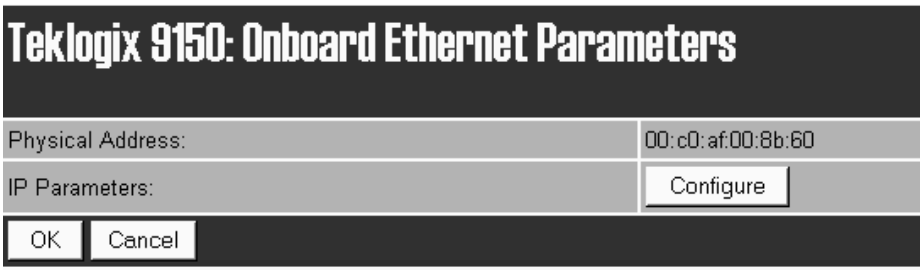
3.4.1 Interfaces

The pull-down menu shown for the Interfaces option indicates which interfaces have been detected in use by the 9150.



3.4.1.1 10BaseT Ethernet

For the selection *10BaseT Ethernet*, entering the "Configure" dialog box will open the *Onboard Ethernet Parameters* page for that Ethernet connection, which shows the 9150's physical (hardware) address and IP address parameters.



Physical Address

A unique *Physical Address* is assigned by Psion Teklogix personnel for each 9150. The values entered for this parameter are presented in hexadecimal in descending order beginning with the MSB (Most Significant Byte), the highest value, and ending with the LSB (Least Significant Byte), the lowest value. The allowable value for each field ranges from **00** to **FF**.

Warning: ***It is not advisable to modify the* Physical Address*. However, if these values are changed, the Network Administrator must assign a unique address to each Ethernet station on the network, including all 9150s.***

IP Parameters

Each 9150 that is connected to a local network has a unique IP address designated for it. The *10BaseT Ethernet IP Parameters* used to assign the IP address are accessed by entering the "Configure" dialog box.

Teklogix 9150: 10BaseT Ethernet IP Parameters

Current IP Address:	10.136.90.101	Default IP Address:	10.136.90.101
Current Subnet Mask:	255.255.0.0	Default Subnet Mask:	255.255.0.0

OK Cancel

IP Address

The *Current IP Address* shown in the read-only field is the IP address currently set on the 9150. The *Default IP Address* text box allows you to change the value of the IP address.

The IP address must be a unique value on the network, so that each 9150 in your system can be identified. The acceptable value ranges from **0.0.0.0** to **239.255.255.255**.

Note: *The value **255.255.255.255** is reserved for the broadcast address.*

Subnet Mask

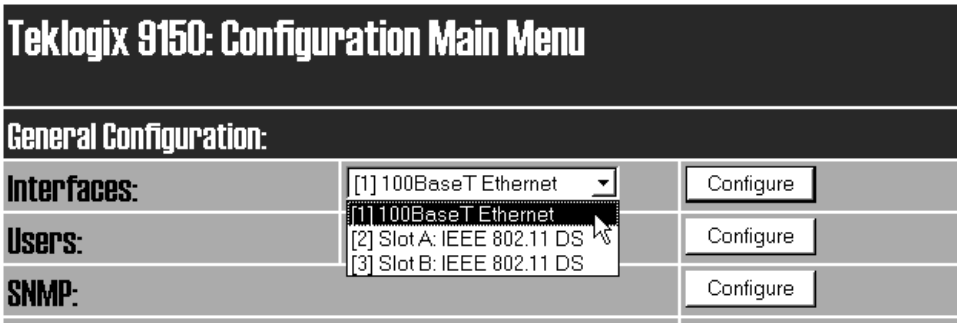
The *Current Subnet Mask* shown in the read-only field is the subnet mask currently set on the 9150. The *Default Subnet Mask* text box allows you to change the value of the subnet mask.

The 9150 uses the *Subnet Mask*, its own IP address, and the destination IP address to determine if a packet should be sent on the local network or to a remote segment. If the destination is found on the local network, the packet is sent directly to its destination. If the destination resides on a remote network, the packet is routed to the gateway. Enter your subnet mask in "**xxx.xxx.xxx.xxx**" notation.

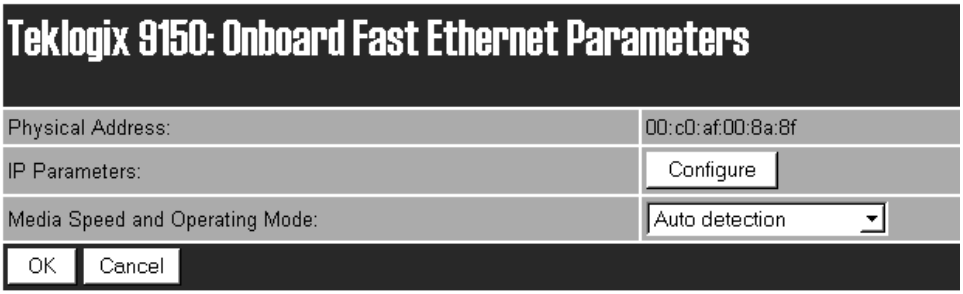
Important: ***The maximum packet size supported is 1500 bytes. This parameter is not set at the 9150, but should be set at the host.***

The acceptable values range from **0.0.0.0** to **255.255.255.255**.

3.4.1.2 100BaseT Ethernet



For the selection *100BaseT Ethernet*, entering the "Configure" dialog box will open the *Onboard Fast Ethernet Parameters* page for that Ethernet connection, which shows the 9150's physical (hardware) address, and give access to the IP address, and Media Speed and Operating Mode parameters.



Physical Address

A unique *Physical Address* is assigned by Psion Teklogix personnel for each 9150. The values entered for this parameter are presented in hexadecimal in descending order beginning with the MSB (Most Significant Byte), the highest value, and ending with the LSB (Least Significant Byte), the lowest value. The allowable value for each field ranges from **00** to **FF**.

Warning: ***It is not advisable to modify the* Physical Address*. However, if these values are changed, the Network Administrator must assign a unique address to each Ethernet station on the network, including all 9150s.***

IP Parameters

Each 9150 that is connected to a local network has a unique IP address designated for it. The *IP Parameters* used to assign the IP address are accessed by entering the "Configure" dialog box.

Teklogix 9150: 100BaseT Ethernet IP Parameters

Current IP Address:	10.136.90.100	Default IP Address:	10.136.90.100
Current Subnet Mask:	255.255.0.0	Default Subnet Mask:	255.255.0.0

OK Cancel

IP Address

The *Current IP Address* shown in the read-only field is the IP address currently set on the 9150. The *Default IP Address* text box allows you to change the value of the IP address.

The IP address must be a unique value on the network, so that each 9150 in your system can be identified. The acceptable value ranges from **0.0.0.0** to **239.255.255.255**.

Note: *The value **255.255.255.255** is reserved for the broadcast address.*

Subnet Mask

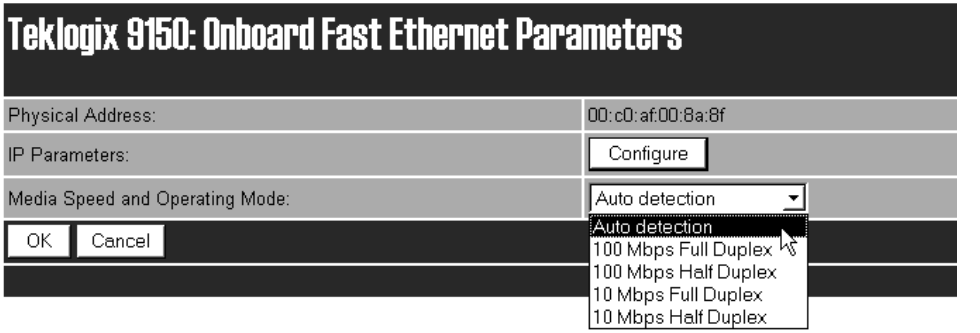
The *Current Subnet Mask* shown in the read-only field is the subnet mask currently set on the 9150. The *Default Subnet Mask* text box allows you to change the value of the subnet mask.

The 9150 uses the *Subnet Mask*, its own IP address, and the destination IP address to determine if a packet should be sent on the local network or to a remote segment. If the destination is found on the local network, the packet is sent directly to its destination. If the destination resides on a remote network, the packet is routed to the gateway. Enter your subnet mask in "**xxx.xxx.xxx.xxx**" notation.

Important: ***The maximum packet size supported is 1500 bytes. This parameter is not set at the 9150, but should be set at the host.***

Media Speed and Operating Mode

You can choose the operational mode of the 9150T by selecting the media speed, either 10 or 100 Mbps, and the operational mode, either full or half duplex. If the parameter value is left at the default, **Auto detection**, the 9150T's physical interface will be detected, and the speed and mode will be set automatically.



Select the media speed and mode from the drop-down list. The values are: **Auto detection**, **100 Mbps Full Duplex**, **100 Mbps Half Duplex**, **10 Mbps Full Duplex,** or **10 Mbps Half Duplex**.

The default value is **Auto detection**.

Important: ***If the mode chosen for the 9150 is incorrect, it will become inaccessible from the network when it is rebooted. If this occurs, the 9150 will have to be re-configured using the console.***

3.4.1.3 Slot n: PC Card Radio

Each PC (PCMCIA) card radio resident in the 9150 will be located in one of two Slots: A or B. Selecting a PC card will open the sub-menu for that radio.

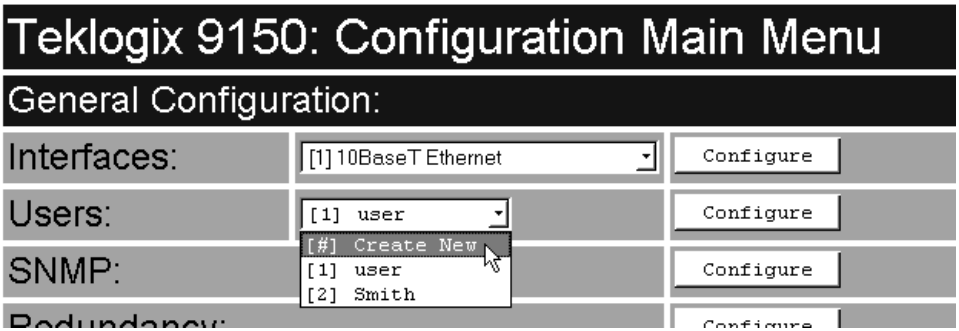
IEEE 802.11 DS: See "IEEE 802.11 Direct Sequence Radio Parameters Menu" on page 62 for details on setting the radio parameters for the PC card.

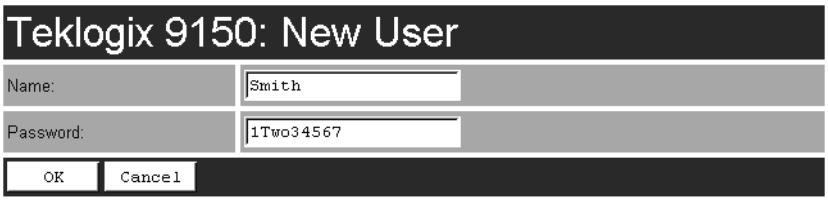
TekLAN Card: See "TekLAN Parameters" on page 102 for details on setting the radio and Wlan parameters.

Teklogix Narrowband: See "Narrow Band Radio Parameters" on page 106 for details on setting the radio and polling parameters.

3.4.2 Users

The Users option provides security for access to the 9150 Configuration menus. New individuals and their passwords can be added by selecting “[#] Create New” in the listbox before entering the “Configure” dialog box.





Name

The name should be comprised of alphanumeric characters only, is case-sensitive, and should not contain spaces. The minimum length of the name is 4 characters, the maximum length is 32 characters.

The default value is **user.**

Password

The password should be comprised of alphanumeric characters only, is case-sensitive, and should not contain spaces. The minimum length of the password is 6 characters, the maximum length is 32 characters.

The default value is **123456**.

Individual names and their assigned passwords may be changed or deleted in the "Configure" dialog box for this option by selecting the name in the listbox and then opening the "Configure" dialog box.

3.4.3 SNMP

SNMP (Simple Network Management Protocol) is the protocol that governs network management and the monitoring of network devices and their functions, including those in mapRF systems.

3.4.3.1 mapRF

The 9150 is fully compatible with mapRF management software. For complete details on mapRF, please refer to the *mapRF User Guide*. When participating in a mapRF system, manual configuration of the 9150 is minimal. The following parameters must be correctly configured:

- "10BaseT Ethernet" on page 34 and "100BaseT Ethernet" on page 36. The IP address, default gateway and subnet mask must be correctly configured for mapRF, either directly in the web pages or dynamically through DHCP/Bootp (see "Network Interface Configuration Protocol" on page 52).
- SNMP must be enabled (see page 42).

Some parameters may need to be configured, depending on your firmware version. These are listed below. To determine whether the firmware version in your 9150 already supports these parameters through SNMP, please contact PsionTeklogix Support Services (see Appendix A: "Support Services And Worldwide Offices").

- "Serial Ports Parameters" on page 55.
- "Mobile IP Configuration" on page 93.
- "TekLAN Parameters" on page 102.
- "Narrow Band Radio Parameters" on page 106.
- "RRM Groups" on page 120.

The SNMP "Configure" page, entered from the *Configuration Main Menu* page, allows various network management parameters to be set or changed.

Teklogix 9150: SNMP Parameters

System Parameters:

Name:	
Contact:	
Location:	
Enabled:	☑
Enable Proxy for non-IP terminals:	☐
Proxy throttling:	Disabled

SNMP Communities and Trap Receivers:

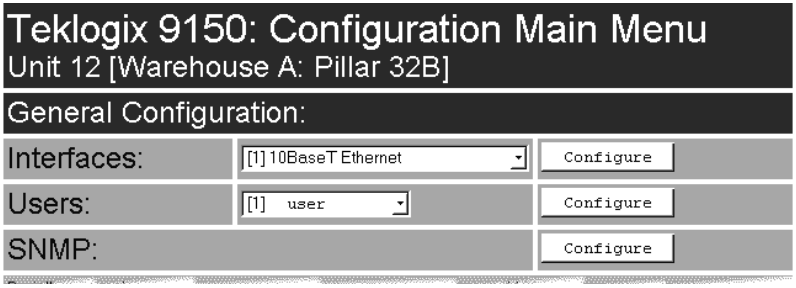
Number:	Name:	IP Address:	Access:
1	public	0.0.0.0	read_only
2	private	0.0.0.0	read_write
3		0.0.0.0	read_only
4		0.0.0.0	read_only
5		0.0.0.0	read_only
6		0.0.0.0	read_only

OK Cancel

3.4.3.2 System Parameters

Name, Contact, Location

The entries in these parameters set the name, contact and location identifiers for this specific 9150 Wireless Gateway. The entries should be of 7-bit, US-ASCII character type and not more than 78 characters. The name and location are then shown as the sub-heading of each Configuration page. In the following example the identifier appears as "Unit 12 [Warehouse A: Pillar 32B]".



Enabled

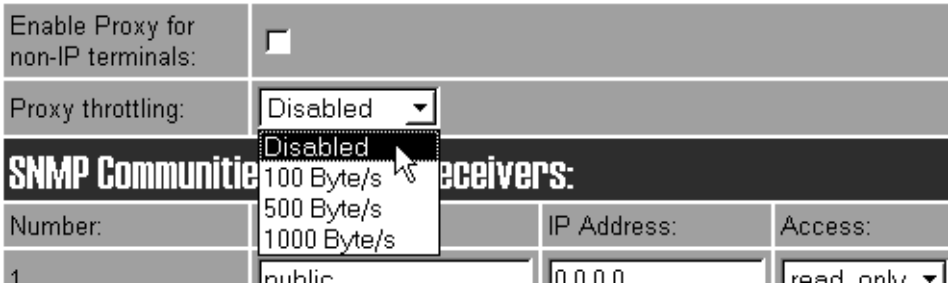
When this parameter is **enabled** (√), the 9150 will respond to SNMP inquiries and provide SNMP information. For the 9150 to operate with mapRF, the checkbox must be enabled. The default setting is **enabled**.

3.4.3.3 Enable Proxy for non-IP terminals

When this parameter is **enabled** (√), the 9150 acts as the proxy with the mapRF manager, for terminals without IP addresses. This option should be used only when the 9150 is acting as the Cellular Master (mini-controller).

3.4.3.4 Proxy throttling

To ensure that increased radio traffic due to the 9150 acting as proxy does not create a problem, the amount of traffic can be controlled by setting it to **100**, **500**, or **1000** bytes per second. The default is **Disabled**.



3.4.3.5 SNMP Communities and Trap Receivers

These parameter settings allow the network administrator to define the network environment and determine the type of access allowed (**read_only** or **read_write**) for each area name and IP address. The *Name* entries should be of 7-bit, US-ASCII character type and not more than 255 characters. The **trapDest** IP addresses determine which SNMP manager's stations will receive SNMP Traps from the 9150.

The 9150 sends the “Cold Start” Trap on reboot or power up.

Important: ***Any parameters that are changed in the SNMP Communities and Trap Receivers menu must also be changed in the mapRF manager.***

SNMP Communities and Trap Receivers:

Number:	Name:	IP Address:	Access:
1	public	0.0.0.0	read_only
2	private	0.0.0.0	read_only read_write trapDest
3		0.0.0.0	read_only

3.4.4 Redundancy

The Redundancy Parameters “Configure” page, entered from the *Configuration Main Menu* page, allows the user to set various options for the redundant (backup) operation of the 9150.

This feature enables two similarly-configured 9150s to operate in parallel. One 9150 is designated as the *primary* 9150, and manages communication to the rest of the Teklogix system. The other 9150 is designated as the *secondary* 9150, and remains idle. Both 9150s communicate with one or two *arbiters*, an extremely stable device on the network, such as a host, which serves as a reference for the status of the network itself.

Both the primary and secondary 9150s must be connected to the network, and each 9150 is aware of the other’s IP address. The secondary 9150 polls the primary 9150, and the primary 9150 responds, exchanging information about their status. There may not be more than one secondary 9150.

If the secondary 9150 cannot communicate with the primary 9150, but can communicate with one or both arbiters, it assumes that the primary 9150 is not working. It then becomes the primary and assumes control of the Teklogix backbone on the network.

When the first 9150 comes online again, it assumes secondary status while the second 9150 continues as the primary. If the 9150’s cannot communicate with the arbiter, they assume that the network is not working.

Important: ***Both 9150s must be configured identically, with the exception of their unique IP addresses and the* Backup IP Address *parameter, which is the IP address of the other 9150.***

Note: *When control of the Teklogix system is passed from one 9150 to the other, sessions between hosts and terminals are closed, and terminals and bases are reset.*

Teklogix 9150: Redundancy Parameters

Enabled:	☐
Preferred Primary:	☑
Backup IP Address:	0.0.0.0
Poll Interval (s):	10
Poll Timeout (s):	2
Poll Tries:	3
Alias IP Address:	0.0.0.0
Arbiter 1 IP Address:	127.0.0.1
Arbiter 2 IP Address:	0.0.0.0

OK Cancel

Enabled

When this checkbox is **enabled** (√), the 9150 uses the Redundancy feature. A second 9150, appropriately configured, and arbiters must be present on the network for the feature to operate properly.

The default is **disabled**.

Preferred Primary

This parameter decides which 9150 becomes primary if both want to be primary. The checkbox should be **enabled** (√) in only **one** of the redundant pair of 9150s.

The default is **enabled**.

Backup IP Address

The *Backup IP Address* parameter contains the address of the other 9150 with which this 9150 communicates. The default value is **0.0.0.0**.

Note: *The Backup IP address cannot be the same as the Alias IP address (page 46).*

Poll Interval, Poll Timeout And Poll Tries Parameters

The next three parameters are closely related. When this 9150 acts as the *secondary* device, it polls the primary 9150 at intervals specified by the *Poll Interval* parameter. After each poll, this 9150 waits for a reply for the length of time specified by the *Poll Timeout* parameter. If there is no reply during this time period, the 9150 sends another poll to the other 9150. The total number of polls sent while this 9150 waits for the response is specified by the *Poll Tries* parameter. If no response is received to the polls, the 9150 then pings the arbiter(s) to determine the status of the network.

Poll Interval

This parameter contains the interval, in seconds, at which this 9150 communicates with the other 9150.

The range of values is **1** to **9999**, the default is **10**.

Poll Timeout

This parameter contains the interval, in seconds, during which this 9150 waits for a reply after sending a poll to the other 9150. If there is no reply, it sends another poll to the other 9150.

The range of values is **1** to **9999**, the default is **2.**

Poll Tries

This parameter contains the number of times this 9150 will re-send a poll to the other 9150, before assuming that it cannot be reached.

The usable range of values is **2** to **7**, the default is **3**. The value can go as high as 9.

Alias IP Address

This parameter contains the alias IP address, identical for both this and the other 9150 in the redundancy system. The primary 9150 presents the alias IP address to the network, as well as its own unique IP address. The secondary 9150 only presents its unique IP address to the network.

When the secondary 9150 becomes the primary, it starts to use the alias IP address as well as its unique address, while the other 9150 stops using the alias IP address.

Wireless devices in the system which communicate directly with the Teklogix network controller's IP address, such as terminals using TCP Direct, may communicate with the alias IP address. They will then communicate with whichever of the two redundant 9150s is the primary.

This address must be the same on both the primary and secondary 9150.

The default address is **0.0.0.0**.

Note: *The Alias IP address cannot be the same as the Backup IP address (page 45).*

Arbiter 1 IP Address

This parameter contains the address of a device on the network which is known to be reliable. Both 9150s ping this device; if they receive no reply, they ping Arbiter 2 if so configured (see page 46), otherwise they assume that the network is not operating. This address should be the same on both the primary and secondary 9150s.

Arbiter 1 must always be configured when Redundancy is enabled. The default value is the loop-back address **127.0.0.1**.

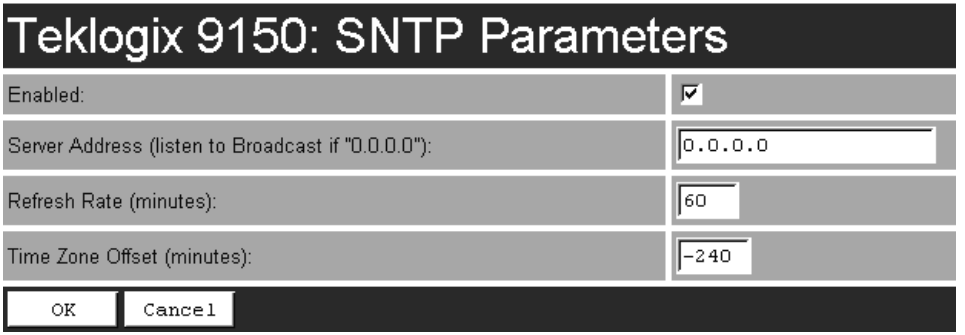
Arbiter 2 IP Address

This parameter contains the address of an optional second device on the network which is known to be reliable. Both 9150s ping this device if they receive no reply from Arbiter 1. If they receive no reply from Arbiter 2, they assume that the network is not operating. This address should be the same on both the primary and secondary 9150s. If the default address is configured, Arbiter 2 won't be used in the protocol.

The default address is **0.0.0.0**.

3.4.5 SNTP

SNTP (Simple Network Time Protocol) is the protocol that enables the network to maintain an accurate system time. The SNTP Parameters “Configure” page, entered from the *Configuration Main Menu* page, allows the user to set the options.



Enabled

When this checkbox is **enabled** (√), the 9150 automatically sends requests to the SNTP server to retrieve the time in GMT (Greenwich Mean Time) format. The 9150 then sets the current local time using the *Time Zone Offset* value (see page 47).

The default is **enabled**.

Server Address

This parameter contains the IP address of the SNTP server. If the server address is specified, the 9150 sends unicast messages to the server to retrieve the time. If the address is not specified (i.e. 0.0.0.0.), the 9150 retrieves the broadcast messages.

The default value is **0.0.0.0**.

Refresh Rate

This parameter contains the interval, in minutes, at which the 9150 retrieves the time. The range of values is **1** to **1440** minutes. The default value is **60**.

Time Zone Offset

The *Time Zone Offset* is the difference between the GMT and the local time where the 9150 is located. If you are not sure of your time zone offset, you can get the GMT by using the console command “ `?T` ” five minutes after booting up the 9150.

The 9150 will retrieve the GMT and you can determine the offset value.

The range of values is **-1339** to **1339** minutes. The default value is **-240**.
(This default represents Eastern Standard Time, Canada, with Daylight Saving.)

Note: *The 9150 does not automatically compensate for Daylight Saving time.*

3.4.6 TCP/IP Parameters

If the 9150 is situated on a wired network, it uses TCP/IP. A Routing Table, Host Table, DHCP, Bootp, and DNS options are available to resolve IP addressing issues.

Note: *The term* host *in this context refers to any device with an IP address, including parts of the Teklogix system such as controllers, the 9150, and associated base stations.*

This use of host is common in the networking field. It should be distinguished from Psion Teklogix's use of host *versus* terminal.

Teklogix 9150: TCP/IP Parameters		
Route Table:		
Routing Table:	[#] Add Entry	Configure
Host Table:		
Host Table:	[#] Add Entry	Configure
Host Table Entries:	Never Expire	
Host Table Entry Maximum Age [seconds]	600	
Network Interface Configuration Protocol:		
Network Interface Configuration Protocol:	None	
DHCP Lease Time: [days]	0	
Default Gateway Address:	10.128.0.1 10.128.0.1	
DNS:		
DNS Resolver Enabled:	☐	
DNS Default Domain:	default.com	
DNS Name Server 1:	0.0.0.0	
DNS Name Server 2:	0.0.0.0	
OK Cancel		

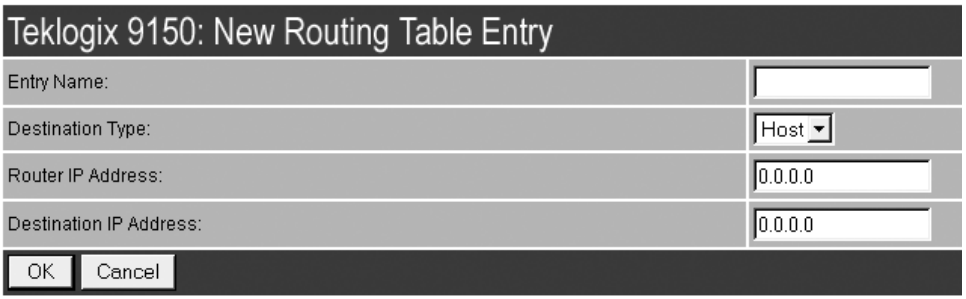
3.4.6.1 Route Table

Routing Table

The routing table is used when the 9150 and the host are not connected directly on a single physical network segment.

Packets are routed between network segments to the network connections, depending on the packets' destination addresses and on the contents of the 9150's Host and Routing tables.

To add an entry to the 9150's routing table, select "Configure" beside "[#] Add Entry" in the listbox. This will open the *New Routing Table Entry* menu.



New Routing Table Entry

Entry Name

This is the designated name of the entry.

Destination Type

Select a destination type for this entry from the drop-down list, either **Host** or **Net**.

Router IP Address

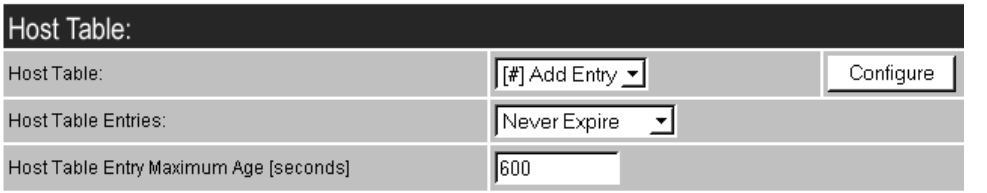
Enter the router's IP address in this textbox. This device must be on the same subnet as the 9150, and must be capable of sending packets to the host. If the host is on the same subnet as the 9150, enter its address here and in the *Destination IP Address* textbox.

Destination IP Address

Enter the IP address of the host. If the host is on the same subnet as the 9150, enter its address here and in the *Router IP Address* textbox.

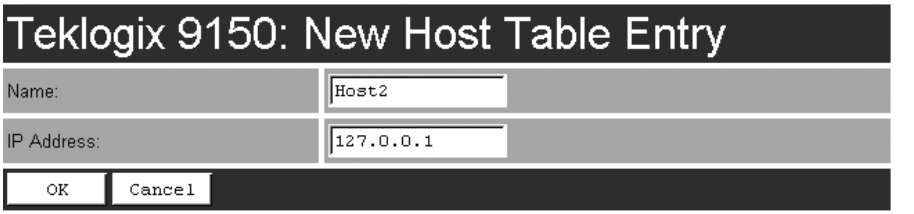
3.4.6.2 Host Table

If no external DNS server is available, the 9150 may resolve host names to IP addresses using its internal host table.

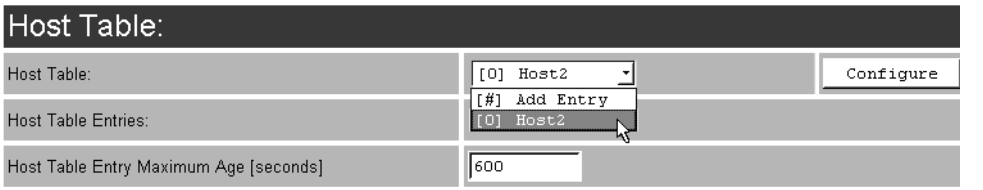


Host Table

Hosts are added to the table by selecting “Configure” beside “[#] Add Entry” in the listbox. This will open the *New Host Table Entry* menu where a new host name and IP address can be entered.



An existing host’s name and IP address may be edited in the *Host Table Entry* menu by selecting “Configure” beside the host name in the listbox.



The host may also be deleted from the table. When choosing to delete a host, you will be prompted for confirmation of the deletion, which will give you the opportunity to cancel the action.