

WS1500 e-Scanner

994-T058 Rev F September, 2007



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WARNING: This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the installation manual, may cause interference to radio communications. Operation of the equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

CAUTION: Changes or modifications not expressly approved by Westronic could void the user's authority to operate this equipment.



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Revision History

Rev Level	Issue Date	Reason for Reissue
А	November, 2001	First Release
В	January, 2002	Remote Configuration and Manual Corrections
С	November, 2002	Address Changes, and formatting
D	November, 2003	Logo, address changes
E	September, 2005	Updated address and fax number
F	September, 2007	Updated address

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1 Introduction

Product Description

The WS1500 e-Scanner Remote Telemetry Unit (RTU), shown in Figure 1, provides 32 discrete alarm input points, four control outputs, and an Ethernet interface capable of communicating to the host using Simple Network Management Protocol (SNMP).



Figure 1 WS1500 e-Scanner

Designed to meet Network Equipment Building Standards (NEBS) Level-3 testing requirements, the WS1500 e-Scanner augments Westronic's current product line by adding an economically priced product to collect smaller point counts and interface with SNMPmanaged networks.

Front-panel indicators instantly report active alarms and controls as well as the Microprocessor Unit (MPU) and Ethernet activity. Compact in size, the WS1500 requires only one Vertical Unit (VU or 1.75 inches) of rack space, and the hardware kit includes hardware for 19-inch and 23-inch racks as well as wall-mount installations.

Easy configuration and upgrade capabilities ensure that the WS1500 features continue to evolve with market demands. Nonvolatile memory stores the configuration, ensuring rapid recovery in the event of site power outage. The WS1500 has the following features:

- Four Form-C control outputs with common wiper for wettedvoltage applications
- Easy configuration using a local Personal Computer (PC), Telnet or SNMP from a remote location
- Convenient default database to get you up-and-running
- Retrievable alarm and control event history from an on-board memory
- Integrated sequence tag in the Management Information Base (MIB) ensures fail-safe alarm reporting
- Hardware for 19-inch or 23-inch rack-mount installations
- Supplied hardware for easy wall- or rack-mount installations

Table 0-1 lists cables and connectors that are available for use with the WS1500 e-Scanner.

Part Number	Description		
585-T073	Kit, 9-pin subminiature Insulation Displacement Connection (IDC) connectors with hood and insertion tool. (Two are included with the unit)		
620-T045	Male 9-pin subminiature IDC connectors		
620-T042	Screwlock Kit, CHAMP (2 per unit)		
620-T043	Screwlock		
620-T030	Rear-Access Wire-Wrap Connector		
977-T003-003	Cable, Discrete, 25 Pair, Male to Female, 3 Ft		
977-T003-005	Cable, Discrete, 25 Pair, Male to Female, 5 Ft		
977-T003-007	Cable, Discrete, 25 Pair, Male to Female, 7 Ft		
977-T003-050	Cable, Discrete, 25 Pair, Male to Female, 50 Ft		
977-T003-100	Cable, Discrete, 25 Pair, Male To Female, 100 Ft		
977-T003-150	Cable, Discrete, 25 Pair, Male to Female, 150 Ft		
977-T003-250	Cable, Discrete, 25 Pair, Male to Female, 250 Ft		
977-T004	100-foot, Single-Ended Cable with 50-Pin Connector		
977-T005	200-foot, Single-Ended Cable with 50-Pin Connector		

 Table 0-1
 Compatible Cables and Connectors

Overview of the WS1500 and SNMP

The WS1500 supports SNMP as defined in Request for Comment (RFC) 1157. SNMP is a manager/agent or server/client protocol. The agent runs on the WS1500 to monitor and report discrete and control status to the Manager. The Manager runs on the Network Management System (NMS).

SNMP is also a request/response protocol. In using SNMP, the Host Manager requests information from the WS1500 with *GetRequest* messages. The WS1500 agent responds with a *GetResponse* message. The Manager can also set variables, such as discrete point parameters, WS1500 network configuration, or the WS1500 password with *SetRequest* messages. Under predefined circumstances, the agent automatically informs the manager of its status. The WS1500 can inform the NMS Host Manager of discrete point state changes, control point actuation, and other important events using SNMP *Traps* (an autonomous response). When predefined events, Traps, occur, the agent does not wait for the Manager to poll. Instead, the agent sends information about the event to the Manager. Traps allow the Manager to be informed of events occurring at the agent in real time.

The WS1500 uses *EnterpriseSpecific* traps (vendor specific) to report alarms to the NMS. The WS1500 can be configured to generate a trap for each of the 32 discrete points and four control points based on the state of the contact and system errors. Through configuration, the WS1500 can report traps to a maximum of five SNMP Host Managers. The WS1500 traps to the same host multiple times or to different hosts. To generate traps, at least one Host Manager must be enabled in the WS1500.

Traps for discrete points and control points can be enabled or disabled through each point administration object. System traps cannot be disabled because they are critical to system operation. Traps are built and queued for output after being detected. The time required for the Manager to receive a trap is relative to the number of other traps in queue to be sent.

Other Products From Westronic

The remainder of this section provides information about other Westronic products that are available to meet alarm system needs. Call **972-235-5292** to talk with a Westronic representative to learn more about these and other Westronic Systems, Inc. products.

C1000

The C1000 complements many operation support systems by providing an economical and flexible means of collecting small-to-large quantities (32 - 256 points) of discrete alarm and status data and converting them to simple, easy-to-handle TABS or TBOS interface.



Figure 2 C1000

Different versions of the C1000 allow communications with either a TABS or TBOS host. The C1000 can pass-through polls for other addresses, permitting multiple chaining of C1000 units in larger configurations and permitting the C1000 and local Network Element (NE) telemetry data to combine into a single channel. In some cases, data can combine through a single modem.

The C1000 requires only one VU (1.75 inch) in either a 19-inch or 23-inch equipment rack, allowing location as close as possible to the source of discrete interfaces. The result is a large reduction in the amount of wiring required to pick up alarm and status data. Serial and discrete field connections are through standard 9-pin subminiature and 50-pin connectors, making installation and replacement exceptionally fast and simple.

The C1000 is equipped with two serial ports:

- The first, a host port, serves as a TABS or TBOS host communications interface that can be equipped with an optional 1,200-bps Bell 202T-compatible internal modem, allowing the C1000 to be located beyond the range of standard RS-422/RS-485 interfaces.
- The second, an expansion port, serves as a TABS or TBOS data collection interface.

The housing can accommodate a maximum of eight 50-pin discrete interface connectors. All the different configurations use this same housing.

WS1000

The WS1000 product line complements many operations and network management systems by providing an economical, flexible means of converting varying quantities of discrete (dry-contact) alarm, status, and control data into simple, easy-to-handle TABS or TBOS interface.



Figure 3 WS1000

Available configurations provide the flexibility to select the unit best suited for various applications. Choose 64/128 discrete inputs with 8/16 discrete outputs.

Small size and flexible mounting requirements allow placement of the unit close to the source of discrete interfaces. The WS1000 can mount in an equipment bay or on a distribution frame as the application demands. This flexibility results in considerable reduction in the amount of required wiring. The basic structure of a front-facing wire-wrap

block, commonly found on distribution frames, provides a sturdy housing for the WS1000. Located on the easily removable module contained within the housing are all the active components. WS1000 is the ideal way to collect discrete alarms throughout a site or service area with feedback to a WS1500 or WS3000 hub.

WS2000

The WS2000 product line offers the data collection and reporting capabilities necessary to make small RTUs more flexible and efficient. WS2000s combine compact design with the power to configure multiple serial and discrete interfaces in virtually any arrangement to best serve the needs of the network. WS2000 units fit within 19-inch or 23-inch racks and occupy a single vertical space (1.75 inches). Other mountings are available.



Figure 4 WS2000

A WS2000 remote can be equipped with the following:

- 4 or 8 serial ports supporting user-selectable RS-232, RS-422, and RS-485 interfaces at 1,200; 2,400; and 9,600* bps
- 32 512 discrete alarm/status inputs and 8 128 discrete control outputs, expandable to 2,048 inputs and 512 outputs in some configurations
- 8 pulse accumulator inputs
- 8 analog inputs, expandable to 24 analog inputs
- Host port interface for RS-232, RS-422, and RS-485 at 1,200;
 2,400; or 9,600* bps. An optional internal modem is available.

To support a broad range of equipment, the WS2000 can incorporate many of the following interface types:

- Asynchronous serial
- Discrete inputs and outputs
- Analog and pulse inputs

Some of the many types of available serial protocols include the following:

- E-Telemetry (E2A format)
 MCS-11
- TABS ASCII

^{*} The WS2000 TABS with dial out capability offers the optional data rate of 9,600 bps for the host and serial collection ports.

TBOS

WS3000

The WS3000 is a powerful telemetry unit that combines a high-speed processor and large database capacity with the most useful functions of discrete and serial alarm collection, mediation, and access. The WS3000 is the ideal bridge between today's telemetry networks and the advanced protocols now appearing. WS3000 units fit within 19-inch or 23-inch racks and occupy a single vertical space (1.75 inches). Other mountings are available.



Figure 5 WS3000

WS3000 features include the following:

- Optional Ethernet interface
- Available solutions for remote alarm monitoring over Transaction Language 1 (TL1 – ASCII) TCP/IP Ethernet, Open Systems Integration (OSI) Ethernet, and asynchronous communications
- Data collection using TBOS, TABS, and Teltrac protocols and discrete dry contacts
- Five serial ports supporting user-selectable RS-232/RS-422/ RS-485 interfaces from 1,200 – 9,600 bps
- Four serial ports supporting RS-422/485 interfaces from 1,200 9,600 bps
- 32 512 discrete alarm/status inputs and 8 128 discrete control outputs with capability to support a maximum of 30,000 alarm points (about 2,000 SIDs)
- Remote database configuration and software upgrade through exchanging PCMCIA cards or downloading through a Trivial File Transfer Protocol (TFTP) server or X-modem
- Switched Network Software (SNS, also referred to as String TABS) to control network access devices, such as PADs, terminal servers, and modems, for monitoring network elements and remotes
- Fault-Tolerant Monitor (FTM, also referred to as TABS2) software to provide redundant 2-way monitoring of long-distance network elements
- Custom protocols are available on a special assembly basis

WS3500 Metago™

WS3500 Metago[™] intelligent RTU is designed to NEBS Level-3 testing requirements by National Television Standards Committee (NTSC). The WS3500 Metago[™] augments Westronic's current product line by adding a NEBS 3 product to collect serial and discrete telemetry information while interfacing with industry-standard management systems using TL1).



Figure 6 WS3500 Metago ™

The WS3500 offering is modular in design, allowing customers to configure a unit to their specific collection requirements. Available configurations include from 0 to 512 discrete inputs, and a maximum of 24 serial ports that can be configured as RS-422/485 or RS-232. Reporting to host management systems is accomplished using RS-232, modems, TCP/IP, and Cellular Digital Packet Data (CDPD – a wireless IP). Front-panel visual indicators instantly report active controls, as well as MPU and network activity. Also, with an integrated web-server, alarm and control status can be viewed through any web browser. Compact in size, the WS3500 takes only two VU rack units and includes hardware for 19-inch and 23-inch mounting. Remote configuration and upgrade capabilities ensures that the WS3500 features evolve with market demands. Nonvolatile memory, which can be updated "on the fly," stores the configuration. Simplicity in configuration and ease of use means low cost to install and maintain.

Digital Bridge

The Westronic Digital Bridge is an ideal solution for achieving alldigital data communications networks. The bridge enables you to deploy multi-point asynchronous networks, including telemetry and data acquisition. The bridge eliminates the complexity of analog equipment, such as modems, data station terminations, and analog bridges. As a result, you have free bandwidth, improved speeds, and reduced maintenance throughout your telemetry network.



Figure 7 Digital Bridge

The Westronic Digital Bridge broadcasts host system polls to all stations, routing the sole responding station back to the host. In peer-topeer applications, any message from a station on the bridge replicates to all other stations in the network.

Dual/Quad Modem

The Westronic Dual and Quad Modems are an effective way to connect telemetry equipment to analog facilities. Created specifically for central office telecommunications applications, the unit's simple, lowmaintenance design ensures trouble-free operation.



Figure 8 Dual/Quad Modem

User-selectable digital interfaces configurable for RS-232, RS-422 or RS-485 separate the Westronic Dual/Quad Modem from its competitors in the telecommunications industry. The RS-485 option permits a single remote telemetry unit or collection port to connect to a maximum 32 modems. Such a configuration allows each remote site to operate in a point-to-point arrangement, thus eliminating troublesome analog bridges.

2 Hardware Description

The hardware platform is one Vertical Unit (VU – 1.75 inches) inches high. The platform mounts easily in a rack or on a wall. Each unit comes with mounting hardware for mounting in standard 19- or 23-inch communications racks. The unit can also mount to a wall when the mounting ears are rotated 90° and the unit is bolted to any flat surface in the vertical position.

The WS1500 meets international industry standards for network equipment, including Bellcore NEBS and the European Community (CE) standards. Designed for Electrostatic Discharge (ESD) resistance and use in telecommunication environments, the WS1500 is a rugged and dependable unit compatible with both Central Office (CO) and remote installations.

Figure 9 is an illustration of the WS1500 e-Scanner front panel showing the front panel indicators.



Figure 9 WS1500 e-Scanner Front Panel

Figure 10 illustrates the rear connector locations.

		p5	
	00	P4 LAN	

Figure 10 WS1500 e-Scanner Rear Panel

Front-Panel Indicators

PWR

Solid Green when power is correctly applied to P5, **PWR** lights red when power connection polarity is reversed. The unit has reverse polarity protection.

MPU

The green **MPU** health monitor LED blinks On/Off to indicate normal Microprocessor Unit operation.

LNK

The LNK (Link) LED illuminates green when the WS1500 is properly connected to a network device.

ACT

The data activity (**ACT**) LED monitors an Ethernet connection and indicates yellow when packet data is present.

DISCRETE INPUTS

The LEDs illuminate to indicate which discrete input points are in alarm condition.

CONTROL OUTPUTS

The LEDs illuminate to indicate which control output relays are activated.

Rear Panel Connections

P1 AUX

Use this connector to upgrade application software.

P2 Craft

Use this connector to perform basic craft functions and define the database.

Р3

Use this connector for discrete and control connections.

P4 LAN

Use this connector to provide 10baseT LAN connection (RJ-45) with built in duplicate LNK (green) and ACT (yellow) LEDs. These LEDs replicate the front-panel LEDs in color and function.

P5

Use this quick-connect plug for input power connection. The power plug is polarized and marked "–" for negative battery and "+" for positive battery connections.

Interfaces

This section describes the following interfaces:

- Alarm/Status Inputs
 Control Outputs
 Auxiliary Port
- Craft Port
 LAN Port

Discrete Alarm/Status Inputs

Discrete inputs consist of discrete alarm/status inputs (scan points). Scan points, which have an internal reference to the negative battery input, are single line inputs whereby an Off condition exists with the input is open or tied to –Battery (–24/–48 Vdc). An On condition exists when the input ties to +Battery (battery return). If the source is a set of isolated contacts, seven ground connections are available on discrete connector P3. Refer to Table 0-1 on Page 3-3 for all P3 connections.

Discrete Control Outputs

The discrete control outputs (control points) use conventional Single-Pole Double-Throw (SPDT) relay contacts with the wiper of all four relays connected to a control common reference (Form C). Each control can be individually configured through software to operate in latched mode or in momentary mode, with momentary durations from 400 through 999 milliseconds.

The Normally Open (NO) and Normally Closed (NC) contacts of each relay and the common reference input is available on P3. Refer to Table 0-1 on Page 3-3 for all P3 connections.

Serial Interface Functions

The P1 Auxiliary and P2 Craft ports are 9-pin subminiature connectors commonly referred to as DB9 connectors. Refer to Table 3-2 on Page 3-5 for P1 and P2 connections.

2.1.1.1 Auxiliary Port

The P1 Auxiliary port is used for software upgrades and factory/engineering testing. Connection to this port is only advised when directed by Westronic Systems, Inc. Customer Service.

2.1.1.2 Craft Port

Use Craft port P2 to monitor the WS1500 e-Scanner unit and configure the database using the built-in Command Line Interface (CLI) software. The connections on the plug are Tx, Rx, and GND. The Craft interface does not use hardware or software flow control. Incorporating software or hardware flow control is not needed because the WS1500 issues simple ASCII command strings in half-duplex mode.

The P2 Craft port is an RS-232 interface that communicates at a rate of 9,600 bps; eight data bits; no parity, one Stop bit, no flow control.

The RS-232 Craft port CLI process uses an ASCII command interface. The CLI command set is straightforward, human-readable text, enabling an easy learning curve in configuring the WS1500 e-Scanner.

The CLI uses all the functionality available in SNMP process, such as configuration, operation control and history. The CLI maintains a user database and requires a password-protected user login before performing any other input/output.

2.1.1.3 LAN Port

The P4 LAN Port interfaces to the Ethernet network through an RJ-45 connector wired for 10baseT operation. The connector physically includes **LNK** (green) and **ACT** (yellow) LEDs built into the connector frame and visible from the rear of the unit. The LEDs replicate the **LNK** and **ACT** LEDs located on the front panel.

SNMP traps, as well as remote configuration and controls are accessed via the network.

Specifications

This section provides electrical, environmental, and mechanical specifications for the WS1500 and various interface specifications.

Electrical

The following shows typical power and electrical requirements.

- Input voltage: -24 Vdc or -48 Vdc (-20 Vdc to -60 Vdc)
- Maximum external fusing: 0.75 Amps (-24 Vdc) or 0.5 Amps (-48 Vdc) Type 70 or GMT
- Power dissipation: 2.7 Watts (no input sense currents, no relays on); 7 Watts maximum (all relays controls and discrete inputs active)

Environmental

- Ambient operating ambient temperature range: $0 \circ C$ to $+60 \circ C$
- Humidity: < 95% non-condensing

Mechanical

Dimensions

- Height: 1.75 inches (4.4 cm)
- Width: 17.18 inches (43.6 cm)
- Depth: 8.0 inches (20.3 cm)

Mounting

- 19-inch (48.3 cm) rack mounting
- 23-inch (58.4 cm) rack mounting with included adapters
- Wall Mounting

Weight

• 5.1 lbs (2.31 kg)

Connectors

- Power: two-position, compression mating plug that accepts #14-AWG through #24-AWG wire (plug included with unit – PN 640-T005)
- Serial: standard female DB9 that accepts #22-AWG through #26-AWG wire
- LAN: RJ-45 connection wired according to standard 10baseT specifications.
- Discrete: standard female 50-pin D connector that accepts #22-AWG through #26-AWG wire (connections made using 50-pin connector assembly – PN 620-0078). Mating connector:
 - TRW: PN 97-12500-180 or PN 97-12500-181
 - Westronic: PN 620-0078

Interfaces

The WS1500 e-Scanner contains discrete input and control output capabilities. The host port communicates using SNMP protocol. The remainder of this section describes the discrete and SNMP serial interfaces used in the WS1500.

Discrete Interface

Internally, the WS1500 discrete alarm/status inputs reference the negative battery input (-24/-48 Vdc). Essentially, the inputs are single lines whereby an Off condition exists when the input is open or tied to negative battery. An On condition exists when the input is tied to positive battery (return). If the source is a set of isolated contacts, positive battery (return) connections are available on rear panel discrete connector P3 for application to one side of the contacts. Table 0-1 lists the discrete input logic levels.

Input Power	Logic Level	Voltage
-24 Vdc	0 (Off) 1 (On)	-15 Vdc through -30 Vdc -7 Vdc through +5 Vdc
-48 Vdc	0 (Off) 1 (On)	-15 Vdc through -60 Vdc -7 Vdc through +5 Vdc

Table 0-1 Discrete Input Logic Levels

Discrete logic control outputs use Form C contacts and operate in momentary or latching mode. The database configuration defines the mode of operation.

Each discrete output is a normally open Single-Pole, Double Throw (SPDT) isolated contact with both the Normally Open (NO) and Normally Closed (NC) contact connections individually available to the user. All discrete output relay wiper arm connections are wired together and brought out to Pin 34 in the rear-panel discrete connector P3.

Nine ground connections are available on the rear-panel connector as a convenience for applications where one contact side needs ground.

The following describes the discrete status/alarm inputs and control outputs:

Discrete Status/Alarm Inputs

- Number of inputs: 32
- Protection: sustain maximum transient voltages of 15 kV
- Ground: common ground for all inputs

Current

- ~1.0mA for each input at +Batt (-48 Vdc operation)
- ~0.5 mA for each input at +Batt (-24 Vdc operation)

Discrete Control Outputs

- Number of outputs: 4 relay control outputs
- Contact type: SPDT normally open, normally closed (Form C)
- Operation: latched or momentary. Momentary duration is programmable from 400 through 999 ms
- Contact Ratings:
 - 0.5 Amps at 60 Vdc or 0.3 Amps at 110 Vdc
 - 30 Watts (maximum) switching power

Serial Interface

Craft Port (P2) is an RS-232 interface that communicates at a rate of 9,600 bps; 8 data bits; no parity; one stop bit; and no flow control. The WS1500 uses a main menu and a configuration menu through the Craft port. The main menu displays or informs the user of current system aspects while the configuration menu alters the WS1500 database stored in flash memory.

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3 Hardware Installation

This section contains detailed installation instructions, tables, diagrams, special material handling considerations, and precautions.

Handling Considerations and Precautions

The WS1500 e-Scanner unit contains Complementary Metal-Oxide Semiconductor (CMOS) integrated circuits to maximize noise immunity and promote low power consumption. These components are Electro-Static Discharge (ESD) sensitive and can be damaged if subjected to high static voltage levels. Therefore, you should ensure that you are familiar with the ESD procedures that follow. Packaging containing CMOS and NMOS components has a label as shown in Figure 11.



Static Sensitive Maintain Antistatic Protection

Figure 11 Electrostatic Discharge (ESD) Label

CMOS devices are equipped with protection diodes, but incorrect handling that allows excessive static energy to enter the devices can still cause device failure. These failures are not readily detected and, in time, can lead to premature device failure.

Adhering to the following guidelines significantly reduces the possibility of electrostatic damage on CMOS components, thus improving system reliability and keeping downtime to a minimum:

- Before opening the unit, always verify the workstation is an ESD compliant work area that is free of static charges. Always wear a personal grounding device, such as an ESD heel or wrist strap that is connected to the worksurface.
- Perform repair work on modules in an antistatic workstation. All personnel performing repair work must be grounded through wrist straps and antistatic matting in the workstation.

- Exercise extreme care when handling CMOS components. Do not touch the pins and always place components in antistatic foam for storage and transportation.
- Ensure that desoldering tools have static reduction. Some desoldering tools can actually generate large static voltages that damage CMOS devices.

Component Substitution

Only qualified electronics service personnel who are familiar with microcomputers and input/output (I/O) interfacing should carry out actual module repair. Attendance by such personnel in a WS1500 e-Scanner training course to learn special circuit concepts and applications is highly recommended. When returning a faulty module, describe the suspected problem, fault, or symptom on the documentation that accompanies the module.

Installation Procedures

The following describes how to install the WS1500 e-Scanner into a permanent location. Refer to the checklist at the end of this section for a step-by-step WS1500 installation guide. After you work through the installation steps, the WS1500 unit is ready for software configuration. Refer to Section 6 "Getting the WS1500 up and running" for these procedures.

Inspecting the WS1500

Remove the WS1500 from the packing carton and inspect the entire unit for possible damage that may have occurred in shipment and postshipment handling. If visible damage is present, it may be necessary to return the unit to the factory.

Installing the WS1500

The WS1500 e-Scanner occupies one vertical space (1.75 inches) in a 19-inch standard telecommunications rack. Rack adapters are included with the unit for mounting in 23-inch wide racks. Figure 12 shows the external dimensions for the WS1500.



Figure 12 WS1500 Rack Mount

Figure 12 illustrates the mounting ears in the normal mounting position. Screw holes located closer to the unit front panel allow a "flush mount." In a flush mount, the unit front is flush with the rack front edge. Not shown in Figure 12 is the WS1500 wall-mount option. To accommodate a wall-mount installation, use either set of mounting locations for the ears and simply rotate the ears 90°.

Wiring the Unit

Make all connections to the WS1500 e-Scanner through the rear panel. Refer to Figure 10 on page 2-1for connector location.

3.1.1.1 Discrete and Control connections

Table 0-1 lists the discrete input and control output connections to P3. If wire-wrap connections to P3 are preferable, order adapter 620-T030 shown in Figure 13. This adapter mounts directly onto P3.



Figure 13 620-T03	0 Optional Wire-Wrap	Rear Connector
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 Table 0-1
 Pinouts for WS1500 e-Scanner Discrete Interface Connector P3

Function		in	Function
Control Output 1, Normally Closed	1	26	Control Output 1, Normally Open
Control Output 2, Normally Closed	2	27	Control Output 2, Normally Open
Control Output 3, Normally Closed	3	28	Control Output 3, Normally Open
Control Output 4, Normally Closed	4	29	Control Output 4, Normally Open

Function	Pin		Function
Ground	5 30		Ground
Ground	6	6 31 Ground	
Ground	7	7 32 Ground	
Ground	8	8 33 Ground	
Ground	9	34	Control Output Common Voltage
Status/Alarm Input 1	10	1035Status/Alarm Input 2	
Status/Alarm Input 3	11	11 36 Status/Alarm Input 4	
Status/Alarm Input 5	12 37 Status/Alarm Input 6		Status/Alarm Input 6
Status/Alarm Input 7	13	13 38 Status/Alarm Input 8	
Status/Alarm Input 9	1439Status/Alarm Input 10		Status/Alarm Input 10
Status/Alarm Input 11	15 40 Status/Alarm Input 12		Status/Alarm Input 12
Status/Alarm Input 13	16	16 41 Status/Alarm Input 14	
Status/Alarm Input 15	17	1742Status/Alarm Input 16	
Status/Alarm Input 17	18	1843Status/Alarm Input 18	
Status/Alarm Input 19	1944 Status/Alarm Input 20		
Status/Alarm Input 21	20	2045Status/Alarm Input 22	
Status/Alarm Input 23	21	2146 Status/Alarm Input 24	
Status/Alarm Input 25	22	22 47 Status/Alarm Input 26	
Status/Alarm Input 27	23	3 48 Status/Alarm Input 28	
Status/Alarm Input 29	24	2449Status/Alarm Input 30	
Status/Alarm Input 31	25 50 Status/Alarm Input 32		

 Table 0-1
 Pinouts for WS1500 e-Scanner Discrete Interface Connector P3

3.1.1.2 Craft and Aux Port Connections

Figure 14illustrates the physical pin orientation of the DCE connector viewed from the rear panel. Table 3-2 shows the cable wiring from the rear-panel Aux (P1) and Craft (P2) port connectors to a PC serial output port.



Figure 14 Craft and Aux Rear-Panel DB9 DCE Connections

Table 3-2 WS1500 Front-Panel DB9 Craft Port Pinouts and PC Connections

	Function		
Pin	DB9 WS1500 (DCE)	DB9 PC (DTE)	
2	Rx (Out)	Rx (In)	
3	Tx (In)	Tx (Out)	
5	GND/Common	GND/Common	

The DTE terminal, typically a PC, incorporates a DTE receptacle. Pinouts for the DTE connector are a mirror image of Figure 14. Refer to the actual pin labels on the connector to avoid confusion.

3.1.1.3 Craft Port Interface parameters

Craft port (P2) is an RS-232 interface that communicates at a rate of 9,600 bps; eight data bits; no parity, one stop bit, no flow control.

3.1.1.4 P5 Power Connections

Use #14 - #24 AWG wire to make power connections [-(-24/-48 Vdc), + (Ground or Return)] at P5 as shown in Figure 15.



Figure 15 Input Power Connector

3.1.1.5 LAN Connection

The Ethernet LAN connection to P4 on the rear panel uses a RJ-45 connector (Figure 16) wired for standard 10baseT interface (Table 3-3).



Figure 16 RJ-45 10baseT Connector P4

RJ-45	Circuit	Description	
1	TxD +	Transmit Data +	
2	TxD –	Transmit Data –	
3	RxD +	Received Data +	
4	_	_	
5	-	—	
6	RxD –	Received Data –	
7	_	_	
8	_	_	

Table 3-3	LAN Connection P4
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Powering the WS1500

Table 3-4 provides fuse requirements. The input voltage can range from -20 Vdc to -60 Vdc. Verify that power input leads are terminated before inserting the fuse.

Table 3-4 WS1500 Fusing Requirements

-48 Vdc		–24 Vdc		
GMT	Type 70	GMT	Type 70	
0.5 A	0.5 A	0.75 A	0.75 A	

Each WS1500 unit consumes a maximum load of 7 Watts, assuming all discrete inputs and output relays are active, which results in all LEDs being lit.

Install the appropriate fuse at the power distribution panel to power the WS1500. The front-panel **PWR** LED lights solid green when polarity is correctly applied to P5. When polarity is reversed, the LED displays solid red.

Installation Check List

Use the following checklist when installing the WS1500 hardware:

- Mount the unit on the wall or in a rack. Refer to *Installing the WS1500* on Page 3-2.
- Cable the unit

- Verify discrete connections to P3 (Table 0-1)
- Verify LAN connection to P4 (Table 3-3)
- Verify power connections P5 (Figure 15)
- Connect the PC to the Craft port (P2 Figure 14 and Table 3-2)
- Configure the PC serial port for communication (9,600 bps; eight data bits; no parity; and one stop bit)
- Apply power to the unit
- Apply power to the unit using the appropriate size fuse (Table 3-4)

The unit is now ready for software configuration. See Section 7 for instructions on installing the e-Scanner Configurator.

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4 WS1500 Configuration

Four methods are available to configure the WS1500 e-Scanner for operation in an alarm network:

- Remote configuration from the SNMP host using SNMP commands
- Local configuration from a PC connected to the Craft port using CLI commands
- Remote configuration using CLI commands via Telnet.
- Local configuration from a PC equipped with the WS1500 e-Scanner Configurator (this software application is the easiest and quickest manner of configuration)

PC Configurator Application

The WS1500 e-Scanner Configurator application program, running under Microsoft[®] Windows[®], provides a Graphical User Interface (GUI) that enables you to configure the WS1500. The Configurator allows you to work offline to save configurations for later use or to upload configurations to save as backups. The Configurator uses a serial PC COM port connected to the WS1500 Craft port. Section 3.1.1.2, *Craft and Aux Port Connections*, contains interconnection details on the PC.

Craft and Telnet Configuration

Configuration via the Craft port is performed through a local serial connection from the PC COM port. WS1500 commands are accessed using a terminal emulator session such as Microsoft's HyperTerminal, TeraTerm, or the equivalent. Not only does the craft interface offer configuration of the RTU, it also reports any trap configured discrete or control events and system error events.

Telnet Configuration or remote configuration consists of a user remotely accessing the WS1500 RTU over TCP/IP via Telnet application. The user simply connects to the WS1500 via the IP address of the RTU on port 23. Only one connection is allowed for configuration. Unlike the Craft interface the Telnet interface is designed for configuration of the box only. Events that would be seen on the craft are not reported to the Telnet session.

SNMP Configuration

SNMP configuration is not as easy as the craft and Telnet configuration, but allows for the occasional modification from any SNMP Manager. Before any configuraton via SNMP can occur, the WS1500's basic IP interface parameters and at least one host with a community name of something other than "public" must be configured.

The WS1500 has a maximum of 32 ASCII characters for the community name. After you configure the database in the WS1500, you must give community names to the appropriate NMSs. The default community names are "public" in the WS1500 database.

Note: A manager can have a configured community name and exercise SNMP commands on the WS1500 without having the manager IP address configured in the host list. To prevent unauthorized use of a community name, a user must log in to the WS1500 using SNMP before he can modify any of the MIB objects.

5 Using the Command Line Interface

Overview

The WS1500 e-Scanner software includes a command line interface (CLI) that enables monitoring and configuration of the WS1500 over a Telnet or console connection. Use the command line interface to enter and update a WS1500's configuration settings, monitor its status, and restart it.

You can open a command line interface session by opening a Telnet connection from a workstation on your network or by connecting a terminal to the craft port on the WS1500 e-Scanner.

Connecting from the Craft Port

Connect a terminal or a terminal emulator to the craft port of the WS1500 to configure, administer, and monitor the WS1500.

To use the WS1500 e-Scanner craft port, a serial cable and a terminal or terminal emulator (such as a personal computer with a terminal emulation application that supports 9600-baud communication) is required. Use the following settings to configure your terminal emulation session:

Setting	Set To
Speed	9600 bps
Parity	None
Data bits	8
Stop bits	1
Flow Control	None

To enter into the CLI on the WS1500, enter the question mark (?). The WS1500 will respond with a ">" prompt to indicate the user is not yet logged in. When configuration is complete exit the CLI and return the WS1500 craft port to Normal mode by entering the ampersand (&). While the craft port is in Normal mode, events that are configured to generate traps are also reported out the craft. While in the CLI, these messages are not reported on the craft session.

Connecting from Telnet

Initiate a Telnet connection by issuing the following command from an IP host that supports Telnet (or a personal computer running a Telnet application such as Microsoft Window's HyperTerminal). Change the application settings so that each character is sent as it is typed. Sometimes this is done by using binary mode. (Windows HyperTerminal will not need its settings altered.)

telnet ip_address

By default, the WS1500 is configured with 192.168.0.1. Once a connection has been established, the WS1500 prompt, "WS1500 Server" appears. To enter into the CLI of the WS1500 enter the question mark (?). The WS1500 will respond with ">" indicating the user is not logged in. Enter the question mark again to retrieve the Help menu. Only the help, version, and login commands are available with out logging into the WS1500. The default password is set to "password". Once the user is logged in, the WS1500 will respond with a ">>" prompt.

When the Telnet session is disconnected, the user is logged out.

WS1500 CLI Commands

The Command line Interface (CLI) commands can be accessed from either the craft port or remotely using Telnet. Accessing the WS1500 locally from the craft or remotely will generate a trap event indicating the WS1500 was accessed. WS1500 will also generate a trap if either method of connection enters the WS1500 Configuration Menu. This gives the SNMP Host a history of RTU local or remote access that other wise may go undetected. Most of the CLI commands are privileged commands that require the user to log into the WS1500 with a valid password. The commands Login, Help, and Version do not require the user to login.

CLI Main Menu Commands

Command	Usage
help	Displays WS1500 e-Scanner CLI commands.
login	Returns prompt to enter system login password. The default user password is "password". System trap sent to SNMP Host every three invalid login attempts.
logout	Logs user out of system. User will be automatically logged out after 30 minutes of inactivity on the craft port or remote connection.
modlogin	Allows the user to modify the user password. The password must correctly match the 'old' user password.
version	Displays the current software version and other relevant system information.
state	Displays the current system IP address, Router IP address, and Subnet Mask address.
editcnfg	Enters the Configuration mode to modify the database stored in Flash memory. System trap sent to SNMP Host for entering or exiting menu.
cnfg	Outputs the complete database in ASCII-readable format.
ping	Functions to 'ping' a network address with primary goal to ensure connectivity.

Table 0-1 Main Menu Commands

Command	Usage	
trap	Sends an SNMP "warm start" trap to the configured host address and is primarily used to test application operability.	
agent	Toggles to enable or disable the SNMP functionality.	
host	Displays the currently configured Host addresses that SNMP traps are sent to.	
elogdump	Outputs the complete Event log buffer to the Craft port.	
dstatus	Outputs the current status of the 32 discrete alarm point inputs.	
cstatus	Outputs the current status of control output points.	
time	Displays the current system date and time	
rmtcntrl	Activates a control point. When using this command, the user must enter the number 1, point, control type, and the on/off properties to execute. Momentary control-type duration values taken from the configured value.	
	From the WS1500 e-Scanner menu, the following command activates the control:	
	"rmtcntrl [1] [Pnt#] [mntry conts] [on off]"	
	For example:	
	"rmtcntrl 1 2 conts on"	
	"rmtcntrl 1 3 mntry on"	

Help

The **help** command is available by either typing the word "help" or typing the question mark "?". This command prints to the terminal a list of all the supported CLI commands. This command does not require the user to log into the system.

>help
WS1500: escanner commands:
help - help with menus
login - Login to system
logout - Logout of system
modlogin - Modify login password
version - SW version information

state - IP,SubMask,Router address
editcnfg - Enter configuration mode (tasks halted)
cnfg - Display configuration
ping - Ping [IP address(xxx.xxx.xxx.xxx)] [#times]
trap - Send a test (warm start) SNMP trap
agent - Enable/Disable SNMP Agent
host - Host IP address
elogdump - Discrete Event Log buffer
dstatus - Discrete Status
cstatus - Control Status
time - System time/date
rmtcntrl - Activate cpoint [1] [Pnt#] [mntry conts] [on off]
Type '&' to exit menu

CLI Help Command

Ping

The **ping** command is a well-known tool for testing network connectivity. Enter the IP address of the network interface you are testing for connectivity followed by the number of tries. Omitting the number of ping tries causes the WS1500 to ping that address 3 times or until you press a key.

>>ping 192.168.8.5 3
...press any key to stop pinging...
ping 0 to 192.168.8.5 ping 0 sent...
got ping reply; len :62 seq 0 from 192.168.8.5
ping 1 to 192.168.8.5 ping 1 sent...
got ping reply; len :62 seq 1 from 192.168.8.5
ping 2 to 192.168.8.5 ping 2 sent...
got ping reply; len :62 seq 2 from 192.168.8.5
ping complete; send 3, received 3

CLI Ping Command

Trap

The **trap** command generates a warm-start trap to send to the enabled hosts that are configured in the database. This is a quick test to see if you have your network and host information configured correctly. >>trap trap sent

CLI Trap Command

Host

The **host** command causes the WS1500 to report its configured host list. If a host is not receiving traps, this command quickly identifies whether the IP address and Community Name are correct and whether the host is enabled in the WS1500 database.

>>host
Host Ip # 1 :192.168.1.2 Enabled secret1a
Host Ip # 2 : 137.237.196.70 Disabled public
Host Ip # 3 : 192.168.1.2 Disabled public
Host Ip # 4 : 192.168.1.2 Disabled public
Host Ip # 5 : 192.168.1.2 Disabled public

CLI Host Command

State

The **state** command causes the WS1500 to report its configured network information: IP Address, Router, and Subnet Mask. State is useful to quickly verify that your network information is configured properly. The other reported items are for future implementations of functionality.

>>state

Station IP address for iface 1: 192.168.0.1router address192.168.0.254subnet mask255.255.255.0ping delay time:200 ticks (~16 msecs).ping host:0.0.0.0current tick count 1491269

CLI State Command

Remote Control

The **rmtcntrl** command actuates one of the four WS1500 control points. The command is useful to test the control points during installation.

At the CLI promt, enter the command "rmtentrl 1 [Point#] [mntry|conts] [on|off]". When actuating a momentary control, the defined duration for that point is the amount of time the control is closed and then released. When issuing a momentary control point, using On or Off will achieve the same result.

Note: The Duration of a momentary is determined by the duration length configured for the control point.

>>rmtcntrl 1 1 conts off >>rmtcntrl 1 1 conts on >>rmtcntrl 1 1 mntry on

CLI Remote Control Activation (Rmtcntrl) Command

Login-Logout

Use the **login** command to access the WS1500 e-Scanner Menu. The **login** command will prompt the user for a password. The user has three tries to key in a valid password. After three tries, the system generates an invalid login attempt trap.

>login	
Enter password :	
System login fail	
>login	
Enter password :	
System logged in	
>>logout	
System logged out	
,	
>	

CLI Login / Logout command

Users should always use the logout command when finished.

Modlogin

The **modlogin** command configures the password to access the WS1500. This password applies to Craft, Telnet or SNMP login, however each interface maintains separate access from the other. The **modlogin** command prompts the user for the old password as verification, then prompts user to enter new password and confirmation of new password before the password is changed. After the modification is completed, use the Config Menu "Save to Flash" command to permanently save the new password.

>>modlogin Enter old password : Enter new password : Confirm new password : Password changed >>

CLI Modify Login Password (Modlogin) Command

Time

The **time** command causes the WS1500 to report its current date and time in the following format:

YY-MM-DD HH:MM:SS

>>time

System Date and Time 01-10-17 11:28:32

CLI Time Command

Version

The **version** command retrieves the Manufacturer name, Model, Software Number and WS1500 Version, and the last tech note. Disregard the checksum value.

>>version Manufacturer: Westronic Systems, Inc Model: WS1500 e-Scanner 586-T001 Software: 569-T121 Version 1.2 10-11-01 Software Checksum: 0x99a3076b LastTech: Discrete point 8 modified

CLI Version Command

Configuration

The **cnfg** command cause the WS1500 to print the entire database. The sections are separated and require the user to press the Space bar before the print continues.

>>cnfg

1 Trap_All_States	Cleared	Not_Inverted "Discrete Point 1"
2 Trap_All_States	Cleared	Not_Inverted "Discrete Point 2"
3 Trap_All_States	Cleared	Not_Inverted "Discrete Point 3"
4 Trap_All_States	Cleared	Not_Inverted "Discrete Point 4"
5 Trap_All_States	Cleared	Not_Inverted "Discrete Point 5"
6 Trap_All_States	Cleared	Not_Inverted "Discrete Point 6"
7 Trap_All_States	Cleared	Not_Inverted "Discrete Point 7"
8 Trap_All_States	Cleared	Not_Inverted "Discrete Point 8"
9 Trap_All_States	Cleared	Not_Inverted "Discrete Point 9"
10 Trap_All_States	Cleared	Not_Inverted "Discrete Point 10"
11 Trap_All_States	Cleared	Not_Inverted "Discrete Point 11"
12 Trap_All_States	Cleared	Not_Inverted "Discrete Point 12"
13 Trap_All_States	Cleared	Not_Inverted "Discrete Point 13"
14 Trap_All_States	Cleared	Not_Inverted "Discrete Point 14"

15 Trap_All_States Cleared Not_Inverted "Discrete Point 15" -- More --

Event Log

The **elogdump** command cause the WS1500 to print the event log, which can contain up to a maximum of 40 trappable events. This circular history buffer only stores events that had reported traps. The event log contains events for discretes, controls, and systems errors. Retrieval of the buffer using the CLI and configurator labels the events as discretes, controls, or system. Observe that the control messages have zero for their SeqNum. Traps generated for control events do not have a sequence number associated.

>>elogdump System-> SeqNum: 1 Display: 1 Point: 13 **OperationalState:** 1 AlarmStatus: 3 LastEnabledTime: 01-02-06 12:01:09 LastDisabledTime: **Description: Craft Access Connection** Control-> SeqNum: 0 Display: 1 Point: 1 **OperationalState:** 1 AlarmStatus: 0 LastEnabledTime: 01-02-06 12:01:27 LastDisabledTime: 01-02-06 12:01:27 Description: Control Point 1 Discrete-> SeqNum: 2 Display: 1

Point: 10
OperationalState: 1
AlarmStatus: 7
LastEnabledTime: 01-02-06 12:01:31
LastDisabledTime: DTimeNotSetPoint10
Description: Discrete Point 10
>>

Control Status

The **cstatus** command cause the WS1500 to print the current status of all four control points.

>>cstatus
Display: 1 Point: 1 OperationalState: Momentary Duration: 400ms Cntrl Status: NotInUse Description: Control Point 1
Display: 1 Point: 2 OperationalState: Continuous_Off Duration: 400ms Cntrl Status: NotInUse Description: Control Point 2
Display: 1 Point: 3 OperationalState: Continuous_Off Duration: 400ms Cntrl Status: NotInUse Description: Control Point 3
Display: 1 Point: 4 OperationalState: Continuous_Off Duration: 400ms Cntrl Status: NotInUse Description: Control Point 4 >>

CLI Cstatus Command

Discrete Status

The **dstatus** command cause the WS1500 to print the current status of all 32 discrete points.

>>dstatus

SeqNum: 41 Display: 1 Point: 1 OperationalState: enabled AlarmStatus: Minor LastEnabledTime: 01-10-17 11:48:15 LastDisabledTime: 01-10-17 11:48:10 Description: discrete point 1

CLI dstatus Command

Note: entire output not shown in above figure.

Agent

The **agent** command toggles the SNMP agent so that it stops responding to SNMP commands. When the agent is On, the WS1500 SNMP agent responds normally to SNMP commands. When the agent is Off, it stops responding to SNMP commands, but continues to report traps.

Configuration Menu Commands

The Configuration menu is accessed through the WS1500 e-scanner menu via the **editcnfg** command. When the configuration menu is accessed, the "WS_1500>" prompt appears. To see a list of commands in the Configuration menu, enter the "?".

WS_1500> ? CONFIG MENU (?) Help Config (D)ump Config (P)oints Config (C)ontrols Config (C)ontrols Config (I)p Address Config (H)ost IP Address/Community Name Config (R)eal Time Clock Config (R)eal Time Clock Config (W)si system information Config (T)echnician note Config (B)ox Trap Enable Config (S)ave to Flash (X) exit

WS_1500>

CLI Config Menu

When exiting the Config menu of the CLI, the prompt will change from "WS_1500" to ">>" again.

WS_1500> x Returning from WS1500 config

>>

Exiting Config Menu

The commands in the WS1500 Configuration menu all deal specifically with modifying the current database, retrieving it, or exiting back to the Main menu of the CLI.

Table 0-1 Config Menu Commands

Command	Usage
Config (D)ump	Outputs the complete database in ASCII-readable format.
Config (P)oints	Configures the discrete point $(1 - 32)$ description, reporting state, severity, and inverted point properties.
	Item Options
	Point#
	1 – 32
	Admin State
	Trap_All_States
	Trap_On_Enable
	Disable_Traps
	Severity
	Cleared
	Warning Major
	Active Pending
	Indeterminate
	Minor Critical
	Inversion
	Inverted
	Not_Inverted
	Desc
	32 chars Max

Command	Usage
Config (C)ontrols	Configures the control point $(1 - 4)$ description, reporting state, duration, and control type (momentary or continuous).
	Item Options
	Options
	Point#
	1 - 4
	Admin State
	Trap_All_States
	Trap_OII_Enable
	Disable_Trap
	— I
	Туре
	Momentary
	Continuous_Off
	Continuous_On
	Duration#
	400 - 999 ms
	Text
	32 chars Max
Config (I)p Address	Configures the WS1500 IP address, Router IP address, and Subnet Mask.
	Variable format xxx.xxx.xxx

Command	Usage	
Config (H)ost IP Address/Community	Configures the SNMP Trap destination (Host) Ip addresses $0 - 4$. Each address requires a community name to be configured as well.	
Name	Host#	
	1-5	
	Host Addr	
	xxx.xxx.xxx	
	Name	
	32 chars Max Community Name	
	Тгар	
	Enable/Disable	
Config (R)eal Time Clock	Sets the system time(24hour format) and date.	
	hr:	
	0-23	
	min:	
	00-59	
	sec:	
	00-59	
	yr:	
	00-99	
	mon:	
	01-12	
	day:	
	01-31	
Config (W)si system information	Configures the SNMP system Contact, System Location, and System Name strings.	
	New System Contact	
	New System Name	
	New System Location	
	115 chars Max	

Command	Usage	
Config (T)technician note	• Configures the Last Tech string. This field contains technician notes.	
	New Last Tech to Modify RTU	
	100 chars Max	
Config (B)ox Trap Enable	Configures the RTU Trap enable value. When enabled, the WS1500 generates traps on configured events. When disabled, the WS1500 does not generate traps even when an event is configured to send a trap.	
	RTU TRAPS	
	Enable/Disable	
Config (S)ave to Flash	Writes configuration changes in RAM to ROM Flash memory.	
	The editcnfg \rightarrow S commands causes the WS1500 to write its database in RAM to Flash memory so that it becomes permanent and loads when the WS1500 reboots. These commands also cause the WS1500 to reboot. After reboot, the WS1500 time and date clock resets to a default value and need to be configured. Reboot also logs the user out.	
	Example:	
	>>editcnfg WS_1500> s Are you sure [y n] y	
(X) exit	Returns to the Configuration Main Menu	

6 Getting the WS1500 up and running

Use a terminal emulation package such as HyperTerm, TeraTerm or ProComm.

Connect a cable to the Craft Port and verify that the terminal emulation used has the port parameters set to 9600 baud eight data bits, no parity, one stop bit, (9600,8,N,1) and no flow control.

Accessing the Craft Port Interface CLI Commands



Figure 17 WS1500 CLI Command Set

- Press '?' and select Enter. A '>' prompt appears to indicate that a user is in the main menu but not logged in. Normal SNMP functions continue to run on the network session.
- Press '?' and select Enter to execute the command. A listing of the main menu appears. You can enter the "help" command to obtain the same results. The only command that you can execute at this point without a valid login is the "Version" command.

- To login, enter 'login' and select **Enter**. When prompted for a password, enter the appropriate password and select **Enter**. The factory-set password for the WS1500 is "password". After you enter a valid password and the "System Logged In" message appears, a ">>" prompt appears, indicating that the user has successfully logged in.
- You can now use all commands in the main menu. The main menu includes commands to view the current configuration, parameters, and other useful utilities. You must access the Configuration Menu to make any changes to the configuration.

Changing the Password

- At the '>>' prompt, enter "modlogin" and select Enter. The message "Enter Old Password:" appears.
- Type the old password and select **Enter**. A new password prompt appears.
- Enter a password (maximum of 20 characters) and select **Enter**.
- Confirm the new password by entering it again and select Enter. Note: Passwords are case sensitive! The message "Password changed" appears. The new password takes effect the next time you log in.

Configuration Menu

🛄 Tera Term - COM1 VT	
<u>File E</u> dit <u>S</u> etup C <u>o</u> ntrol <u>W</u> indow <u>H</u> elp	
WS_1500> ? CONNICE MENU (?) Help Config (D)ump Config (C)ontrols Config (I)p Address Config (H)ost IP Address/Community Name Config (R)eal Time Clock Config (R)si system information Config (T)echnician note Config (B)ox Trap Enable Config (S)ave to Flash (X) exit WS_1500>	

Figure 18 CLI CONFIG menu

- At the '>>' prompt, enter "editcnfg" and select Enter. This results in a 'WS_1500>' prompt. At this point the WS1500 is in configuration mode, stopping all tasks.
- Enter '?' and select **Enter** to display a list of all the configuration options shown above.

Editing the IP Address

- At the 'WS_1500>' prompt, enter 'I' and select **Enter**. The current WS1500 IP address is shown along with a prompt for a new IP address.
- If the current IP is correct, select Enter. Otherwise, enter the new IP address [xxx.xxx.xxx] and select Enter. The current Router IP displays along with a prompt to change it.
- To continue with no changes, press ENTER. Otherwise, enter a new IP address and select Enter. The current Subnet Mask displays along with a prompt to change it.
- To make no changes, select **Enter**. Otherwise, enter a new subnet and select **Enter**. The 'WS_1500>' prompt returns after you enter all data.

Editing the Host IP and Community Name

- At the 'WS_1500>' prompt, enter 'H' and select **Enter**. A summary of all five host configurations appears at the top of the screen and a 'Host #' prompt appears.
- Press the 'Esc' key at this point to return to the 'WS_1500>' prompt without making changes or enter a number (1 5) and select Enter to configure a specific host. Selecting Enter key at this point steps you through the host process. You must configure at least one host before the WS1500 can communicate with a SNMP Manager.
- At the 'Host Addr:' prompt, enter the host IP address. If the current IP address is correct when you select **Enter**, you advance to the next field without making any changes.
- At the 'Name:' prompt, specify the Community Name. A Community Name of "public" gives read only access. Any other Community Name gives read/write access. Select **Enter** to make no changes or enter a Community Name (maximum of 32 characters) and select **Enter**. A Trap Enable prompt appears.
- Use the Tab, Spacebar, or Arrow keys to toggle between Enable and Disable. You must enable at least one host for communication with a SNMP Manager. Select Enter when the appropriate selection is visible. You will again see a 'Host #' prompt.
- Select the 'Esc' key at this point to return to the 'WS_1500>' prompt or select Enter to continue with the next host.
- Enter a number from 1 to 5 to configure a specific host.

Configuring Discrete Inputs

- At the 'WS_1500>' prompt, enter 'P' and select
 Enter. The current configuration of Discrete Input #1 displays at the top of the screen.
- If you select 'Esc' at this point, you return to the 'WS_1500>' prompt without making any changes

to the discrete inputs. If you enter a valid point number, you can configure a specific point. Selecting **Enter** steps you through the point configuration process one point at a time. The first parameter to display is the 'Admin State'.

- Use the Tab, Spacebar, or Arrow keys to step through the different options. When the desired selection is visible, select Enter to continue. The next parameter to be displayed is 'Severity'.
- Use the Tab, Spacebar, or Arrow keys to step through the different options. When the desired selection is visible, select Enter to continue. The next parameter to display is 'Inversion'.
- Use the Tab, Spacebar, or Arrow keys to step through the different options. When the desired selection is visible, select Enter to continue. The next parameter to display is the point description.
- To change the description, enter a description (maximum of 32 characters) and select **Enter**. To keep the current description, select **Enter**. At this point, the next status point configuration displays.
- To continue editing status points, select **Enter**. Otherwise, select 'Esc' to return to the configuration menu or enter a valid point number to configure a specific point. Repeat for all 32 points.

Editing Control Outputs

- At the 'WS_1500>' prompt, enter 'C' and select **Enter**. The top of the screen displays the current configuration of all four control outputs.
- At the 'Point #' prompt, enter a specific control to configure, press 'Esc' to return to the 'WS_1500>' prompt, or select Enter to step through the control point configuration process. The first parameter is 'Admin State'.
- Use the Tab, Spacebar, or Arrow keys to toggle between the valid choices. Select Enter to proceed to the next parameter. The next parameter is 'Type'.
- Use the Tab, Spacebar, or Arrow keys to toggle between the valid choices. Select Enter to proceed to the next parameter. The next parameter is 'Duration#'.

- Enter a value between 400 999 ms; after you enter 3-digit number, you automatically advance to the next parameter. The final parameter is 'Text'.
- Enter a maximum of 32 characters for the control output description and select **Enter** when done. You return to the 'Point #' prompt. Repeat until required changes are complete.

Saving Configuration to Flash

- You must save any changes made to the WS1500 configuration to the Flash memory for the changes to be made permanent, and retained during a power cycle. Otherwise the changes will be temporary. At the 'WS_1500' prompt, press the 'S' key and select **Enter**. A confirmation message appears.
- Enter 'Y' and select **Enter**. The configuration writes to the on-board Flash memory and the WS1500 reboots.

Setting the Real Time Clock

The WS1500 does not retain the system time or date during a power cycle or reboot sequence. Therefore, you must set the time and date each time the unit resets.

- Access the Main Menu and login as described in Section 0.
- Access the Configuration Menu as described in Section 0.
- At the 'WS_1500' prompt, enter 'R' and select **Enter**.
- Follow the prompts to enter the time and date.
- Type the 'X' key and then ENTER to exit the Configuration Menu.

Logging Out

Logging out of the WS1500 when configuration is complete is important. If you fail to log out, the system automatically logs you out after 30 minutes of inactivity.

- Exit the Configuration menu by entering "x" and then the **Enter** key.
- At the '>>' prompt, enter 'logout' and select Enter. A message appears, indicating the system has been logged out and a '>' remains.
- Enter '&' to exit the main menu.

Testing Discrete Inputs

- Connect a terminal session to the Craft port as described earlier in the document. Verify that the Main Menu is not active (meaning there are no active prompts).
- Create an alarm on Discrete Input #1 by shorting Pin 10 to ground on the J3 connector.
 - Verify that Discrete Input #1 LED lights on the front of the WS1500.
 - Verify that an ASCII message reports on the Craft port showing that Discrete Input #1 has been enabled.
 - Remove the alarm and verify that the LED clears and that another message displays on the Craft session indicating that the alarm has disabled.
- Repeat for all 32 Discrete Inputs.

Testing Control Outputs

Connect a terminal session and enter the main menu as described previously in this document. Log into the WS1500.

- Use the Rmtcntrl command to issue the first control as follows:
 - >>rmtcntrl 1 1 conts on
- Verify that the Control Output #1 LED lights.
- Use the Rmtcntrl command to release the control as follows:
 - >>rmtcntrl 1 1 conts off
- Verify that the Control Output #1 LED clears.
- Repeat these steps for all four Control Outputs.

Hint: The next command is as follows:

• >>rmtcntrl 1 2 conts on

7 WS1500 e-Scanner Configurator

The WS1500 e-Scanner Configurator application program, running under Microsoft[®] Windows[®], provides a Graphical User Interface (GUI) that automates the task of configuration through Command line entry.

The Configurator allows you to work offline to save configurations for later use or to upload configurations to save as backups. The Configurator uses a serial PC COM port connected to the WS1500 Craft port.

This section addresses the following topics:

- Installing the e-Scanner-Configurator
- Database and Terminal windows
- Menus
- Database File description

Installation

The WS1500 e-Scanner has the following minimum system requirements:

- Pentium[®]-class processor operating at 200 MHz
- Windows[®] 95/98, NT, or Me[®] 2000 operating system
- 64 MB RAM
- 6 MB of available hard disk space
- RS-232 serial port
- Monitor screen resolution of at least 600 by 800

The installation program automates the installation of the WS1500 e-Scanner Configurator application. To install the application, insert the installation Compact Disc (CD) and execute the *setup.exe* program located on the disk. The WS1500 e-Scanner Configurator creates a program group called Westronic and adds a WS1500 e-Scanner Configurator program item to the group. If the target PC has other program adds the WS1500 e-Scanner

Configurator to the existing Westronic program group containing those programs.

Configuration Basics

The WS1500 e-Scanner Configurator provides for offline configuration. Just open the program and begin modifying the default values found on the tabs of the Database window. This allows the user to configure a WS1500. If there is a previously saved configuration, it can be modified by selecting File \rightarrow Open. Both can be performed with out being connected to a WS1500.

Note: For the remainder of this section online configuration will be discussed.

The WS1500 RTU is shipped with a factory-installed configuration to provide fast and simple installations. However, some basic configuration is required before the WS1500 can successfully begin communication with an SNMP Manager. These include the following:

- Open the WS1500 Configurator and connect to the WS1500 by the COM menu
- Login to the WS1500 when prompted.
- Change the default password on the WS1500 through the Admin menu.
- Set IP, Netmask, and Router addresses for the WS1500.
- Enable at least one host, as well as the Host IP and Community Name set.
- Download the configuration to the WS1500 through the File menu.
- Make the changes permanent by saving the configuration to Flash when prompted by the Configurator application.
- Archive the configuration to File via the File menu.
- Logout of the WS1500 and close the application.

The above steps are required to set up a WS1500 RTU to begin reporting to an SNMP Manager or have the

WS1500 ready for remote configuration via Telnet. These parameters are all found on the System Configuration tab.

Configurator Program Windows

The WS1500 e-Scanner has two main program windows: Database and Terminal.

Database Window

The WS1500 e-Scanner Configurator opens to the Database window. The database window contains the entire WS1500 database on it's 4 tabs. This allows the user a broader view of the WS1500 by having the database in a easy to view and modifiable format. The four tabs are: System Configuration, Discretes 1-16, Discretes 17-32, and Controls 1-4.

	<u>D</u> iscretes 1-16	Discretes 17-32	Controls 1-4
System IP Address:	System Subnet M	Mask: Router Address:	RTU Traps
192.168.0.1	255.255.255.0	0.0.0	Enabled 🗾
System Name:	Westronic Systems, Inc.	WS1500 e-Scanner	
System Location:	System location not set.		
System Contact:	/ Westronic Systems, Inc. 1850 N. Greenville Ave., Suite 184, Richardson, TX 75081 (972) 235-5292		
Technical Note:	Westronic Engineering		
Enable	Host IP Address	Community Name	
Γ 1	192.168.0.1	public	
1000 C 1000 C	192.168.0.1	public	
<u> </u>	192.168.0.1	public	
□ 2 □ 3			
□ 2 □ 3 □ 4	192.168.0.1	public	



ТАВ	Field Usage	
System Configuration	The System Configuration tab allows you to configure the WS1500.	
	System IP Address – Internet Protocol Address. A 32-bit address that, in combination with the Subnet mask, identifies the network and a specific WS1500 on that network.	
	System Subnet Mask – Internet Protocol Address. A 32-bit address that, in combination with IP Address, identifies the network and a specific WS1500 on that network.	
	Router Address – All traps destined for a SNMP host not on the WS1500 network contain the router address to forward on to the appropriate network.	
	RTU Trap (enable/disable) – The RTU trap enables or disables the entire box from sending traps for various configured discretes and control points. Each point can be configured to send trap events, however, if an individual point is configured to send traps and the RTU trap is disabled, no traps are sent. If a point is configured not to send traps and the RTU trap is enabled, the particular point does not send any traps until individually configured to do so.	
	System Name – The system name identifies the WS1500. This is a user-defined field that can contain a maximum of 115 characters.	
	System Location – The system location identifies the individual WS1500 location. This is a user-defined field that can contain a maximum of 115 characters.	
	System Contact – The system contact identifies the local point of the contact responsible for WS1500 unit administration. This is a user-defined field that can contain a maximum of 115 characters.	
	Technical Note – The Technical Note or Last Technician Note is a user-defined textual description of the nature of the configuration. The Technical Note is used to store brief messages for the next user. This field, which has no history, contains only one entry. Each new note overwrites the previous note. This field has a maximum of 100 characters.	
	Host IP address and Community Names (1 – 5) – The Host IP (the address that the WS1500 traps to) and Community Name. The Community Name, which has a maximum of 32 characters, identifies the combination of authentication and access-control between the WS1500 and its SNMP Host Managers. Multiple traps enabled to several hosts or to one host creates trap redundancy.	

ТАВ	Field Usage	
Discretes 1 – 16 and Discretes 17 – 32	Administrative State – User-defined description of the point administrative state, such as "open door," "high temp," and so on. The administrative state determines when to generate an SNMP trap for a point.	
	Four possible administrative states are available:	
	1. Trap_On_Enable	
	Send trap on point-enable event.	
	2. Trap_On_Disable	
	 Send trap on point-disable event. 3. Trap_All_States Send trap on point-enable and disable events. 4. Disable_Trap Send no traps for any events on this point. <i>Note:</i> The Box Trap state overrides the point administrative state. That is, if the Box Trap is set to Disable and the point is set to Trap All States, no trap is sent for this point or any other point in the box. Alarm Status – The alarm status indicates the severity of a point. This is a user-defined field on a point-by-point basis. Alarm status has seven valid values: 	
	1. Indeterminate	
	2. Warning	
	3. Minor	
	4. Major	
	5. Critical	
	6. Active_Pending	
	7. Cleared	
	Inversion – Inversion defines whether a point is normally open or normally closed. Only two values are possible:	
	1. Inverted (NO)	
	2. Not_Inverted (NC)	
	Description – The description field is a 32-character, user-defined description of the point, such as "open door," "high temp," and so on.	

ТАВ	Field Usage	
Controls 1 – 4	Administrative State – The administrative state determines when to generate an SNMP trap for a point. Four administrative states exist:	
	1. Trap_On_Enable	
	Send trap on point-enable event .	
	2. Trap_On_Disable	
	Send trap on point-disable event.	
	3. Trap_All_States	
	Send trap on point-enable and disable events.	
	4. Disable_Trap	
	Send no traps for any events on this point.	
	<i>Note:</i> The Box Trap state overrides the point administrative state. That is, if the Box Trap is set to "Disable" and the point is set for "Trap All States", no trap is sent for this point or any other point in the box.	
	Duration – The duration, applicable only to the momentary operational state, is the amount of time for the control point to be active. The range is 400 – 999 milliseconds.	
	Control Type – The control type, which defines how to actuate the control point, has the following values:	
	Continuous_On	
	Continuous_Off	
	Momentary (duration is 400-999ms)	
	Description – The description field is a 32-character, user-defined description of the point, such as "open door," "high temp," and so on.	

7.1.1.1 Program Database Window Menus

The WS1500 eases command entry with menu clicks. Each window has several menus that group program commands.

<u>File Terminal Logout Admin</u>	Com	Help	
System Configuration	Υ <u> </u>	Discretes 1-16	Discretes 17-3

Menu	Command	Usage
FILE		
	OPEN	Opens previously archived database from a file.
	SAVE AS	Saves a database with a new file name.
	SAVE	Saves a database to file.
	UPLOAD DATABASE FROM WS1500	Retrieves database from connected WS1500
	DOWNLOAD DATABASE TO WS1500	This menu contains the following submenu items for downloading all or only portion of the WS1500 configuration to the RTU.
		AII - Downloads the entire database to the WS1500.
		Discrete Points – Downloads only discrete points 1 – 32 to the WS1500.
		Control Points – Downloads only control points 1 – 4 to the WS1500.
		Network Config – Downloads the RTU IP address, Router address, and Subnet Mask.
		System Info – Downloads the RTU name, location, and contact information.

Figure 20 Database Window Menus

	Host IP – Downloads the Host IP and community names $(1 - 5)$.
	Technical Note – Downloads the RTU technical note.
	RTU Trap – Downloads the RTU trap (enabled/disabled).
WRITE WS1500 FLASH	Sends a command to WS1500 to save its database Flash memory (RTU is rebooted)

Menu	Command	Usage
	CANCEL CHANGES	This will undo recent changes to a database.
	APPLY CHANGES	Applies changes to a database enabling modifications to be saved or downloaded.
	EXIT	Logs out of the WS1500, closes the Com port, and quits the program.
СОМ	OPEN/CLOSE	This menu is available from the Database or the Terminal windows. It allows you to open and close the serial communications port that the Configurator uses to upload, download, and issue commands to the WS1500 through its Craft port. After opening the Com port with the necessary Com port settings that allow the WS1500 to communicate successfully with the Configurator, the WS1500 prompts the user to login.
		When the Com port is closed, the user is also logged out and the WS1500 returns to Normal mode.
LOGIN / LOGOUT		The menu name, which toggles between Login and Logout, allows the user to login to the WS1500 if the Com port is open or logged out. This menu is available from the Database or the Terminal window.
TERMINAL		Causes the Terminal window to be visible. The Terminal window shows the communication between the WS1500 e-Scanner Configurator and the WS1500. This menu is available from the Database window.
ADMIN		This menu is available from the Database and the Terminal window. This menu contains the following menu items:
		Set Password – Displays the Set Password window.
		Set Date/Time – Displays the Set Date/Time window.
Help		
Menu	Command	Usage
------	--------------------	---
	Help Topics	Opens the WS1500 Configurator help file system. Pressing 'F1' key will also open the help file to a specific topic.
	About Configurator	Displays About window that contains version, copyright, and contact information.

7.1.1.2 Terminal Window

The other main window in the Configurator program is called the Terminal window. Select Terminal from the menu to switch to this window. The Terminal window shows the communication between the Configurator program and the WS1500. This window can be used to issue extra commands to the WS1500 through the Admin and Command menus. To return to the Database window select the Database menu.

🚡 WS1500 Configurator - Terminal Window	×
<u>C</u> om <u>D</u> atabase <u>Logout A</u> dmin Com <u>m</u> and <u>H</u> elp	
SeqNum: 52 System Error Id: 14 Date/Time of Error: 01-02-06 14:53:57 Description: Craft Access Disconnect SeqNum: 53 System Error Id: 13 Date/Time of Error: 01-02-06 14:53:58 Description: Craft Access Connection >logout Login required >login Enter password : System logged in >>	



7.1.1.3 Program Terminal Window Menus

<u>C</u> om	<u>D</u> atabase	Logout	Admin	Com <u>m</u> and	<u>H</u> elp	

Figure 22 Terminal Window Menu

Menu	Command	Usage
Com	OPEN/CLOSE	This menu is available from the Database or the Terminal window. After opening the Com, the WS1500 prompts the user to login. When the Com port is closed, the user is also logged out and the WS1500 returns to Normal mode.
DATABASE		Causes the Database window to be visible. The Database window contains four tabs that allow you to configure the System Information, Discretes $1 - 32$, and Controls $1 - 4$. This menu is available from the Terminal window.
LOGIN / LOGOUT		The menu name, which toggles between Login and Logout. This menu is available from the Database or the Terminal window.

Menu	Command	Usage
ADMIN		This menu contains the following menu items (user must have previously logged into WS1500):
		Set Password – Displays the Set Password window.
		Set Date/Time – Displays the Set Date/Time window.
		Ping – Prompts the user for an IP address that the WS1500 attempts to ping at least three times.
		Trap – Causes the WS1500 to send out a 'warm start' trap.
		Remote Control – Prompts the user for the control point and state information to issue to the WS1500.
		Agent – The command toggles the SNMP agent on the WS1500. When turned off, the WS1500 stops responding to SNMP commands.
Help		
	Help Topics	Opens the WS1500 Configurator help file system. Pressing 'F1' key will also open the help file to a specific topic.
	About Configurato	r Display About window that contains version, copyright, and contact information.

Menu	Command	Usage
COMMAND		This menu is only available from the Terminal window. It contains the following menu items which output commands useful for retrieving WS1500 information:
		Time – Reports WS1500's current time.
		Version – Displays the WS1500 version information.
		State – List the WS1500 IP, MASK, and Router.
		Configuration – Displays the entire WS1500 current configuration.
		Host – Lists the configured SNMP trap to addresses, community names, and Enabled/Disabled status.
		Event Log – Displays the WS1500's current log of events. The WS1500 event log is a circular buffer that holds the last 40 events that generated traps.
		Control Status – Displays the current status of the WS1500 controls 1-4.
		Discrete Status – Displays current status of the WS1500 discretes inputs 1-32.

Configurator Database File

The following is the database format:

"Discrete Point 1", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 2", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 3", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 4", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 5", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 6", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 7", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 8", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 9", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 10", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 11", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 12", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 13", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 14", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 15", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 16", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 17", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 18", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 19", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 20", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 21", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 22", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 23", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 24", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 25", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 26", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 27", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 28", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 29", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 30", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 31", [Administrative State], [Alarm Status], [Inversion], [Description] "Discrete Point 32", [Administrative State], [Alarm Status], [Inversion], [Description] "Control Point 1", [Administrative State], [Duration], [Control Type], [Description] "Control Point 2", [Administrative State], [Duration], [Control Type], [Description] "Control Point 3", [Administrative State], [Duration], [Control Type], [Description] "Control Point 4", [Administrative State], [Duration], [Control Type], [Description] "IP Address", [IP] "Router Adress",[IP] "Subnet Mask", [MASK] "Host IP Address 1",[IP] "Community Name", [Community Nmae] "Host Enable/Disable" [enable|disable] "Host IP Address 2",[IP] "Community Name", [Community Nmae] "Host Enable/Disable"[enable|disable] "Host IP Address 3",[IP] "Community Name", [Community Nmae]

"Host Enable/Disable" [enable|disable]

"Host IP Address 4",[IP]

"Community Name",[Community Nmae] "Host Enable/Disable"[enable|disable]

"Host IP Address 5",[IP]

"Community Name",[Community Nmae]

"Host Enable/Disable"[enable|disable]

"System Contact",[syscontact] "System Location",[syslocation] "System Name",[sysname]

"System Last Tech Notes",[technote] "RTU Traps",[enable|disable]

Configurator Operations

This section contains the most common operations that will be performed when using the WS1500 Configurator application. These operations have been arranged in a chronological order for configuring a WS1500 RTU. Some administrative, testing, and miscellaneous operations have been included at the end of this section such as:

- Saving a configuration to file
- Opening a configuration from file
- Changing the WS1500 password
- Setting the WS1500 date and time
- Pinging and IP address from the RTU
- Issuing a control point
- Viewing craft online messages

Connecting and Logging In

Online configuration requires that the PC running the Configurator application be connected to the WS1500 RTU's craft port via a RS232 cable (see section 3.4.3.2).

To establish a connection to the WS1500, select **Com** > **Open** on the menu bar. A Com Port Properties dialog box appears.

Com Port Properties	2
Properties	
Port: Com1 💌	
Maximum Speed	
9600 -	
	Default
Connection Preferences	
Data Bits: 8 💌	
Parity: None 💌	
Stop Bits: 1	
Stop Bits: 1	

Figure 23 Com Port Properties Dialog

8

The WS1500 Craft port connection properties are as follows:

- 9,600 bps
- Eight data bits
- No parity
- One stop bit

Clicking **Default** restores these default values.

Click **OK** when done. A WS1500 Login dialog box appears.

🚡 WS1500 Login	×
Password:	
<u>0</u> K	<u>C</u> ancel

Figure 24 Login Dialog

Enter the WS1500 password and click **OK**. The default password is "password". A Login Successful dialog box appears.

Click OK.

Uploading Default and Custom Configurations

If this is the first time a unit has been configured, it is not necessary to upload the configuration. You can skip this step. Otherwise, to upload the configuration from the WS1500, select **File** > **Upload Database** on the menu bar.

A progress bar appears toward the top of the main screen to indicate the status of the Upload.

When the Upload function has completed, an Upload Completed dialog box appears. Click **OK**.

<u>O</u> pen Sa <u>v</u> e As. <u>S</u> ave		
<u>U</u> pload D <u>D</u> ownloa	atabase from WS1500 d Database to WS1500	200
Write WS	1500 <u>F</u> lash	
<u>C</u> ancel C Apply Ch	hanges anges	
E <u>s</u> it		

Figure 25 Upload Database Command

Editing System Configuration Parameters

Use the **System Configuration** fields to set the IP Address, Subnet, and Router information for the WS1500. Also be sure to enable the WS1500 traps.

Before the WS1500 can communicate with an SNMP host, the configuration requires at least one enabled host with an configured IP. Use the **Enable** check box and enter a valid host IP address for the selected host. A Community Name of "public" has read only access; any other Community Name has read/write access.

	Discretes 1-	16 Discretes 17-32	<u>C</u> ontrols 1-4
System IP Address:	System Subne	et Mask: Router Address:	RTU Traps
192.168.0.1	255.255.255.	0 0.0.0	Enabled 🗾
System Name:	Westronic Systems, In	nc. WS1500 e-Scanner	
System Location:	System location not se	et.	
System Contact:	Westronic Systems, In (972) 235-5292	nc. 1850 N. Greenville Ave., Suite 18	34, Richardson, TX 75081
Technical Note:	Westronic Engineering	3	
Enable	Host IP Address	Community Name	
	192.168.0.1	public	
Γ 1			
☐ 1 ☐ 2	192.168.0.1	public	
☐ 1 ☐ 2 ☐ 3	192.168.0.1 192.168.0.1	public	
☐ 1 ☐ 2 ☐ 3 ☐ 4	192.168.0.1 192.168.0.1 192.168.0.1	public public public	

Figure 26 System Configuration Tab

Note: Click the tab or press Alt + the underscored letter (hot-key) to switch between the **System Configuration**, **Discretes** and **Controls** fields.

Editing Discrete Inputs

Click the tab or press Alt + the underscored letter (hotkey) to switch between the **System Configuration**, **Discretes** and **Controls** fields.

Drop-down boxes appear on the **Administrative State**, **Alarm Status**, and **Inversion** fields. Select from the valid options as required.

Click in the **Discrete Point Description** field and enter a maximum of 32 characters for a description. To clear the field, use spaces.

<u>S</u> ys	tem Configuration	Discretes 1-16		cretes 17-32 <u>C</u> ontrols 1-4	
PT#	Administrative State	Alarm Status	Inversion	Discrete Point Description	
1	Trap_All_States	Cleared	Not_Inverted	Discrete Point 1	
2	Trap_All_States	Cleared	Not_Inverted	Discrete Point 2	
3	Trap_All_States	Cleared	Not_Inverted	Discrete Point 3	
4	Trap_All_States	Cleared	Not_Inverted	Discrete Point 4	
5	Trap_All_States	Cleared	Not_Inverted	Discrete Point 5	
6	Trap_All_States	Cleared	Not_Inverted	Discrete Point 6	
7	Trap_All_States	Cleared	Not_Inverted	Discrete Point 7	
8	Trap_All_States	Cleared	Not_Inverted	Discrete Point 8	
9	Trap_All_States	Cleared	Not_Inverted	Discrete Point 9	
10	Trap_All_States	Cleared	Not_Inverted	Discrete Point 10	
11	Trap_All_States	Cleared	Not_Inverted	Discrete Point 11	
12	Trap_All_States	Cleared	Not_Inverted	Discrete Point 12	
13	Trap_All_States	Cleared	Not_Inverted	Discrete Point 13	
14	Trap_All_States	Cleared	Not_Inverted	Discrete Point 14	
15	Trap_All_States	Cleared	Not_Inverted	Discrete Point 15	
16	Trap_All_States	Cleared	Not_Inverted	Discrete Point 16	

Figure 27 Discrete Input Configuration Screen

Editing the Control Output Properties

Click the tab or press Alt + the underscored letter (hotkey) to switch between the **System Configuration**, **Discretes** and **Controls** fields.

Drop down boxes will appear for the Administrative State and Control Type fields. Select from the valid choices as required. If using momentary control, enter a number from 400 to 999 ms.

Type a description for the control points up to 32 characters.

System Configuration	<u> </u>	iscretes 1-16	Discretes 17-32	<u>C</u> ontrols 1-4
T# Administrative State	Duration	Control Type	Control Point Description	
1 Trap_All_States	400 C	ontinuous_Off 🔄	Control Point 1	
2 Trap_All_States	400 C	ontinuous_Off 🔄	Control Point 2	
3 Trap_All_States	400 C	ontinuous_Off 🔄	Control Point 3	
4 Trap_All_States	400 C	ontinuous_Off 🔄	Control Point 4	

Figure 28 Control Output Configuration Screen

Applying and Saving Changes to the Configuration

After you make changes to the WS1500 Configuration, you must apply them. Select **<u>File > Apply Changes</u>**. To cancel any changes made since opening a saved configuration or performing an upload operation, select **<u>File > Cancel Changes</u>**.

Downloading a Database to a WS1500

To download a configuration or configuration changes to a WS1500, select File > <u>D</u>ownload Database to WS1500. Downloading the database sends the configuration to WS1500.

🐷 WS1500 Configurator - Database Window			
<u>File</u> <u>T</u> erminal <u>L</u> ogout <u>A</u> dmin <u>C</u> om	<u>H</u> elp		
<u>0</u> pen			
Sa <u>v</u> e As Sava	Discretes 1-16	Djscretes 17-32	
<u> </u>			
Upload Database from WS1500			
<u>D</u> ownload Database to WS1500 →	All	Router Address:	
Write WS1500 <u>F</u> lash	<u>D</u> iscrete Points Control Points	192.168.0.254	
<u>C</u> ancel Changes	 Network Configuration	an ner	
Apply Changes	System Information		
Exit	<u>H</u> ost IP		
System Location: System	<u>T</u> echnical Note		
	<u>R</u> TU Trap		
System Contact: tronic Systems, Inc. 1850 N. Greenville Ave., Suite 184, Rick 235-5292			
Technical Note: Westron	nic Engineering		

Figure 29 Download Database to WS1500 Command

You can download the entire configuration or specific sections. If only a few changes are made, sending specific parts results in a faster download. An entire download takes about 3 minutes. During the download, a Terminal window appears, indicating the status of the download.

After the download completes, a window appears prompting to write the configuration to Flash.

Click <u>Y</u>es. The WS1500 saves and reboots.

After the WS1500 save and reboot, the Configurator prompts user to set the time on the WS1500. Each time the WS1500 reboots or powers down, the time resets to a default and must be set. To modify the system Date and Time Click <u>Y</u>es, and use the drop-down boxes to set the time in the WS1500.

The configuration of the WS1500 should now be complete.

Recommendation: Save the configuration into a text file as a backup and for offline editing. You can load the file into the WS1500 Configurator and download to the WS1500 at any time.

Write the WS1500 Flash

The configuration running in RAM on the WS1500 can be written to Flash by selecting <u>File > Write WS1500</u> Flash from the Database window. This will make the WS1500 configuration bootable.

Save Configuration to File

Once changes have been applied or a database has been uploaded from the WS1500, the configuration can be archived to a file by selecting **<u>File</u> > Save As...** from the Database window. This allows the user to revert back to a previous configuration in the event of configuration error.

Open Configuration from File

Previously saved databases can be opened from a file by selecting **<u>File</u> > <u>Open...</u>** from the Database window. Once the configuration has been opened, the values will be reflected in the 4 configuration tabs and are now ready to modify or download to the WS1500.

For details on the format of the database's comma delimited text file see section 0.

Changing the Password

For network security, you should change the WS1500 password. Select <u>Admin > Set Password</u>. A WS1500 login box appears.

🚡 WS150	0 Login		×
Password:	******		_
Confirm:	******		
	<u>0</u> K	<u>C</u> ancel]

Figure 30 Change Password Screen

Enter the new password using a maximum of 20 characters and reenter the password in the Confirm box. Click **OK** when done. The new password takes effect immediately but is not permanent until written to Flash memory.

Note: Passwords are case sensitive!

Setting the WS1500 Date and Time

After saving the WS1500 Flash, you will be prompted to set the date and time on the RTU. The date and time can also be set by clicking on Select <u>Admin > Set</u> <u>Time/Date</u>

The correct date and time will need to be set after power cycle of the RTU.

Figure 31 Set Time and Date Dialog

WS1500 Ping an Address

The Ping function is a well known tool for testing network connectivity. Select <u>Admin >Ping</u> from the Terminal window. Enter the IP address of the network interface you are testing for connectivity. When the Configurator issues the ping command, it appends a 3 for three tries.

The response can be seen in the Terminal window.

Ping	×
Enter IP address to Ping.	ОК
	Cancel
192.168.8.5]

Figure 32 Ping Dialog

Issue a Control

The <u>A</u>dmin > <u>Remote Control</u> command actuates one of the four WS1500 control points and are often useful to test the control points during installation. When actuating a momentary control, the defined duration for that point is the amount of time the control is closed and then released. When issuing a momentary control point, using On or Off to achieve the same result. Select <u>Admin</u> > <u>**Remote Control**</u> from the menu. You are prompted for the point number and the control type from a drop-down list.

There is no response for this command.

Activate Control	
trol Type	
ntinuous_Off	•
Cancel	
<u> </u>	ć.
	trol Type htinuous_Off Cancel

Figure 33 Control Activation Window

Veiw Craft Messages

Because it is sometimes useful in trouble shooting to see the message output on the craft port when the WS1500 RTU is in Normal mode (not in the CLI), you can select **Command > View Craft Output** from the Terminal window. This will cause the WS1500 to exit the CLI so that trappable events can be seen in the Terminal window. No other commands can be issued from the Configurator until you select **Command > Hide Craft Output.** This page intentionally left blank.

9 The WS1500 and SNMP

WS1500 and SNMP Overview

The WS1500 supports SNMP as defined in Request for Comment (RFC) 1157. SNMP is a manager/agent or server/client protocol. The agent runs on the WS1500 to monitor and report discrete and control status to the manager. The manager runs on the Network Management System (NMS).

SNMP is also a request/response protocol. In using SNMP, the host manager requests information from the WS1500 with GetRequest messages. The WS1500 agent responds with a GetResponse message. The manager can also set variables, such as discrete point parameters, WS1500 network configuration, or the WS1500 password with SetRequest messages. Under predefined circumstances, the agent automatically informs the manager of its status. The WS1500 can inform the NMS host manager of discrete point state changes, control point actuation, and other important events using SNMP Traps (an autonomous response).

SNMP uses User Datagram Protocol/Internet Protocol (UDP/IP) as its transport protocol. The manager requests or polls over UDP Port 161 and the WS1500 agent sends responses and traps over UDP Port 162. SNMP does not require the overhead of TCP/IP because each request generates a response. Because UDP is not a guaranteed delivery protocol, the manager typically retransmits a message when it does not receive a response within a specified time. The WS1500 also has a trap redundancy feature to ensure delivery of important events to the NMS. Through configuration, the WS1500 can report traps to a maximum of five host managers. The WS1500 can be configured to trap to the same host multiple times or to different hosts.

Making periodic requests is called polling. The host manager determines the interval between polls, reducing network congestion. However, this polling type does not allow for real-time updates. To handle this, SNMP uses a modified system of polling called trap-directed polling.

When predefined events occur, the agent does not wait for the manager to poll. Instead, the agent sends information about the event to the manager. Traps allow the manager to be informed in real time of events occurring at the agent and still maintain control over polling. The WS1500 uses Enterprise Specific traps (vendor specific) to report alarms to the NMS. The WS1500 can be configured to generate a trap for each of its 32 discrete points and four control points based on the point state. System errors are predefined and are not configurable.

SNMP Trap Usage

Traps for discrete points and control points can be enabled or disabled through each point administration object. System traps cannot be disabled because they are critical to system operation. Traps are built and queued for output after being detected. The time required for the Manager to receive a trap is relative to the number of other traps in queue to be sent.

9.1.1.1 Discrete Point Traps

Discrete point trap output is as follows:

discreteTrap	TRAP-TYPE (Enterprise-specific Trap Number 10)
ENTERPRISE	point
VARIABLES{	dDisplayIdIndex (display number)
	dPointIdIndex (point number)
	dSequenceTag (event ID number)
	dOperationalState (enabled/disabled)
	dAlarmStatus (severity)
	dLastEnabledTime (date/time)
	dLastDisabledTime (date/time)
	dDescription (textual description of discrete event)}

9.1.1.2 Control Point Traps

Control point trap output is as follows:

controlTrap	TRAP-TYPE (Enterprise-specific Trap Number 20)
ENTERPRISE	point
VARIABLES{	cDisplayIdIndex (display number)
	cPointIdIndex (point number)
	cOperationTrigger (command execution status - done)
	cOperationalState (mntry, conts)
	cOperationDuration (400-999ms)

9.1.1.3 System Point Traps

System traps are those error events that occur within the RTU at an application level. These errors occur with serial port communication, hardware failures, and possibly any other significant error of which the user should be aware.

System trap output is as follows:

systemTrapTRAP-TYPE (Enterprise-specific Trap Number 30)ENTERPRISEpoint

VARIABLES{ sysErrSeqTag (unique ID correlation number) sysErrId (system ID number of the error) sysErrDescr (textual description of error) SysErrDateTime (date and time event error) SysErrSeqTagAcknwldg (flag to confirm received trap)}

Table 0-1 WS1500 SNMP Error Messages			
SysErrId	Descripton	Occurance	
1	"System Error"		
2	"Login threashold exceeded"	After three failed login attempts	
3	"System Out of service"	When entering Config Mode (v1.2)	
4	"Memory Checksum Fail"	After powerup if calculation does not match stored checksum	
5	"Disc./Cntrl HW busy_err"	When hardware driver sees that the application has not finished with last changes	
6	"System In Service"	When exiting from Config Mode (v1.2)	
7	"User Enter WS1500 Config- CRFT"	When entering Configuration Menu. (v2.0)	
8	"User Exit WS1500 Config- CRFT"	When exiting Configuration Menu. (v2.0)	
9	"Remote Access Connection"	Telnet access to RTU for remote configuration. (v2.0)	
10	"Remote Access Disconnect"	Telnet access to RTU Terminated. (v2.0)	
11	"User Enter WS1500 Config- RMT"	When entering Configuration Menu through Telnet access. (v2.0)	
12	"User Exit WS1500 Config- RMT"	When exiting Configuration Menu through Telnet access. (v2.0)	
13	"Craft Access Connection"	When entering WS1500 e-Scanner Menu. (v2.0)	
14	"Craft Access Disconnect"	When exiting WS1500 e-Scanner Menu. (v2.0)	

hle 0-1	WS1500 SN	MP Frror Message	S

SNMP Community Name

The WS1500 agent contains the community concept definition. The community concept allows the agent to limit MIB access to authorized managers. Therefore, the SNMP host manager must have the community name before it can exercise SNMP commands on the WS1500. The WS1500 has two access policies: READ-ONLY, READ-WRITE. When a host manager has a "public" community name in the WS1500 database, its rights to the objects in the MIB are READ-ONLY, meaning that these host managers can only request the status on the MIB objects. When a host manager has a community name of anything besides "public," in the WS1500 database, its access policy is READ-WRITE. Thus, with a READ-WRITE access a manager can retrieve and set values in the WS1500 database. Different host managers can have the same community name.

The MIB objects also have assigned READ-ONLY or READ-WRITE access policies as well. A "public" community name allows the host manager to retrieve variables of either type. Other community names can only access the MIB objects according to the MIB object's access policy.

Before any configuration through the SNMP manager can occur, you must configure at least one host with a community name of something other than "public." The WS1500 has a maximum of 32 ASCII characters for the community name. After you configure the database in the WS1500, you must give the community names to the appropriate NMS. The default community names are "public" in the WS1500 database.

Note: A manager can have a configured community name and exercise SNMP commands on the WS1500 without having the manager IP address configured in the host list. To prevent unauthorized use of a community name, a user must login to the WS1500 using SNMP before he can modify any of the MIB objects.

Management Information Base

To provide this management capability, SNMP specifies a database of variables called the Management Information Base (MIB), which is defined in RFC 1213 and RFC 1155. The MIB defines everything that SNMP manages. As defined by Abstract Syntax Notation 1 (ASN.1), each variable has a globally unique Object Identifier (OID) that consists of a sequence of integers separated by decimal points. Each OID also has a human-readable name. A hierarchical name structure guarantees that each name is globally unique. A number and a corresponding name identify each level of the hierarchy. The number/name combination follows a tree structure called Structure of Management Information (SMI). SNMP can reference only the leaf nodes in the MIB variable tree. For example, all of the variables in a MIB start with the name iso.org.dod.internet.mgmt.mib, with a corresponding integer sequence of 1.3.6.1.2.1. The SNMP message packets pass this sequence.

The WS1500 has a private MIB (westvXX.mib [XX refers to version number), which enables it to provide alarm reporting. The MIB allows the manager to access the WS1500 database and monitor the status of the discrete inputs and control outputs. The monitoring manager software must have this MIB compiled in before it can manage the WS1500. Refer to the SNMP host management software you are using, for details on how to compile the WS1500 MIB.

WS1500 MIB Structure Overview

The WS1500's MIB definitions describe to the SNMP host, how to formulate SNMP commands and how to interpret a response. As specified by SNMP protocol, the MIB has a lexicographical order layout. This section does not discuss general MIB definitions for SNMP, interfaces, IP, and so on. Instead, the following focuses on the specific definitions related to the SNMP-to-WS1500 product.

The Westronic Object Identifier (OID) lives under Enterprises at ID number 10385.

The basic OIDs are the following:

- WsiRTUinfo (board information)
- wsiRTUDiscInfo (discrete point information/access)
- wsiRTUCntrlInfo (control point information/access)
- wsiRTUsysErr (system error access)

Note: The OID has actual numbers repesenting the above OID varibles, but for explanation purposes, the remainder of this section uses actual text rather than numbers.

Every OID in the WS1500 MIB begins with: org.dod.internet .mgmt.private.westronic.products.ws1500.

Thus, the four main branches become:

- General System Information: org.dod.internet.mgmt .private.westronic.products.ws1500.wsi RTUInfo
- Discrete Point Information: org.dod.internet.mgmt .private.westronic.products.ws1500.wsi RTUDiscInfo
- Control Point Information: org.dod.internet.mgmt .private.westronic.products.ws1500.wsiR TUCntrlInfo
- System Errors: org.dod.internet.mgmt .private.westronic.products.ws1500.wsi RTUSysErr

The following descriptions cover the MIB structure and hierarchy shown in the illustration on the next page.

wsiRTUinfo

The WsiRTUinfo OID is the system information depository used to store information specific to the RTU, such as Manufacturer, Software version, and checksum. Most are hard-coded items and cannot be changed.

wsiRTYinfo Object Identifiers

The following objects create wsiRTUInfo:

wsiRTUInfo. wsiRTUManufacturer	Remote Terminal Unit Manufacture Name set by software updates – (32 characters).
wsiRTUInfo. wsiRTUModel	Model/Serial/WSI Part number set buy software updates – (32 characters).
wsiRTUInfo. wsiRTUFirmwareVersion	Software version currently running on the installation and set by software updates $-(32 \text{ characters})$.
wsiRTUInfo. wsiRTUCs	Software checksum – (32 characters)

wsiRTUInfo. Identifying remark of change-(100 characters); Textual description of the configuration modification supplied by the user to allow storing a brief message in the box for the next user.



wsiRTUInfo.WsiRTUDate wsiRTUInfo.WsiRTUTime	Date: YY-MM-DD (20 characters), Time: HH:MM:SS (20 characters); Current system date and time values. Time and date are volatile and require resetting at system boot up.
wsiRTUInfo .wsiRTUTrapEnable	Enable/disable the entire box from sending traps for various configured discrete or control points. This is a global scale. Each point can be configured to send/not send trap events.
wsiRTUInfo .wsiSeqTag	This value always contains the current sequence number $(1 - 120)$. The sequence number is a unique ID number given to every event. The sequence number serves to allows the manager keep a running track of the expected event number and event numbers that have happened.
	At any time, the Manager can use the SNMP <i>Get</i> request to retrieve the current system sequence number. The manager then can use this value to determine if its records match with the last known sequence numbered event.
wsiRTUInfo.wsiLogin	Log in to box to view or modify (20 characters). Enables login from SNMP. Like the craft port login, this login allows you access to view and modify parameters. The SNMP <i>Get</i> command returns the string "********", which hides the password. Only on the SNMP <i>Set</i> command is the password string returned. For example: SNMP Set wsiLogin "password".
	After logging in, you can use the SNMP <i>Get</i> and <i>Set</i> commands (where applicable) for all WS1500 objects, discretes, controls, discrete log, system errors, and system information.
	After logging out, you can only use the SNMP <i>Get</i> command to retrieve information from discretes, controls, discrete log, and system errors. After you use the <i>Get</i> command to retrieve system information, the system returns Null values. If you use the <i>Set</i> command for any object except login, the system returns a Null value.
wsiRTUInfo.wsiLogout	Logs the user out of the RTU, disabling view or modification. The SNMP <i>Get</i> command retrieves one of three states for this varible:
	 logout (0), when system is logged out
	 userlogin (1), for successful user password login
	 dlftusrlogin (2), for successful default user login.
	Use the SNMP <i>Set</i> command with the logout varible to log out of the system. For example: SNMP Set wsiLogout 0. (Logout of box from view or modify)

wsiRTUInfo .wsiModLogin	Allows you to change the login password (41 characters). This command requires you to give the old password followed by the new password. If the old password parameter does not match the current user password or default user password, the system returns an error and password does not change. The command format is "Old password:New password". You must include the colon in the string for the system to distinguish the old from the new.
wsiRTUInfo .wsiIPAddr	View or modify the system IP address (15 characters maximum). The system requires saving and rebooting for the IP address to take effect. The variable format is {xxx.xxx.xxx}.
wsiRTUInfo .wsiRouterAddr	View or modify the system router address (15 characters maximum). The system requires saving and rebooting for the IP address to take effect. The variable format is {xxx.xxx.xxx}.
wsiRTUInfo .wsiSubnetMask	View or modify the system Subnet Mask (15 characters maximum). The system requires saving and rebooting for the IP address to take effect. The varible format is {xxx.xxx.xxx}.
wsiRTUInfo .wsiSaveConfig	This command saves the current configuration to Flash memory and reboots the system. This object ID requires the string parameter "REBOOT" to execute the command and reboot the system. The command does not accept any other string. When the system receives the reboot command, it kills SNMP and reboots the system without returning any type of completion or rebooting indication. When you use the SNMP <i>Get</i> command, this object returns the string "System Active".
	<i>Note:</i> No other output exists for this object.
wsiRTUInfo .wsiHostTable	(No Access)
wsiRTUInfo .wsiHostTableEntry	_
wsiRTUInfo .wsiHostTableEntry .hostIndex	Unique ID for the host information $(1-5)$, which indicates the host information that you are inquiring. For example: OID 1.3.6.1.4.1 .ENTERPRISE.2.1.1.16.1. HostIPAddr. HostIndex.1.
wsiRTUInfo .WsiHostTableEntry .HostIPAddr	View/modify the Host IP address (15 characters maximum). This is the address for the SNMP Manager that receives the traps from this box. This varible format is {xxx.xxx.xxx}. Changes to this variable take effect immediately.

wsiRTUInfo .wsiHostTableEntry .HostCommunityName	View/modify the host community name (32 characters maximum). Community name, This object ID allows you to view or alter the community name. Changes to this variable take effect immediately. The community name from SNMP cannot be seen, but instead has "**********" in the response string to keep other users from gaining access to Read/Write Community names.
	<i>Note:</i> Even though a user may/may not have access rights to change configured items, the user must log into the RTU before granted any access to modify.
wsiRTUInfo .wsiHostTableEntry .TrapToHost	This field enables/disables the RTU from sending trap events to the configured address. The default is "disabled". <i>Suggestion:</i> Disable all inactive hosts to prevent the RTU from sending needless information out onto the network.

wsiRTUInfo OID Properties

The following summarizes the access and object type properties for each wsiRTUInfo OID:

Object	Access	Object Type
wsiRTUManufacturer	R	String
wsiRTUModel	R	String
wsiRTUFirmwareVersion	R	String
wsiRTUCs	R	String
wsiRTULastTech	WR	String
wsiRTUDate	WR	String
wsiRTUTime	WR	String
wsiRTUTrapEnable	WR	Integer
wsiSeqTag	WR	Integer
wsiLogin	WR	String
wsiLogout	WR	Integer
wsiModLogin	WR	String
wsiIPAddr	WR	String
wsiRouterAddr	WR	String
wsiSubnetMask	WR	String
wsiSaveCnfg	WR	String
wsiHostTable	NA	NA

wsiHostTableEntry Properties

The following leaf objects create the wsiHostTableEntry:

Object	Access	Object Type
wsiHostTableEntry.hostIndex	NA	Integer
wsiHostTableEntry.HostIPAddr	WR	String
wsiHostTableEntry.Host CommunityName	WR	String
wsiHostTableEntry.Trap ToHost	WR	Integer

When referencing the HostIPAddr,

HostCommunityName, and TrapToHost objects, remember to add the host index (that is, object ID = org.dod.internet.mgmt.private.westronic .products.ws1500.wsirtuinfo.wsihosttable .wsihosttableentry.hostipaddr.3).

Default Values for wsiRTUinfo Object Identifiers

Before any configuration begins, a Manager receives the following default values:

wsiRTUManufacturer	{"Westronic Systems, Inc"},
wsiRTUModel	{"WS1500 e-Scanner 586- T001"},
wsiRTUFirmwareVersion	{"569-T121 Version x.y MM- DD-YY"}, [x.y =current version]
wsiRTUCs	{"0x ####### "},
wsiRTULastTech	{"Westronic Engineering" },
wsiRTUDate	{"systemDateNotSet"},
wsiRTUTime	{"systemTimeNotSet"}
wsiRTUTrapEnable	{RTU_TRAP_ENABLE}
wsiSeqTag	0

wsiLogin	{user -> "password"}
wsiLogout	0
wsiModLogin	{"[oldpwd]:[newpwd]"}
wsiIPAddr	{``192.168.0.1``}
wsiRouterAddr	{``192.168.0.254``}
wsiSubnetMask	{``255.255.255.0``}
wsiReboot	{"System Active"}
HostIPAddr(1-5)	{``192.168.0.1``}
HostCommunityName (1- 5)	{"public"}
TrapToHost (1-5)	{disabled}

Default Values for System Group

Not defined in the Westronic MIB, the following values are required objects for any system. The following comprise the system group objects modified for WS1500 use:

SysDescr	{"Discrete to SNMP, 32 Input Discrete points, 4 Output Control points, 1 craft port"}[128char]
SystObjectID	1.3.6.1.4.1.10385.2.1
SystUpTime	Time Ticks since power on.
SysContact	{"Westronic Systems, #2, 1715 27 th Ave, NE,Calgary, AB T2E7E1 Canada .ph(403)- 250-8304"} [115char] (Changeable)
SysLocation	{"syslocation not set"} [115char] (Changeable)
SysName	{"Westronic Systems, WS1500 e- Scanner" }[115char] (Changeable)

wsiRTUDiscInfo

The wsiRTUDiscInfo OID describes each configured alarm. The discrete point table stores the current status of a discrete point. Status information is retrieved through the Craft or the SNMP port when you supply the Display and Point number.

wsiRTUDiscInfo Object Identifiers

The following objects create wsiRTUDiscInfo:

wsiRTUDiscInfo.discreteTable.discreteEntry

wsiRTUDiscInfo .discreteTable. discreteEntry. dDisplayIdIndex	The unique ID (display number) of the display to which a discrete point belongs. For example: OID 1.3.6.1.4.1.ENTERPRISE.2.1.2.1.1. dDescription. dDisplayIdIndex.1.
wsiRTUDiscInfo .discreteTable .discreteEntry .dPointIdIndex	The unique ID (point number) of a discrete point in a particular display. For example, OID 1.3.6.1.4.1.ENTERPRISE.2.1.2.1.1. dDescription. dDisplayIdIndex. DPointIdIndex
wsiRTUDiscInfo .discreteTable .discreteEntry .AdministrativeState	Enable/disable SNMP traps on this point. The OID has four settings to control SNMP trap output:
	 "trap_on_enable" (value 1) – send trap on discrete enabled event
	 "trap_on_disable" (value 2) – send trap on discrete disabled event
	 "trap_all_states" (value 3) – send trap on descrete enabled and disabled events
	 "disable_trap" (value 4) – send no trap for any event.
wsiRTUDiscInfo .discreteTable .discreteEntry .dOperationalState	Discrete point is closed or open. This value sets to "Enabled" (value 1) when a discrete point is in an alarm state. When the alarm is in a cleared state, the value sets to "Disabled" (value 2).
wsiRTUDiscInfo .discreteTable .discreteEntry .dAlarmStatus	The alarm severity value has seven settings to indicate the severity of the point. Setting values are as follows:
	 ActiveReportable-indeterminate – 1
	• ActiveReportable-warning – 2
	 ActiveReportable-minor – 3
	 ActiveReportable-major – 4

- ActiveReportable-critical 5
- ActivePending 6
- Cleared 7

wsiRTUDiscInfo .discreteTable .discreteEntry .dLastEnabledTime	This 20-character value indicates the last recorded time the discrete point changed from the Off to On state and has the "YY-MM-DD HH:MM:SS" format.
wsiRTUDiscInfo .discreteTable .discreteEntry .dLastDisabledTime	This 20-character value indicates the last recorded time the discrete point changed from the On to Off state and has the "YY-MM-DD HH:MM:SS" format.
wsiRTUDiscInfo .discreteTable .discreteEntry .dDescription	A 32-character textual description of the discrete point.
wsiRTUDiscInfo .discreteTable .discreteEntry .dSequenceTag	A unique correlation tag number to identify events as they happen.
wsiRTUDiscInfo .discreteTable .discreteEntry .dSeqTagAcknwldg	Reserved for Future Use:
wsiRTUDiscInfo. discreteTable .discreteEntry .dPointInverted	 A point is normally open or normally closed. Example settings are as follows: Inverting - 1 Noninverting - 2

Default Values for wsiRTUDiscInfo Objects

Before any configuration begins, a Manager receives the following default values:

dAdministrativeState	TRAP_ALL_STATES
dOperationalState	DISABLED (to be determined by system startup)
dAlarmStatus	CLEARED
dLastEnabledTime	{"EtimeNotSetPoint##"}(## - two digit point number) [20char]
dLastDisabledTime	{"DateNotSetPoint##"}(## - two digit point number) [20char]
dDescription	{"Discrete Point ##"} (## - two digit point number) [32char]
-----------------	--
dSequenceTag	0
dSeqTagAcknwldg	SEQ_TAG_UNACKD (to be determined by system startup)
dPointInverted	PNT_NON_INVERT

discreteTable Properties

The following leaf objects create the discreteTable.

Object	Access	Object Type
dDisplayIdIndex	NA	Integer
dPointIdIndex	NA	Integer
dAdministrativeSta te	WR	Integer
dOperationalState	R	Integer
dAlarmStatus	WR	Integer
dlastEnabledTime	R	String
dLastEnabledTime	R	String
dDescription	WR	String
dSequenceTag	RW	Integer
dSeqTagacknwldg	RW	Integer
dPointInverted	RW	Integer

Note: When referencing the discreteTable objects, remember to add the display and the point index (that is, object ID = org.dod.internet.mgmt.private.westronic.p roducts .ws1500.wsiRTUDiscInfo.discreteTable.disc

```
reteEntry
```

```
.dDescription.1.32).
```

wsiRTUDiscInfo.discreteLogEvents

The following describes the LogEventTable object ID. The LogEventTable allows the SNMP Manager to use the *Get* and *Getnext* commands to walk through the buffer of discrete events that have occurred. As a discrete goes into alarm or clears, the event goes into the discrete buffer and a trap message is sent to the Manager. (The trap is sent according to individual point and global RTU settings.) Access to the discrete event buffer occurs through the dlBufferIndex value. Through the SNMP, the *Getnext* command retrieves each event in the buffer and increments this value. The following example demonstrates use of the index value:

Example: OID 1.3.6.1.4.1.ENTERPRISE.2.1.2.2.1. dlAlarmstatus. dlBufferIndex.

The information contained in the LogEventTable is basically a copy of the discrete information.

After it receives the SNMP *Get* request from the Manager, the WS1500 system uses the index value to retrieve event information from buffer. The buffer contains only minimal information that must be used to extract the following information:

wsiRTUDiscInfo.discreteLogEventTable
.discreteLogEventEntry

wsiRTUDiscInfo.discreteLogEventTable
.discreteLogEventEntry.dlBufferIndex

wsiRTUDiscInfo.discreteLogEventTable
.discreteLogEventEntry.dlDisplayIdIndex

wsiRTUDiscInfo.discreteLogEventTable .discreteLogEventEntry.dlPointIdIndex

wsiRTUDiscInfo.discreteLogEventTable
.discreteLogEventEntry.dlAdministrativeSt
ate

wsiRTUDiscInfo.discreteLogEventTable
.discreteLogEventEntry.dlOperationalState

wsiRTUDiscInfo.discreteLogEventTable
.discreteLogEventEntry.dlAlarmStatus

wsiRTUDiscInfo.discreteLogEventTable
.discreteLogEventEntry.dlLastEnabledTime

wsiRTUDiscInfo.discreteLogEventTable
.discreteLogEventEntry.dlLastDisabledTime

wsiRTUDiscInfo.discreteLogEventTable .discreteLogEventEntry.dlDescription

```
.discreteLogEventEntry.dlSeqTagAcknwldg
wsiRTUDiscInfo.discreteLogEventTable
.discreteLogEventEntry.DlPointInvert
```

wsiRTUDiscInfo.discreteLogEventTable
.discreteLogEventEntry.dlSequenceTag
wsiRTUDiscInfo.discreteLogEventTable

The wsiRTUDiscInfo portion in the WS1500 MIB contains discrete point attributes. The objects that create wsiRTUDiscInfo are discreteTable and discreteLogEventTable.

discreteLogEventTable Properties

The discreteLogEventTable is a circular buffer of discrete, control, and system events. The buffer records the circumstances of an event as a trap is generated giving a brief history. When using SNMP, you must look to see if certain fields return a zero or a null string to distinguish between a discrete, control, or system event in the history buffer:

- Every field has a value for a discrete event.
- The dlSequenceTag is always zero for a control event.
- The dlLastDisabledTime is always a null string for system events.

The following Read Only leaf objects create the discreteLogEventTable.

OID	Discrete	Controls	System	Object Type
dlBufferIndex	This circular history buffer stores 40 events. Add the dlBufferIndex when referencing objects in this table.	This circular history buffer stores 40 events. Add the dlBufferIndex when referencing objects in this table.	This circular history buffer stores 40 events. Add the dlBufferIndex when referencing objects in this table.	Integer
dlDisplayIdIndex	WS1500 has one display.	WS1500 has one display.	WS1500 has one display.	Integer
dlPointIdIndex	The WS1500 has 32 discrete points.	The WS1500 has four control points	The WS1500 has 6 (v1.2) / 14 (v2.0) error messages.	Integer

OID	Discrete	Controls	System	Object Type
dlAdministrative State	Defines the state on which the WS1500 traps a discrete point change of state. Four possible values: 1 = "trap_on_enable" 2 = "trap_on_disable" 3 = "trap_all_states" 4 = "disable_trap	Defines the state on which the WS1500 traps a control point change of state. Four possible values: 1 = "trap_on_enable" 2 = "trap_on_disable" 3 = "trap_all_states" 4 = "disable_trap	Defines the state on which the WS1500 traps on a system event. 1 = "trap_on_enable"	Integer
dlOperational State	Reports a discrete point state: 1 = "enabled" 2 = "disabled" Based on the inversion parameter for this point.	Defines how to actuate a control point: 1 = Momentary (control is On for the configured duration, then turns off) 2 = Continuous_On 3 = Continuous_Off	Reports a system alarm state: 1 = "enabled"	Integer
dlAlarmStatus	Indicates alarm severity (seven alarm states): 1 = "indeterminate" 2 = "warning" 3 = "minor" 4 = "major" 5 = "critical" 6 = "active_pending" 7 = "cleared"	This parameter has no value for a control (reports zero)	Indicates alarm severity: 3 = "minor"	Integer
dlLastEnabled Time	Date-time stamp of last recorded time the discrete point changed states from Off to On. "YY-MM-DDHHMMSS" Based on the inversion parameter.	Date-time stamp of last recorded time the control point changed states from Off to On. "YY-MM-DDHH:MM:SS"	Date-time stamp of event error. "YY-MM-DDHH:MM:SS"	String
dlLastEnabled Time	Date-time stamp of last recorded time the discrete point changed states from On to Off. "YY-MM-DDHH:MMSS" Based on the inversion parameter.	Date-time stamp of last recorded time the control point changed states from On to Off. "YY-MM-DDHH:MMSS"	NULL	String

OID	Discrete	Controls	System	Object Type
dlDescription	User-defined ASCII description of the discrete point. Max of 32 characters.	Description of the intended control point use. Max of 32 characters. Example: "A/C backup generator starter control"	Textual description of the error. Six possible values: 1 = "System Error" 2 = "Login threashold exceeded" 3 = "System out of service" 4 = "Memory Checksum Fail" 5 = "Disc./Cntrl HW busy_err" 6 = "System In Service" 7 = "User Enter WS1500 Config-CRFT"" 8="User Exit WS1500 Config-CRFT" 9="Remote Access Disconnection" 10="Remote Access Disconnect" 11="User Enter WS1500 Config- RMT" 12="User Exit WS1500 Config-RMT" 13="Craft Access Disconnect"	String
dlSequenceTag	Unique correlation tag to identify events as they happen. A number $(1 - 120)$ shared with the system.	This parameter has no value for a control (reports zero).	Unique correlation tag to identify events as they happen. A number (1 – 120 shared with the discrete traps.	Integer
dlSeqTagacknwldg	NA	NA	NA	Integer

OID	Discrete	Controls	System	Object Type
dlPointInverted	Defines the discrete: 1 = normally closed (inverted) 2 = normally open (not inverted)	This parameter has no value for a control point (reports zero)	This parameter has no value for a system error message (reports zero)	Integer

wsiRTUCntrlInfo

The wsiRTUCntrlInfo OID describes and allows control point actuation. You can retrieve control point information or activate a control point through the Craft, telnet or SNMP port. Besides providing a method for activating a particular control point, the wsiRTUCntrlInfo OID also indicates the duration of control point closed and opened states.

wsiRTUCntrlInfo Object Identifiers

The following objects create wsiRTUCntrlInfo:

wsiRTUCntrlInfo.ControlTable.ControlTableEntry

wsiRTUCntrlInfo .ControlTable .ControlTableEntry .cDisplayIdIndex	The unique ID (display number) of the display to which a control point belongs. For example: OID 1.3.6.1.4.1.ENTERPRISE.2.1.3.1.1. cDescription. cDisplayIdIndex.1.
wsiRTUCntrlInfo .ControlTable .ControlTableEntry .cPointIdIndex	The unique ID (point number) of a control point in a particular display. For example, OID 1.3.6.1.4.1.ENTERPRISE.2.1.3.1.1. cDescription. cDisplayIdIndex. cPointIdIndex
wsiRTUCntrlInfo .ControlTable .ControlTableEntry .cAdministrativeState	 Enable/disable SNMP traps on this point. The OID has four settings to control SNMP trap output: "trap_on_enable" (value 1) – send trap on control enabled event "trap_on_disable " (value 2) – send trap on control disabled event "trap_all_states" (value 3) – send trap on control enabled and

- disabled events
- "disable_trap" (value 4) send no trap for any event.

WS1500 e-Scanner

.ControlTable

.ControlTableEntry

.cLastDisabledTime

.ControlTableEntry .cDescription

wsiRTUCntrlInfo

.ControlTable

.ControlTableEntry .cOperationalState wsiRTUCntrlInfo .ControlTable .ControlTableEntrv .cOperationalDuration wsiRTUCntrlInfo .ControlTable .ControlTableEntry states: .cOperationalTrigger . control wsiRTUCntrlInfo .ControlTable .ControlTableEntry format. .cLastEnabledTime wsiRTUCntrlInfo

wsiRTUCntrlInfo

.ControlTable

This OID defines how to actuate the control point. Three states are available:

- Momentary (value 1)
- ContinuousOn (value 2)
- ContinuousOff (value 3)

This OID, along with cOperationalDuration, must be set prior to actuating the control with a Set command to cOperationalTrigger.

The amount of time for the control point to remain activate. Applicable to momentary cOperationalState only. Duration range is 400 ms minimum (default) to 999 ms. This object along with cOperationalDuration must be set before actuating the control with a Set command to cOperational Trigger.

Flag to actuate or execute a control point command. This value is set after the operation state and operation duration have been set. The trigger has four

- DoIt Set state to "DoIt" (value 1) to execute and activate a
- Done the value is set to NotInUse
- NotInUse When the Control releases,
- InUse The system, when using control as a ContinousOn, sets the state to InUse

This 20-character value indicates the last recorded time the control point changed from the Off to On state and has the "YY-MM-DD HH:MM:SS"

This 20-character value indicates the last recorded time the control point changed from the On to Off state and has the "YY-MM-DD HH:MM:SS" format.

A 32-character textual description of the control point intended use. For example, "A/C backup generator Starter control"

Default Values for wsiRTUCntrlInfo Objects

cAdministrativeState	Trap_all_States
cOperationalState	ContinuousOff
cOperationalDuration	400ms

cOperationalTrigger	NotInUse
cLastEnabledTime	{"EtimeNotSetCPoint##"} (## point number of control)
cLastDisabledTime	{"DtimeNotSetCPoint##"} (## point number of control)
cDescription	{"Control Point ## not configured"} (## point number of control)

ControlTable Properties

The following leaf objects in the ControlTable make up the wsiRTUCntrolInfo branch of the WS1500 MIB.

Object	Access	Object Type
cDisplayIDIndex	R	Integer
cPointIDIndex	R	Integer
cAdministrativeState	RW	Integer
cOperationalState	RW	Integer
cOperationalDuration	RW	Integer
cOperationalTrigger	RW	Integer
cLastEnabledTime	R	String
cLastDisabledTime	R	String
cDescription	RW	String

Note: When referencing the controlTable objects, remember to add the display and the point index (that is, object ID =

```
org.dod.internet.mgmt.private.westronic.p
roducts
.ws1500.wsiRTUCntrolInfo.controlTable.con
trolEntry
.cDescription.1.4).
```

wsiRTUSysErr

The wsiRTUSysErrInfo OID describes each of the internal system alarms that the RTU can indicate. The

system point table stores the current status of a system error. You can retrieve this information through the Craft or the SNMP port.

wsiRTUSysErr Object Identifiers

The following objects create wsiRTUSysErr:

wsiRTUSysErr .sysErrSeqTag	The unique ID number of the system error event
wsiRTUSysErr .sysErrId	System error ID number 1-6 (v1.2); 1-14 (v2.0)
wsiRTUSysErr .sysErrDescr	A 32-character textual description of the error that matches the corresponding SysErrID number:
wsiRTUSysErr .sysErrDateTime	A 20-character Date and Time string of an event error
wsiRTUSysErr .sysErrSeqTagAcknwldg	Reserved for Future Use

wsiRTUSysErr Properties

The wsiRTUSysErr portion in the WS1500 MIB contains the following leaf objects that describe the current WS1500 internal system alarm only. Unlike discrete and control traps, the wsiRTUTrapEnable parameter does not turn off these traps.

Object	Access	Object Type
SysErrSeqTag	R	Integer
SysErrID	R	Integer
SysErrDescr	R	String
SysErrDateTime	R	String
SysErrSeqTagAcknwldg	R	Integer

EnterpriseSpecific WS1500 Traps

The following lists the EnterpriseSpecific traps and there content of information for discrete, control, and system errors.

Enterprise Trap	Fields Reported to Enabled Hosts	Definition
Discrete Point Trap 10	dDisplayIdIndex	Display number (1)
	dPointIdIndex	Point number
	dSequenceTag	Event ID number
	dOperationalState	Enabled/Disabled
	dAlarmStatus	Severity
	dLastEnabledTime	Date/Time
	dLastDisabledTime	Date/Time
	dDescription	Description of the discrete point
Control Point Trap 20	cDisplavIdIndex	Display number (1)
	cPointIdIndex	Point number
	cSequenceTag	Event ID number
	cOperationalState	Enabled/Disabled
	cAlarmStatus	Severity
	cLastEnabledTime	Date/time
	cLastDisabledTime	Date/time
	cDescription	Discription of the control point usage
System Error Trap 30	sysErrSeqTag	Event ID number
	sysErrID	System Id number of the Error
	sysErrDateTime	Date and Time event error
	sysErrSeqTagAcknwldg	Flag to confirm received trap
	sysErrDescr	Description of the alarm

Configuring the WS1500 via SNMP Interface

This section contains the basic concepts and operations that are require to configure and monitor the WS1500 via SNMP.

General

To view leaf nodes, which make up the WS1500 database, use the SNMP *Get* command.

To view MIB objects, use the configured and enabled Community Name that you were provided or configure and enable at least one host with the "public" Community Name.

To modify leaf node values, you must have a Community Name configured and enabled with something other than "public".

Before you can view or modify any of the leaf node parameters (excepting wsilogin), you must login to the WS1500 using SNMP. To do this, perform a SNMP *Set* command on the OID wsiLogin under wsiRTUinfo. Set the datatype to Octet String and enter the password to login. The default password is "password". Send the SNMP *Set* command. To see if you are logged in, send the SNMP *Get* command on the wsiLogout object. The response is "usrlogin" or "logout".

After you log into the WS1500, you can start viewing or modifying leaf node parameters. For more details on the different WS1500 database objects, refer to Appendix C. Remember to add the index numbers to the OID when you are referencing objects in a table. These WS1500 tables require the following:

- wsiHostTable requires a HostIndex number
- discreteTable requires the Display number (1) and Point number
- discreteLogEventTable requires Buffer index number
- ControlTable requires Display number (1) and Point number

Modify the password Using SNMP

Perform a *Set* command on the wsiModLogin. Choose the datatype to be Octet String. The string you send must contain the current password separated by a colon and the new password.

Actuate a control point Using SNMP

You must first set the cOperationalState and cOperationalDuration (if momentary operational state) with the SNMP *Set* command. Refer to the WS1500 MIB section for values and the datatype to set.

Next use the SNMP *Set* command to set the cOperationalTrigger with a Integer datatype to 1 "DoIt".

Remember to append the display number (1) and control point number to the OID that you are performing the *Set* command on.

Write the WS1500 database to FLASH Using SNMP

After making configuration changes to the WS1500 database (MIB objects), perform the SNMP *Set* command on the wsiSaveCnfg object under wsiRTUinfo. Set the datatype to Octet String and the value to "REBOOT". This causes the WS1500 to reboot. You have to log back in to set the WS1500 Date and Time with the wsiRTUDate and wsiRTUTime objects.

How to set the Date and Time Using SNMP

Use the SNMP *Set* command on the wsiRTUDate object. Set the datatype to Octet String. Use the format YY-MM-DD for the date to set. Next use the *Set* command on the wsRTUTime object. With a datatype of Octet String, use the format HH:MM:SS to set the time. This page intentionally left blank.



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