

WS2200 Technical Manual

W001631 Rev B



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REGULATORY INFORMATION

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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Handling Considerations and Precautions

The WS2200 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, ensure familiarity with the ESD procedures that follow.

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.

Typical Box Contents

The standard WS2200 unit and install kit includes the following items used to facilitate the installation of a WS2200 RTU:

- The WS2200
- 2x mounting bracket for 19" rack with 8x screws, plus 2x 23" adaptors with 4x screws
- 1x package with RJ-45 to DB9-F adaptor. (Note: some kits may also include a short RJ-45 M-M cable)
- two 2-pin power plugs for A and B DC power.
- 2x grasshopper fuse (0.5 amp)
- Some kits *may* include a USB drive with documentation.
- Some client-specific variants of the WS2200 may be shipped with additional cables, or hardware. - consult the packing list of your particular unit for more details.

Hardware Description

The WS2200 is a rack mount unit with 50-pin Amphenol connector for field connections. It is designed to be compliant with international industry standards for network equipment, including Bellcore NEBS and the European Community (CE) standards. Designed for Electrostatic Discharge (ESD) resistance and use in telecommunications environments, the WS2200 is a rugged and dependable unit compatible with both Central Office (CO) and remote installations.

Front Panel Indicators

RUN: Solid Red during boot up and flashes Green once every second with normal operation.

+5V: Illuminates Green indicating +5V power is available to the CPU.

-48V A: Illuminates with power applied to the A side feed. Green indicates correct polarity while Red indicates the power is applied in reverse polarity.

-48V B: Illuminates with power applied to the B side feed. Green indicates correct polarity while Red indicates the power is applied in reverse polarity.

DISCRETE INPUTS: Alarm LEDs are solid or flashing and Green, Yellow, or Red to indicate the alarm state and severity of monitored discrete inputs. Off means the input is not currently in alarm (CL). On states indicate severity as follows:

NA -> green

RN -> green flash

MN -> yellow

MJ -> yellow flash

CR -> red

ANALOG INPUTS: Alarm LEDs are solid or flashing and Green, Yellow, or Red to indicate the state of monitored analog inputs.

OUTPUTS: LED show the state of a control output. This LED will be solid for a closed output.

Rear Panel Connections

ETHERNET: This connector is used to connect to the Ethernet/IP network, used to report alarms to the host Management System.

CRAFT: Use this connection to perform basic initial configuration.

SERIAL: This port is used for additional serial communications reporting protocols (i.e., TABS, TBOS, etc.). This port is factory configurable as an RS-232 or RS-485 interface.

INPUTS/OUTPUTS: This connector is the standard interface for connecting discrete inputs and control points to the WS2200 using a 50 pin Amp Female termination.

POWER +/-: Use this quick-connect plug for input power connection. Both or either of the dual power connections can be used.

CHASSIS GROUNDING STUD: Use this 8-32 stud to connect the unit to ground per appropriate local practices. All versions of the WS2200 can be installed in Common Bonded (CBN) or Isolated Bonded Networks (IBN) as may be appropriate for the local site requirements.

Hardware Installation

1. Attach mounting brackets to the WS2200 RTU in the desired positions. Typically, the forward position is used, shown here using the 19" bracket without 23" adaptors.



Figure 1 - Install mounting brackets to chassis

2. Mount the WS2200 in a suitable rack location.
3. Connect the grounding wire to stud on WS2200 chassis per best practices. Torque nut to 16-19 in/lb.



Figure 2 - Connecting Earth Ground

4. Connect one or two 2-pin power plugs (included with the WS2200) to the rear panel using appropriate size wire and best practices. A single power connection can be made using Power **A** or **B**. Alternatively, a dual power connection can be made by connecting to **A** and **B**. Note correct polarity of **A** and **B** power. See photo below.

NOTE: For all versions of the WS2200, the DC power battery return (BR) terminal(s) or positive terminal(s) must be grounded at the source end (power feed or DC mains power end). The DC power BR input terminal(s) is not connected to the chassis within the unit, so the WS2200 is configured as DC-I according to the GR1089 Issue 6 definitions (R9-15 [151]).

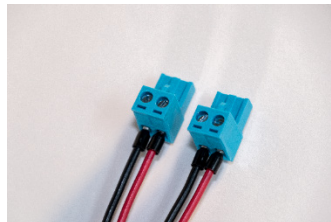


Figure 3 - Correct DC power wiring of WS2200 power connectors, showing Red as positive with respect to Black

5. Connect the power plug to the WS2200 as shown below.

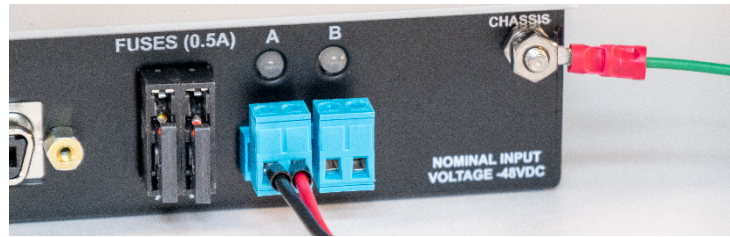


Figure 4 - Power connector installed on WS2200 chassis

6. Install the two supplied 0.5-Amp grasshopper fuses on the rear of the WS2200.
7. Connect Amp 50 pin alarm connector as required. See technical manual for pinout and associated information. A completed installation is shown in Figure 5.

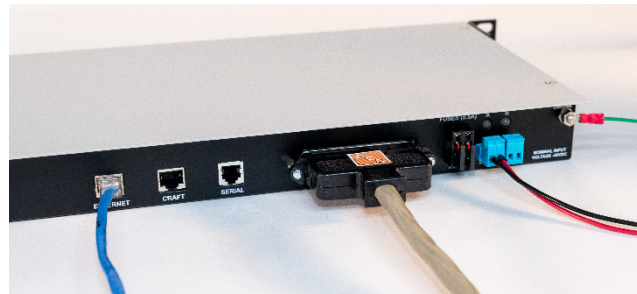


Figure 5 - Typical WS2200 with 50-pin cable connection

8. Connect Ethernet cable to WS2200. Router should have **POE DISABLED** as Power Over Ethernet can damage the unit. Speed should be set to 100Mbps - Full Duplex.
9. Put appropriate fuses in main fuse panel and power up unit. **NOTE:** DO NOT insert a live power plug into the WS2200. Damage to the unit may result if it is not inserted correctly. Always control power from the main fuse panel with the 2 pin power plugs fully connected to the unit.

Initial WS2200 Configuration

The WS2200 is shipped from the factory with a default configuration. Site specific network information must be configured for the device to communicate on the network and correctly report alarms. Use a PC or laptop with an available serial port to perform the initial configuration of the WS2200. A straight-through serial cable (DB9M-DB9F) and a terminal program are also required for this process.

1. Connect the PC's serial port to the WS2200 "CRAFT" port on the rear panel using the serial cable + DB9 adaptor. The WS2200's CRAFT port is RS232-DCE.
2. Configure the PC's terminal program for 8 bits, No parity, 1 Stop bit, and 57600 baud.
3. Press 'Enter' to start the WS2200 console session.
4. Login using the default username and password (login: **MTC**, password: **shipping**)
5. Select menu item 2 to modify the default configuration.

6. Set IP address, netmask, router, and SID.
7. Press 'R' to return to the main menu.
8. OPTIONAL: If a secure connection to WS Manager is required, press 'U' to Enable SSH on the Upgrade Port. Following this step, you should see SSH Enable on Upgrade Port near the top of the menu.

NOTE: If setting SSH for the Upgrade Port, WS Manager will need to have it set to connect to the WS2200.

9. Select menu item 8 to Restart the WS2200 and apply the new settings.
10. Test the network connection by having a user on the network ping the specified IP address, or by entering the address in a web browser (e.g., <http://172.16.6.120>) to view the current alarm summary for that unit.
11. The remainder of the configuration must be done over LAN/IP using WS Manager.

Full WS2200 Configuration

Many companies have a central group which remotely provisions the WS2200 once it is installed and network connectivity is established. For these installations the WS2200 is generally not shipped with either the WS Manager Lite CD or associated manual. Your central group will configure the WS2200, then all alarms will require verification and testing per standard corporate practise.

For installations where local configuration may be performed, WS Manager may be used to configure alarm and serial communications parameters for the WS2200. A summary of required steps to modify point descriptions is described below.

1. Establish a physical LAN connection from a PC with WS Manager installed, to the WS2200.
Note: The default IP of a new WS2200 is 192.168.0.110 with Router of 192.168.0.1 and Netmask of 255.255.252.0.
2. If using a previously saved or template configuration, bring it into Manager using File → Restore RTU → correct filename. Change any points, ports or other configuration data as required for the site. If starting from default, all point and parameter information must be entered manually in the appropriate tabs and option windows.
3. Enter the IP address of the target WS2200 in the WS Manager main window.
4. OPTIONAL: If SSH has been enabled on the WS2200 for the Upgrade Port, the Enable Upgrade SSH box will need to be checked on the Communications tab.
5. Connect to the WS2200 by clicking the CONNECT button.
6. Download the configuration to the target WS2200.
7. Once the download has completed, a confirmation dialog box appears. Click Yes to reset the WS2200 and return it to service with the new configuration.
8. Verify and test all alarms and other communications per standard corporate practise.

Port Descriptions

50-Pin Alarm Connectors

Pin	Signal	Pin	Signal
1	Control Output 1 (Common)	26	Control Output 1 (Normally Open)
2	Control Output 2 (Common)	27	Control Output 2 (Normally Open)
3	Control Output 3 (Common)	28	Control Output 3 (Normally Open)
4	Control Output 4 (Common) or Alternate-Statwet	29	Control Output 4 (Normally Open)
5	Analog 1 +	30	Analog 1 -
6	Analog 2 +	31	Analog 2 -
7	Analog 3 +	32	Analog 3 -
8	Analog 4 +	33	Analog 4 -
9	Status Input Ground	34	Control Output 1 (Normally Closed)
10	Status/Alarm Input 1 - 1	35	Status/Alarm Input 1 - 2
11	Status/Alarm Input 1 - 3	36	Status/Alarm Input 1 - 4
12	Status/Alarm Input 1 - 5	37	Status/Alarm Input 1 - 6
13	Status/Alarm Input 1 - 7	38	Status/Alarm Input 1 - 8
14	Status/Alarm Input 1 - 9	39	Status/Alarm Input 1 - 10
15	Status/Alarm Input 1 - 11	40	Status/Alarm Input 1 - 12
16	Status/Alarm Input 1 - 13	41	Status/Alarm Input 1 - 14
17	Status/Alarm Input 1 - 15	42	Status/Alarm Input 1 - 16
18	Status/Alarm Input 1 - 17	43	Status/Alarm Input 1 - 18
19	Status/Alarm Input 1 - 19	44	Status/Alarm Input 1 - 20
20	Status/Alarm Input 1 - 21	45	Status/Alarm Input 1 - 22
21	Status/Alarm Input 1 - 23	46	Status/Alarm Input 1 - 24
22	Status/Alarm Input 1 - 25	47	Status/Alarm Input 1 - 26
23	Status/Alarm Input 1 - 27	48	Status/Alarm Input 1 - 28
24	Status/Alarm Input 1 - 29	49	Status/Alarm Input 1 - 30
25	Status/Alarm Input 1 - 31	50	Status/Alarm Input 1 - 32

Table 1 - WS2200 P1 Alarm Connector Pins

Pin	Signal	Pin	Signal
1	Not Connected	26	Not Connected
2	Not Connected	27	Not Connected
3	Not Connected	28	Not Connected
4	Alternate-Statwet	29	Not Connected
5	Not Connected	30	Not Connected
6	Not Connected	31	Not Connected
7	Not Connected	32	Not Connected
8	Not Connected	33	Not Connected
9	Status Input Ground	34	Not Connected
10	Status/Alarm Input X - 1	35	Status/Alarm Input X - 2
11	Status/Alarm Input X - 3	36	Status/Alarm Input X - 4
12	Status/Alarm Input X - 5	37	Status/Alarm Input X - 6
13	Status/Alarm Input X - 7	38	Status/Alarm Input X - 8
14	Status/Alarm Input X - 9	39	Status/Alarm Input X - 10
15	Status/Alarm Input X - 11	40	Status/Alarm Input X - 12
16	Status/Alarm Input X - 13	41	Status/Alarm Input X - 14
17	Status/Alarm Input X - 15	42	Status/Alarm Input X - 16
18	Status/Alarm Input X - 17	43	Status/Alarm Input X - 18
19	Status/Alarm Input X - 19	44	Status/Alarm Input X - 20
20	Status/Alarm Input X - 21	45	Status/Alarm Input X - 22
21	Status/Alarm Input X - 23	46	Status/Alarm Input X - 24
22	Status/Alarm Input X - 25	47	Status/Alarm Input X - 26
23	Status/Alarm Input X - 27	48	Status/Alarm Input X - 28
24	Status/Alarm Input X - 29	49	Status/Alarm Input X - 30
25	Status/Alarm Input X - 31	50	Status/Alarm Input X - 32

Table 2 - WS2200 P2 – P5 Alarm Connector Pins. (X corresponds with P number below)

Serial Port Connections

The CRAFT Port on the WS2200 uses a standard RJ45 Connector, shown in Figure 6. A typical DB9 serial port on a PC is shown in Figure 7. Table 2 shows the pin outs for a cable connecting the WS2200 to a PC Serial Port.

The WS2200 is shipped with an RJ45 to DB9 adaptor, pn# 585-T093. By using this adapter, a straight-through cable with RJ45 connectors on each end may also be used when connecting to a PC.

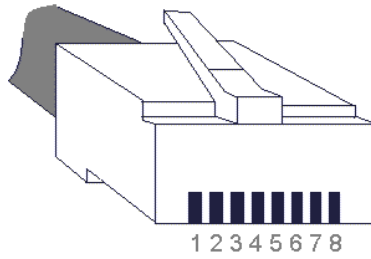


Figure 6 - WS2200 RJ45 Craft Port Connector

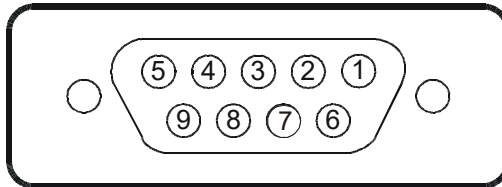


Figure 7 - DB9F Connector

Signal	Function	
	WS2200 RJ45 Pin (DCE)	PC DB9F Pin (DTE)
TX	3	2
RX	6	3
GND	4,5	5
CTS	8	7
RTS	1	8

Table 3 - WS2200 Serial Port RJ45 to RS-232 Pin Out

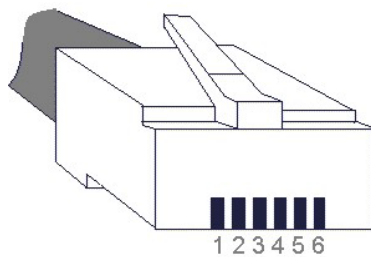


Figure 8 - WS2200 RJ11 Serial Connector

- The SERIAL Port on the WS2200 uses a standard RJ11 Connector, shown in Figure 8. A typical DB9 serial port on a PC is shown in Figure 7. Table 4 shows the pin outs for a cable connecting the WS2200 to an RS-232 serial port. Table 5 shows the pin outs for a cable connecting the WS2200 to an RS-485 serial port.

Signal	WS2200 RJ11 Pin (DCE)	Function	
		PC DB9F Pin (DCE)	PC DB9M Pin (DTE)
RTS	1	8	7
TX	2	2	3
GND	3,4	5	5
RX	5	3	2
CTS	6	7	8

Table 4 - WS2200 RJ11 to RS-232 Pin Out

Signal	Function	
	WS2200 RJ11 Pin (DCE)	WS2200 DB9F Pin (DTE)
TX+	5	8
TX-	2	7
GND	1	5
RX+	3	2
RX-	4	3
VCC	6	N/C

Table 5 - WS2200 RJ11 to RS-485 Pin Out

Engineering Specifications

Chassis

CPU:	32 bit, 800 MHz x86 Microcontroller
Power (V):	Dual -48 VDC (monitored and alarmed)
Power Consumption:	75 mA idle, 300 mA maximum @ -48 VDC
Operating Voltage Range:	-40 to -60 VDC
Dimensions (HxWxD):	1.75" x 17.2" x 7.5" (without mounting brackets) (4.45 cm x 43.6 cm x 19.0 cm)
Weight:	6.2 lb (2.81 kg)
I/O Termination Interface:	50 pin AMP connector

Display - LED

LED Indicators:	Power Feed, +5V Power, CPU Run, all Discrete Inputs, Analog Inputs, and Control Outputs
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Display - LCD (option)

LED Indicators:	Power Feed, +5V Power, CPU Run, CR, MJ, MN
Navigation Controls:	Next, Previous, Select, Exit
LCD Panel:	4 x 20 character, shows alarm status and alarm history

Inputs - Discrete

Input Count:	32, 64, or 160 optically isolated
Protection:	Sustain maximum transient voltages of 15 kV per Telcordia GR1089
Ground:	Common ground for all inputs
Sampling Rate:	100 Hz
Input Voltage:	Referenced to -48 VDC
Input Current:	~ 1.0 mA for each input
Logic Levels:	0 (Off) -40 VDC through -48 VDC (nominal voltage) 1 (On) -30 VDC through +5 VDC (nominal voltage)

Inputs - Analog

Input Count:	4 total Preconfigured for +/-100 mV, 0-60V, or 4-20 mA User configurable scaling and thresholds
Temperature:	1 onboard temperature sensor

Outputs - Discrete

Output Count:	4 mechanical relays
Relay Type:	1 - Form C, SPDT 3 - Form A, SPST
Operation Types:	Latched or momentary Momentary duration is programmable from 400 through 999 milliseconds
Contact Ratings:	0.5 A at 60 VDC 0.5 A at 125 VAC 60 W (maximum) switching power

Communications

Serial Port:	1 RJ11, preconfigured RS232/RS485, 300 to 57600 bps
Craft Port:	1 RJ45, RS232, 57600 bps
Ethernet:	1 Ethernet port, 10/100 Base-T, RJ45
Miscellaneous:	Secure webserver, TL1, and configuration available

General Specifications

Storage Temperature:	-40 °F to +158 °F (-40 °C to +70 °C)
Operating Temperature:	-40 °F to +158 °F (-40 °C to +70 °C)
Relative Humidity:	5% to 90% non-condensing

Firmware

- Northbound Protocols
- SNMP (includes re-trap method to resend current alarms)
 - TL1
 - TABS Serial

Miscellaneous

- Serial pass-through functionality (terminal server)
- Non-volatile alarm logging possible.
- NTP
- Remote firmware upgrades
- Configuration version query, upload and download
- Derived alarm engine
- Alarm correlation
- Central configuration database and single point of access for RTUs possible through WS Manager

Certifications and Standards

- NEBS 3 Certified

Warranty and Support

- Two years parts and labor
- Unlimited support

Warranty

Westronic Inc., a division of Circa Enterprises Inc., warrants that its products are free from defective workmanship and materials. Westronic will, within two years from the date of final sale to the customer, replace or repair any such products provided they are returned to our facilities for examination. Freight costs (including brokerage if applicable), both to and from Westronic, are the sole responsibility of the customer. This warranty does not extend to any items that are deemed to have been misused, modified, neglected, improperly specified, improperly installed, or used in violation of instructions or specifications approved by Westronic. Westronic Inc., a division of Circa Enterprises Inc., shall not be liable for incidental or consequential damage of any kind caused by any defect in our product. The total liability shall not, under any circumstances, exceed the purchase price of the products furnished by Westronic Inc., a division of Circa Enterprises Inc.

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