FieldServer Technologies

FieldServer Technologies
A Sierra Monitor Corporation Company
1991 Tarob Court, Milpitas, California 95035 USA
Phone: (408) 262-2299
Toll Free: (888) 509-1970
Fax: (408) 262-2296
Email: support@fieldserver.com
Web Site: www.fieldserver.com

FS-X20 Series

FS-X20 Start-up Guide

APPLICABILITY & EFFECTIVITY

This manual provides instructions for the following FieldServer products:

	Description
FS-X20 Series	FieldServer

The instructions are effective for the above as of February 2005

Applicability and Effectivity

TABLE OF CONTENTS

1. Pre-Installation Check List

1.1. Supplied equipment

The following components are supplied:
- FS-X20 Series FieldServer, loaded with Modbus RTU driver, SMT Ethernet driver and any other drivers ordered.[1]
- FS-X20 Series Start-up Guide (T17005)
- FieldServer Configuration Manual (T17003)
- FieldServer Utilities Manual (T17009)
- Driver Manual(s) specific to all Drivers ordered with the FieldServer.
- Utility CD – *note that the Utilities support the following platforms only:*
  - *Windows XP*
  - *Windows 2000*
  - *Windows NT*
  - *Windows 98*
- Any additional Diskettes related to special files configured for a specific FieldServer.
- Additional components as required -. See Driver Manual Supplement for details
- An accessory bag consisting of the following: :
  - DB9F/RJ45 Connection Adapter. (Part Number FS-8917-02)
  - 7-ft Cat5 cable with RJ45 connectors at both ends (Part Number FS-8915-10)
  - RS-232 Mini Tester, 25-pin (Part Number FS-8915-13)
  - RS-485 connector (Part Number FS-SPA59137)
  - Set of four different connectors DB9M, DB9F, DB25M, DB25F (Part Number FS-8915-11)
  - Power Supply
  - Connector for power (SPA59136)

1.2. Start-up

- Read this Start-up Guide in conjunction with the Configuration Manual, the Driver Manual(s) and the Utilities manual.
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- The power socket mates with a pluggable terminal block, connector, that is supplied separately (SPA59136). The terminal block is manufactured by Phoenix Contact, model MSTB, (PN 1754465), No.30-12 AWG, 5-7 in/lbs torque.
-
- USE COPPER CONDUCTORS ONLY
- Select an external power supply certified for safety, for the correct destination country and an output rating, which is considered a NEC Class 2 circuit or is a SELV Limited power source with the following ratings:
- 9-30 VDC, 1A;   OR 24 VAC, 50/60Hz, 0.5A
-

> - INPUT VOLTAGE SPECIFICATION
>   - **24 VAC FLOATING**
> - Using a grounded VAC will cause irreparable damage to the product.

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- The operating environment for the product is 0 to 60°C (32 to 140°F).
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[1] Note that a default configuration file has already been loaded onto the FieldServer. Check the Driver Manual and the FieldServer Configuration Manual for further information on this file.

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2. Product Description

2.1. Specifications

Power requirements (power supply is external)	
X20 power supply P/N 69155 Input voltage: 9-30VDC, 8W; 24VAC **Floating**. Voltage variation of ±10% tolerated. Output voltage / current: 24VDC @ 0.5A	
Physical Dimensions(excluding the external power supply)	
(WxDxH):	3.82 x 4.08 x 1.7 inches (9.70 x 10.36 x 4.31 cm)
Weight:	0.8 lbs. (0.36 Kg)
Available Ports	
1 x RJ45 / RS-232 serial connector 1 x RS-485 serial connector 1 x RJ45 10-BaseT Ethernet connector	
Environment:	
Operating Temperature:	0 – 60°C (32 – 140°F)
Humidity:	10 - 90% RH (non-condensing)
Approvals:	UL 916 ULC 916 FCC Tested to comply with FCC part 15 CE Marked
(Specifications subject to change without notice)	

2.2. Mounting

The FS-X20 Series FieldServer is supplied with an accessory bag which allows selection of adhesive feet (for standing on a shelf) or mounting plates for wall or panel mount. A DIN Rail Mounting Kit (P/N FS-8915-28) may be ordered separately.

2.3. Wiring

The 110VAC to 9VDC or 24VDC/ power supply received with the unit needs to be plugged into a power source and then connected to the   back of the FieldServer using the SPA59136 connector. This power supply is designed to temporarily provide the 9-24V 100mA required by the FieldServer during testing and start-up. Permanent 9-30V, 100mA power will need to be provided for continuous operation.

The FS-X20 Series FieldServer is shipped as either a FS-X20XX-01 in which case the RS-232 port is activated, or as a FS-X20XX-02 in which case the RS-485 port is activated.

If using an RS-232 RJ45 Serial connection then use one of the RJ45 cables to connect from the appropriate port on the FieldServer to the connection adapter provided with the FieldServer or the Driver Kit. Then plug the connection adapter to the node.

If using RS-485 from the node to the FS-X2010, the + and - wire connections can be used on the RS-485 port on the FieldServer. For the FS-X2011, LonWorks® enabled modules, the orange port is the TP/FT-10 connection, and the RS-485 connection needs to be made via the serial RJ-45 port. To change between RS-232 and RS-485 connection, it is necessary to modify jumpers on the internal board. Refer to eNote0017[2] for further information.

Ethernet connections simply require connection of a standard Cat5 UTP Ethernet cable with an RJ45 connector between the FieldServer and the network. Note that when connecting the FieldServer directly to another Ethernet enabled device without using a hub, then standard Ethernet principles apply, and a Crossover cable must be used.

Note that the USB port is <u>not</u> activated.

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[2] eNotes are available at
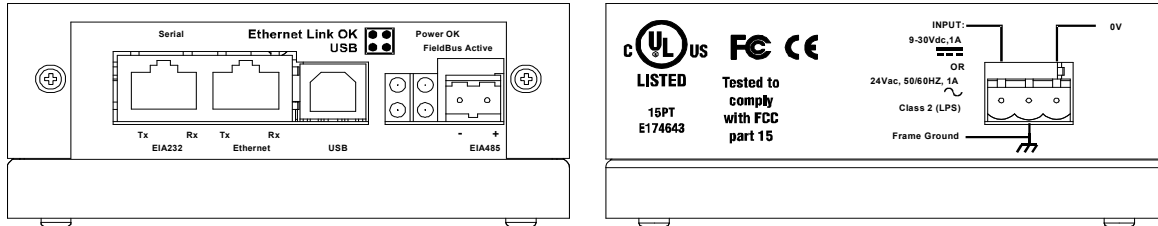www.fieldserver.com/techsupport/enotes/enotes.asp

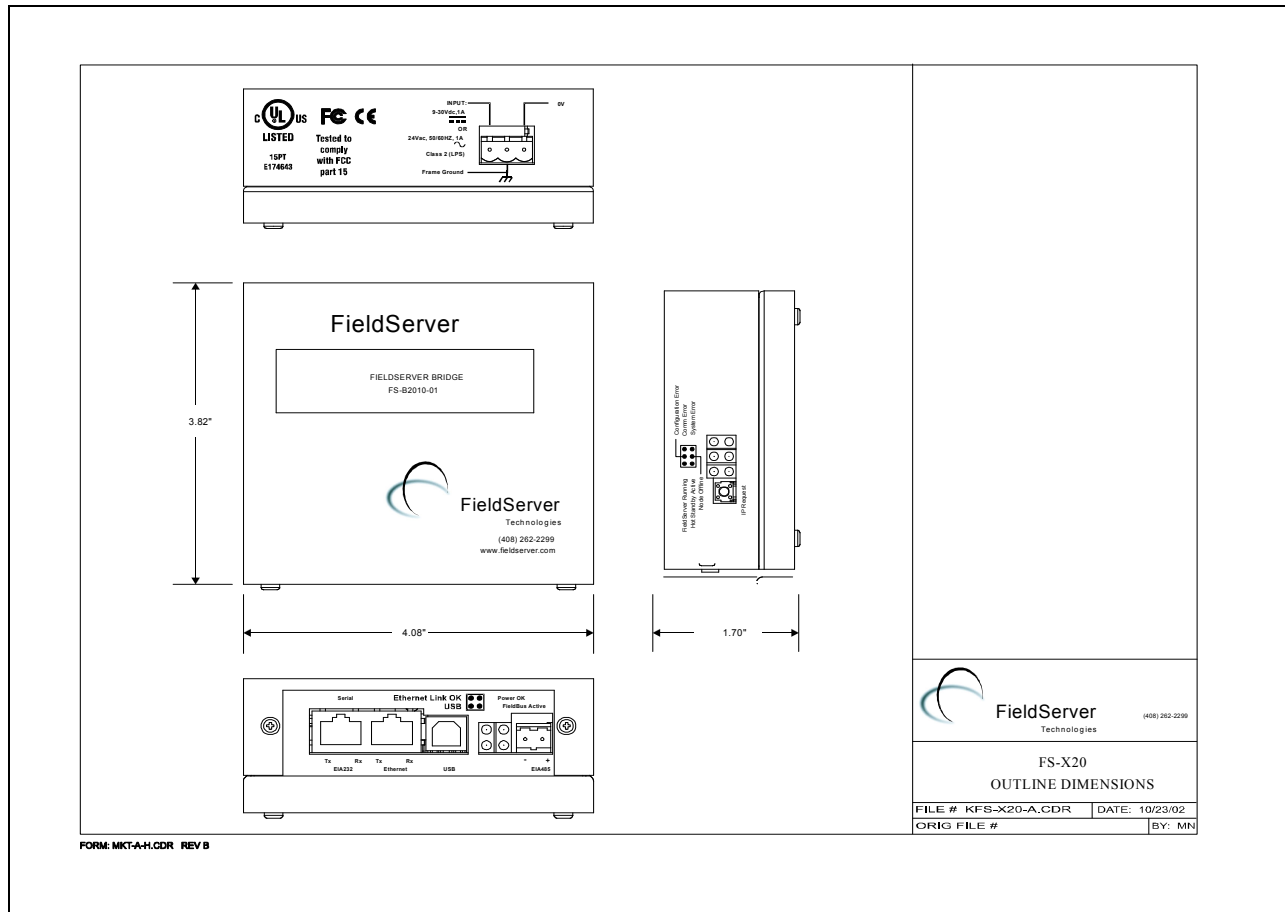**Figure 2-1: Diagram of FS-X20 showing Connection Ports**

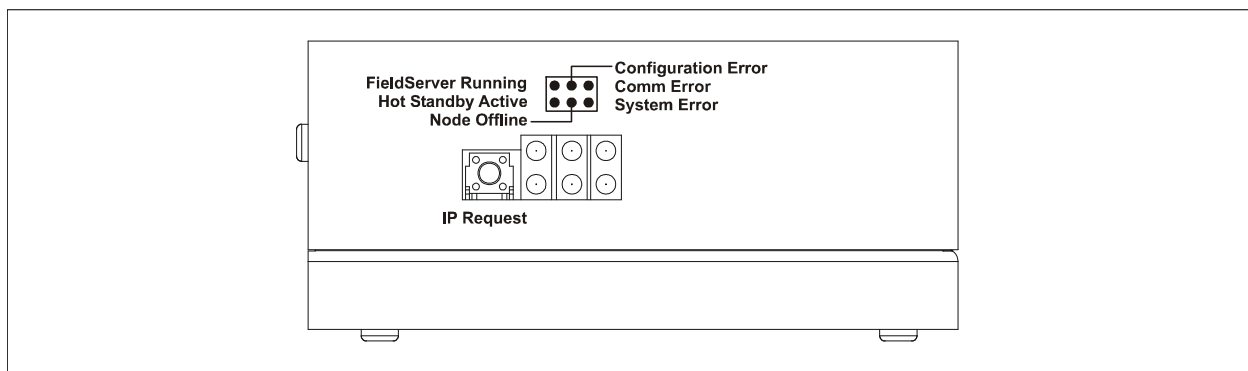**Figure 2-2: Diagram of FS-X20 Showing External Dimensions**

Figure 2-3: Diagram of FS-X20 Showing LED's

2.4. Supplied Connector Kit (FS-8915-11)

In order to facilitate RS-232 communications on the RJ-45 RS-232 port, a connector kit is supplied containing one of each of the connectors shown in the diagram below. The tables in the diagram show the functions applied to each of the RJ-45 pins by the FieldServer to assist in determination of the required pinout configuration for connection to the third party device.
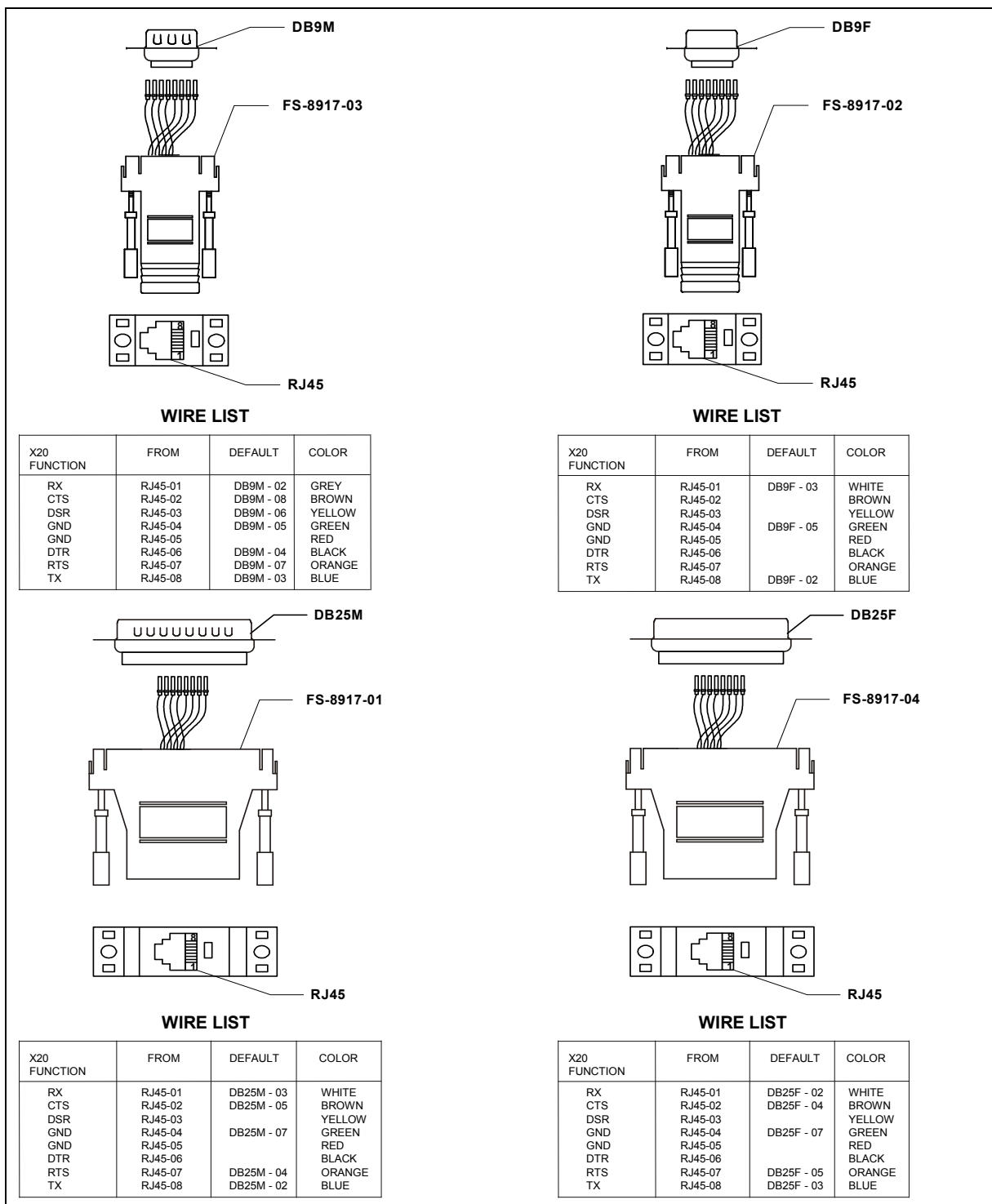
WIRE LIST

X20 FUNCTION	FROM	DEFAULT	COLOR
RX	RJ45-01	DB9M - 02	GREY
CTS	RJ45-02	DB9M - 08	BROWN
DSR	RJ45-03	DB9M - 06	YELLOW
GND	RJ45-04	DB9M - 05	GREEN
GND	RJ45-05		RED
DTR	RJ45-06	DB9M - 04	BLACK
RTS	RJ45-07	DB9M - 07	ORANGE
TX	RJ45-08	DB9M - 03	BLUE

WIRE LIST

X20 FUNCTION	FROM	DEFAULT	COLOR
RX	RJ45-01	DB9F - 03	WHITE
CTS	RJ45-02		BROWN
DSR	RJ45-03		YELLOW
GND	RJ45-04	DB9F - 05	GREEN
GND	RJ45-05		RED
DTR	RJ45-06		BLACK
RTS	RJ45-07		ORANGE
TX	RJ45-08	DB9F - 02	BLUE

WIRE LIST

X20 FUNCTION	FROM	DEFAULT	COLOR
RX	RJ45-01	DB25M - 03	WHITE
CTS	RJ45-02	DB25M - 05	BROWN
DSR	RJ45-03		YELLOW
GND	RJ45-04	DB25M - 07	GREEN
GND	RJ45-05		RED
DTR	RJ45-06		BLACK
RTS	RJ45-07	DB25M - 04	ORANGE
TX	RJ45-08	DB25M - 02	BLUE

WIRE LIST

| X20 FUNCTION	FROM	DEFAULT	COLOR
RX	RJ45-01	DB25F - 02	WHITE
CTS	RJ45-02	DB25F - 04	BROWN
DSR	RJ45-03		YELLOW
GND	RJ45-04	DB25F - 07	GREEN
GND	RJ45-05		RED
DTR	RJ45-06		BLACK
RTS	RJ45-07	DB25F - 05	ORANGE
TX	RJ45-08	DB25F - 03	BLUE

Figure 2-4: FieldServer Connector Reference

Note: FS-X20 Series RS-232 numbering convention is reverse to the 10BaseT numbering convention.

| | RJ45 Male Modular Jack | | RJ45 Female Modular Jack |
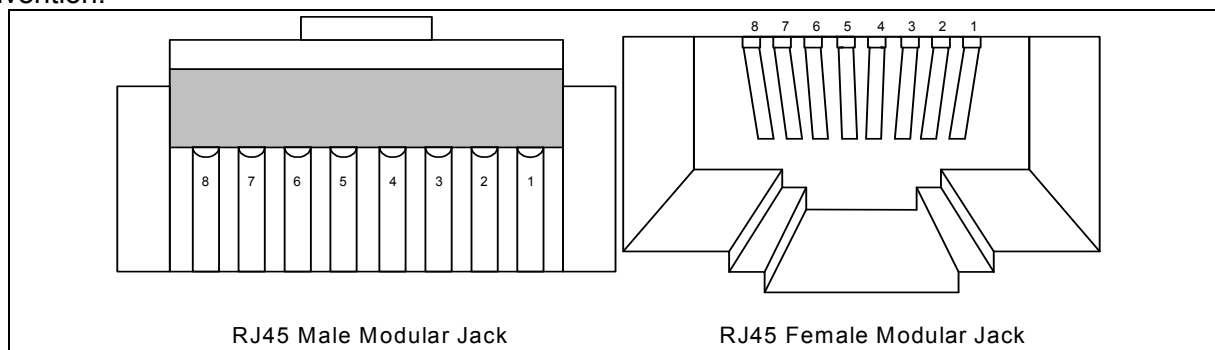
Figure 2-5 RS-232/Cat 5 Wire Functions/Connections

	PIN	DESCRIPTION	From DCE	To DCE
	1	Frame Ground		
	2	Transmitted Data		D (Data)
	3	Received Data	D	
	4	Request to Send		C (Control)
	5	Clear to Send	C	
	6	Data Set Ready	C	
	7	Signal Gnd/Common return		
	8	Rcvd Line Signal Detector	C	
	11	Undefined		
	12	Secondary Rcvd Line Signal Detector	C	
	13	Secondary Clear to Send'	C	
DB25 Male	14	Secondary Transmitted Data		D
	15	Transmitter Sig Element Timing	T (Timing)	
	16	Secondary Received Data	D	
	17	Receiver Sig Element Timing	T	
	18	Undefined		
	19	Secondary Request to Send		C
	20	Data Terminal Ready		C
	21	Sig. Quality Detector		C
	22	Ring Indicator	C	
	23	Data Sig Rate Detector		C
	24	Transmitter Sig Element Timing		T
	25	Undefined		

Figure 2-6: - General PC Connector pinouts – DB25M

	PIN	SIGNAL
	1	Data Carrier Detect
	2	Received Data
	3	Transmitted Data
	4	Data Terminal Ready
DB9 Male	5	Signal Ground
	6	Data Set Ready
	7	Request to Send
	8	Clear to Send
	9	Ring Indicator

Figure 2-7: - General PC Connector Pinouts – DB9M

Serial

FS-X20

RJ45 Male Modular
Jack

ORANGE/WHITE
(RJ45-08)

BROWN
(RJ45-01)

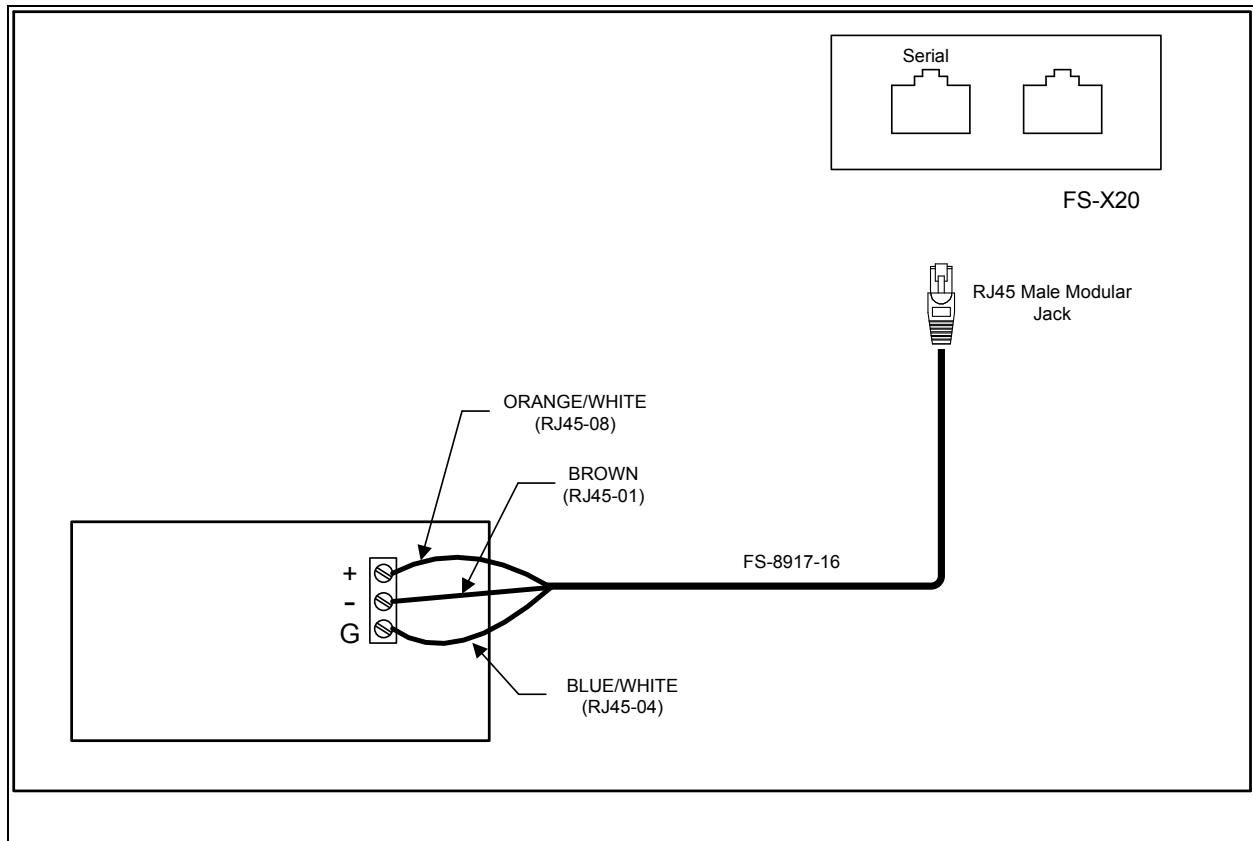FS-8917-16

+
-
G

BLUE/WHITE
(RJ45-04)

Figure 2-8: - RS-485 Connection pinouts on the serial RJ45 port.

3. Operation

3.1. Install and Run the Utility Software

The FieldServer is shipped with a utility CD-ROM containing all the utility software that needs to be installed.

All configuration file transfers and system diagnostics are executed via the RUI or "Remote User Interface" which is installed with the utility software.

Insert the supplied Utility CD into the PC and follow the installation instructions on the screen.

Once installed, the FieldServer Utilities can be located in the Windows Start menu.

Refer to the FieldServer Utilities manual for information on how to connect to the FieldServer via serial or Ethernet ports.

3.2. Use PING to Identify the FieldServer on the Network

- Select Start|Programs|FieldServer Utilities, browse to the Ping Utility and select it
- The display should show
  FieldServer Name
  IP Number (192.168.2.X)
  FieldServer Version
- If it does not (even after repeated attempts) then either the network cabling is incorrect or the computer network card is faulty or incorrectly configured.
- Check the Ethernet Link OK LED displayed on the FieldServer. This LED will be lit if the 10/100BaseT cable is good. (Refer to Appendix B)
- Check the "Activity" LED on the Ethernet connection (see Figure 2-3), this should flash at least once every 2 seconds if RUI is still running, and perhaps more often, depending on network traffic. (Refer to Appendix B)
- Check that the IP netmask of the PC matches the FieldServer. This means the first three sections of both IP addresses match.

- Confirm that there is an Ethernet adapter installed in the PC's Device Manager List, and that it is configured to run the TCP/IP protocol.
- If using Windows XP, ensure that the firewall is disabled.

3.3. Connect using "Remote User Interface" (RUINET)

Browse to the Remote User Interface icon in the Start menu directory and click on it - the RUI menu screen should appear.

Refer to the FieldServer Utilities manual for further information.

3.4. Use RUINET to change the FieldServer IP Address and Network

Should it be necessary to change the IP address of the FieldServer, this can be done via the "*I*" screen on Ruinet. Refer to the FieldServer Utilities manual for details.

3.5. Upload the Default Configuration

NOTE: Refer to the Configuration Manual and the Driver Manual(s) provided with the FieldServer for further information on configuration files.

The configuration of the FieldServer is provided to the FieldServer's operating system via a comma-delimited file called "CONFIG.CSV". If ordered with the FieldServer, the custom configuration is installed; (Reference documentation FS-8790-XX). If a custom configuration is not purchased, a template config.csv is loaded on the FieldServer to facilitate user configuration of the FieldServer.

The initial default configuration software will be loaded on the FieldServer. In the main menu of the Remote User Interface screen, type "*U*" to upload the configuration. Then type "*U*" again. The Utility will fetch the default configuration and put it into the Config File folder which is located in (Start|Programs|FieldServerUtilities|Configuration File folder).

3.6. Change the Configuration File to Meet the Application

Refer to the Configuration Manual in conjunction with the Driver supplements for information on configuring the FieldServer. *Note: FieldServer Technologies offers training on this topic as well as a configuration service to complete this portion of the work. See www.fieldserver.com for specific details.*

The simulation utility mb8sim.exe can be used to test configuration files. This file can be found with the latest Utility CD (v.14 and higher) or downloaded from the web. Instructions on its use can be found in the FieldServer Configuration Manual."

3.7. Download the Updated Configuration File

Before attempting to send files to the FieldServer, ensure that the files are in the configuration file folder. Refer to the FieldServer Utilities manual for further information.

- From the main menu, type "*D*".
- Type "*L*" to specify the name and extension of the file to be sent to the FieldServer. Hit **<Enter>** when done.
- The Utility will automatically select config.csv for download of csv files. On rare occasions where other files need to be downloaded to the FieldServer type "*O*" for other files, then type "*R*" to specify the remote filename needed on the FieldServer.
- When satisfied that the correct file names are specified, Type "*D*" to send the file to the FieldServer. The utility will display a menu showing download progress.

- *Note: Wait until the utility indicates that download is complete before resetting the FieldServer or you could corrupt the FieldServer.*
- Once download is complete, type **<Esc>** to get back to the main menu and use the "*!*" option (or simply cycle power to the FieldServer) to put the new file into operation.
  Note that it is possible to do multiple downloads to the FieldServer before resetting it.
- (Firmware created by FieldServer Technologies can be downloaded from the configuration file by simply typing "*F*" from the download menu.)
  Note that FieldServer usually supplies firmware upgrades as an install.zip, for which a separate procedure is used, see FieldServer utilities Manual for more information.

3.8. Test and commission the FieldServer

- Connect the FieldServer to the third party device(s), and test the application.
- Should you experience problems, refer to the Troubleshooting manual which can be found in the FieldServer utilities directory under Documentation.
- Before contacting FieldServer technical support, create a log by using Serial and Capture Utility (Ruidebug) to take a snapshot or a serial capture log – see FieldServer Utilities Manual for more information. Send this log together with the configuration file to support@fieldserver.com for evaluation.
  Note that application notes and other resources are available on the web at www.fieldserver.com.
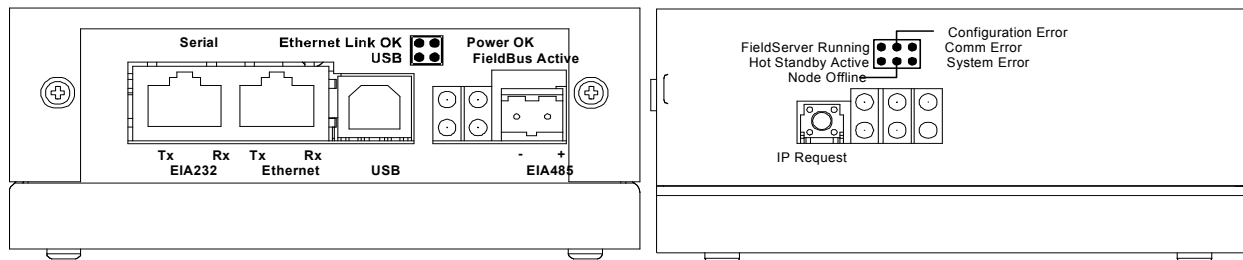
Appendix A.   Limited Warranty

FieldServer Technologies warrants its products to be free from defects in workmanship or material under normal use and service for two years after date of shipment. FieldServer Technologies will repair or replace without charge any equipment found to be defective during the warranty period.   Final determination of the nature and responsibility for defective or damaged equipment will be made by FieldServer Technologies personnel.

All warranties hereunder are contingent upon proper use in the application for which the product was intended and do not cover products which have been modified or repaired without FieldServer Technologies approval or which have been subjected to accident, improper maintenance, installation or application, or on which original   identification marks have been removed or altered.   This Limited Warranty also will not apply to interconnecting cables or wires, consumables or to any damage resulting from battery leakage.

In all cases FieldServer Technology's responsibility and liability under this warranty shall be limited to the cost of the equipment. The purchaser must obtain shipping instructions for the prepaid return of any item under this warranty provision and compliance with such instruction shall be a condition of this warranty.

Except for the express warranty stated above, FieldServer Technologies disclaims all warranties with regard to the products sold hereunder including all implied warranties of merchantability and fitness and the express warranties stated herein are in lieu of all obligations or liabilities on the part of FieldServer Technologies for damages including, but not limited to, consequential damages arising out of/or in connection with the use or performance of the product.

Appendix B.   LED Functions

Light	Description
Ethernet Link OK.	This light relates to the Ethernet network port provided on the FieldServer. The **Ethernet Link OK** light shows steady green when the physical connection to the network hub is healthy. The **Rx** (Receive) light flashes green when the FieldServer is receiving data from the network. The frequency of flashing is directly related to the network activity. It does not necessarily mean data is being received by the FieldServer. The **Tx** (Transmit) light flashes yellow when the FieldServer is sending data. The frequency of flashing is directly proportional to the frequency of data transmission.
Power OK	This is the power light and should show steady green at all times when the FieldServer is powered.
Fieldbus Active	This light should show steady green when the Fieldbus connection is active.
FieldServer Running	The light should flash green once per second once the FieldServer has booted up. *Note that it may take a while from power up to booting up the FieldServer if the loaded configuration is particularly large. The light indicates that the FieldServer firmware is running.*
Configuration Error	A steady amber light will indicate a configuration error exists in the active configuration. See the Error Screen in the Remote User Interface for a description of the configuration error.
Comm Error	A steady red light will indicate the communications problem if there is a configured node connected to the FieldServer that is offline. To establish the cause of the error, go to the error screen of the RUI interface.
Hot Standby Active	Not applicable
Node Offline	An amber light will flash when a configured node on the FieldServer is detected as being offline. The flash will repeat after every unsuccessful retry.
System Error	A steady red light will indicate there is a system error on the FieldServer. If this occurs, immediately report the related "system error" shown in the error screen of the RUI interface to FieldServer Technologies for evaluation.
EIA-232	These lights, built into the connector, are related to the RS-232 serial port provided on the FieldServer. The **Rx** (Receive) light flashes green when the FieldServer is receiving data and the **Tx** (Transmit) light flashes yellow when the FieldServer is sending data. The frequency of flashing is directly proportional to the frequency of data transfer.

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