



FieldServer

QuickServer Start-up Guide

FS-QS-1011/12X0/12X1/1X50/1X51



APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after July 2020.

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1 QUICKSERVER DESCRIPTION

QuickServer is a high performance, cost effective Building and Industrial Automation multi-protocol gateway providing protocol translation between serial, Ethernet, and LonWorks¹ devices and networks.

NOTE: For troubleshooting assistance refer to [Appendix B](#), or any of the troubleshooting appendices in the related driver supplements. Check the [Sierra Monitor website](#) for technical support resources and documentation that may be of assistance.

The QuickServer is cloud ready and connects with MSA Safety's SMC Cloud. See [Section 8.5.1](#) for further information.

2 SUPPLIED EQUIPMENT

QuickServer Gateway

- Preloaded with two selected drivers (on the FS-QS-1X11 and FS-QS-12X1 one of those drivers is LonWorks). A sample configuration file is also pre-loaded onto the QuickServer.
- All instruction manuals, driver manuals, support utilities are available on the USB drive provided in the optional accessory kit, or on the [Sierra Monitor website](#).

Accessory kit (optional) (Part # FS-8915-36-QS) includes:

- 7-ft Cat-5 cable with RJ45 connectors at both ends
- Power Supply -110/220V (p/n 69196)
- DIN rail mounting bracket
- Screwdriver for connecting to terminals
- USB Flash drive loaded with:
 - QuickServer Start-up Guide
 - FieldServer Configuration Manual
 - All FieldServer Driver Manuals
 - Support Utilities
 - Any additional folders related to special files configured for a specific QuickServer
 - Additional components as required – see Driver Manual Supplement for details



¹ LonWorks is a registered trademark of Echelon Corporation.

3 CERTIFICATIONS

3.1 BTL Mark – BACnet² Testing Laboratory



BACnet is a registered trademark of ASHRAE. ASHRAE does not endorse, approve or test products for compliance with ASHRAE standards. Compliance of listed products to requirements of ASHRAE Standard 135 is the responsibility of the BACnet International. BTL is a registered trademark of the BACnet International.

The BTL Mark is a symbol that indicates that a product has passed a series of rigorous tests conducted by an independent laboratory which verifies that the product correctly implements the BACnet features claimed in the listing. The mark is a symbol of a high-quality BACnet product.

Go to www.BACnetInternational.net for more information about the BACnet Testing Laboratory. Click [here](#) for the BACnet PIC Statement.

3.2 LonMark Certification



LonMark International is the recognized authority for certification, education, and promotion of interoperability standards for the benefit of manufacturers, integrators and end users. LonMark International has developed extensive product certification standards and tests to provide the integrator and user with confidence that products from multiple manufacturers utilizing LonMark devices work together. MSA Safety has more LonMark Certified gateways than any other gateway manufacturer, including the QuickServer, ProtoCessor, ProtoCarrier and ProtoNode for OEM applications and the full featured, configurable gateways.

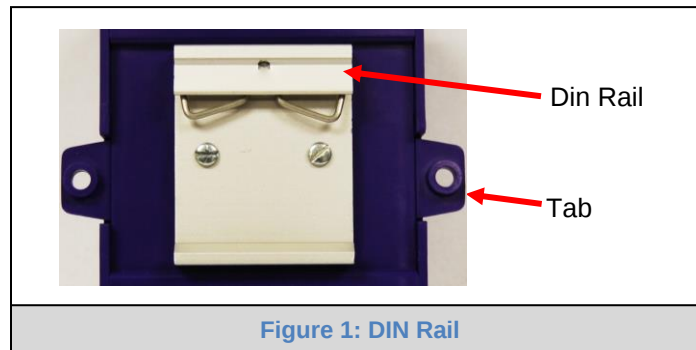
² BACnet is a registered trademark of ASHRAE.

4 QUICKSERVER SETUP

4.1 Mounting

The following mounting options are available:

- Product comes with tabs for wall or surface mount. These can be snapped off if not required.
- DIN rail mounting bracket – Included in the accessory kit or ordered separately (part # FS-8915-35-QS).



WARNING: Install only as instructed, failure to follow the installation guidelines or using screws without the DIN rail mounting bracket could result in permanent damage to the product. If the FieldServer is removed from the DIN rail, use the original screws to reattach. Only screws supplied by MSA Safety should be used in the holes found on the back of the unit when attaching the optional DIN Rail bracket. **USE OF ANY OTHER SCREWS MAY DAMAGE THE UNIT.**

4.2 Dimensions

4.2.1 Dimension Drawing FS-QS-1X10-XXXX

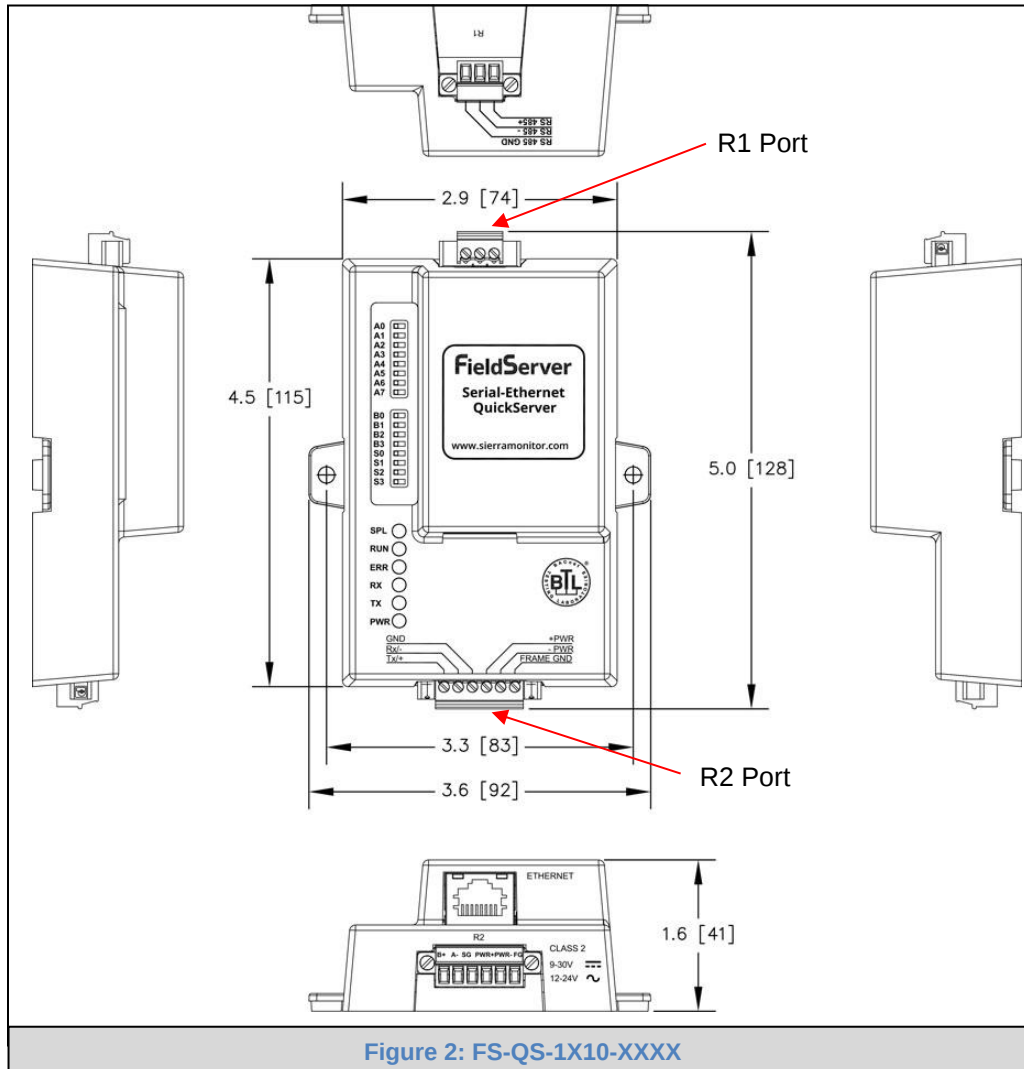


Figure 2: FS-QS-1X10-XXXX

4.2.2 Dimension Drawing FS-QS-1XX1-XXXX

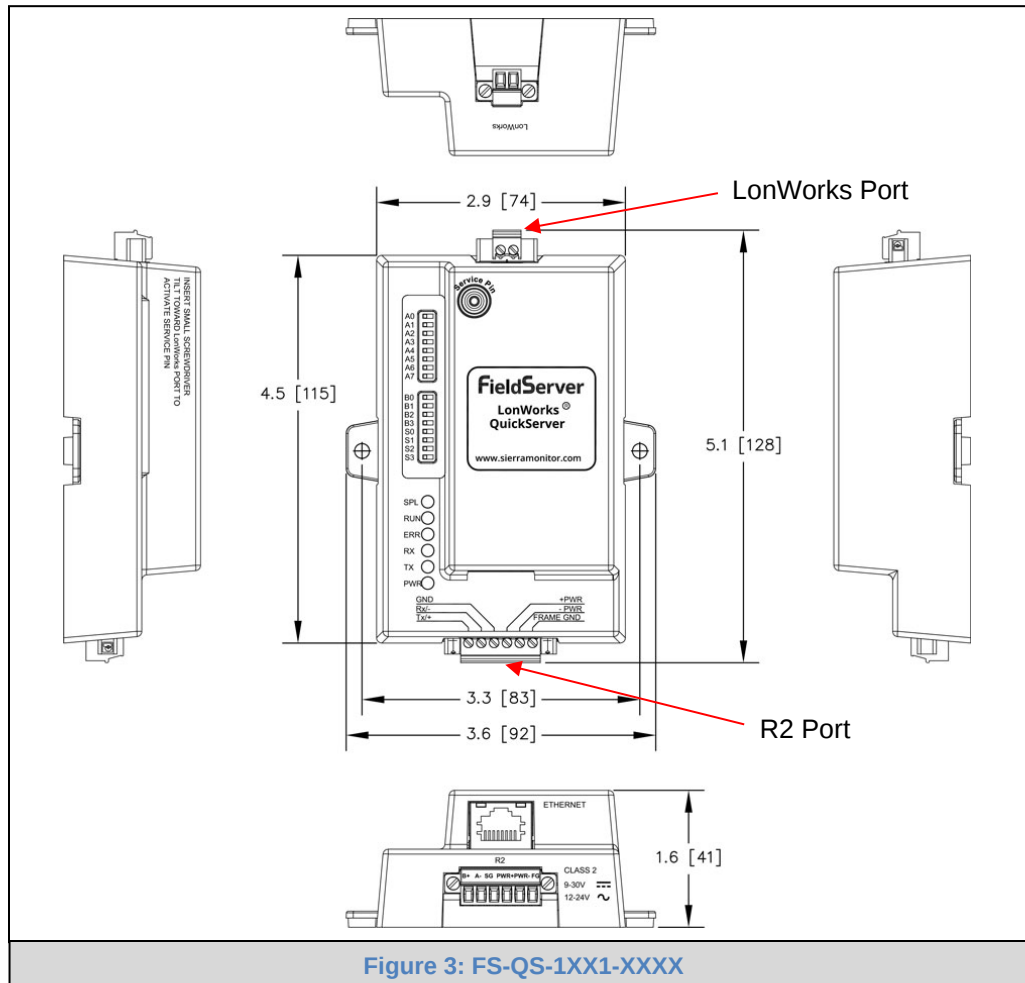


Figure 3: FS-QS-1XX1-XXXX

4.2.3 Dimension Drawing FS-QS-123X Models with RS-422

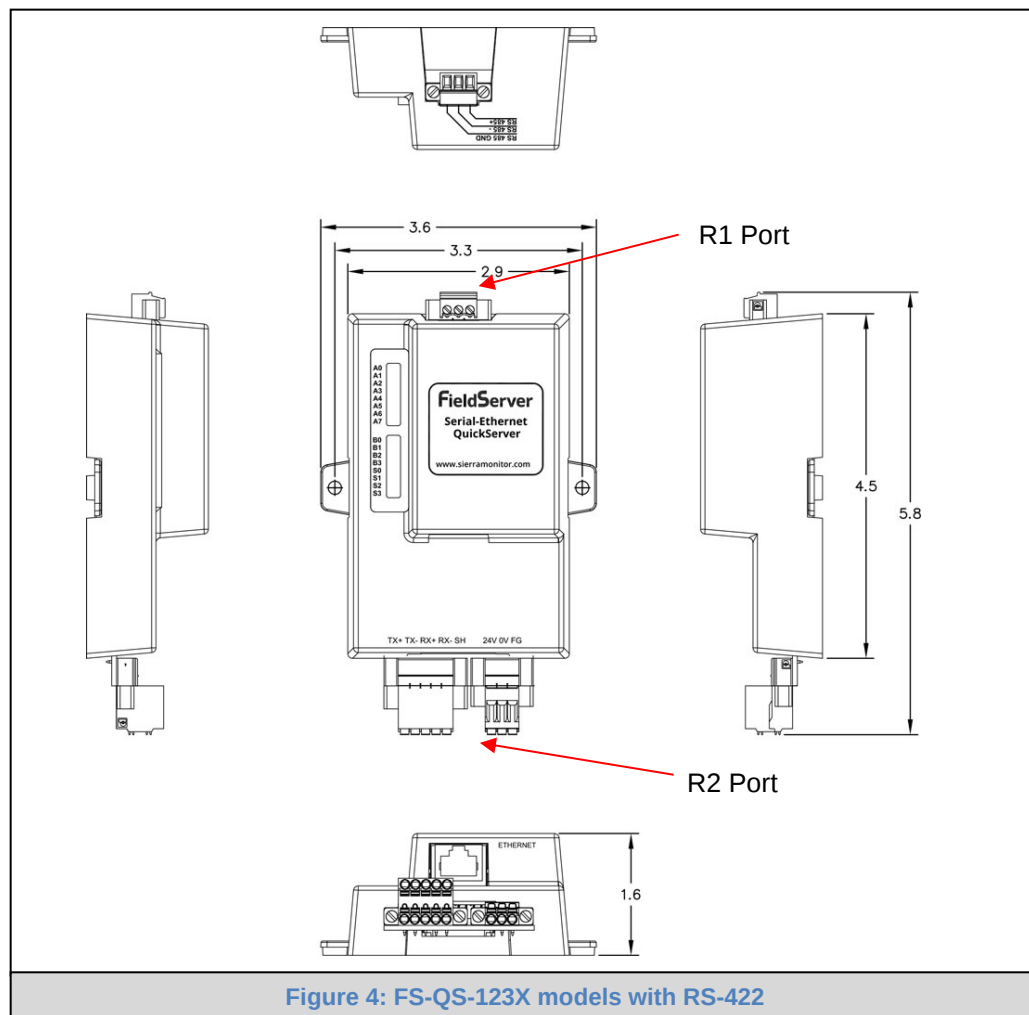


Figure 4: FS-QS-123X models with RS-422

4.3 R2 Port Jumper Settings

Gently remove the QuickServer enclosure to access the jumpers on the unit.

4.3.1 RS-485 Port

NOTE: The following Sections only apply to QuickServer models: FS-QS-1011 and FS-QS-1211.

4.3.1.1 Bias Resistors

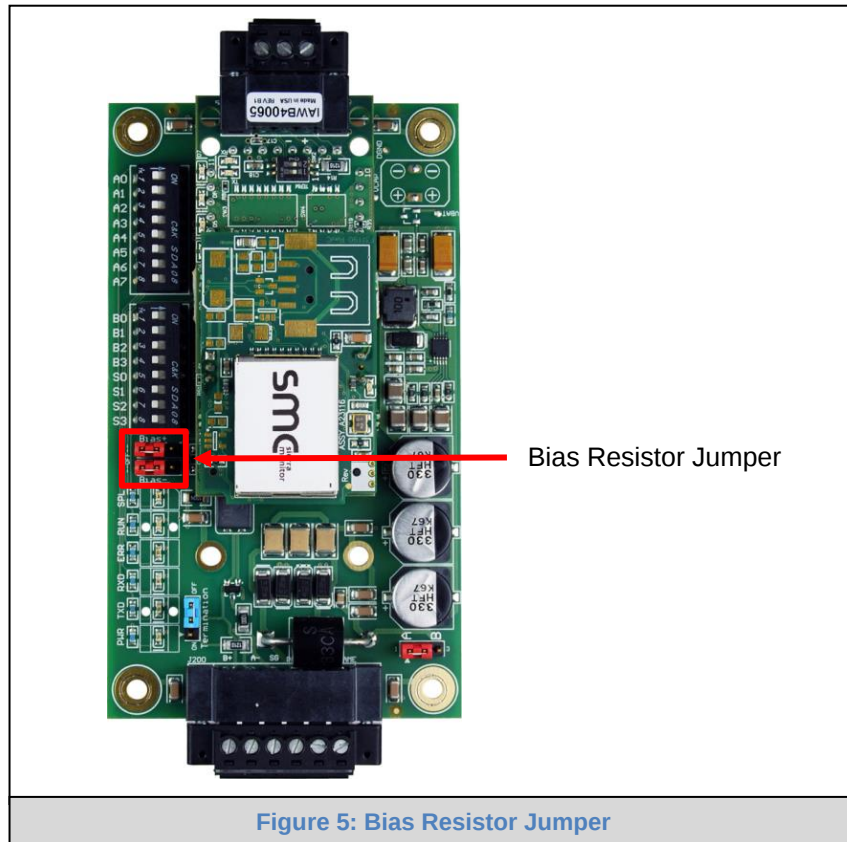


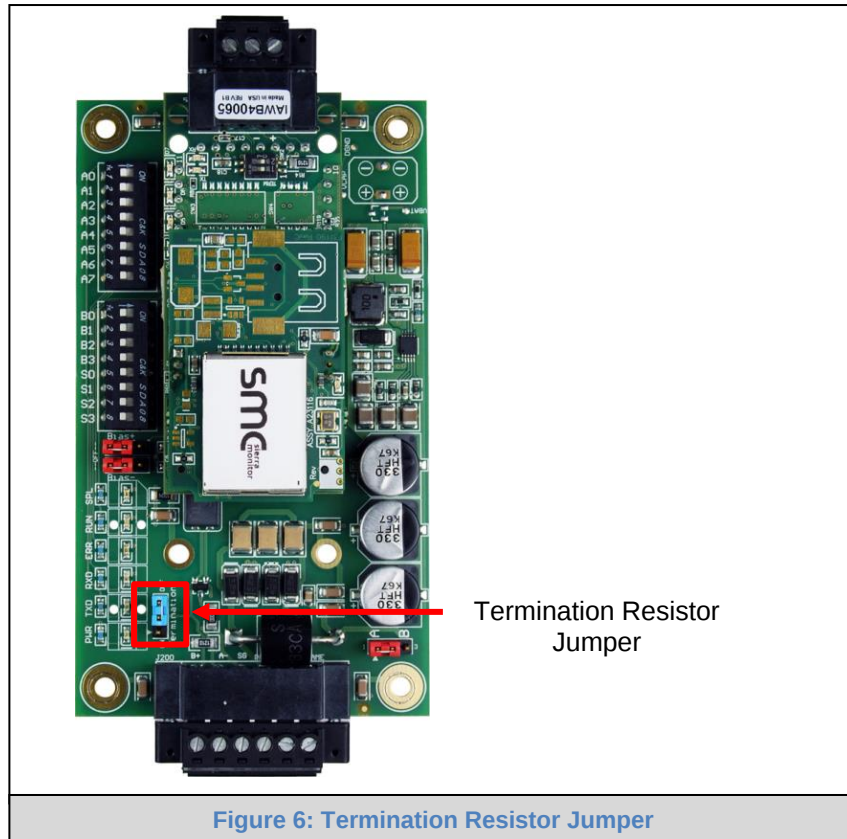
Figure 5: Bias Resistor Jumper

The QuickServer bias resistors are used to keep the RS-485 bus to a known state, when there is no transmission on the line (bus is idling), to help prevent false bits of data from being detected. The bias resistors typically pull one line high and the other low - far away from the decision point of the logic.

In the RS-485 carrier, the bias resistor is 510 ohms which is in line with the BACnet spec. It should only be enabled at one point on the bus (on the field port were there are very weak bias resistors of 100k). Since there are no jumpers, many FieldServers can be put on network without running into the bias resistor limit which is < 500 ohms.

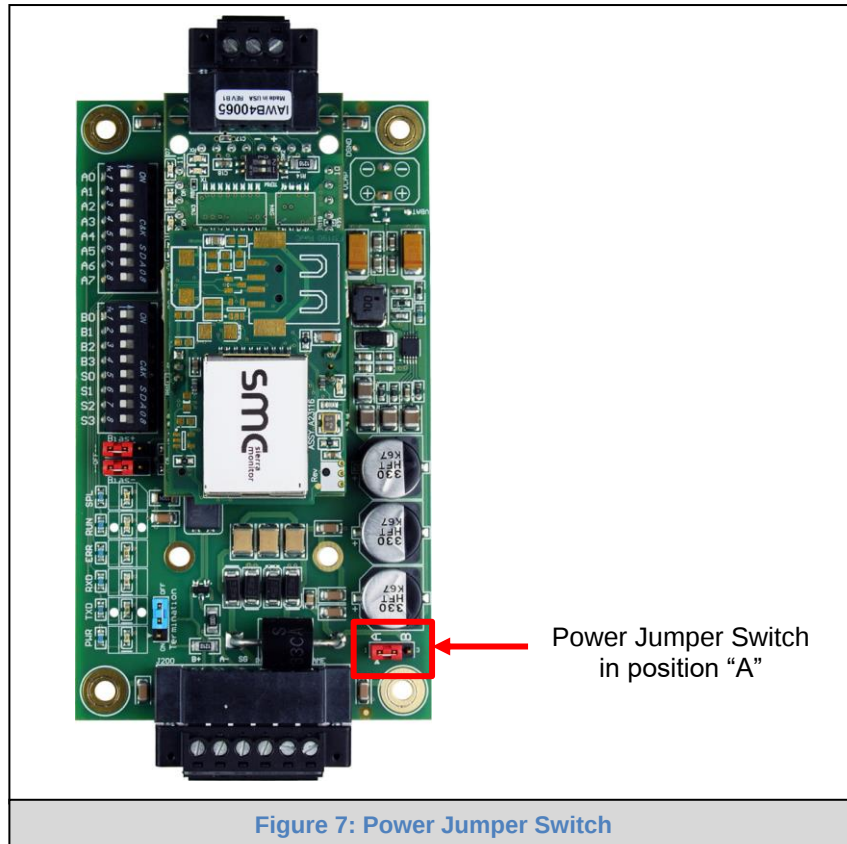
NOTE: See www.ni.com/support/serial/resinfo.htm for additional pictures and notes.

4.3.1.2 Termination Resistor



Termination resistors are also used to reduce noise. These pull the two lines of an idle bus together. However, they would override the effect of any bias resistors, if connected.

4.3.1.3 Power Jumper Settings



The QuickServer Carrier Board power jumper is set to position A by default but can be changed to position B for other power supply requirements.

Position A: The Carrier makes use of a full-wave rectifying bridge. Can be used for 12-24VAC input or 9 – 30VDC input. At 9VDC this becomes marginal.

Position B: The Carrier makes use of a half-wave rectifying bridge. Best position for grounded AC transformers and for using DC voltage down to 9VDC.

4.3.2 M-Bus Port: Master/Slave Jumper

NOTE: The following only applies to models: FS-QS-1A50, FS-QS-1A51, FS-QS-1B51, FS-QS-1B51, FS-QS-1C51 and FS-QS-1C51.

The Master/Slave jumper is used to set the M-Bus hardware as a Master or Slave device (indicated by the labels on the board).

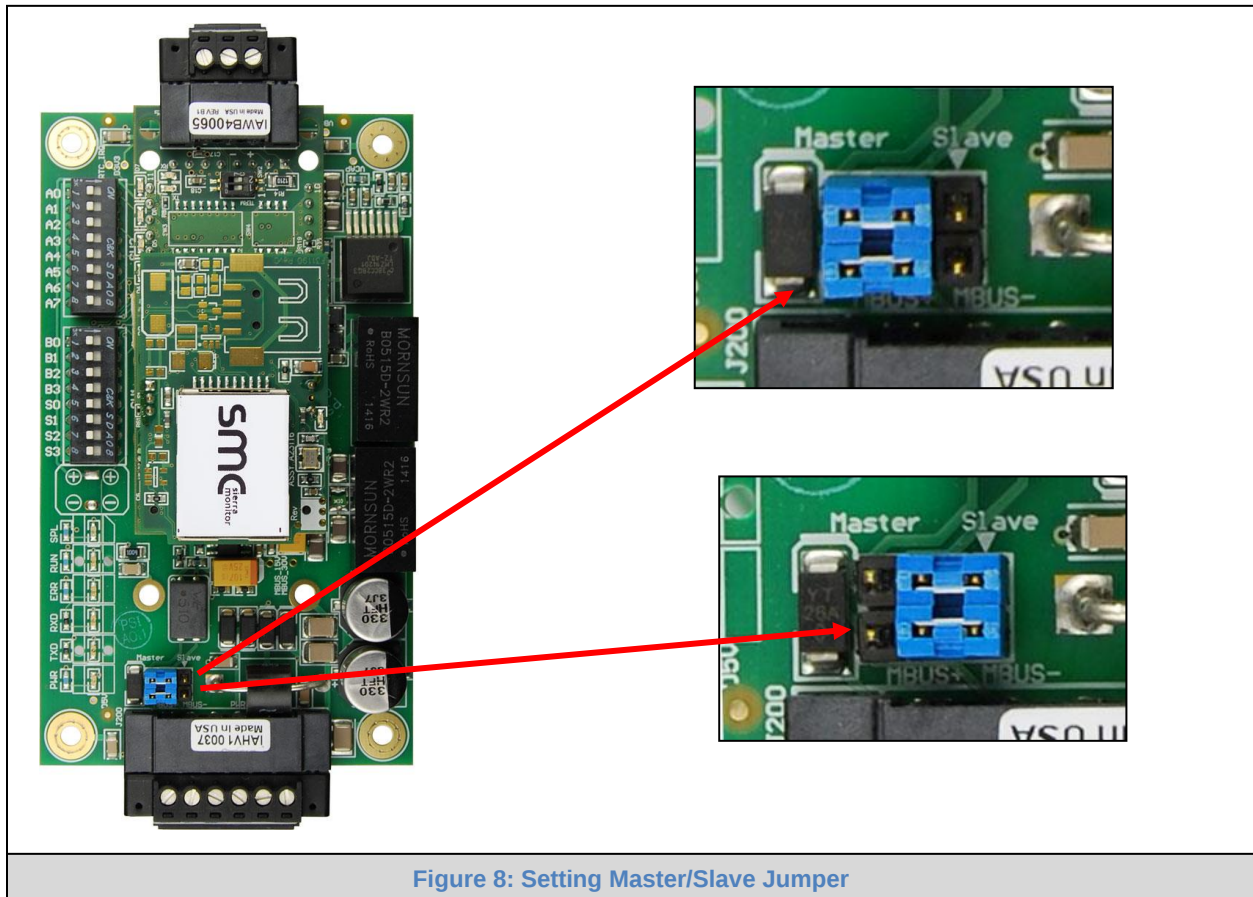


Figure 8: Setting Master/Slave Jumper

4.4 R1 Port Small DIP Switches

Gently remove the QuickServer enclosure to access the small DIP switches for the R1 Port.

4.4.1 RS-485 Port

NOTE: The following only applies to QuickServer models FS-QS-1XX0 or all non-LonWorks models.

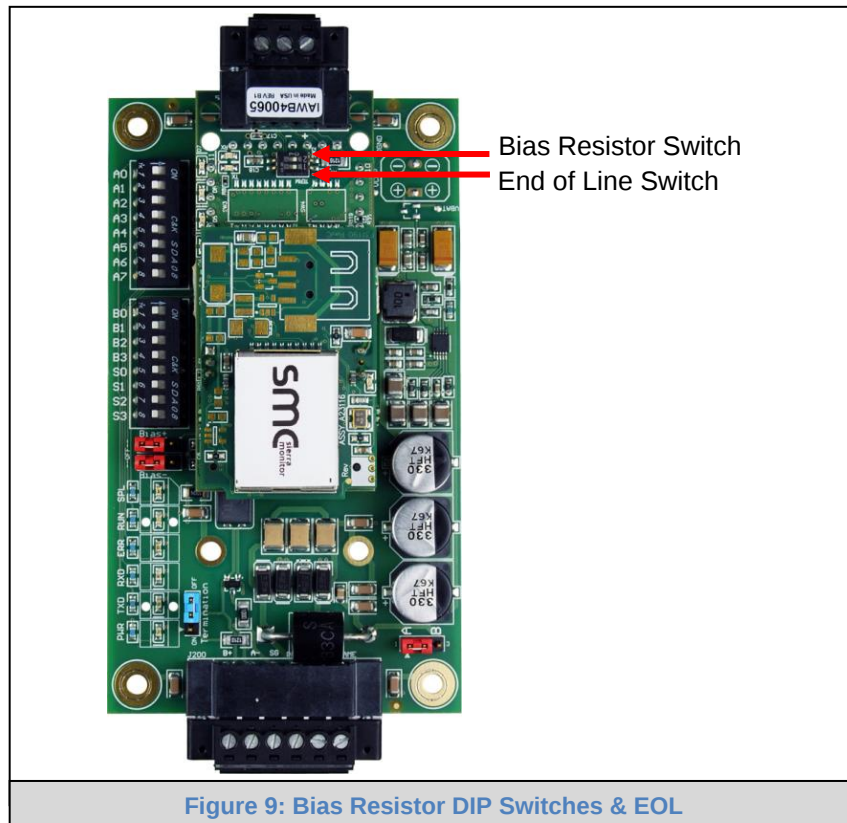


Figure 9: Bias Resistor DIP Switches & EOL

- If more than one RS-485 device is connected to the network, then the field bias resistor switch needs to be enabled to ensure proper communication. See [Figure 9](#) for the orientation of switch positions referenced below.
 - The default factory setting is OFF (switch position = right side)
 - To enable biasing, turn the bias switch ON (switch position = left side)

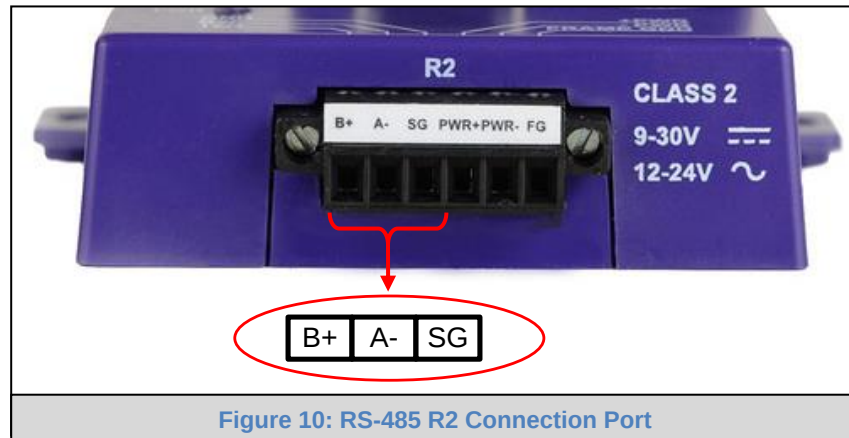
NOTE: Biasing only needs to be enabled on one device. The QuickServer has 510-ohm resistors that are used to set the biasing.

- If the FieldServer is the last device on the trunk, then the end of line (EOL) termination switch needs to be enabled. See [Figure 9](#) for the orientation of switch positions referenced below.
 - The default factory setting is OFF (switch position = right side)
 - To enable the EOL termination, turn the EOL switch ON (switch position = left side)

5 INSTALLING THE QUICKSERVER

5.1 RS-485

5.1.1 RS-485 Connection R2 Port



Connect to the 3 pins on the left-hand-side of the 6-pin connector as shown.

The following Baud Rates are supported on the R2 Port:

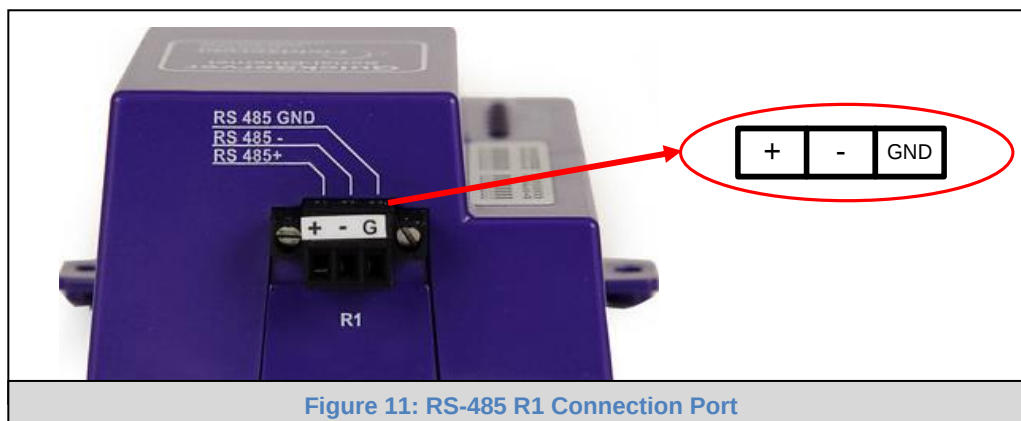
4800, 9600, 19200, 38400, 57600, 115200

For connection details to RS-232 or RS-422, refer to [Appendix A.1](#).

5.1.2 RS-485 Connection R1 Port

NOTE: The following only applies to non-LonWorks QuickServers with an RS-435 R1 port.

Connect to the 3-pin connector as shown.



The following Baud Rates are supported on the R1 Port:

110, 300, 600, 1200, 2400, 4800, 9600, 19200, 20833, 28800, 38400, 57600, 76800, 115200

5.2 QuickServer LonWorks (FS-QS-1XX1-XXXX)

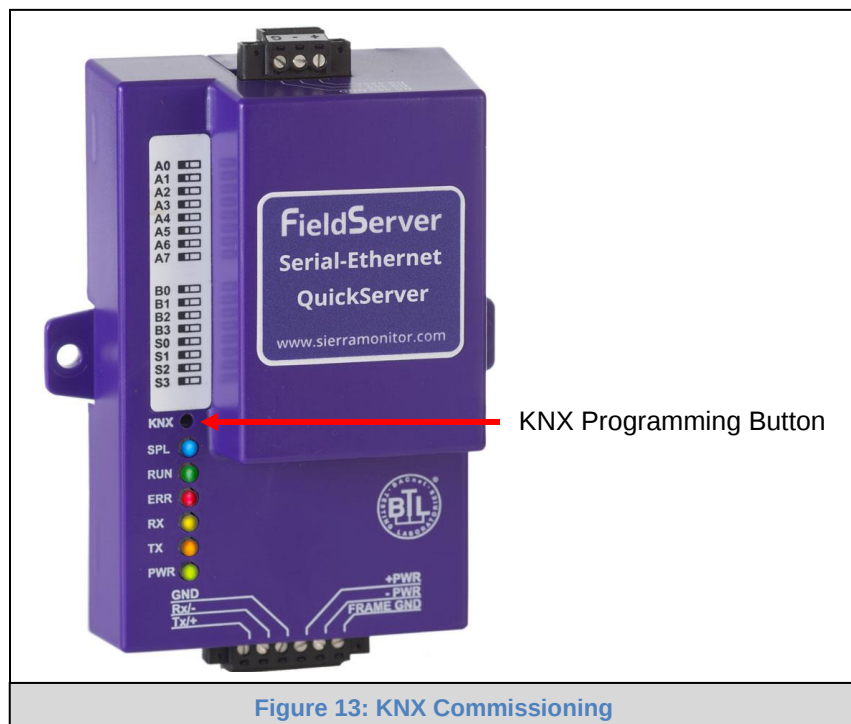
Connect the QuickServer to the LonWorks terminal using a twisted pair non-shielded cable.



To commission the QuickServer LonWorks port, insert a small screwdriver in the commissioning hole on the face of the QuickServer's enclosure to access the Service Pin. See the instructions on the QuickServer as to which way to toggle the screwdriver during commissioning.

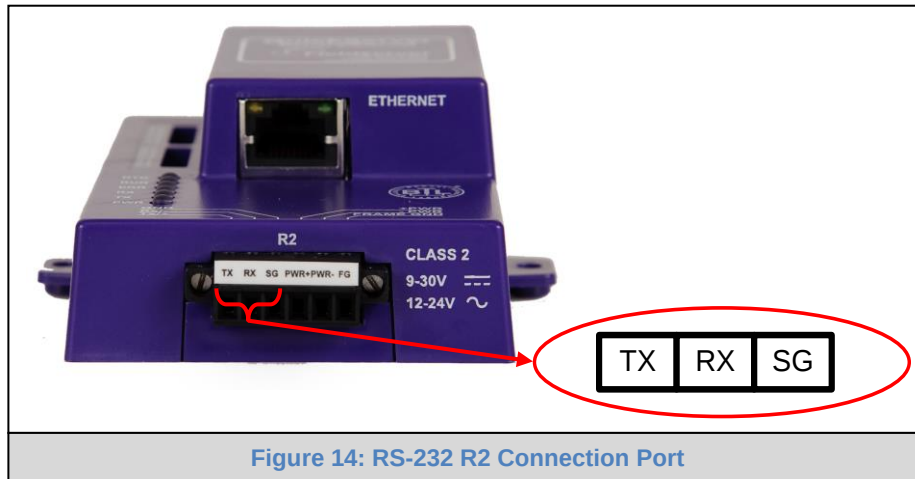
5.3 QuickServer KNX (FS-QS-124X-XXXX)

Connect the QuickServer to the KNX bus using the standard KNX twisted pair cable.



To commission the QuickServer as a KNX device in ETS Software, insert a small pin into the KNX commissioning hole on the face of the QuickServer to access the button.

5.4 RS-232 Connection R2 Port (only available on FS-QS-122X Models)



Refer to [Appendix A2](#) for further hardware connection options.

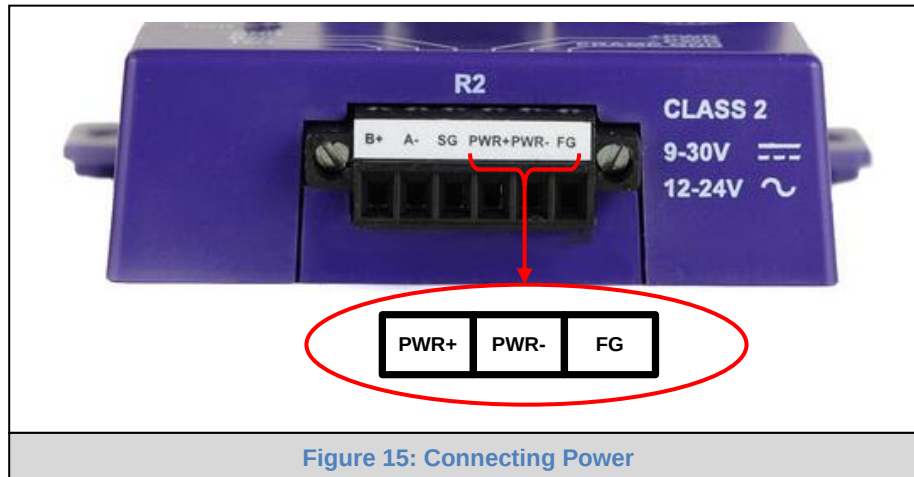
The following Baud Rates are supported on the R2 Port:

4800, 9600, 19200, 38400, 57600, 115200

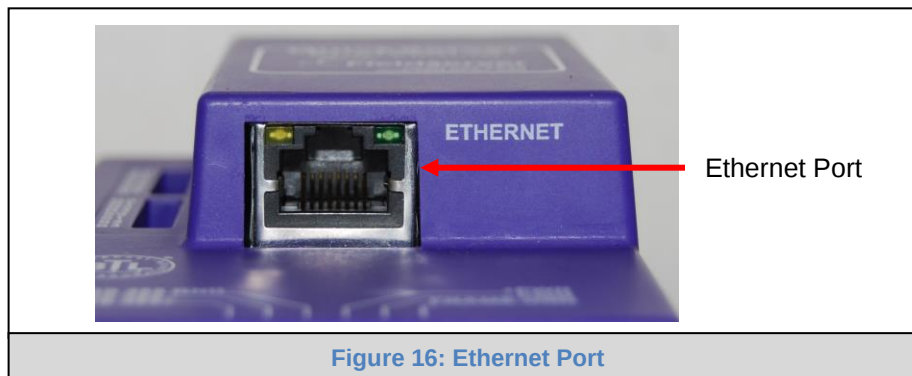
6 OPERATION

6.1 Power Up the Device

Apply power to the device. Ensure that the power supply used complies with the specifications provided. Ensure that the cable is grounded using the "Frame GND" terminal. The QuickServer is factory set for 9-30V DC or 12-24V AC.



6.2 Connect the PC to the QuickServer Over the Ethernet Port



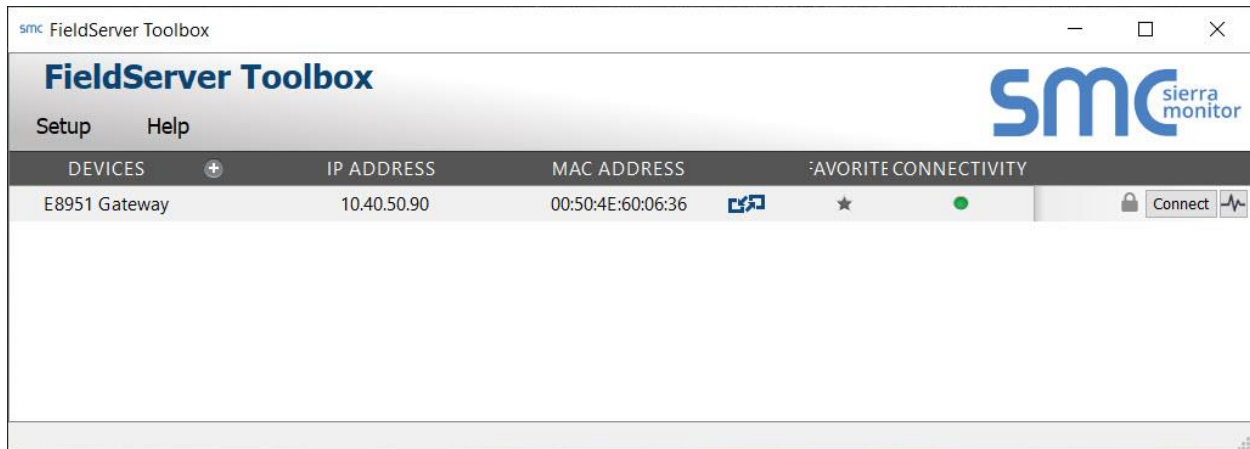
- Connect an Ethernet cable between the PC and QuickServer or connect the QuickServer and the PC to the switch using a straight Cat-5 cable.
- The Default IP Address of the QuickServer is **192.168.2.101**, Subnet Mask is **255.255.255.0**.

6.3 Connecting to the QuickServer

6.3.1 Using the FieldServer Toolbox to Discover and Connect to the QuickServer

- Install the Toolbox application from the USB drive or download it from the [Sierra Monitor website](#).
- Use the FS Toolbox application to find the QuickServer and launch the FS-GUI.

NOTE: If the connect button is greyed out, the QuickServer's IP Address must be set to be on the same network as the PC. (Section 8.1)



6.3.2 Using a Web Browser to Connect to the QuickServer

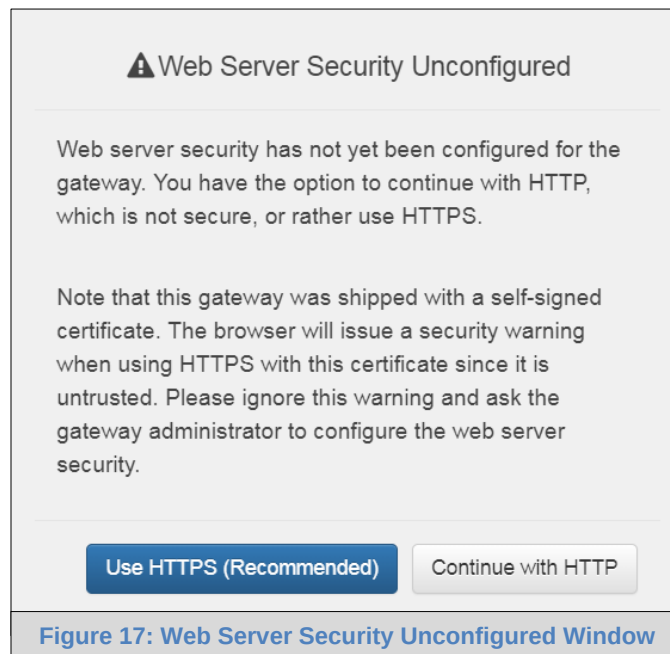
- Open a web browser and connect to the QuickServer's default IP Address. The default IP Address of the FieldServer is **192.168.2.101**, Subnet Mask is **255.255.255.0**.
- If the PC and the QuickServer are on different IP networks, assign a static IP Address to the PC on the 192.168.2.X network.

7 SETUP WEB SERVER SECURITY

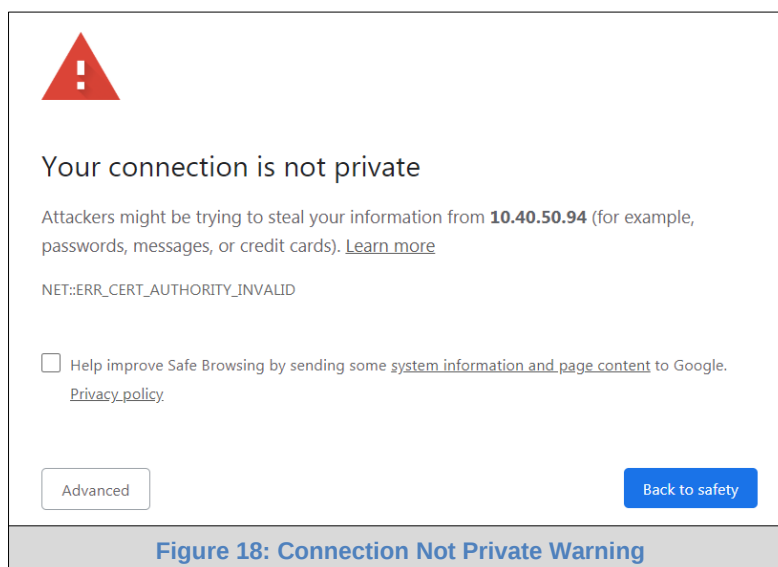
7.1 Login to the FieldServer

The first time the FieldServer GUI is opened in a browser, the IP Address for the gateway will appear as untrusted. This will cause the following pop-up windows to appear.

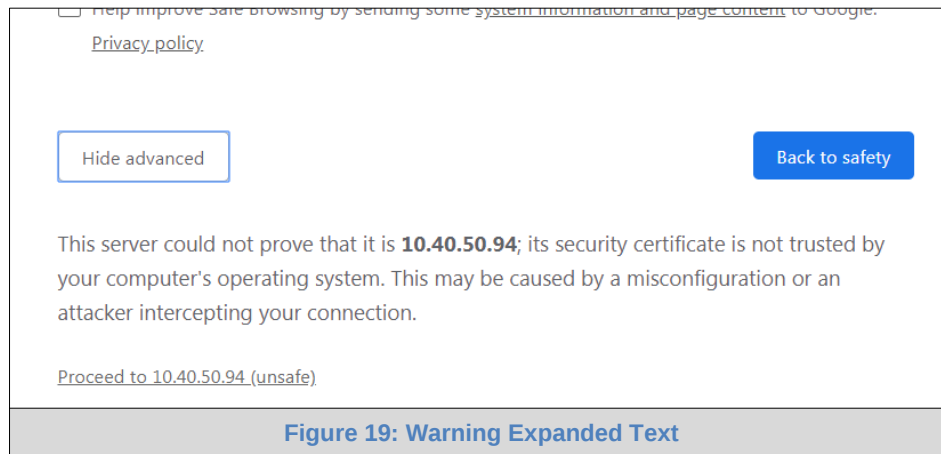
- When the Web Server Security Unconfigured window appears, read the text and choose whether to move forward with HTTPS or HTTP.



- When the warning that "Your connection is not private" appears, click the advanced button on the bottom left corner of the screen.

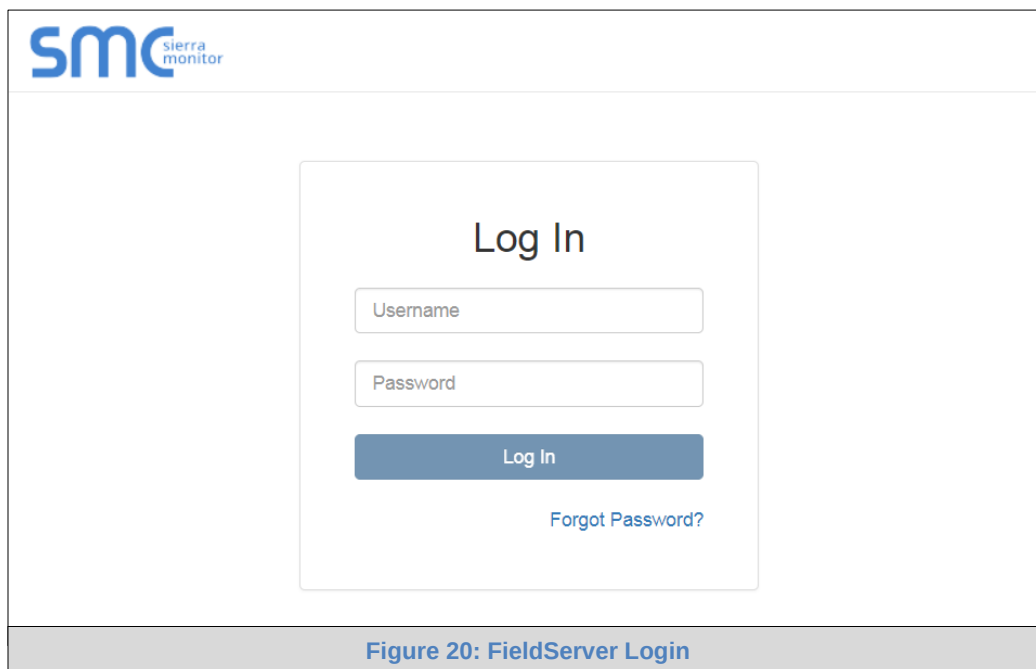


- Additional text will expand below the warning, click the underlined text to go to the IP Address. In the **Figure 19** example this text is “Proceed to 10.40.50.94 (unsafe)”.



- When the login screen appears, put in the Username (default is “admin”) and the Password (found on the label of the FieldServer).

NOTE: There is also a QR code in the top right corner of the FieldServer label that shows the default unique password when scanned.

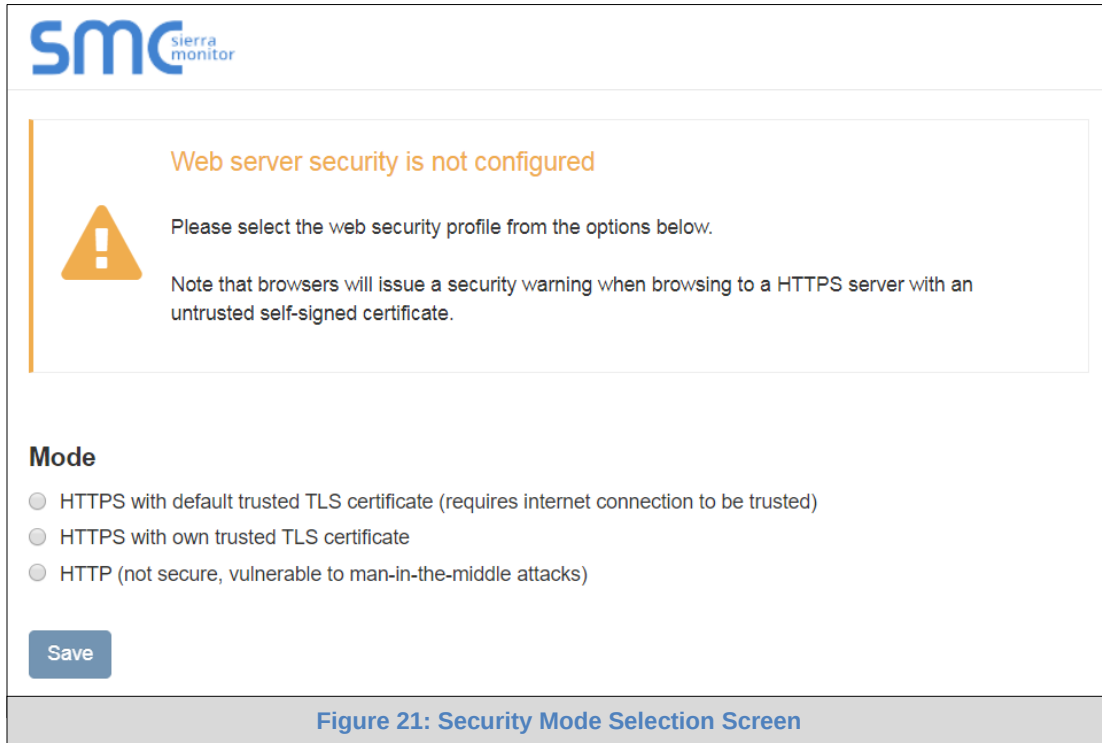


NOTE: A user has 5 attempts to login then there will be a 10-minute lockout. There is no timeout on the FieldServer to enter a password.

NOTE: To create individual user logins, go to **Appendix C.5**.

7.2 Select the Security Mode

- On the first login to the FieldServer, the following screen will appear that allows the user to select which mode the FieldServer should use.



The screenshot shows the SMC Sierra Monitor web interface. At the top left is the SMC logo. Below it, a warning message is displayed in a light gray box with an orange border. The message reads: "Web server security is not configured" in orange text, followed by "Please select the web security profile from the options below." and "Note that browsers will issue a security warning when browsing to a HTTPS server with an untrusted self-signed certificate." Below this, under the heading "Mode", there are three radio button options: "HTTPS with default trusted TLS certificate (requires internet connection to be trusted)", "HTTPS with own trusted TLS certificate", and "HTTP (not secure, vulnerable to man-in-the-middle attacks)". At the bottom left of the form is a blue "Save" button. The entire form is enclosed in a light gray border.

Web server security is not configured

Please select the web security profile from the options below.

Note that browsers will issue a security warning when browsing to a HTTPS server with an untrusted self-signed certificate.

Mode

- ☐ HTTPS with default trusted TLS certificate (requires internet connection to be trusted)
- ☐ HTTPS with own trusted TLS certificate
- ☐ HTTP (not secure, vulnerable to man-in-the-middle attacks)

Save

Figure 21: Security Mode Selection Screen

NOTE: Cookies are used for authentication.

NOTE: To change the web server security mode after initial setup, go to [Appendix C.4](#).

The sections that follow include instructions for assigning the different security modes.

7.2.1 HTTPS with Own Trusted TLS Certificate

This is the recommended selection and the most secure.

- Once this option is selected, the Certificate, Private Key and Private Key Passphrase fields will appear under the mode selection.

Certificate

XzyMbQZFIRuJZJPe7CTHLcHOrHLowoUFoVTaBMYd4d6VGdNklKazByWKcNOL7mrX
A4lBAQBFM+IPvOx3T/47VEmaiXqE3bx3zEuBFJ6pWPlw7LHf2r2ZoHw+9xb+aNMU
dVvAelhBMTMsnI2ERvQVp0xj3psSv2EJyKXS1bOYNRLsq7UzpwuAdT/Wy3o6vUM5
K+Cwf9qEoQ0LUXDZTIECt67MkcHMiuFi5pk7TRicHnQF/sfOAYOulduHOy9exlk9
FmHFVDIZt/cJUaF+e74EuSph+qEr0IQo2wvmhyc7L22UXse1NoOfU2Zq0Eu1VVtu
JRryaMWIRFEWuuzMGZtKFWVC+8q2JQsVcqiRWM7naoblEhOCMH+sKHJMCxDoXGt
vtZjpZUoAL51YXxWSVcyZdGiAP5e
-----END CERTIFICATE-----

Private Key

-----BEGIN RSA PRIVATE KEY-----
sHB0zZoHr4YQSDk2BbYVzzbl0LDuKtc8+JiO3ooGjoTuHnqkeAj/fkfbTAsKeAzW
gKQe+H5UQNK0bdvZfOJrm6daDK2vDmR5k+juUhej5N49uplroB97MQgYotzqfT+
THlbpq5t1SIK617k04ObKmHF5l8fck+ru545sVmpeezh0m5j5SURYAZMvbg5daCu
J4l5NlihbEvxRF4UK41ZDMCvujopC BKUWrb1a/3XXnDnM2K9xyz2wze998D6Wk46
+7aOFY9F+7j5ljmkoS3GYtwCyH5iP+mPP1K6RnuiD019wvGPb4dtN/RTnfd0eF
GYeVskl9fxkxDOFtdWRZbM/rPjn4tmO1Xf8HqONVN1x/iaMynOXG4cukoi4+VO
u0rZaUEsII2zNkfrn7fAASm5NBWg202Cy9IAYnuujs3aALl5uGBeekA62oTMxlzx
-----END RSA PRIVATE KEY-----

Private Key Passphrase

Specify if encrypted

Save

Figure 22: Security Mode Selection Screen

- Copy and paste the Certificate and Private Key text into their respective fields. If the Private Key is encrypted type in the associated Passphrase.
- Click Save.
- A “Redirecting” message will appear. After a short time, the Web Configurator page will open.

7.2.2 HTTPS with Default Untrusted Self-Signed TLS Certificate or HTTP with Built-in Payload Encryption

- Simply select one of these options and click the Save button.
- A “Redirecting” message will appear. After a short time, the Web Configurator page will open.

8 CONFIGURING THE QUICKSERVER

Once the web server setup is complete, the FS-GUI landing page will appear.

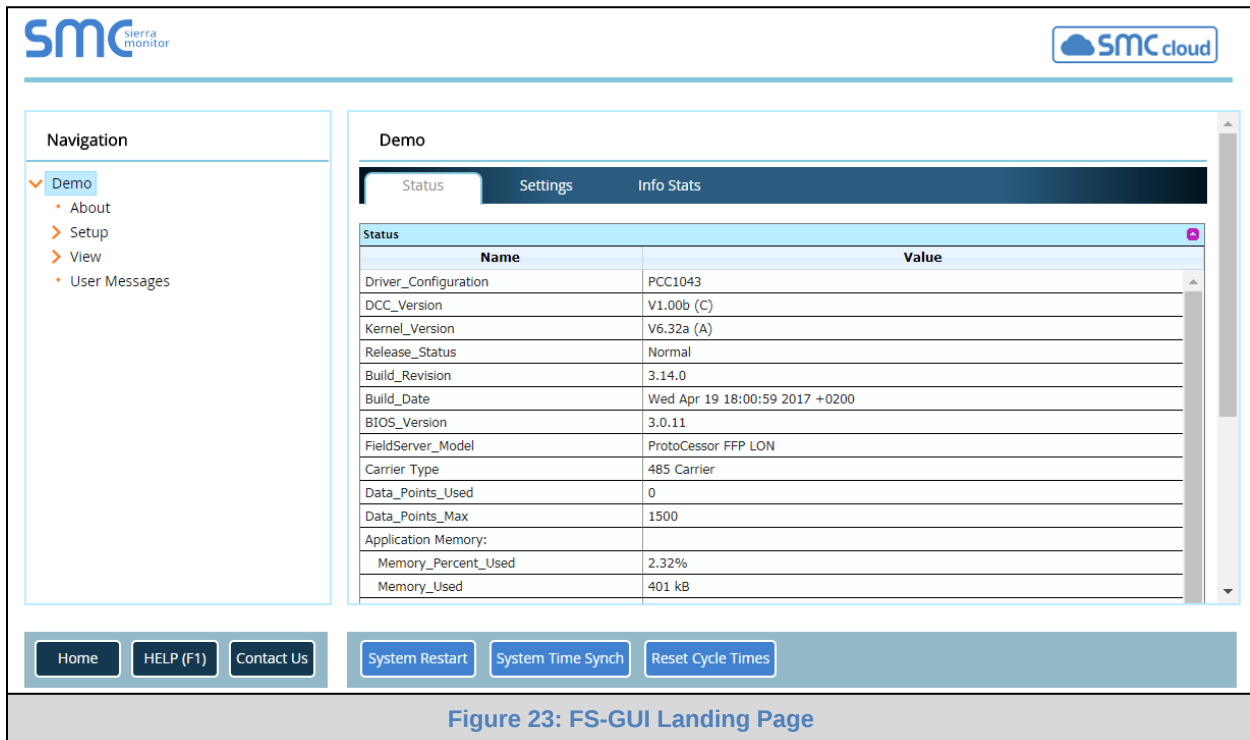


Figure 23: FS-GUI Landing Page

NOTE: The SMC Cloud button  (see [Figure 23](#)) allows users to connect to the SMC Cloud, MSA Safety's device cloud solution for IIoT. The SMC Cloud enables secure remote connection to field devices through a FieldServer and its local applications for configuration, management, maintenance. For more information about the SMC Cloud, refer to the [SMC Cloud Start-up Guide](#).

8.1 Set IP Address of the QuickServer Using FS-GUI

- From the FS-GUI home page, click on setup and then Network Settings to enter the Edit IP Address Settings menu.
- Modify the IP Address (N1 IP Address field) of the QuickServer Ethernet port.
- If necessary, change the Netmask (N1 Netmask field).
- Type in a new Subnet Mask.
- If necessary, change the IP Gateway (Default Gateway field).
- Type in a new IP Gateway.

NOTE: If the FieldServer is connected to a router, the IP Gateway of the FieldServer should be set to the same IP Address of the router.

- Click Update IP Settings, then click on the System Restart to restart the Gateway and activate the new IP Address.

NOTE: If the FS-GUI was open in a browser, the browser will need to be pointed to the new IP Address of the QuickServer before the FS-GUI will be accessible again.

The screenshot displays the FS-GUI Network Settings interface. On the left, a navigation menu lists options: Modbus Client, About, Setup (with sub-items File Transfer, Network Settings, Passwords, Time Settings), View, User Messages, and Diagnostics. The 'Network Settings' option is highlighted. The main content area is titled 'Network Settings' and includes a 'Note' stating that updated settings require a system restart. Below the note is a form for configuring network parameters:

Parameter	Value
N1 IP Address	192.168.3.17
N1 Netmask	255.255.255.0
N1 DHCP Client State	DISABLED
Default Gateway	192.168.3.1
Domain Name Server1	8.8.8.8
Domain Name Server2	8.8.4.4

Below the form are two buttons: 'Cancel' and 'Update IP Settings'. Underneath is a 'MAC Address' section showing the N1 MAC Address as 00:50:4E:60:06:3C. At the bottom of the page, there are buttons for 'Home', 'HELP (F1)', 'Contact Us', and 'System Restart'.

Figure 24: FS-GUI Network Settings

8.2 Retrieve the Sample Configuration File

The configuration of the QuickServer is provided to the QuickServer's operating system via a comma-delimited file called "CONFIG.CSV".

If a custom configuration was ordered, the QuickServer will be programmed with the relevant device registers in the Config.csv file for the initial start-up. If not, the product is shipped with a sample config.csv that shows an example of the drivers ordered.

- In the main menu of the FS-GUI screen, go to "Setup", then "File Transfer", and finally "Retrieve".
- Click on "config.csv", and open or save the file.

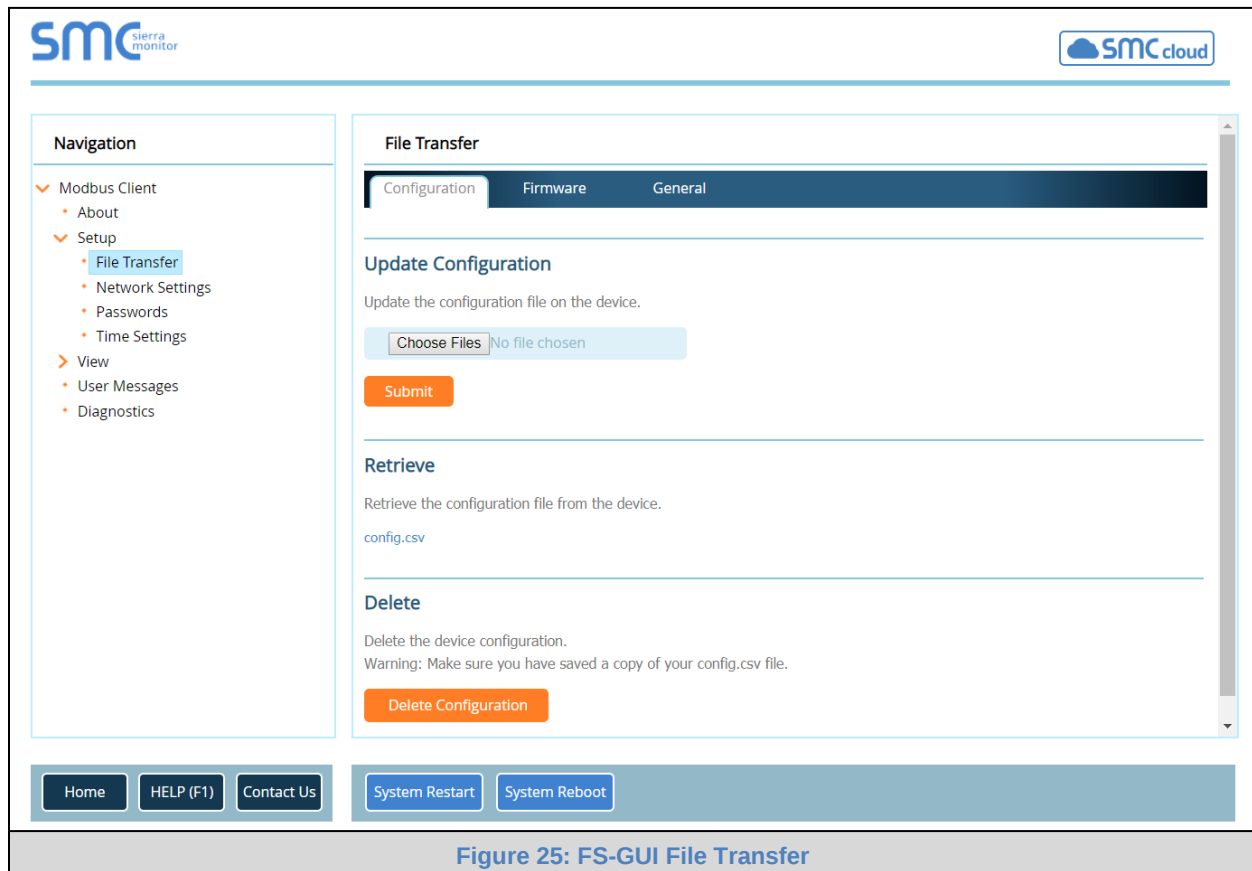


Figure 25: FS-GUI File Transfer

8.3 Change the Configuration File to Meet the Application

Refer to the FieldServer Configuration Manual in conjunction with the Driver supplements for information on configuring the QuickServer.

8.4 Load the Updated Configuration File

8.4.1 Using the FS-GUI to Load a Configuration File

- In the main menu of the FS-GUI screen, click “Setup”, then “File Transfer” and finally “Update”.
- Browse and select the .csv file, open, then click “Submit”.

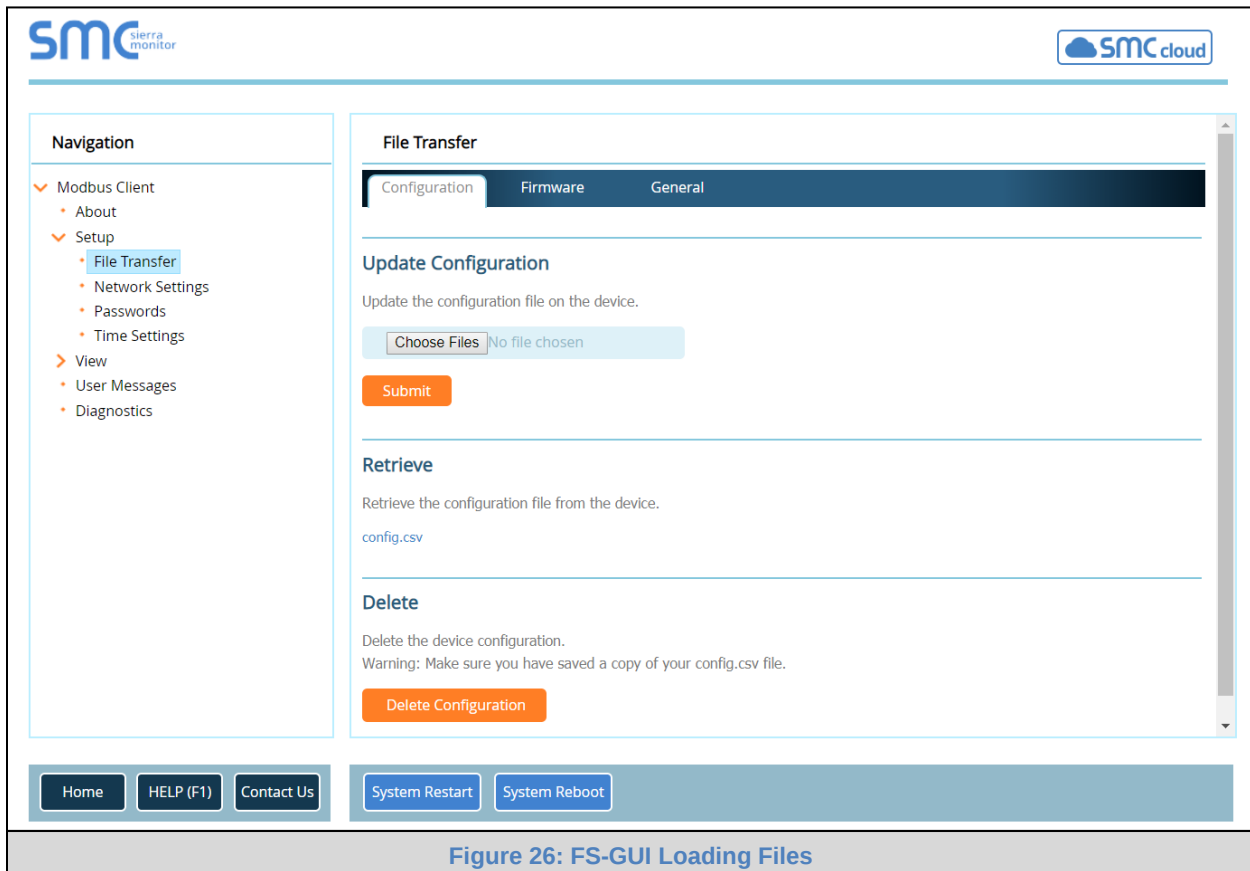


Figure 26: FS-GUI Loading Files

- Once download is complete, a message bar will appear confirming that the configuration was updated successfully.
- Click the System Restart Button to put the new file into operation.

NOTE: It is possible to do multiple downloads to the QuickServer before resetting it.

8.4.2 Retrieve the Configuration File for Modification or Backup

To get a copy of the configuration file for modifying or backing up a configuration on a local computer, do the following:

- In the main menu of the FS-GUI screen, click “Setup”, then “File Transfer”.

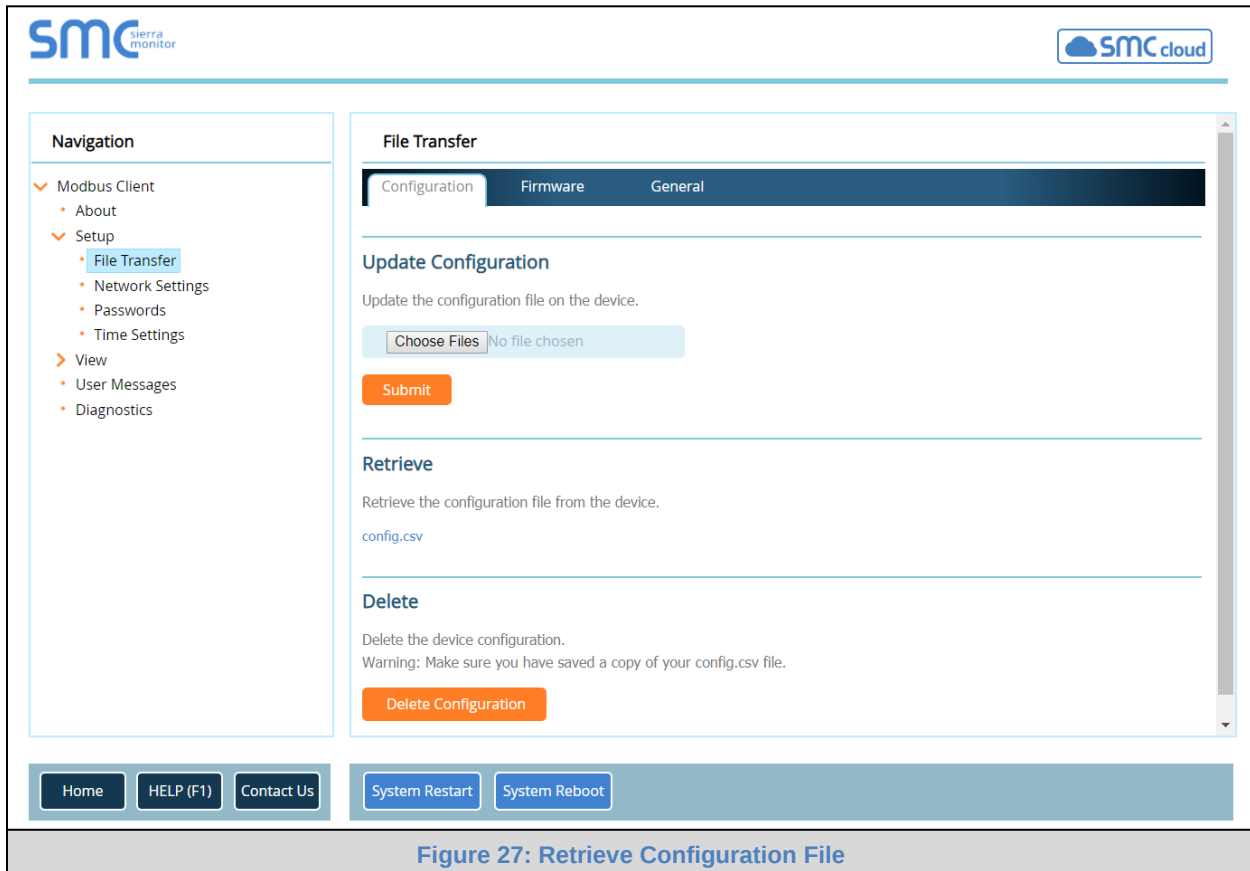


Figure 27: Retrieve Configuration File

- Click the “config.csv” link under the “Retrieve” heading in the middle section of the screen.
 - The file will automatically download to the web browser’s default download location.
- Edit or store the file as desired.

NOTE: Before using any backup configuration file to reset the configuration settings, check that the backup file is not an old version.

8.5 Test and Commission the QuickServer

- Connect the QuickServer to the third-party device(s) and test the application.
- From the landing page of the FS-GUI click on “View” in the navigation tree, then “Connections” to see the number of messages on each protocol.

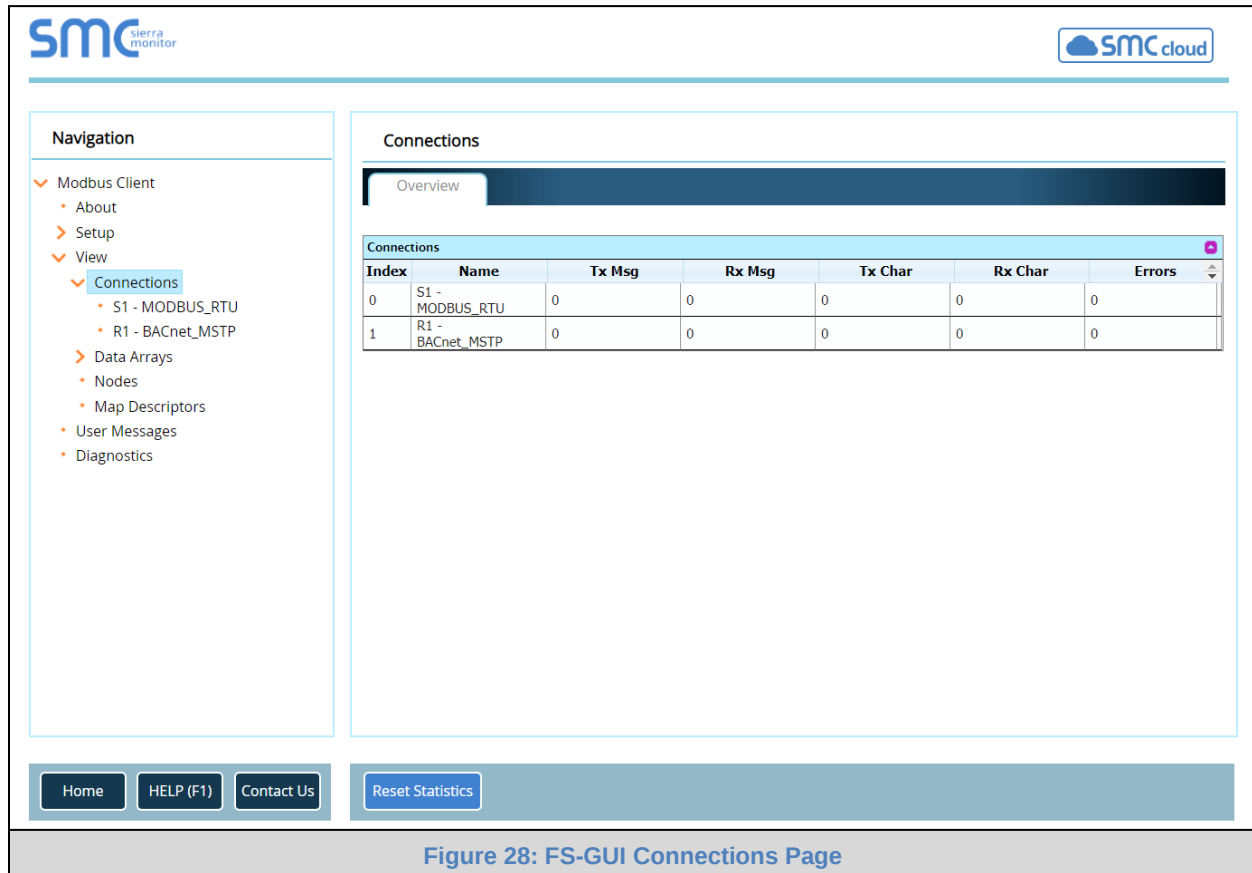


Figure 28: FS-GUI Connections Page

8.5.1 Accessing SMC Cloud

The SMC Cloud button  (see [Figure 23](#)) allows users to connect to the SMC Cloud, MSA Safety’s device cloud solution for IIoT. The SMC Cloud enables secure remote connection to field devices through a FieldServer and its local applications for configuration, management, maintenance. For more information about the SMC Cloud, refer to the [SMC Cloud Start-up Guide](#).

APPENDIX A USEFUL FEATURES

Appendix A.1. RS-422 Connection R2 Port

NOTE: The following only applies to models: FS-QS-1230 and FS-QS-1231.

RS-422 is a full duplex multi-drop multi-master differential bus. It can be wired to conform to a RS-485 network when less wiring/cabling is used (due to being less expensive to install), but then it becomes a half-duplex multi-drop multi-master differential bus. RS-422 is used for dedicated peer to peer high speed communication when low bus latency is required (very few devices on the bus). Its usage is very specific to client installations/requirements.

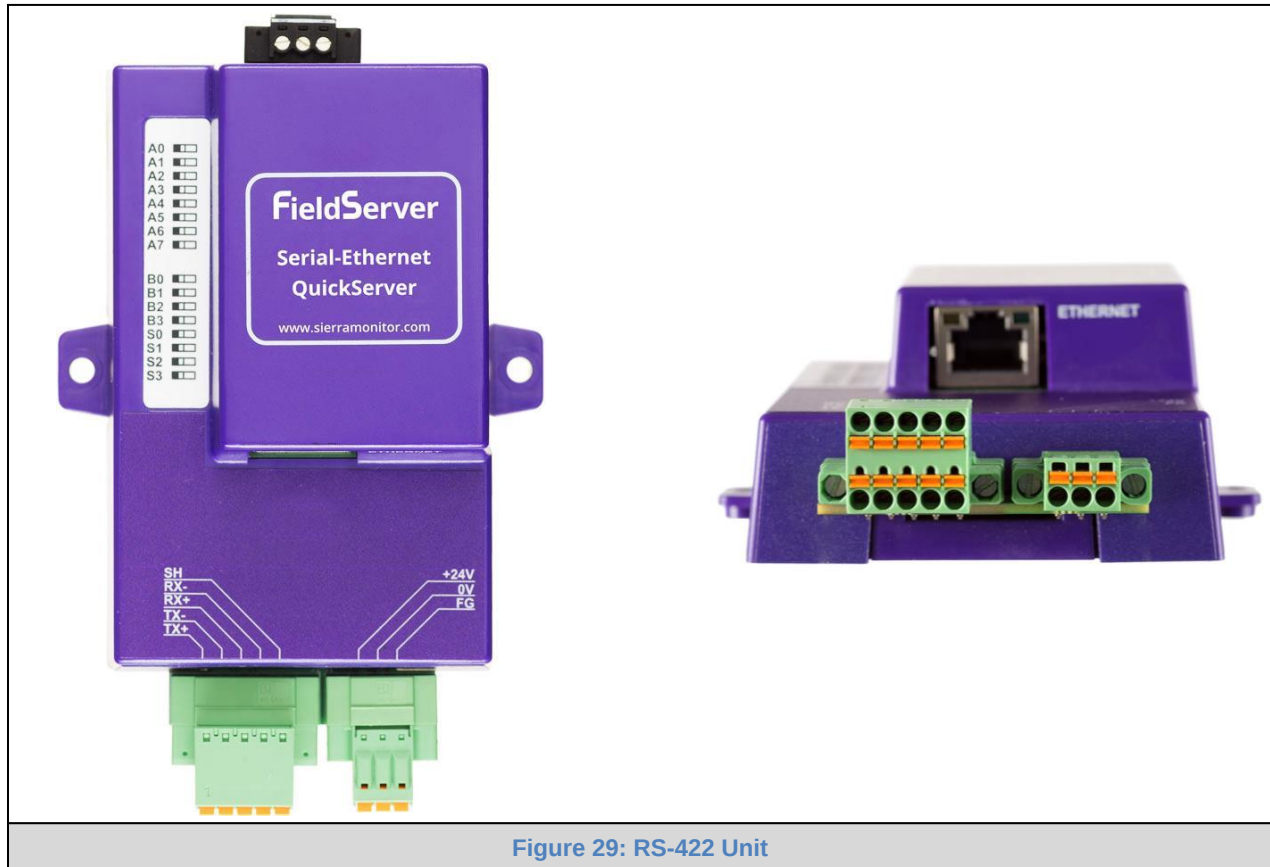
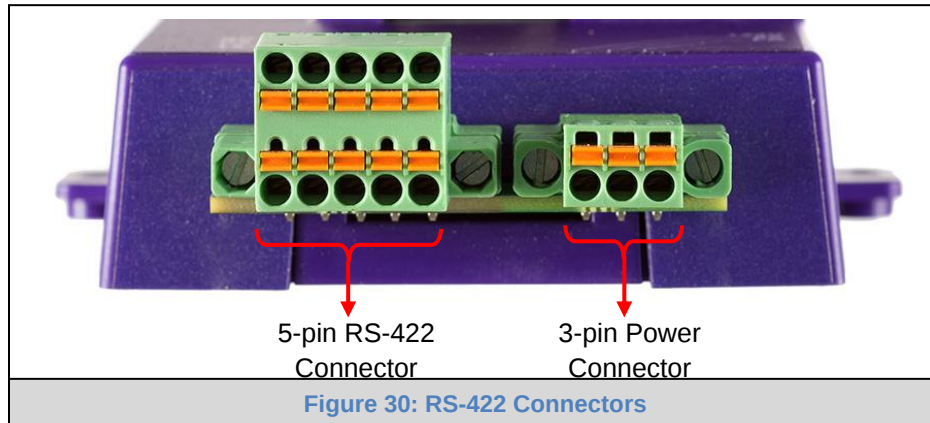


Figure 29: RS-422 Unit

NOTE:

- The RS-232 looks similar to the RS-485 but does not have the blue jumper. The blue jumper is used to enable the termination resistor for the RX signals (120 ohms), while the red jumpers are used to enable the bias resistors for RX signals (510 ohms). In the case of Rockwell/Tetrapak, all jumpers are always required to be in default position (not enabled). For other clients, the bias resistors should always be in the “on” state.
- The part number on the back of the box will identify the port.

Appendix A.1.1. Connection and Operation via the RS-422 Port



RS-422 Connector

- Pin 1-2:* TX +/- (Differential TX outputs: All + signals must be connected to each other, and same applies to - signals; no +/- signals may be crossed)
- Pin 3-4:* RX +/- (Differential RX inputs: All + signals must be connected to each other, and same applies to - signals; no +/- signals may be crossed)
- Pin 5:* SHD (Shield connection, must be connected on at least one side of the bus, but not necessarily on both sides)

POWER Connector

Please note that AC voltage is not supported on the RS-422 carrier, and that DC voltage range is ~20VDC to ~28VDC.

- Pin 1:* +24V (DC power requires this pin be used for the positive voltage)
- Pin 2:* 0V (DC power requires this pin is used for ground / return voltage)
- Pin 3:* FG (this pin needs to be connected to EARTH or noise free reference point - CHASSIS)

Appendix A.2. KNX Connection R2 Port

NOTE: The following only applies to models: FS-QS-1240 and FS-QS-1241.

The KNX QuickServer is used to transfer data to and from devices using KNX protocol. The KNX driver enables data access from KNX networks to other FieldServer protocols. Most KNX data-point types are supported, allowing communication to almost any kind of KNX device in an installation, such as temperature sensors, shutters, light switches, actuators, alarms, etc. This allows BMS systems to access a KNX network using direct read and write or with KNX configured groups. This setup does not require the use of ETS4 to configure the QuickServer KNX gateway. The KNX protocol is a connectionless protocol and therefore supports multiple clients and multiple servers. The QuickServer is intended to act as a Passive Client on the KNX bus and makes information available to other protocols.



Figure 31: KNX Unit

The KNX Connector consist of a KNX + and KNX- terminal. Each terminal corresponds to the red KNX+ and gray KNX- bus connections on a KNX bus.

The following Baud Rates are supported on the R2 Port:
4800, 9600, 19200, 38400, 57600, 115200

Appendix A.3. M-Bus Connection R2 Port

NOTE: The following only applies to models: FS-QS-1A50, FS-QS-1A51, FS-QS-1B50, FS-QS-1B51, FS-QS-1C50 and FS-QS-1C51.

The M-Bus driver allows the FieldServer to transfer data to and from devices using M-Bus protocol. The Fieldbus connection is included with the FieldServer. The M-Bus QuickServer Gateway is configurable to act as both a Master and a Slave M-Bus device.

The M-Bus Connector consist of a + and – terminal. Most M-Bus Devices are not polarity sensitive, although the polarity of the M-Bus Connector is indicated on the device diagram, should it be a requirement. The M-Bus devices to communicate with the FieldServer must be configured according to the manufacturer's instructions (for example primary address and readout data).

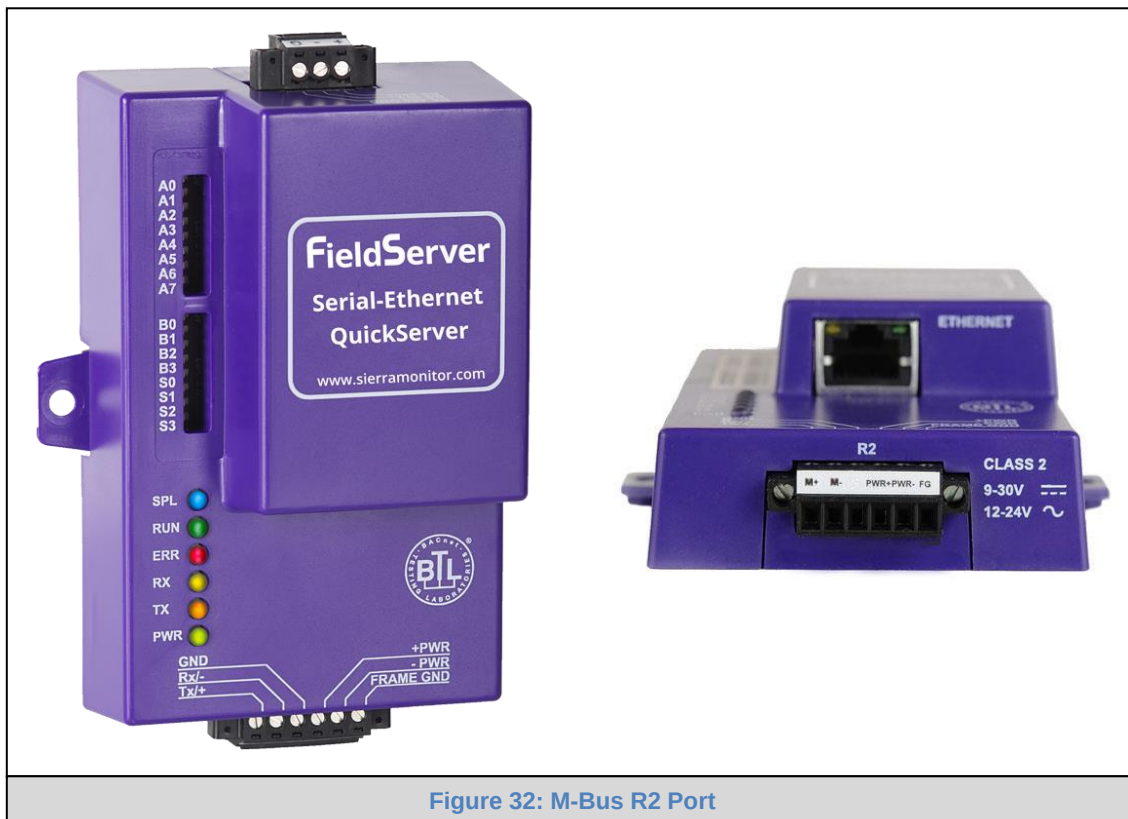


Figure 32: M-Bus R2 Port

The following baud rates are supported on the R2 Port:
300, 600, 1200, 2400, 4800, 9600, 19200, 38400

Appendix A.4. SSL/TLS for Secure Connection

SSL/TLS (Secure Sockets Layer/Transport Layer Security) is a security technology for establishing an encrypted connection between a server and a client. This allows the secure transfer of data across untrusted networks.

These functions are supported on the following:

FS-QS-1011 or **FS-QS-1211** with a serial number starting with 15 or later (indicating the year it shipped).

Minimum BIOS requirement: 2.6.1

Appendix A.4.1. Configuring FieldServer as a SSL/TLS Server

The following example sets the FieldServer to accept a secure Modbus/TCP connection on port 1502.

Appendix A.4.1.1. Simple Secure Server Configuration

Add TLS_Port parameter in the connections section of the configuration file and set to a port number between 1 – 65535.

Connections		
Adapter	Protocol	TLS_Port
N1	Modbus/TCP	1502

This configuration sets the FieldServer to accept any incoming connection but will not request a client's certificate for verification. This means that the FieldServer end point communication will be encrypted but not authenticated.

The FieldServer will send an embedded self-signed certificate if one is requested by a connecting client.

NOTE: If a remote client requires a certificate, then request the **smc_cert.pem** certificate from FieldServer Technical Support and update the remote client's authority as per vendor instructions.

Appendix A.4.1.2. Limiting Client Access

In addition to TLS_Port parameter also add Validate_Client_Cert in the connections section of the configuration file and set it to "Yes".

Connections				
Adapter	Protocol	TLS_Port	Validate_Client_Cert	
N1	Modbus/TCP	1502	Yes	

The configuration above sets the FieldServer to request and verify a client's certificate against its internal authority file before accepting connection. By default, this means the FieldServer will only accept connections from other FieldServers.

In order to load an authority file so that the FieldServer will accept connections from a chosen list of remote clients, configure the FieldServer with the following connection settings:

Connections				
Adapter	Protocol	TLS_Port	Validate_Client_Cert	Cert_Authority_File
N1	Modbus/TCP	1502	Yes	my_authorized_clients.pem

This configuration has the FieldServer accept connections from clients who have the correct certificate. The authority file is a collection of client certificates in PEM format. This file can be edited using any text file editor.

NOTE: Cert_Authority_File is useful only if Validate_Client_Cert is set to 'Yes'.

Appendix A.4.1.3. To Upload the Authority File to the FieldServer

1. Enter the IP address of the FieldServer into a web browser.
2. Choose the 'Setup' option in the Navigation Tree and Select 'File Transfer'.
3. Choose the 'General' tab.
4. Click on the 'Browse' button and select the PEM file you want to upload.
5. Click on 'Submit'.
6. When the message, "The file was uploaded successfully" appears, click on the 'System Restart' button.

Appendix A.4.1.4. Certificate Validation Options

If connections must be limited to only a particular domain (vendor devices), include Check_Remote_Host to specify the domain/host name.

```
Connections
Adapter , Protocol , TLS_Port , Validate_Client_Cert , Cert_Authority_File , Check_Remote_Host
N1 , Modbus/TCP , 1502 , Yes , my_authorized_clients.pem , SMC
```

The configuration above tells the FieldServer to only accept connections that have the correct certification and is coming from the specified host.

The Check_Remote_Host value is synonymously known as common name, host name or domain etc. The common name can be obtained by the following methods:

- Ask the certificate issuer for the host name.
- Use online tools to decode the certificate (for example: <https://www.sslshopper.com/certificate-decoder.html>).
- If the program openssl is installed on the local PC, then run the following command to get the common name: `openssl x509 -in certificate.pem -text -noout`

Appendix A.4.1.5. Set up Server Certificate

Make sure the certificate is in PEM format. Otherwise, convert it to PEM format (reference the link below). support.ssl.com/Knowledgebase/Article

Configure the FieldServer to use a custom certificate as shown below:

```
Connections
Adapter , Protocol , TLS_Port , Server_Cert_File
N1 , Modbus/TCP , 1502 , my_server_cert.pem
```

Appendix A.4.2. Configuring FieldServer as SSL/TLS Client

The following Node configurations set the FieldServer to open a secure Modbus/TCP connection to Server at IP Address 10.11.12.13 on port 1502.

Appendix A.4.2.1. Simple Secure Client Configuration

Add Remote_Node_TLS_Port parameter in the nodes section of the configuration file and set to a port number between 1 – 65535.

Nodes	Node_Name	Node_ID	Protocol	Adapter	IP_Address	Remote_Node_TLS_Port
	PLC_11	11	Modbus/TCP	N1	10.11.12.13	1502

The above configuration sets the FieldServer to connect to a remote server but does not request a server's certificate for verification. This means that the FieldServer end point communication will be encrypted but not authenticated.

If requested by a remote server, the FieldServer will send an embedded self-signed certificate.

Appendix A.4.2.2. Limit Server Access

Add the Validate_Server_Cert parameter to the client node section of the configuration.

.....	Remote_Node_TLS_Port	Validate_Server_Cert
.....	1502	Yes

The above configuration sets the FieldServer to request and verify the server's certificate against its own internal authority file before finalizing the connection. By default, this means the FieldServer will only establish connections to other FieldServers.

.....	Remote_Node_TLS_Port	Validate_Server_Cert	Cert_Authority_File
.....	1502	Yes	my_authorized_servers.pem

The above configuration sets the FieldServer to use a specified PEM file to allow custom server connections.

The authority file is a collection of server certificates in PEM format. This file can be edited using any text file editor (such as notepad). When the file has all required certificates, paste it into the PEM formatted server certificate. Now the FieldServer will connect to a server if it can find the server's certificate in the authority file.

NOTE: Cert_Authority_File is useful only if Validate_Client_Cert is set to 'Yes'.

To upload the Certificate to the FieldServer follow the directions for the authority file in [Appendix A.4.1.3](#).

Appendix A.4.2.3. Certificate Validation Options

Use the Check_Remote_Host element as described in [Appendix A.4.1.4](#).

Appendix A.4.2.4. Set up Client Certificate

Make sure the certificate is in PEM format. Otherwise, convert it to PEM format (reference the link below).

support.ssi.com/Knowledgebase/Article

Configure the FieldServer to use a custom certificate as shown below:

.....	Client_Cert_File
.....	my_client_cert.pem

APPENDIX B VENDOR INFORMATION – M-BUS DATA PROFILES

NOTE: All points are Float Data Type. The first Modbus register contains the least significant word.

Appendix B.1. Aquametro Calec ST Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Vol Flo 1	AI 01	30001-30002
Temp Flo 1	AI 02	30003-30004
Temp Ret 1	AI 03	30005-30006
Temp Diff 1	AI 04	30007-30008
Power W 1	AI 05	30009-30010
Energy Wh 1	AI 06	30011-30012
Energy Wh 2	AI 07	30013-30014
Volume 1	AI 08	30015-30016
Volume 2	AI 09	30017-30018
Time 1	AI 10	30019-30020
Time 2	AI 11	30021-30022
Mass 1	AI 12	30023-30024
Time P 1	AI 13	30025-30026
Time P 2	AI 14	30027-30028
Time P 3	AI 15	30029-30030
Unknown 1	AI 16	30031-30032
Unknown 2	AI 17	30033-30034
Unknown 3	AI 18	30035-30036
Unknown 4	AI 19	30037-30038
Unknown 5	AI 20	30039-30040
Unknown 6	AI 21	30041-30042
Unknown 7	AI 22	30043-30044
Unknown 8	AI 23	30045-30046
Unknown 9	AI 24	30047-30048

Appendix B.2. Comet XRM-50 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
MBUS Meter \$node_id Alarms	AI 01	30001-30002
Volume	AI 02	30003-30004
Time stamp	AI 03	30005-30006
Error Flags	AI 04	30007-30008
M BUS STATE	AI 05	30009-30010

Appendix B.3. Elvaco CMA20 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
MBUS Meter \$node_id Alarms	AI 01	30001-30002
Temp Inst	AI 02	30003-30004
Temp Min	AI 03	30005-30006
Temp Max	AI 04	30007-30008
Temp Avg	AI 05	30009-30010
RH Ins	AI 06	30011-30012
RH Min	AI 07	30013-30014
RH Max	AI 08	30015-30016
RH Avg	AI 09	30017-30018

Appendix B.4. EMU 3PH Power 3-85 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
MBUS Meter \$node_id Alarms	AI 01	30001-30002
Energy WH 1	AI 02	30003-30004
Energy WH 2	AI 03	30005-30006
Energy WH 3	AI 04	30007-30008
Voltage 1	AI 05	30009-30010
Voltage 2	AI 06	30011-30012
Voltage 3	AI 07	30013-30014
Current 1	AI 08	30015-30016
Current 2	AI 09	30017-30018
Current 3	AI 10	30019-30020

Appendix B.5. Kamstrup 601 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy T WH 1	AI 01	30001-30002
Energy T WH 2	AI 02	30003-30004
Energy T WH 3	AI 03	30005-30006
Energy T WH 4	AI 04	30007-30008
Energy T WH 5	AI 05	30009-30010
Energy T WH 6	AI 06	30011-30012
Energy T WH 7	AI 07	30013-30014
Energy T WH 8	AI 08	30015-30016
Energy T WH 9	AI 09	30017-30018
Energy T WH 10	AI 10	30019-30020
Temp Flow 1	AI 11	30021-30022
Temp Flow 2	AI 12	30023-30024
Temp Flow 3	AI 13	30025-30026
Temp Ret 1	AI 14	30027-30028
Temp Ret 2	AI 15	30029-30030
Temp Ret 3	AI 16	30031-30032
Temp Dif 1	AI 17	30033-30034
Temp Dif 2	AI 18	30035-30036
Temp Dif 3	AI 19	30037-30038
Time Hrs 1	AI 20	30039-30040
Time Hrs 2	AI 21	30041-30042
Time Hrs 3	AI 22	30043-30044
Power W 1	AI 23	30045-30046
Power W 2	AI 24	30047-30048
Power W 3	AI 25	30049-30050
Power W 4	AI 26	30051-30052
Power W 5	AI 27	30053-30054
Power W 6	AI 28	30055-30056
Power W 7	AI 29	30057-30058
Power W 8	AI 30	30059-30060
Power W 9	AI 31	30061-30062
Vol Flo L H 1	AI 32	30063-30064
Vol Flo L H 2	AI 33	30065-30066
Vol Flo L H 3	AI 34	30067-30068
Vol Flo L H 4	AI 35	30069-30070
Vol Flo L H 5	AI 36	30071-30072
Vol Flo L H 6	AI 37	30073-30074
Vol Flo L H 7	AI 38	30075-30076
Vol Flo L H 8	AI 39	30077-30078

Vol Flo L H 9	AI 40	30079-30080
Volume 1	AI 41	30081-30082
Volume 2	AI 42	30083-30084
Volume 3	AI 43	30085-30086
Volume 4	AI 44	30087-30088
Volume 5	AI 45	30089-30090
Volume 6	AI 46	30091-30092
Volume 7	AI 47	30093-30094
Volume 8	AI 48	30095-30096
Volume 9	AI 49	30097-30098
Volume 10	AI 50	30099-30100
Time Point 1	AI 51	30101-30102
Time Point 2	AI 52	30103-30104
Time Point 3	AI 53	30105-30106
Time Point 4	AI 54	30107-30108
Time Point 5	AI 55	30109-30110
Time Point 6	AI 56	30111-30112
ID Num 1	AI 57	30113-30114
ID Num 2	AI 58	30115-30116
ID Num 3	AI 59	30117-30118

Vol Flo L H 7	AI 42	30083-30084
Vol Flo L H 8	AI 43	30085-30086
Vol Flo L H 9	AI 44	30087-30088
Vol Flo L H 10	AI 45	30089-30090
Volume 1	AI 46	30091-30092
Volume 2	AI 47	30093-30094
Volume 3	AI 48	30095-30096
Volume 4	AI 49	30097-30098
Volume 5	AI 50	30099-30100
Volume 6	AI 51	30101-30102
Volume 7	AI 52	30103-30104
Volume 8	AI 53	30105-30106
Volume 9	AI 54	30107-30108
Volume 10	AI 55	30109-30110
Time Point 1	AI 56	30111-30112
Time Point 2	AI 57	30113-30114
Time Point 3	AI 58	30115-30116
Time Point 4	AI 59	30117-30118
Time Point 5	AI 60	30119-30120
Time Point 6	AI 61	30121-30122
ID Num 1	AI 62	30123-30124
ID Num 2	AI 63	30125-30126
ID Num 3	AI 64	30127-30128

Appendix B.6. Kamstrup 602 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy T WH 1	AI 01	30001-30002
Energy T WH 2	AI 02	30003-30004
Energy T WH 3	AI 03	30005-30006
Energy T WH 4	AI 04	30007-30008
Energy T WH 5	AI 05	30009-30010
Energy T WH 6	AI 06	30011-30012
Energy T WH 7	AI 07	30013-30014
Energy T WH 8	AI 08	30015-30016
Energy T WH 9	AI 09	30017-30018
Energy T WH 10	AI 10	30019-30020
Temp Flow 1	AI 11	30021-30022
Temp Flow 2	AI 12	30023-30024
Temp Flow 3	AI 13	30025-30026
Temp Ret 1	AI 14	30027-30028
Temp Ret 2	AI 15	30029-30030
Temp Ret 3	AI 16	30031-30032
Temp Dif 1	AI 17	30033-30034
Temp Dif 2	AI 18	30035-30036
Temp Dif 3	AI 19	30037-30038
Temp Dif 4	AI 20	30039-30040
Temp Dif 5	AI 21	30041-30042
Temp Dif 6	AI 22	30043-30044
Time Hrs 1	AI 23	30045-30046
Time Hrs 2	AI 24	30047-30048
Time Hrs 3	AI 25	30049-30050
Power W 1	AI 26	30051-30052
Power W 2	AI 27	30053-30054
Power W 3	AI 28	30055-30056
Power W 4	AI 29	30057-30058
Power W 5	AI 30	30059-30060
Power W 6	AI 31	30061-30062
Power W 7	AI 32	30063-30064
Power W 8	AI 33	30065-30066
Power W 9	AI 34	30067-30068
Power W 10	AI 35	30069-30070
Vol Flo L H 1	AI 36	30071-30072
Vol Flo L H 2	AI 37	30073-30074
Vol Flo L H 3	AI 38	30075-30076
Vol Flo L H 4	AI 39	30077-30078
Vol Flo L H 5	AI 40	30079-30080
Vol Flo L H 6	AI 41	30081-30082

Appendix B.7. Sontay Zenner Multidata Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
ID 1	AI 01	30001-30002
Energy WH 1	AI 02	30003-30004
Volume 1	AI 03	30005-30006
Volume 2	AI 04	30007-30008
Error Flags	AI 05	30009-30010
Energy WH 2	AI 06	30011-30012
Volume 3	AI 07	30013-30014
Volume 4	AI 08	30015-30016
Volume 5	AI 09	30017-30018
Vol Flow 1	AI 10	30019-30020
Power W 1	AI 11	30021-30022
Temp Flow	AI 12	30023-30024
Temp Return	AI 13	30025-30026
Energy WH 5	AI 14	30027-30028
Energy WH 6	AI 15	30029-30030
Energy WH 7	AI 16	30031-30032
Energy WH 8	AI 17	30033-30034
Energy WH 9	AI 18	30035-30036
Energy WH 10	AI 19	30037-30038

Appendix B.8. Sontex SuperCal 531 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Dur Avg S 1	AI 01	30001-30002
Dur Avg M 1	AI 02	30003-30004
Energy T WH 1	AI 03	30005-30006
Energy T WH 2	AI 04	30007-30008
Energy T WH 3	AI 05	30009-30010
Energy T WH 4	AI 06	30011-30012
Energy T WH 5	AI 07	30013-30014
Energy T WH 6	AI 08	30015-30016
Energy T WH 7	AI 09	30017-30018
Energy T WH 8	AI 10	30019-30020
Energy T WH 9	AI 11	30021-30022

Energy T WH 10	AI 12	30023-30024
Temp Flow 1	AI 13	30025-30026
Temp Ret 1	AI 14	30027-30028
Time Hrs 1	AI 15	30029-30030
Vol Flo L S 1	AI 16	30031-30032
Error Flags 1	AI 17	30033-30034
Medium 1	AI 18	30035-30036
Medium 2	AI 19	30037-30038
Volume 1	AI 20	30039-30040

Appendix B.9. Siemens WFH21 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy T WH 1	AI 01	30001-30002
Time Hrs 1	AI 02	30003-30004
Power Jh 1	AI 03	30005-30006
ID 1	AI 04	30007-30008
Volume 1	AI 05	30009-30010
Volume 2	AI 06	30011-30012
Unknown 1	AI 07	30013-30014
Unknown 2	AI 08	30015-30016
Unknown 3	AI 09	30017-30018
Unknown 4	AI 10	30019-30020

Appendix B.10. Siemens FUE950 Energy Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy 1	AI 01	30001-30002
Energy 2	AI 02	30003-30004
Energy 3	AI 03	30005-30006
Energy 4	AI 04	30007-30008
Temp Flow	AI 05	30009-30010
Temp Ret	AI 06	30011-30012
Temp Dif	AI 07	30013-30014
Time Op Days	AI 08	30015-30016
Time Point 1	AI 09	30017-30018
Time Point 2	AI 10	30019-30020
Power	AI 11	30021-30022
Volume Flow	AI 12	30023-30024
Volume 1	AI 13	30025-30026
Volume 2	AI 14	30027-30028
Volume 3	AI 15	30029-30030
Volume 4	AI 16	30031-30032
Firmware	AI 17	30033-30034
Software	AI 18	30035-30036
Access Code	AI 19	30037-30038

Appendix B.11. QS All Data Profile Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Dur Avg S 1	AI 1	30001-30002
Dur Avg S 2	AI 2	30003-30004
Dur Avg S 3	AI 3	30005-30006
Dur Avg S 4	AI 4	30007-30008
Dur Avg S 5	AI 5	30009-30010
Dur Avg S 6	AI 6	30011-30012
Dur Avg S 7	AI 7	30013-30014

Dur Avg S 8	AI 8	30015-30016
Dur Avg S 9	AI 9	30017-30018
Dur Avg S 10	AI 10	30019-30020
Dur Avg M 1	AI 11	30021-30022
Dur Avg M 2	AI 12	30023-30024
Dur Avg M 3	AI 13	30025-30026
Dur Avg M 4	AI 14	30027-30028
Dur Avg M 5	AI 15	30029-30030
Dur Avg M 6	AI 16	30031-30032
Dur Avg M 7	AI 17	30033-30034
Dur Avg M 8	AI 18	30035-30036
Dur Avg M 9	AI 19	30037-30038
Dur Avg M 10	AI 20	30039-30040
Dur Avg H 1	AI 21	30041-30042
Dur Avg H 2	AI 22	30043-30044
Dur Avg H 3	AI 23	30045-30046
Dur Avg H 4	AI 24	30047-30048
Dur Avg H 5	AI 25	30049-30050
Dur Avg H 6	AI 26	30051-30052
Dur Avg H 7	AI 27	30053-30054
Dur Avg H 8	AI 28	30055-30056
Dur Avg H 9	AI 29	30057-30058
Dur Avg H 10	AI 30	30059-30060
Dur Avg D 1	AI 31	30061-30062
Dur Avg D 2	AI 32	30063-30064
Dur Avg D 3	AI 33	30065-30066
Dur Avg D 4	AI 34	30067-30068
Dur Avg D 5	AI 35	30069-30070
Dur Avg D 6	AI 36	30071-30072
Dur Avg D 7	AI 37	30073-30074
Dur Avg D 8	AI 38	30075-30076
Dur Avg D 9	AI 39	30077-30078
Dur Avg D 10	AI 40	30079-30080
Dur Act Sec 1	AI 41	30081-30082
Dur Act Sec 2	AI 42	30083-30084
Dur Act Sec 3	AI 43	30085-30086
Dur Act Sec 4	AI 44	30087-30088
Dur Act Sec 5	AI 45	30089-30090
Dur Act Sec 6	AI 46	30091-30092
Dur Act Sec 7	AI 47	30093-30094
Dur Act Sec 8	AI 48	30095-30096
Dur Act Sec 9	AI 49	30097-30098
Dur Act Sec 10	AI 50	30099-30100
Dur Act Min 1	AI 51	30101-30102
Dur Act Min 2	AI 52	30103-30104
Dur Act Min 3	AI 53	30105-30106
Dur Act Min 4	AI 54	30107-30108
Dur Act Min 5	AI 55	30109-30110
Dur Act Min 6	AI 56	30111-30112
Dur Act Min 7	AI 57	30113-30114
Dur Act Min 8	AI 58	30115-30116
Dur Act Min 9	AI 59	30117-30118
Dur Act Min 10	AI 60	30119-30120
Dur Act Hrs 1	AI 61	30121-30122
Dur Act Hrs 2	AI 62	30123-30124
Dur Act Hrs 3	AI 63	30125-30126
Dur Act Hrs 4	AI 64	30127-30128
Dur Act Hrs 5	AI 65	30129-30130
Dur Act Hrs 6	AI 66	30131-30132
Dur Act Hrs 7	AI 67	30133-30134
Dur Act Hrs 8	AI 68	30135-30136
Dur Act Hrs 9	AI 69	30137-30138
Dur Act Hrs 10	AI 70	30139-30140
Dur Act Day 1	AI 71	30141-30142
Dur Act Day 2	AI 72	30143-30144
Dur Act Day 3	AI 73	30145-30146
Dur Act Day 4	AI 74	30147-30148
Dur Act Day 5	AI 75	30149-30150
Dur Act Day 6	AI 76	30151-30152

Dur Act Day 7	AI 77	30153-30154
Dur Act Day 8	AI 78	30155-30156
Dur Act Day 9	AI 79	30157-30158
Dur Act Day 10	AI 80	30159-30160
Energy T WH 1	AI 81	30161-30162
Energy T WH 2	AI 82	30163-30164
Energy T WH 3	AI 83	30165-30166
Energy T WH 4	AI 84	30167-30168
Energy T WH 5	AI 85	30169-30170
Energy T WH 6	AI 86	30171-30172
Energy T WH 7	AI 87	30173-30174
Energy T WH 8	AI 88	30175-30176
Energy T WH 9	AI 89	30177-30178
Energy T WH 10	AI 90	30179-30180
Energy T J 1	AI 91	30181-30182
Energy T J 2	AI 92	30183-30184
Energy T J 3	AI 93	30185-30186
Energy T J 4	AI 94	30187-30188
Energy T J 5	AI 95	30189-30190
Energy T J 6	AI 96	30191-30192
Energy T J 7	AI 97	30193-30194
Energy T J 8	AI 98	30195-30196
Energy T J 9	AI 99	30197-30198
Energy T J 10	AI 100	30199-30200
Voltage 1	AI 101	30201-30202
Voltage 2	AI 102	30203-30204
Voltage 3	AI 103	30205-30206
Voltage 4	AI 104	30207-30208
Voltage 5	AI 105	30209-30210
Voltage 6	AI 106	30211-30212
Voltage 7	AI 107	30213-30214
Voltage 8	AI 108	30215-30216
Voltage 9	AI 109	30217-30218
Voltage 10	AI 110	30219-30220
Current 1	AI 111	30221-30222
Current 2	AI 112	30223-30224
Current 3	AI 113	30225-30226
Current 4	AI 114	30227-30228
Current 5	AI 115	30229-30230
Current 6	AI 116	30231-30232
Current 7	AI 117	30233-30234
Current 8	AI 118	30235-30236
Current 9	AI 119	30237-30238
Current 10	AI 120	30239-30240
Temp Ext 1	AI 121	30241-30242
Temp Ext 2	AI 122	30243-30244
Temp Ext 3	AI 123	30245-30246
Temp Ext 4	AI 124	30247-30248
Temp Ext 5	AI 125	30249-30250
Temp Ext 6	AI 126	30251-30252
Temp Ext 7	AI 127	30253-30254
Temp Ext 8	AI 128	30255-30256
Temp Ext 9	AI 129	30257-30258
Temp Ext 10	AI 130	30259-30260
Temp Flow 1	AI 131	30261-30262
Temp Flow 2	AI 132	30263-30264
Temp Flow 3	AI 133	30265-30266
Temp Flow 4	AI 134	30267-30268
Temp Flow 5	AI 135	30269-30270
Temp Flow 6	AI 136	30271-30272
Temp Flow 7	AI 137	30273-30274
Temp Flow 8	AI 138	30275-30276
Temp Flow 9	AI 139	30277-30278
Temp Flow 10	AI 140	30279-30280
Temp Ret 1	AI 141	30281-30282
Temp Ret 2	AI 142	30283-30284
Temp Ret 3	AI 143	30285-30286
Temp Ret 4	AI 144	30287-30288
Temp Ret 5	AI 145	30289-30290

Temp Ret 6	AI 146	30291-30292
Temp Ret 7	AI 147	30293-30294
Temp Ret 8	AI 148	30295-30296
Temp Ret 9	AI 149	30297-30298
Temp Ret 10	AI 150	30299-30300
Temp Dif 1	AI 151	30301-30302
Temp Dif 2	AI 152	30303-30304
Temp Dif 3	AI 153	30305-30306
Temp Dif 4	AI 154	30307-30308
Temp Dif 5	AI 155	30309-30310
Temp Dif 6	AI 156	30311-30312
Temp Dif 7	AI 157	30313-30314
Temp Dif 8	AI 158	30315-30316
Temp Dif 9	AI 159	30317-30318
Temp Dif 10	AI 160	30319-30320
Time Sec 1	AI 161	30321-30322
Time Sec 2	AI 162	30323-30324
Time Sec 3	AI 163	30325-30326
Time Sec 4	AI 164	30327-30328
Time Sec 5	AI 165	30329-30330
Time Sec 6	AI 166	30331-30332
Time Sec 7	AI 167	30333-30334
Time Sec 8	AI 168	30335-30336
Time Sec 9	AI 169	30337-30338
Time Sec 10	AI 170	30339-30340
Time Min 1	AI 171	30341-30342
Time Min 2	AI 172	30343-30344
Time Min 3	AI 173	30345-30346
Time Min 4	AI 174	30347-30348
Time Min 5	AI 175	30349-30350
Time Min 6	AI 176	30351-30352
Time Min 7	AI 177	30353-30354
Time Min 8	AI 178	30355-30356
Time Min 9	AI 179	30357-30358
Time Min 10	AI 180	30359-30360
Time Hrs 1	AI 181	30361-30362
Time Hrs 2	AI 182	30363-30364
Time Hrs 3	AI 183	30365-30366
Time Hrs 4	AI 184	30367-30368
Time Hrs 5	AI 185	30369-30370
Time Hrs 6	AI 186	30371-30372
Time Hrs 7	AI 187	30373-30374
Time Hrs 8	AI 188	30375-30376
Time Hrs 9	AI 189	30377-30378
Time Hrs 10	AI 190	30379-30380
Time Days 1	AI 191	30381-30382
Time Days 2	AI 192	30383-30384
Time Days 3	AI 193	30385-30386
Time Days 4	AI 194	30387-30388
Time Days 5	AI 195	30389-30390
Time Days 6	AI 196	30391-30392
Time Days 7	AI 197	30393-30394
Time Days 8	AI 198	30395-30396
Time Days 9	AI 199	30397-30398
Time Days 10	AI 200	30399-30400
Time Op Sec 1	AI 201	30401-30402
Time Op Sec 2	AI 202	30403-30404
Time Op Sec 3	AI 203	30405-30406
Time Op Sec 4	AI 204	30407-30408
Time Op Sec 5	AI 205	30409-30410
Time Op Sec 6	AI 206	30411-30412
Time Op Sec 7	AI 207	30413-30414
Time Op Sec 8	AI 208	30415-30416
Time Op Sec 9	AI 209	30417-30418
Time Op Sec 10	AI 210	30419-30420
Time Op Min 1	AI 211	30421-30422
Time Op Min 2	AI 212	30423-30424
Time Op Min 3	AI 213	30425-30426
Time Op Min 4	AI 214	30427-30428

Time Op Min 5	AI 215	30429-30430
Time Op Min 6	AI 216	30431-30432
Time Op Min 7	AI 217	30433-30434
Time Op Min 8	AI 218	30435-30436
Time Op Min 9	AI 219	30437-30438
Time Op Min 10	AI 220	30439-30440
Time Op Hrs 1	AI 221	30441-30442
Time Op Hrs 2	AI 222	30443-30444
Time Op Hrs 3	AI 223	30445-30446
Time Op Hrs 4	AI 224	30447-30448
Time Op Hrs 5	AI 225	30449-30450
Time Op Hrs 6	AI 226	30451-30452
Time Op Hrs 7	AI 227	30453-30454
Time Op Hrs 8	AI 228	30455-30456
Time Op Hrs 9	AI 229	30457-30458
Time Op Hrs 10	AI 230	30459-30460
Time Op Days 1	AI 231	30461-30462
Time Op Days 2	AI 232	30463-30464
Time Op Days 3	AI 233	30465-30466
Time Op Days 4	AI 234	30467-30468
Time Op Days 5	AI 235	30469-30470
Time Op Days 6	AI 236	30471-30472
Time Op Days 7	AI 237	30473-30474
Time Op Days 8	AI 238	30475-30476
Time Op Days 9	AI 239	30477-30478
Time Op Days 10	AI 240	30479-30480
Custom 1	AI 241	30481-30482
Custom 2	AI 242	30483-30484
Custom 3	AI 243	30485-30486
Custom 4	AI 244	30487-30488
Custom 5	AI 245	30489-30490
Custom 6	AI 246	30491-30492
Custom 7	AI 247	30493-30494
Custom 8	AI 248	30495-30496
Custom 9	AI 249	30497-30498
Custom 10	AI 250	30499-30500
Power W 1	AI 251	30501-30502
Power W 2	AI 252	30503-30504
Power W 3	AI 253	30505-30506
Power W 4	AI 254	30507-30508
Power W 5	AI 255	30509-30510
Power W 6	AI 256	30511-30512
Power W 7	AI 257	30513-30514
Power W 8	AI 258	30515-30516
Power W 9	AI 259	30517-30518
Power W 10	AI 260	30519-30520
Power Jh 1	AI 261	30521-30522
Power Jh 2	AI 262	30523-30524
Power Jh 3	AI 263	30525-30526
Power Jh 4	AI 264	30527-30528
Power Jh 5	AI 265	30529-30530
Power Jh 6	AI 266	30531-30532
Power Jh 7	AI 267	30533-30534
Power Jh 8	AI 268	30535-30536
Power Jh 9	AI 269	30537-30538
Power Jh 10	AI 270	30539-30540
Pressure 1	AI 271	30541-30542
Pressure 2	AI 272	30543-30544
Pressure 3	AI 273	30545-30546
Pressure 4	AI 274	30547-30548
Pressure 5	AI 275	30549-30550
Pressure 6	AI 276	30551-30552
Pressure 7	AI 277	30553-30554
Pressure 8	AI 278	30555-30556
Pressure 9	AI 279	30557-30558
Pressure 10	AI 280	30559-30560
Mass 1	AI 281	30561-30562
Mass 2	AI 282	30563-30564
Mass 3	AI 283	30565-30566

Mass 4	AI 284	30567-30568
Mass 5	AI 285	30569-30570
Mass 6	AI 286	30571-30572
Mass 7	AI 287	30573-30574
Mass 8	AI 288	30575-30576
Mass 9	AI 289	30577-30578
Mass 10	AI 290	30579-30580
Mass Flow 1	AI 291	30581-30582
Mass Flow 2	AI 292	30583-30584
Mass Flow 3	AI 293	30585-30586
Mass Flow 4	AI 294	30587-30588
Mass Flow 5	AI 295	30589-30590
Mass Flow 6	AI 296	30591-30592
Mass Flow 7	AI 297	30593-30594
Mass Flow 8	AI 298	30595-30596
Mass Flow 9	AI 299	30597-30598
Mass Flow 10	AI 300	30599-30600
Vol Flo L M 1	AI 301	30601-30602
Vol Flo L M 2	AI 302	30603-30604
Vol Flo L M 3	AI 303	30605-30606
Vol Flo L M 4	AI 304	30607-30608
Vol Flo L M 5	AI 305	30609-30610
Vol Flo L M 6	AI 306	30611-30612
Vol Flo L M 7	AI 307	30613-30614
Vol Flo L M 8	AI 308	30615-30616
Vol Flo L M 9	AI 309	30617-30618
Vol Flo L M 10	AI 310	30619-30620
Vol Flo L H 1	AI 311	30621-30622
Vol Flo L H 2	AI 312	30623-30624
Vol Flo L H 3	AI 313	30625-30626
Vol Flo L H 4	AI 314	30627-30628
Vol Flo L H 5	AI 315	30629-30630
Vol Flo L H 6	AI 316	30631-30632
Vol Flo L H 7	AI 317	30633-30634
Vol Flo L H 8	AI 318	30635-30636
Vol Flo L H 9	AI 319	30637-30638
Vol Flo L H 10	AI 320	30639-30640
Vol Flo ML S 1	AI 321	30641-30642
Vol Flo ML S 2	AI 322	30643-30644
Vol Flo ML S 3	AI 323	30645-30646
Vol Flo ML S 4	AI 324	30647-30648
Vol Flo ML S 5	AI 325	30649-30650
Vol Flo ML S 6	AI 326	30651-30652
Vol Flo ML S 7	AI 327	30653-30654
Vol Flo ML S 8	AI 328	30655-30656
Vol Flo ML S 9	AI 329	30657-30658
Vol Flo ML S 10	AI 330	30659-30660
ID 1	AI 331	30661-30662
ID 2	AI 332	30663-30664
ID 3	AI 333	30665-30666
ID 4	AI 334	30667-30668
ID 5	AI 335	30669-30670
ID 6	AI 336	30671-30672
ID 7	AI 337	30673-30674
ID 8	AI 338	30675-30676
ID 9	AI 339	30677-30678
ID 10	AI 340	30679-30680
Volume 1	AI 341	30681-30682
Volume 2	AI 342	30683-30684
Volume 3	AI 343	30685-30686
Volume 4	AI 344	30687-30688
Volume 5	AI 345	30689-30690
Volume 6	AI 346	30691-30692
Volume 7	AI 347	30693-30694
Volume 8	AI 348	30695-30696
Volume 9	AI 349	30697-30698
Volume 10	AI 350	30699-30700
Error Flags 1	AI 351	30701-30702
Error Flags 2	AI 352	30703-30704

Error Flags 3	AI 353	30705-30706
Error Flags 4	AI 354	30707-30708
Error Flags 5	AI 355	30709-30710
Error Flags 6	AI 356	30711-30712
Error Flags 7	AI 357	30713-30714
Error Flags 8	AI 358	30715-30716
Error Flags 9	AI 359	30717-30718
Error Flags 10	AI 360	30719-30720
Medium 1	AI 361	30721-30722
Medium 2	AI 362	30723-30724
Medium 3	AI 363	30725-30726
Medium 4	AI 364	30727-30728
Medium 5	AI 365	30729-30730
Medium 6	AI 366	30731-30732
Medium 7	AI 367	30733-30734
Medium 8	AI 368	30735-30736
Medium 9	AI 369	30737-30738
Medium 10	AI 370	30739-30740
Unknown 1	AI 371	30741-30742
Unknown 2	AI 372	30743-30744
Unknown 3	AI 373	30745-30746
Unknown 4	AI 374	30747-30748
Unknown 5	AI 375	30749-30750
Unknown 6	AI 376	30751-30752
Unknown 7	AI 377	30753-30754
Unknown 8	AI 378	30755-30756
Unknown 9	AI 379	30757-30758
Unknown 10	AI 380	30759-30760
Time Pt 1	AI 381	30761-30762
Time Pt 2	AI 382	30763-30764
Time Pt 3	AI 383	30765-30766
Time Pt 4	AI 384	30767-30768
Time Pt 5	AI 385	30769-30770
Time Pt 6	AI 386	30771-30772
Time Pt 7	AI 387	30773-30774
Time Pt 8	AI 388	30775-30776
Time Pt 9	AI 389	30777-30778
Time Pt 10	AI 390	30779-30780
Fab Number 1	AI 391	30781-30782
Fab Number 2	AI 392	30783-30784
Fab Number 3	AI 393	30785-30786
Fab Number 4	AI 394	30787-30788
Fab Number 5	AI 395	30789-30790
Fab Number 6	AI 396	30791-30792
Fab Number 7	AI 397	30793-30794
Fab Number 8	AI 398	30795-30796
Fab Number 9	AI 399	30797-30798
Fab Number 10	AI 400	30799-30800
Alarm Flags 1	AI 401	30801-30802
Alarm Flags 2	AI 402	30803-30804
Alarm Flags 3	AI 403	30805-30806
Alarm Flags 4	AI 404	30807-30808
Alarm Flags 5	AI 405	30809-30810
Alarm Flags 6	AI 406	30811-30812
Alarm Flags 7	AI 407	30813-30814
Alarm Flags 8	AI 408	30815-30816
Alarm Flags 9	AI 409	30817-30818
Alarm Flags 10	AI 410	30819-30820

Appendix B.12. Kamstrup 66 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy T WH 1	AI 01	30001-30002
Energy T WH 2	AI 02	30003-30004
Energy T WH 3	AI 03	30005-30006

Energy T WH 4	AI 04	30007-30008
Energy T WH 5	AI 05	30009-30010
Energy T WH 6	AI 06	30011-30012
Energy T WH 7	AI 07	30013-30014
Energy T WH 8	AI 08	30015-30016
Energy T WH 9	AI 09	30017-30018
Energy T WH 10	AI 10	30019-30020
Energy T J 1	AI 11	30021-30022
Temp Ret 1	AI 12	30023-30024
Temp Dif 1	AI 13	30025-30026
Time Hrs 1	AI 14	30027-30028
Power W 1	AI 15	30029-30030
Power W 2	AI 16	30031-30032
Power W 3	AI 17	30033-30034
Power W 4	AI 18	30035-30036
Power W 5	AI 19	30037-30038
Vol Flo L H 1	AI 20	30039-30040
Vol Flo L H 2	AI 21	30041-30042
Vol Flo L H 3	AI 22	30043-30044
Vol Flo L H 4	AI 23	30045-30046
Vol Flo ML S 1	AI 24	30047-30048
Volume 1	AI 25	30049-30050
Volume 2	AI 26	30051-30052
Volume 3	AI 27	30053-30054
Volume 4	AI 28	30055-30056
Volume 5	AI 29	30057-30058
Volume 6	AI 30	30059-30060
Volume 7	AI 31	30061-30062

Appendix B.13. Amtron Sonic D Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy T WH 1	AI 01	30001-30002
Energy T WH 2	AI 02	30003-30004
Energy T WH 3	AI 03	30005-30006
Temp Flow 1	AI 04	30007-30008
Temp Ret 1	AI 05	30009-30010
Temp Dif 1	AI 06	30011-30012
Time Op Days 1	AI 07	30013-30014
Power W 1	AI 08	30015-30016
Vol Flo L S 1	AI 09	30017-30018
Volume 1	AI 10	30019-30020
Volume 2	AI 11	30021-30022
Time Point 1	AI 12	30023-30024
Time Point 2	AI 13	30025-30026
Time Point 3	AI 14	30027-30028
Time Point 4	AI 15	30029-30030

Appendix B.14. Shenitech STUF-280T Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Dur Avg S 1	AI 01	30001-30002
Dur Avg S 2	AI 02	30003-30004
Dur Avg S 3	AI 03	30005-30006
Dur Act Sec 1	AI 04	30007-30008
Dur Act Sec 2	AI 05	30009-30010
Dur Act Sec 3	AI 06	30011-30012
Temp Flow 1	AI 07	30013-30014
Temp Flow 2	AI 08	30015-30016
Temp Flow 3	AI 09	30017-30018
Temp Ret 1	AI 10	30019-30020

Temp Ret 2	AI 11	30021-30022
Temp Ret 3	AI 12	30023-30024
Power W 1	AI 13	30025-30026
Power W 2	AI 14	30027-30028
Power W 3	AI 15	30029-30030
Vol Flo L H 1	AI 16	30031-30032
Vol Flo L H 2	AI 17	30033-30034
Vol Flo L H 3	AI 18	30035-30036
Volume 1	AI 19	30037-30038
Volume 2	AI 20	30039-30040
Volume 3	AI 21	30041-30042
Enregy MWH 1	AI 22	30043-30044
Enregy MWH 2	AI 23	30045-30046
Enregy MWH 3	AI 24	30047-30048

Appendix B.15. SensusHRI-B1-8Profile Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Volume 1	AI 1	30001-30002
Meter ID 1	AI 2	30003-30004

Appendix B.16. KromSchroderTRZ2S1 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Volume 1	AI 1	30001-30002
Meter ID 1	AI 2	30003-30004

Appendix B.17. KromSchroderDE10R25-40B Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Dur Avg S 1	AI 001	30001-30002
Dur Avg S 2	AI 002	30003-30004
Dur Avg S 3	AI 003	30005-30006
Dur Avg S 4	AI 004	30007-30008
Dur Avg S 5	AI 005	30009-30010
Dur Avg S 6	AI 006	30011-30012
Dur Avg S 7	AI 007	30013-30014
Dur Avg S 8	AI 008	30015-30016
Dur Avg S 9	AI 009	30017-30018
Dur Avg S 10	AI 010	30019-30020
Dur Avg M 1	AI 011	30021-30022
Dur Avg M 2	AI 012	30023-30024
Dur Avg M 3	AI 013	30025-30026
Dur Avg M 4	AI 014	30027-30028
Dur Avg M 5	AI 015	30029-30030
Dur Avg M 6	AI 016	30031-30032
Dur Avg M 7	AI 017	30033-30034
Dur Avg M 8	AI 018	30035-30036
Dur Avg M 9	AI 019	30037-30038
Dur Avg M 10	AI 020	30039-30040
Dur Avg H 1	AI 021	30041-30042
Dur Avg H 2	AI 022	30043-30044
Dur Avg H 3	AI 023	30045-30046
Dur Avg H 4	AI 024	30047-30048
Dur Avg H 5	AI 025	30049-30050
Dur Avg H 6	AI 026	30051-30052
Dur Avg H 7	AI 027	30053-30054

Dur Avg H 8	AI 028	30055-30056
Dur Avg H 9	AI 029	30057-30058
Dur Avg H 10	AI 030	30059-30060
Dur Avg D 1	AI 031	30061-30062
Dur Avg D 2	AI 032	30063-30064
Dur Avg D 3	AI 033	30065-30066
Dur Avg D 4	AI 034	30067-30068
Dur Avg D 5	AI 035	30069-30070
Dur Avg D 6	AI 036	30071-30072
Dur Avg D 7	AI 037	30073-30074
Dur Avg D 8	AI 038	30075-30076
Dur Avg D 9	AI 039	30077-30078
Dur Avg D 10	AI 040	30079-30080
Dur Act Sec 1	AI 041	30081-30082
Dur Act Sec 2	AI 042	30083-30084
Dur Act Sec 3	AI 043	30085-30086
Dur Act Sec 4	AI 044	30087-30088
Dur Act Sec 5	AI 045	30089-30090
Dur Act Sec 6	AI 046	30091-30092
Dur Act Sec 7	AI 047	30093-30094
Dur Act Sec 8	AI 048	30095-30096
Dur Act Sec 9	AI 049	30097-30098
Dur Act Sec 10	AI 050	30099-30100
Dur Act Min 1	AI 051	30101-30102
Dur Act Min 2	AI 052	30103-30104
Dur Act Min 3	AI 053	30105-30106
Dur Act Min 4	AI 054	30107-30108
Dur Act Min 5	AI 055	30109-30110
Dur Act Min 6	AI 056	30111-30112
Dur Act Min 7	AI 057	30113-30114
Dur Act Min 8	AI 058	30115-30116
Dur Act Min 9	AI 059	30117-30118
Dur Act Min 10	AI 060	30119-30120
Dur Act Hrs 1	AI 061	30121-30122
Dur Act Hrs 2	AI 062	30123-30124
Dur Act Hrs 3	AI 063	30125-30126
Dur Act Hrs 4	AI 064	30127-30128
Dur Act Hrs 5	AI 065	30129-30130
Dur Act Hrs 6	AI 066	30131-30132
Dur Act Hrs 7	AI 067	30133-30134
Dur Act Hrs 8	AI 068	30135-30136
Dur Act Hrs 9	AI 069	30137-30138
Dur Act Hrs 10	AI 070	30139-30140
Dur Act Day 1	AI 071	30141-30142
Dur Act Day 2	AI 072	30143-30144
Dur Act Day 3	AI 073	30145-30146
Dur Act Day 4	AI 074	30147-30148
Dur Act Day 5	AI 075	30149-30150
Dur Act Day 6	AI 076	30151-30152
Dur Act Day 7	AI 077	30153-30154
Dur Act Day 8	AI 078	30155-30156
Dur Act Day 9	AI 079	30157-30158
Dur Act Day 10	AI 080	30159-30160
Energy T WH 1	AI 081	30161-30162
Energy T WH 2	AI 082	30163-30164
Energy T WH 3	AI 083	30165-30166
Energy T WH 4	AI 084	30167-30168
Energy T WH 5	AI 085	30169-30170
Energy T WH 6	AI 086	30171-30172
Energy T WH 7	AI 087	30173-30174
Energy T WH 8	AI 088	30175-30176
Energy T WH 9	AI 089	30177-30178
Energy T WH 10	AI 090	30179-30180
Energy T J 1	AI 091	30181-30182
Energy T J 2	AI 092	30183-30184
Energy T J 3	AI 093	30185-30186
Energy T J 4	AI 094	30187-30188
Energy T J 5	AI 095	30189-30190
Energy T J 6	AI 096	30191-30192

Energy T J 7	AI 097	30193-30194
Energy T J 8	AI 098	30195-30196
Energy T J 9	AI 099	30197-30198
Energy T J 10	AI 100	30199-30200
Voltage 1	AI 101	30201-30202
Voltage 2	AI 102	30203-30204
Voltage 3	AI 103	30205-30206
Voltage 4	AI 104	30207-30208
Voltage 5	AI 105	30209-30210
Voltage 6	AI 106	30211-30212
Voltage 7	AI 107	30213-30214
Voltage 8	AI 108	30215-30216
Voltage 9	AI 109	30217-30218
Voltage 10	AI 110	30219-30220
Current 1	AI 111	30221-30222
Current 2	AI 112	30223-30224
Current 3	AI 113	30225-30226
Current 4	AI 114	30227-30228
Current 5	AI 115	30229-30230
Current 6	AI 116	30231-30232
Current 7	AI 117	30233-30234
Current 8	AI 118	30235-30236
Current 9	AI 119	30237-30238
Current 10	AI 120	30239-30240
Temp Ext 1	AI 121	30241-30242
Temp Ext 2	AI 122	30243-30244
Temp Ext 3	AI 123	30245-30246
Temp Ext 4	AI 124	30247-30248
Temp Ext 5	AI 125	30249-30250
Temp Ext 6	AI 126	30251-30252
Temp Ext 7	AI 127	30253-30254
Temp Ext 8	AI 128	30255-30256
Temp Ext 9	AI 129	30257-30258
Temp Ext 10	AI 130	30259-30260
Temp Flow 1	AI 131	30261-30262
Temp Flow 2	AI 132	30263-30264
Temp Flow 3	AI 133	30265-30266
Temp Flow 4	AI 134	30267-30268
Temp Flow 5	AI 135	30269-30270
Temp Flow 6	AI 136	30271-30272
Temp Flow 7	AI 137	30273-30274
Temp Flow 8	AI 138	30275-30276
Temp Flow 9	AI 139	30277-30278
Temp Flow 10	AI 140	30279-30280
Temp Ret 1	AI 141	30281-30282
Temp Ret 2	AI 142	30283-30284
Temp Ret 3	AI 143	30285-30286
Temp Ret 4	AI 144	30287-30288
Temp Ret 5	AI 145	30289-30290
Temp Ret 6	AI 146	30291-30292
Temp Ret 7	AI 147	30293-30294
Temp Ret 8	AI 148	30295-30296
Temp Ret 9	AI 149	30297-30298
Temp Ret 10	AI 150	30299-30300
Temp Dif 1	AI 151	30301-30302
Temp Dif 2	AI 152	30303-30304
Temp Dif 3	AI 153	30305-30306
Temp Dif 4	AI 154	30307-30308
Temp Dif 5	AI 155	30309-30310
Temp Dif 6	AI 156	30311-30312
Temp Dif 7	AI 157	30313-30314
Temp Dif 8	AI 158	30315-30316
Temp Dif 9	AI 159	30317-30318
Temp Dif 10	AI 160	30319-30320
Time Sec 1	AI 161	30321-30322
Time Sec 2	AI 162	30323-30324
Time Sec 3	AI 163	30325-30326
Time Sec 4	AI 164	30327-30328
Time Sec 5	AI 165	30329-30330

Time Sec 6	AI 166	30331-30332
Time Sec 7	AI 167	30333-30334
Time Sec 8	AI 168	30335-30336
Time Sec 9	AI 169	30337-30338
Time Sec 10	AI 170	30339-30340
Time Min 1	AI 171	30341-30342
Time Min 2	AI 172	30343-30344
Time Min 3	AI 173	30345-30346
Time Min 4	AI 174	30347-30348
Time Min 5	AI 175	30349-30350
Time Min 6	AI 176	30351-30352
Time Min 7	AI 177	30353-30354
Time Min 8	AI 178	30355-30356
Time Min 9	AI 179	30357-30358
Time Min 10	AI 180	30359-30360
Time Hrs 1	AI 181	30361-30362
Time Hrs 2	AI 182	30363-30364
Time Hrs 3	AI 183	30365-30366
Time Hrs 4	AI 184	30367-30368
Time Hrs 5	AI 185	30369-30370
Time Hrs 6	AI 186	30371-30372
Time Hrs 7	AI 187	30373-30374
Time Hrs 8	AI 188	30375-30376
Time Hrs 9	AI 189	30377-30378
Time Hrs 10	AI 190	30379-30380
Time Days 1	AI 191	30381-30382
Time Days 2	AI 192	30383-30384
Time Days 3	AI 193	30385-30386
Time Days 4	AI 194	30387-30388
Time Days 5	AI 195	30389-30390
Time Days 6	AI 196	30391-30392
Time Days 7	AI 197	30393-30394
Time Days 8	AI 198	30395-30396
Time Days 9	AI 199	30397-30398
Time Days 10	AI 200	30399-30400
Time Op Sec 1	AI 201	30401-30402
Time Op Sec 2	AI 202	30403-30404
Time Op Sec 3	AI 203	30405-30406
Time Op Sec 4	AI 204	30407-30408
Time Op Sec 5	AI 205	30409-30410
Time Op Sec 6	AI 206	30411-30412
Time Op Sec 7	AI 207	30413-30414
Time Op Sec 8	AI 208	30415-30416
Time Op Sec 9	AI 209	30417-30418
Time Op Sec 10	AI 210	30419-30420
Time Op Min 1	AI 211	30421-30422
Time Op Min 2	AI 212	30423-30424
Time Op Min 3	AI 213	30425-30426
Time Op Min 4	AI 214	30427-30428
Time Op Min 5	AI 215	30429-30430
Time Op Min 6	AI 216	30431-30432
Time Op Min 7	AI 217	30433-30434
Time Op Min 8	AI 218	30435-30436
Time Op Min 9	AI 219	30437-30438
Time Op Min 10	AI 220	30439-30440
Time Op Hrs 1	AI 221	30441-30442
Time Op Hrs 2	AI 222	30443-30444
Time Op Hrs 3	AI 223	30445-30446
Time Op Hrs 4	AI 224	30447-30448
Time Op Hrs 5	AI 225	30449-30450
Time Op Hrs 6	AI 226	30451-30452
Time Op Hrs 7	AI 227	30453-30454
Time Op Hrs 8	AI 228	30455-30456
Time Op Hrs 9	AI 229	30457-30458
Time Op Hrs 10	AI 230	30459-30460
Time Op Days 1	AI 231	30461-30462
Time Op Days 2	AI 232	30463-30464
Time Op Days 3	AI 233	30465-30466
Time Op Days 4	AI 234	30467-30468

Time Op Days 5	AI 235	30469-30470
Time Op Days 6	AI 236	30471-30472
Time Op Days 7	AI 237	30473-30474
Time Op Days 8	AI 238	30475-30476
Time Op Days 9	AI 239	30477-30478
Time Op Days 10	AI 240	30479-30480
Custom 1	AI 241	30481-30482
Custom 2	AI 242	30483-30484
Custom 3	AI 243	30485-30486
Custom 4	AI 244	30487-30488
Custom 5	AI 245	30489-30490
Custom 6	AI 246	30491-30492
Custom 7	AI 247	30493-30494
Custom 8	AI 248	30495-30496
Custom 9	AI 249	30497-30498
Custom 10	AI 250	30499-30500
Power W 1	AI 251	30501-30502
Power W 2	AI 252	30503-30504
Power W 3	AI 253	30505-30506
Power W 4	AI 254	30507-30508
Power W 5	AI 255	30509-30510
Power W 6	AI 256	30511-30512
Power W 7	AI 257	30513-30514
Power W 8	AI 258	30515-30516
Power W 9	AI 259	30517-30518
Power W 10	AI 260	30519-30520
Power Jh 1	AI 261	30521-30522
Power Jh 2	AI 262	30523-30524
Power Jh 3	AI 263	30525-30526
Power Jh 4	AI 264	30527-30528
Power Jh 5	AI 265	30529-30530
Power Jh 6	AI 266	30531-30532
Power Jh 7	AI 267	30533-30534
Power Jh 8	AI 268	30535-30536
Power Jh 9	AI 269	30537-30538
Power Jh 10	AI 270	30539-30540
Pressure 1	AI 271	30541-30542
Pressure 2	AI 272	30543-30544
Pressure 3	AI 273	30545-30546
Pressure 4	AI 274	30547-30548
Pressure 5	AI 275	30549-30550
Pressure 6	AI 276	30551-30552
Pressure 7	AI 277	30553-30554
Pressure 8	AI 278	30555-30556
Pressure 9	AI 279	30557-30558
Pressure 10	AI 280	30559-30560
Mass 1	AI 281	30561-30562
Mass 2	AI 282	30563-30564
Mass 3	AI 283	30565-30566
Mass 4	AI 284	30567-30568
Mass 5	AI 285	30569-30570
Mass 6	AI 286	30571-30572
Mass 7	AI 287	30573-30574
Mass 8	AI 288	30575-30576
Mass 9	AI 289	30577-30578
Mass 10	AI 290	30579-30580
Mass Flow 1	AI 291	30581-30582
Mass Flow 2	AI 292	30583-30584
Mass Flow 3	AI 293	30585-30586
Mass Flow 4	AI 294	30587-30588
Mass Flow 5	AI 295	30589-30590
Mass Flow 6	AI 296	30591-30592
Mass Flow 7	AI 297	30593-30594
Mass Flow 8	AI 298	30595-30596
Mass Flow 9	AI 299	30597-30598
Mass Flow 10	AI 300	30599-30600
Vol Flo L M 1	AI 301	30601-30602
Vol Flo L M 2	AI 302	30603-30604
Vol Flo L M 3	AI 303	30605-30606

Vol Flo L M 4	AI 304	30607-30608
Vol Flo L M 5	AI 305	30609-30610
Vol Flo L M 6	AI 306	30611-30612
Vol Flo L M 7	AI 307	30613-30614
Vol Flo L M 8	AI 308	30615-30616
Vol Flo L M 9	AI 309	30617-30618
Vol Flo L M 10	AI 310	30619-30620
Vol Flo L H 1	AI 311	30621-30622
Vol Flo L H 2	AI 312	30623-30624
Vol Flo L H 3	AI 313	30625-30626
Vol Flo L H 4	AI 314	30627-30628
Vol Flo L H 5	AI 315	30629-30630
Vol Flo L H 6	AI 316	30631-30632
Vol Flo L H 7	AI 317	30633-30634
Vol Flo L H 8	AI 318	30635-30636
Vol Flo L H 9	AI 319	30637-30638
Vol Flo L H 10	AI 320	30639-30640
Vol Flo ML S 1	AI 321	30641-30642
Vol Flo ML S 2	AI 322	30643-30644
Vol Flo ML S 3	AI 323	30645-30646
Vol Flo ML S 4	AI 324	30647-30648
Vol Flo ML S 5	AI 325	30649-30650
Vol Flo ML S 6	AI 326	30651-30652
Vol Flo ML S 7	AI 327	30653-30654
Vol Flo ML S 8	AI 328	30655-30656
Vol Flo ML S 9	AI 329	30657-30658
Vol Flo ML S 10	AI 330	30659-30660
ID 1	AI 331	30661-30662
ID 2	AI 332	30663-30664
ID 3	AI 333	30665-30666
ID 4	AI 334	30667-30668
ID 5	AI 335	30669-30670
ID 6	AI 336	30671-30672
ID 7	AI 337	30673-30674
ID 8	AI 338	30675-30676
ID 9	AI 339	30677-30678
ID 10	AI 340	30679-30680
Volume 1	AI 341	30681-30682
Volume 2	AI 342	30683-30684
Volume 3	AI 343	30685-30686
Volume 4	AI 344	30687-30688
Volume 5	AI 345	30689-30690
Volume 6	AI 346	30691-30692
Volume 7	AI 347	30693-30694
Volume 8	AI 348	30695-30696
Volume 9	AI 349	30697-30698
Volume 10	AI 350	30699-30700
Error Flags 1	AI 351	30701-30702
Error Flags 2	AI 352	30703-30704
Error Flags 3	AI 353	30705-30706
Error Flags 4	AI 354	30707-30708
Error Flags 5	AI 355	30709-30710
Error Flags 6	AI 356	30711-30712
Error Flags 7	AI 357	30713-30714
Error Flags 8	AI 358	30715-30716
Error Flags 9	AI 359	30717-30718
Error Flags 10	AI 360	30719-30720
Medium 1	AI 361	30721-30722
Medium 2	AI 362	30723-30724
Medium 3	AI 363	30725-30726
Medium 4	AI 364	30727-30728
Medium 5	AI 365	30729-30730
Medium 6	AI 366	30731-30732
Medium 7	AI 367	30733-30734
Medium 8	AI 368	30735-30736
Medium 9	AI 369	30737-30738
Medium 10	AI 370	30739-30740
Unknown 1	AI 371	30741-30742
Unknown 2	AI 372	30743-30744

Unknown 3	AI 373	30745-30746
Unknown 4	AI 374	30747-30748
Unknown 5	AI 375	30749-30750
Unknown 6	AI 376	30751-30752
Unknown 7	AI 377	30753-30754
Unknown 8	AI 378	30755-30756
Unknown 9	AI 379	30757-30758
Unknown 10	AI 380	30759-30760

Appendix B.18. RelayPadPulsM1 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy_T_WH_1	AI 1	30001-30002
Vol_Flo_L_M_1	AI 2	30003-30004

Appendix B.19. AILA AUF200 Meter Data Profile Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy_Wh_1	AI 1	30001-30002
Energy_Wh_2	AI 2	30003-30004
Temp_Flow	AI 3	30005-30006
Temp_Return	AI 4	30007-30008
Time_Sec	AI 5	30009-30010
Power_W	AI 6	30011-30012
Volume_Flow_L_H	AI 7	30013-30014
Volume	AI 8	30015-30016

Appendix B.20. Siemens WFN21 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy_T_WH_1	AI 1	30001/30002
Energy_T_WH_2	AI 2	30003/30004
Energy_T_WH_3	AI 3	30005/30006
Energy_T_WH_4	AI 4	30007/30008
Energy_T_WH_5	AI 5	30009/30010
Energy_T_WH_6	AI 6	30011/30012
Energy_T_WH_7	AI 7	30013/30014
Energy_T_WH_8	AI 8	30015/30016
Time_Op_Min_1	AI 9	30017/30018
ID_1	AI 10	30019/30020
Error_Flags_1	AI 11	30021/30022

Appendix B.21. Siemens UH50 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Averaging Duration Minutes	AI 1	30001/30002
Averaging Duration Seconds	AI 2	30003/30004
Actuality Duration	AI 3	30005/30006
Energy 1	AI 4	30007/30008
Energy 2	AI 5	30009/30010
Energy 3	AI 6	30011/30012
Energy 4	AI 7	30013/30014
Energy 5	AI 8	30015/30016

Energy 6	AI 9	30017/30018
Energy 7	AI 10	30019/30020
Energy 8	AI 11	30021/30022
Energy 9	AI 12	30023/30024
Energy 10	AI 13	30025/30026
Energy 11	AI 14	30027/30028
Energy 12	AI 15	30029/30030
Flow Temperature 1	AI 16	30031/30032
Flow Temperature 2	AI 17	30033/30034
Flow Temperature 3	AI 18	30035/30036
Return Temperature 1	AI 19	30037/30038
Return Temperature 2	AI 20	30039/30040
Return Temperature 3	AI 21	30041/30042
Temperature Difference	AI 22	30043/30044
On Time 1	AI 23	30045/30046
On Time 2	AI 24	30047/30048
On Time 3	AI 25	30049/30050
On Time 4	AI 26	30051/30052
Power 1	AI 27	30053/30054
Power 2	AI 28	30055/30056
Power 3	AI 29	30057/30058
Power 4	AI 30	30059/30060
Volume Flow 1	AI 31	30061/30062
Volume Flow 2	AI 32	30063/30064
Volume Flow 3	AI 33	30065/30066
Volume 1	AI 34	30067/30068
Volume 2	AI 35	30069/30070
Volume 3	AI 36	30071/30072
Time Point 1	AI 37	30073/30074
Time Point 2	AI 38	30075/30076
Fabrication Number	AI 39	30077/30078

Appendix B.22. Siemens T230 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Averaging Duration Seconds 1	AI 1	30001/30002
Averaging Duration Seconds 2	AI 2	30003/30004
Averaging Duration Seconds 3	AI 3	30005/30006
Averaging Duration Minutes 1	AI 4	30007/30008
Averaging Duration Minutes 2	AI 5	30009/30010
Averaging Duration Minutes 3	AI 6	30011/30012
Actuality Duration 1	AI 7	30013/30014
Actuality Duration 2	AI 8	30015/30016
Actuality Duration 3	AI 9	30017/30018
Energy 1	AI 10	30019/30020
Energy 2	AI 11	30021/30022
Energy 3	AI 12	30023/30024
Energy 4	AI 13	30025/30026
Energy 5	AI 14	30027/30028
Energy 6	AI 15	30029/30030
Energy 7	AI 16	30031/30032
Energy 8	AI 17	30033/30034
Energy 9	AI 18	30035/30036
Energy 10	AI 19	30037/30038
Flow Temperature 1	AI 20	30039/30040
Flow Temperature 2	AI 21	30041/30042
Flow Temperature 3	AI 22	30043/30044
Flow Temperature 4	AI 23	30045/30046
Flow Temperature 5	AI 24	30047/30048
Flow Temperature 6	AI 25	30049/30050
Flow Temperature 7	AI 26	30051/30052
Flow Temperature 8	AI 27	30053/30054
Flow Temperature 9	AI 28	30055/30056
Flow Temperature 10	AI 29	30057/30058
Return Temperature 1	AI 30	30059/30060

Return Temperature 2	AI 31	30061/30062
Return Temperature 3	AI 32	30063/30064
Return Temperature 4	AI 33	30065/30066
Return Temperature 5	AI 34	30067/30068
Return Temperature 6	AI 35	30069/30070
Return Temperature 7	AI 36	30071/30072
Return Temperature 8	AI 37	30073/30074
Return Temperature 9	AI 38	30075/30076
Return Temperature 10	AI 39	30077/30078
Temperature Difference 1	AI 40	30079/30080
Temperature Difference 2	AI 41	30081/30082
Temperature Difference 3	AI 42	30083/30084
On Time 1	AI 43	30085/30086
On Time 2	AI 44	30087/30088
On Time 3	AI 45	30089/30090
On Time 4	AI 46	30091/30092
On Time 5	AI 47	30093/30094
On Time 6	AI 48	30095/30096
On Time 7	AI 49	30097/30098
On Time 8	AI 50	30099/30100
On Time 9	AI 51	30101/30102
Operating Hours 1	AI 52	30103/30104
Operating Hours 2	AI 53	30105/30106
Operating Hours 3	AI 54	30107/30108
Operating Hours 4	AI 55	30109/30110
Operating Hours 5	AI 56	30111/30112
Operating Hours 6	AI 57	30113/30114
Power 1	AI 58	30115/30116
Power 2	AI 59	30117/30118
Power 3	AI 60	30119/30120
Power 4	AI 61	30121/30122
Power 5	AI 62	30123/30124
Power 6	AI 63	30125/30126
Power 7	AI 64	30127/30128
Power 8	AI 65	30129/30130
Power 9	AI 66	30131/30132
Power 10	AI 67	30133/30134
Volume Flow 1	AI 68	30135/30136
Volume Flow 2	AI 69	30137/30138
Volume Flow 3	AI 70	30139/30140
Volume Flow 4	AI 71	30141/30142
Volume Flow 5	AI 72	30143/30144
Volume Flow 6	AI 73	30145/30146
Volume Flow 7	AI 74	30147/30148
Volume Flow 8	AI 75	30149/30150
Volume Flow 9	AI 76	30151/30152
Volume Flow 10	AI 77	30153/30154
Volume 1	AI 78	30155/30156
Volume 2	AI 79	30157/30158
Volume 3	AI 80	30159/30160
Volume 4	AI 81	30161/30162
Volume 5	AI 82	30163/30164
Volume 6	AI 83	30165/30166
Time Point 1	AI 84	30167/30168
Time Point 2	AI 85	30169/30170
Time Point 3	AI 86	30171/30172
Time Point 4	AI 87	30173/30174
Time Point 5	AI 88	30175/30176
Time Point 6	AI 89	30177/30178
Fabrication Number 1	AI 90	30179/30180
Fabrication Number 2	AI 91	30181/30182
Fabrication Number 3	AI 92	30183/30184

Appendix B.23. Kamstrup Multical Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy T WH 1	AI 1	30001/30002
Energy T WH 2	AI 2	30003/30004
Energy T WH 3	AI 3	30005/30006
Energy T WH 4	AI 4	30007/30008
Energy T WH 5	AI 5	30009/30010
Energy T WH 6	AI 6	30011/30012
Energy T WH 7	AI 7	30013/30014
Energy T WH 8	AI 8	30015/30016
Energy T WH 9	AI 9	30017/30018
Energy T WH 10	AI 10	30019/30020
Energy T WH 11	AI 11	30021/30022
Energy T WH 12	AI 12	30023/30024
Energy T WH 13	AI 13	30025/30026
Energy T WH 14	AI 14	30027/30028
Energy T WH 15	AI 15	30029/30030
Energy T WH 16	AI 16	30031/30032
Energy T WH 17	AI 17	30033/30034
Energy T WH 18	AI 18	30035/30036
Energy T WH 19	AI 19	30037/30038
Energy T WH 20	AI 20	30039/30040
Energy T WH 21	AI 21	30041/30042
Energy T WH 22	AI 22	30043/30044
Energy T WH 23	AI 23	30045/30046
Energy T J 1	AI 24	30047/30048
Temp Flow 1	AI 25	30049/30050
Temp Ret 1	AI 26	30051/30052
Temp Dif 1	AI 27	30053/30054
Time Op Hrs 1	AI 28	30055/30056
Power W 1	AI 29	30057/30058
Power W 2	AI 30	30059/30060
Power W 3	AI 31	30061/30062
Power Jh 1	AI 32	30063/30064
Vol Flo L H 1	AI 33	30065/30066
Vol Flo L H 2	AI 34	30067/30068
Vol Flo L H 3	AI 35	30069/30070
Volume 1	AI 36	30071/30072
Volume 2	AI 37	30073/30074
Volume 3	AI 38	30075/30076
Volume 4	AI 39	30077/30078
Volume 5	AI 40	30079/30080
Volume 6	AI 41	30081/30082
Time Pt 1	AI 42	30083/30084
Time Pt 2	AI 43	30085/30086
Fab Number 1	AI 44	30087/30088

Appendix B.24. Siemens UH50 Combined Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Averaging Duration Seconds	AI 1	30001/30002
Averaging Duration Seconds	AI 2	30003/30004
Averaging Duration Seconds	AI 3	30005/30006
Averaging Duration Minutes	AI 4	30007/30008
Averaging Duration Minutes	AI 5	30009/30010
Averaging Duration Minutes	AI 6	30011/30012
Actuality Duration	AI 7	30013/30014
Actuality Duration	AI 8	30015/30016
Actuality Duration	AI 9	30017/30018
Energy 1	AI 10	30019/30020
Energy 2	AI 11	30021/30022
Energy 3	AI 12	30023/30024

Energy 4	AI 13	30025/30026
Energy 5	AI 14	30027/30028
Energy 6	AI 15	30029/30030
Energy 7	AI 16	30031/30032
Energy 8	AI 17	30033/30034
Energy 9	AI 18	30035/30036
Energy 10	AI 19	30037/30038
Energy 11	AI 20	30039/30040
Energy 12	AI 21	30041/30042
Flow Temperature 1	AI 22	30043/30044
Flow Temperature 2	AI 23	30045/30046
Flow Temperature 3	AI 24	30047/30048
Flow Temperature 4	AI 25	30049/30050
Flow Temperature 5	AI 26	30051/30052
Flow Temperature 6	AI 27	30053/30054
Flow Temperature 7	AI 28	30055/30056
Flow Temperature 8	AI 29	30057/30058
Flow Temperature 9	AI 30	30059/30060
Return Temperature 1	AI 31	30061/30062
Return Temperature 2	AI 32	30063/30064
Return Temperature 3	AI 33	30065/30066
Return Temperature 4	AI 34	30067/30068
Return Temperature 5	AI 35	30069/30070
Return Temperature 6	AI 36	30071/30072
Return Temperature 7	AI 37	30073/30074
Return Temperature 8	AI 38	30075/30076
Return Temperature 9	AI 39	30077/30078
Temperature Difference 1	AI 40	30079/30080
Temperature Difference 2	AI 41	30081/30082
Temperature Difference 3	AI 42	30083/30084
On Time 1	AI 43	30085/30086
On Time 2	AI 44	30087/30088
On Time 3	AI 45	30089/30090
On Time 4	AI 46	30091/30092
On Time 5	AI 47	30093/30094
On Time 6	AI 48	30095/30096
On Time 7	AI 49	30097/30098
On Time 8	AI 50	30099/30100
On Time 9	AI 51	30101/30102
On Time 10	AI 52	30103/30104
Power 1	AI 53	30105/30106
Power 2	AI 54	30107/30108
Power 3	AI 55	30109/30110
Power 4	AI 56	30111/30112
Power 5	AI 57	30113/30114
Power 6	AI 58	30115/30116
Power 7	AI 59	30117/30118
Power 8	AI 60	30119/30120
Power 9	AI 61	30121/30122
Power 10	AI 62	30123/30124
Volume Flow 1	AI 63	30125/30126
Volume Flow 2	AI 64	30127/30128
Volume Flow 3	AI 65	30129/30130
Volume Flow 4	AI 66	30131/30132
Volume Flow 5	AI 67	30133/30134
Volume Flow 6	AI 68	30135/30136
Volume Flow 7	AI 69	30137/30138
Volume Flow 8	AI 70	30139/30140
Volume Flow 9	AI 71	30141/30142
Volume 1	AI 72	30143/30144
Volume 2	AI 73	30145/30146
Volume 3	AI 74	30147/30148
Volume 4	AI 75	30149/30150
Volume 5	AI 76	30151/30152
Volume 6	AI 77	30153/30154
Volume 7	AI 78	30155/30156
Volume 8	AI 79	30157/30158
Volume 9	AI 80	30159/30160
Time Point 1	AI 81	30161/30162

Time Point 2	AI 82	30163/30164
Time Point 3	AI 83	30165/30166
Time Point 4	AI 84	30167/30168
Time Point 5	AI 85	30169/30170
Time Point 6	AI 86	30171/30172
Fabrication Number 1	AI 87	30173/30174
Fabrication Number 2	AI 88	30175/30176
Fabrication Number 3	AI 89	30177/30178

Appendix B.25. Sensostar 2C Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy_T_WH_1	AI 1	30001/30002
Energy_T_J_1	AI 2	30003/30004
Temp_Ext_1	AI 3	30005/30006
Temp_Flow_1	AI 4	30007/30008
Temp_Ret_1	AI 5	30009/30010
Temp_Dif_1	AI 6	30011/30012
Vol_Flo_L_H_1	AI 7	30013/30014
Vol_Flo_ML_S_10	AI 8	30015/30016
ID_1	AI 9	30017/30018
Volume_1	AI 10	30019/30020

Appendix B.26. Axis SKU-03 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy_T_WH_1	AI 1	30001/30002
Temp_Flow_1	AI 2	30003/30004
Temp_Ret_1	AI 3	30005/30006
Temp_Dif_1	AI 4	30007/30008
Time_Sec_1	AI 5	30009/30010
Time_Op_Sec_1	AI 6	30011/30012
Power_W_1	AI 7	30013/30014
Vol_Flo_L_M_1	AI 8	30015/30016
ID_1	AI 9	30017/30018
Volume_1	AI 10	30019/30020
Error_Flags_1	AI 11	30021/30022
M_Bus_State_1	AI 12	30023/30024

Appendix B.27. ECS Elec Mtr Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy_T_WH_1	AI 1	30001/30002
Energy_T_WH_2	AI 2	30003/30004
Energy_T_WH_3	AI 3	30005/30006
Energy_T_WH_4	AI 4	30007/30008
Energy_T_WH_5	AI 5	30009/30010
Energy_T_WH_6	AI 6	30011/30012
Voltage_1	AI 7	30013/30014
Voltage_2	AI 8	30015/30016
Voltage_3	AI 9	30017/30018
Current_1	AI 10	30019/30020
Current_2	AI 11	30021/30022
Current_3	AI 12	30023/30024
Current_4	AI 13	30025/30026
Power_W_1	AI 14	30027/30028
Power_W_2	AI 15	30029/30030

Power_W_3	AI 16	30031/30032
Power_W_4	AI 17	30033/30034
Power_W_5	AI 18	30035/30036
Power_W_6	AI 19	30037/30038
Power_W_7	AI 20	30039/30040
Power_W_8	AI 21	30041/30042
ID_1	AI 22	30043/30044
Error_Flags_1	AI 23	30045/30046
Unknown_2	AI 24	30047/30048
Unknown_3	AI 25	30049/30050
Unknown_4	AI 26	30051/30052
Unknown_5	AI 27	30053/30054
Unknown_6	AI 28	30055/30056

Time_Min_1	AI 4	30007/30008
Custom_1	AI 5	30009/30010
Power_W_1	AI 6	30011/30012
Pressure_1	AI 7	30013/30014
Mass_1	AI 8	30015/30016
Vol_Flo_L_M_1	AI 9	30017/30018
Volume_1	AI 10	30019/30020
Unknown_1	AI 11	30021/30022
Unknown_2	AI 12	30023/30024
Unknown_3	AI 13	30025/30026
Unknown_4	AI 14	30027/30028
Time_Pt_1	AI 15	30029/30030

Appendix B.28. Diehl Hydrus Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Temp_Flow_1	AI 1	30001/30002
Vol_Flo_L_H_1	AI 2	30003/30004
Volume_1	AI 3	30005/30006
Volume_2	AI 4	30007/30008
Volume_3	AI 5	30009/30010
Time_Pt_1	AI 6	30011/30012

Appendix B.29. Diehl Sharky 775 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy_T_WH_1	AI 1	30001/30002
Energy_T_WH_2	AI 2	30003/30004
Energy_T_WH_3	AI 3	30005/30006
Energy_T_WH_4	AI 4	30007/30008
Energy_T_WH_5	AI 5	30009/30010
Energy_T_WH_6	AI 6	30011/30012
Energy_T_WH_7	AI 7	30013/30014
Energy_T_WH_8	AI 8	30015/30016
Temp_Flow_1	AI 9	30017/30018
Temp_Ret_1	AI 10	30019/30020
Temp_Dif_1	AI 11	30021/30022
Time_Days_1	AI 12	30023/30024
Power_W_1	AI 13	30025/30026
Vol_Flo_L_H_1	AI 14	30027/30028
Volume_1	AI 15	30029/30030
Volume_2	AI 16	30031/30032
Volume_3	AI 17	30033/30034
Volume_4	AI 18	30035/30036
Time_Pt_1	AI 19	30037/30038
Time_Pt_2	AI 20	30039/30040
Time_Pt_3	AI 21	30041/30042
Time_Pt_4	AI 22	30043/30044
Time_Pt_5	AI 23	30045/30046

Appendix B.30. Metz T M4 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy_T_WH_1	AI 1	30001/30002
Energy_T_WH_2	AI 2	30003/30004
Temp_Ext_1	AI 3	30005/30006

Appendix B.31. Hydrometer Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy_T_WH_1	AI 1	30001/30002
Energy_T_WH_2	AI 2	30003/30004
Energy_T_WH_3	AI 3	30005/30006
Energy_T_WH_4	AI 4	30007/30008
Energy_T_WH_5	AI 5	30009/30010
Energy_T_WH_6	AI 6	30011/30012
Energy_T_WH_7	AI 7	30013/30014
Energy_T_WH_8	AI 8	30015/30016
Energy_T_WH_9	AI 9	30017/30018
Energy_T_WH_10	AI 10	30019/30020
Temp_Flow_1	AI 11	30021/30022
Temp_Flow_2	AI 12	30023/30024
Temp_Flow_3	AI 13	30025/30026
Temp_Ret_1	AI 14	30027/30028
Temp_Ret_2	AI 15	30029/30030
Temp_Ret_3	AI 16	30031/30032
Temp_Dif_1	AI 17	30033/30034
Temp_Dif_2	AI 18	30035/30036
Temp_Dif_3	AI 19	30037/30038
Time_Op_Hrs_1	AI 20	30039/30040
Time_Op_Hrs_2	AI 21	30041/30042
Time_Op_Hrs_3	AI 22	30043/30044
Power_W_1	AI 23	30045/30046
Power_W_2	AI 24	30047/30048
Power_W_3	AI 25	30049/30050
Vol_Flo_L_H_1	AI 26	30051/30052
Vol_Flo_L_H_2	AI 27	30053/30054
Vol_Flo_L_H_3	AI 28	30055/30056
Volume_1	AI 29	30057/30058
Volume_2	AI 30	30059/30060
Volume_3	AI 31	30061/30062
Volume_4	AI 32	30063/30064
Volume_5	AI 33	30065/30066
Volume_6	AI 34	30067/30068
Volume_7	AI 35	30069/30070
Volume_8	AI 36	30071/30072
Volume_9	AI 37	30073/30074
Volume_10	AI 38	30075/30076
Time_Pt_1	AI 39	30077/30078
Time_Pt_2	AI 40	30079/30080
Time_Pt_3	AI 41	30081/30082
Time_Pt_4	AI 42	30083/30084
Time_Pt_5	AI 43	30085/30086
Time_Pt_6	AI 44	30087/30088
Time_Pt_7	AI 45	30089/30090
Time_Pt_8	AI 46	30091/30092
Time_Pt_9	AI 47	30093/30094
Time_Pt_10	AI 48	30095/30096
Status_Byte	AI 49	30097

Appendix B.32. Kamstrup 402 Mappings to BACnet and Modbus

Point Name	BACnet	Modbus
Energy_T_WH_1	AI 1	30001/30002
Energy_T_WH_2	AI 2	30003/30004
Energy_T_WH_3	AI 3	30005/30006
Energy_T_WH_4	AI 4	30007/30008
Energy_T_WH_5	AI 5	30009/30010
Energy_T_WH_6	AI 6	30011/30012
Energy_T_WH_7	AI 7	30013/30014
Energy_T_WH_8	AI 8	30015/30016
Energy_T_WH_9	AI 9	30017/30018
Energy_T_WH_10	AI 10	30019/30020
Temp_Flow_1	AI 11	30021/30022
Temp_Flow_2	AI 12	30023/30024
Temp_Flow_3	AI 13	30025/30026
Temp_Ret_1	AI 14	30027/30028
Temp_Ret_2	AI 15	30029/30030
Temp_Ret_3	AI 16	30031/30032
Temp_Dif_1	AI 17	30033/30034
Temp_Dif_2	AI 18	30035/30036
Temp_Dif_3	AI 19	30037/30038
Time_Op_Hrs_1	AI 20	30039/30040
Time_Op_Hrs_2	AI 21	30041/30042
Time_Op_Hrs_3	AI 22	30043/30044
Power_W_1	AI 23	30045/30046
Power_W_2	AI 24	30047/30048
Power_W_3	AI 25	30049/30050
Vol_Flo_L_H_1	AI 26	30051/30052
Vol_Flo_L_H_2	AI 27	30053/30054
Vol_Flo_L_H_3	AI 28	30055/30056
Volume_1	AI 29	30057/30058
Volume_2	AI 30	30059/30060
Volume_3	AI 31	30061/30062
Volume_4	AI 32	30063/30064
Volume_5	AI 33	30065/30066
Volume_6	AI 34	30067/30068
Volume_7	AI 35	30069/30070
Volume_8	AI 36	30071/30072
Volume_9	AI 37	30073/30074
Volume_10	AI 38	30075/30076
Time_Pt_1	AI 39	30077/30078
Time_Pt_2	AI 40	30079/30080
Time_Pt_3	AI 41	30081/30082
Time_Pt_4	AI 42	30083/30084
Time_Pt_5	AI 43	30085/30086
Time_Pt_6	AI 44	30087/30088
Time_Pt_7	AI 45	30089/30090
Time_Pt_8	AI 46	30091/30092
Time_Pt_9	AI 47	30093/30094
Time_Pt_10	AI 48	30095/30096
Status_Byte	AI 49	30097

APPENDIX C TROUBLESHOOTING TIPS**Appendix C.1. Communicating with the QuickServer Over the Network**

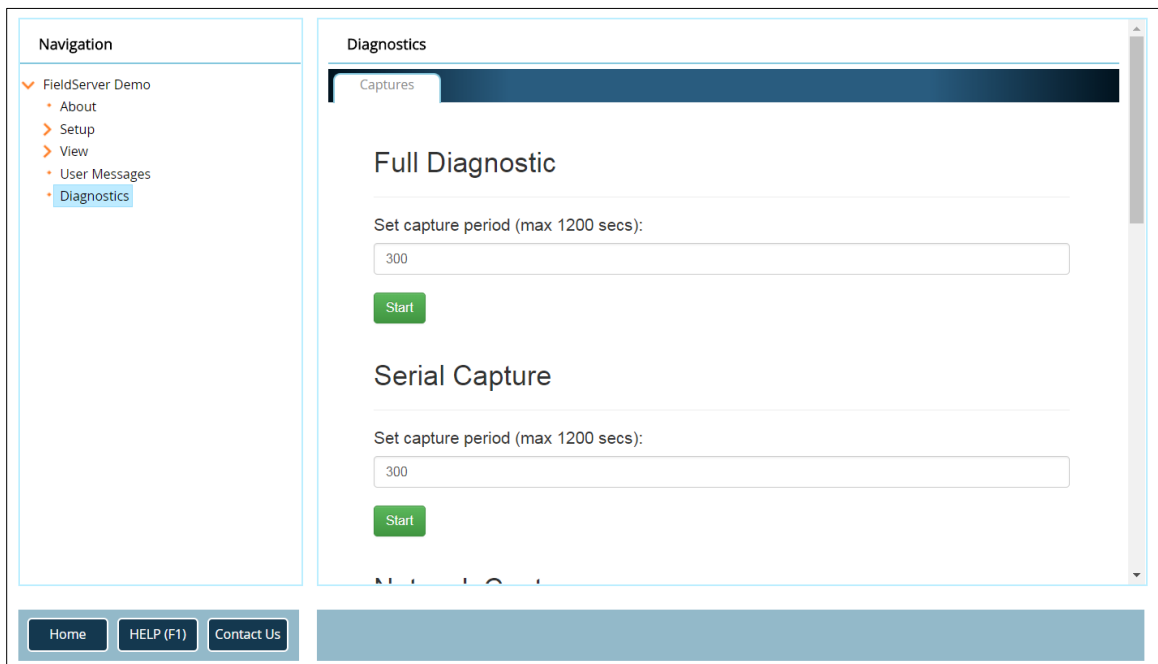
- Confirm that the network cabling is correct.
- Confirm that the computer network card is operational and correctly configured.
- Confirm that there is an Ethernet adapter installed in the PC's Device Manager List, and that it is configured to run the TCP/IP protocol.
- Check that the IP netmask of the PC matches the QuickServer. The Default IP Address of the QuickServer is 192.168.2.X, Subnet Mask is 255.255.255.0.
 - Go to Start|Run
 - Type in "ipconfig"
 - The account settings should be displayed.
 - Ensure that the IP Address is 102.168.2.X and the netmask 255.255.255.0
- Ensure that the PC and QuickServer are on the same IP Network, or assign a Static IP Address to the PC on the 192.168.2.0 network.

Appendix C.2. Take a FieldServer Diagnostic Capture

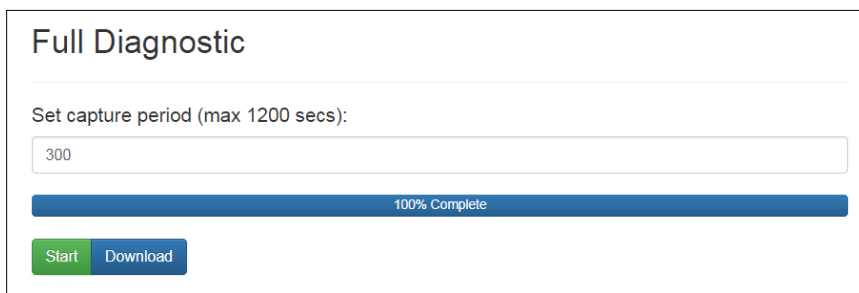
When there is a problem on-site that cannot easily be resolved, perform a Diagnostic Capture before contacting support. Once the Diagnostic Capture is complete, email it to technical support. The Diagnostic Capture will accelerate diagnosis of the problem.

If the FieldServer bios is updated/released on November 2017 or later then the Diagnostic Capture is performed via the gateway's on-board system.

- Access the FieldServer Diagnostics page via one of the following methods:
 - Open the FieldServer FS-GUI page and click on Diagnostics in the Navigation panel
 - Open the FieldServer Toolbox software and click the diagnose icon  of the desired device



- Go to Full Diagnostic and select the capture period.
- Click the Start button under the Full Diagnostic heading to start the capture.
 - When the capture period is finished, a Download button will appear next to the Start button



- Click Download for the capture to be downloaded to the local PC.
- Send the diagnostic zip file to technical support.

NOTE: Diagnostic captures of BACnet MS/TP communication are output in a “.PCAP” file extension which is compatible with Wireshark.

Appendix C.2.1. Taking a Capture with Older Firmware

If the FieldServer firmware is from before November 2017, the Diagnostic Capture can be done by downloading the FieldServer Toolbox software but network connections (such as Ethernet and Wi-Fi) cannot be captured (if a network diagnostic is needed take a Wire Shark capture).

Once the Diagnostic Capture is complete, email it to technical support. The Diagnostic Capture will accelerate diagnosis of the problem.

NOTE: While all necessary documentation is shipped with the FieldServer on the USB flash drive, these documents are constantly being updated. Newer versions may be available on the [Sierra Monitor website](#).

- Ensure that FieldServer Toolbox is loaded onto the local PC. Otherwise, download the FieldServer-Toolbox.zip via the Sierra Monitor website's [Software Downloads](#).
- Extract the executable file and complete the installation.

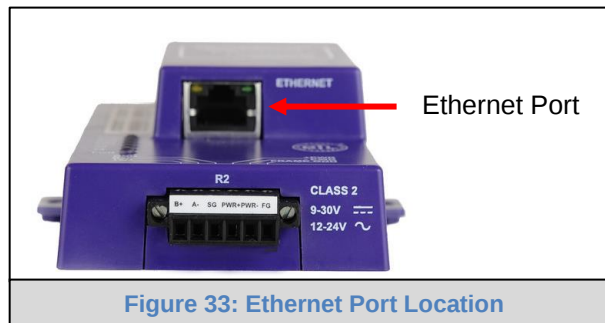
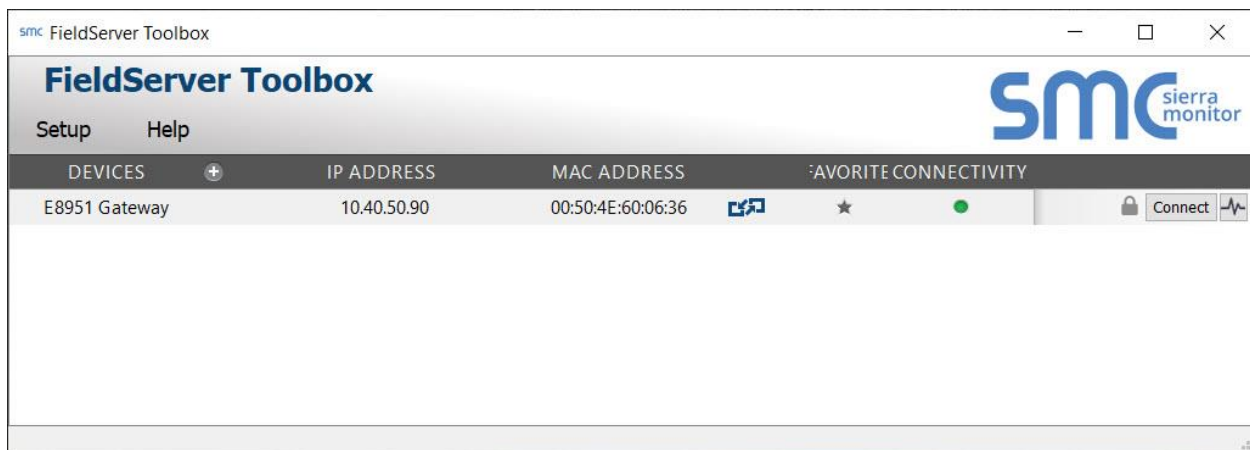


Figure 33: Ethernet Port Location

- Connect a standard Cat-5 Ethernet cable between the PC and QuickServer.
- Double click on the FS Toolbox Utility.
- **Step 1:** Take a Log
 - Click on the diagnose icon  of the desired device



- Select "Full Diagnostic" from the drop down menu



NOTE: If desired, the default capture period can be changed.

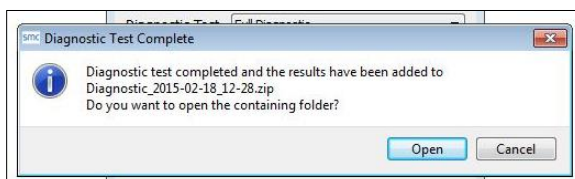
- Click on the Start Diagnostic button



- Wait for the capture period to finish and the Diagnostic Test Complete window will appear

- **Step 2: Send Log**

- Once the diagnostic test is complete, a .zip file is saved on the PC



- Click "Open" to launch explorer and have it point directly at the correct folder
- Email the diagnostic zip file to smc-support@msasafety.com



Appendix C.3. Internet Browser Software Support

The following web browsers are supported:

- Chrome Rev. 57 and higher
- Firefox Rev. 35 and higher
- Microsoft Edge Rev. 41 and higher
- Safari Rev. 3 and higher

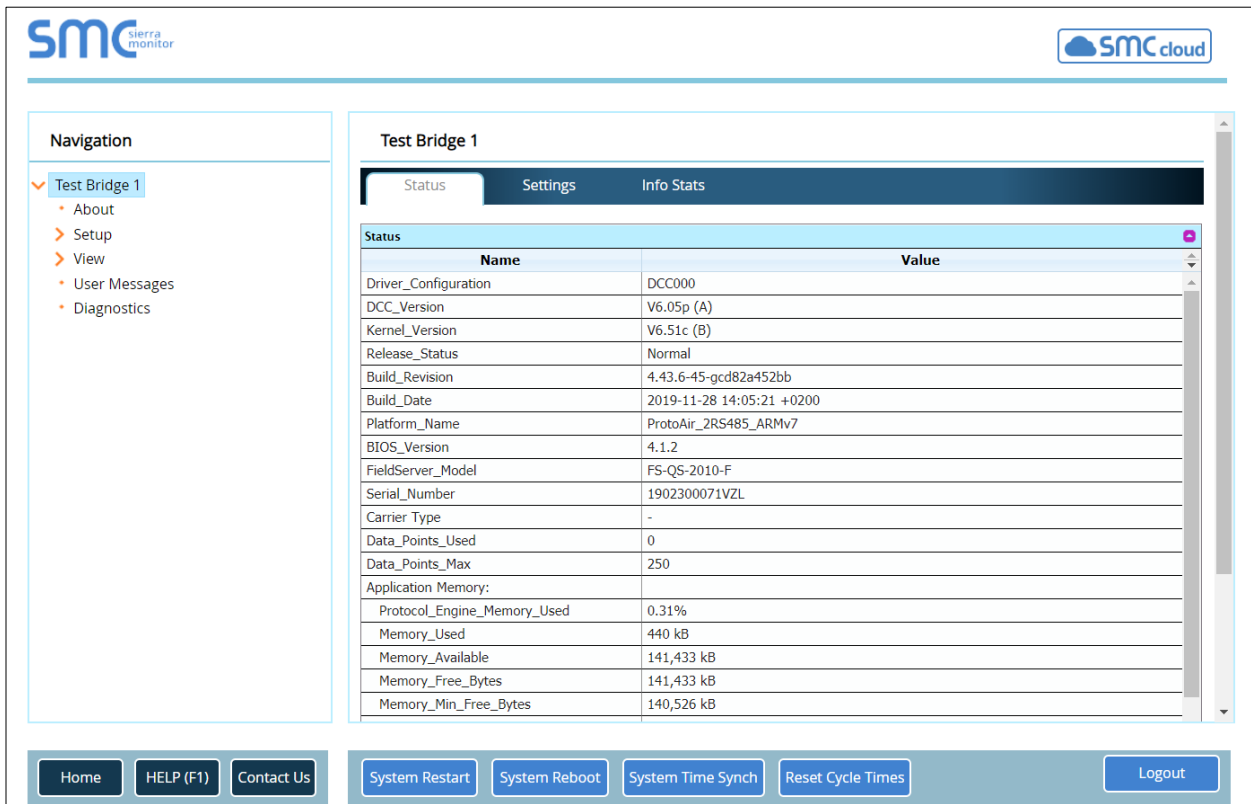
NOTE: Internet Explorer is no longer supported as recommended by Microsoft.

NOTE: Computer and network firewalls must be opened for Port 80 to allow FieldServer GUI to function.

Appendix C.4. Change Web Server Security Settings After Initial Setup

NOTE: Any changes will require a FieldServer reboot to take effect.

- From the FS-GUI landing page, click Setup in the Navigation panel.



The screenshot displays the FS-GUI landing screen. On the left is a 'Navigation' panel with a tree view containing 'Test Bridge 1' (expanded), 'About', 'Setup', 'View', 'User Messages', and 'Diagnostics'. The main content area shows the 'Test Bridge 1' status page, which has tabs for 'Status', 'Settings', and 'Info Stats'. The 'Status' tab is active, displaying a table of system parameters. At the bottom of the screen is a footer bar with buttons for 'Home', 'HELP (F1)', 'Contact Us', 'System Restart', 'System Reboot', 'System Time Synch', 'Reset Cycle Times', and 'Logout'.

Name	Value
Driver_Configuration	DCC000
DCC_Version	V6.05p (A)
Kernel_Version	V6.51c (B)
Release_Status	Normal
Build_Revision	4.43.6-45-gcd82a452bb
Build_Date	2019-11-28 14:05:21 +0200
Platform_Name	ProtoAir_2RS485_ARMv7
BIOS_Version	4.1.2
FieldServer_Model	FS-QS-2010-F
Serial_Number	1902300071VZL
Carrier Type	-
Data_Points_Used	0
Data_Points_Max	250
Application Memory:	
Protocol_Engine_Memory_Used	0.31%
Memory_Used	440 kB
Memory_Available	141,433 kB
Memory_Free_Bytes	141,433 kB
Memory_Min_Free_Bytes	140,526 kB

Figure 34: FS-GUI Landing Screen

Appendix C.4.1. Change Security Mode

- Click Security in the Navigation panel.

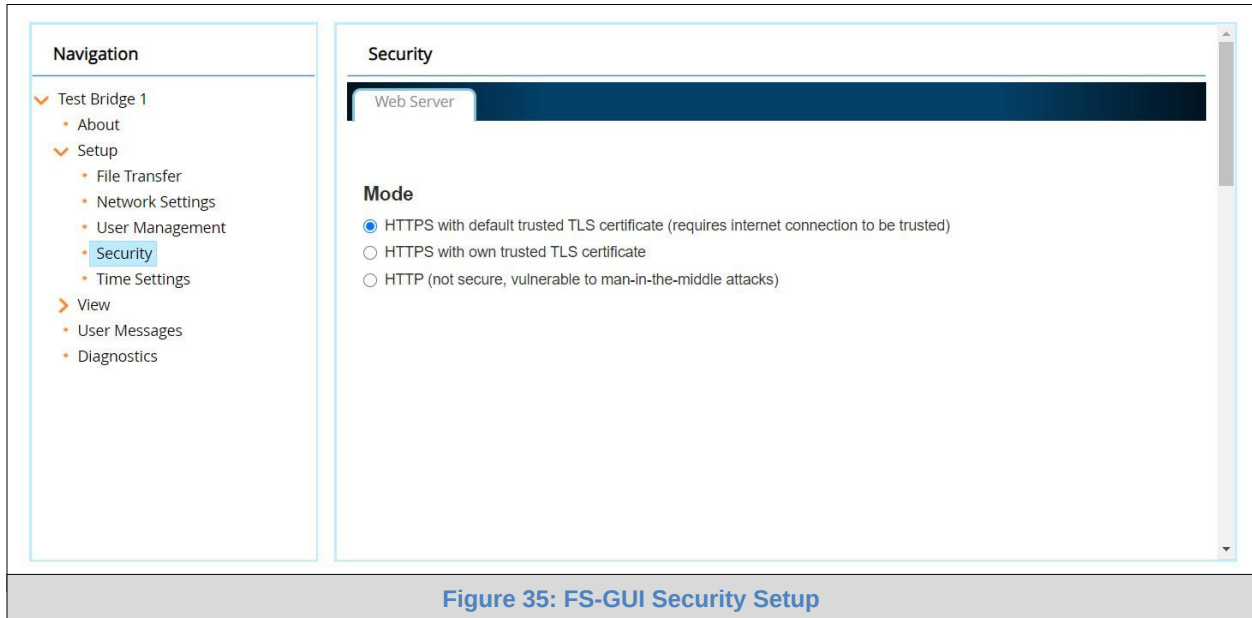


Figure 35: FS-GUI Security Setup

- Click the Mode desired.
 - If HTTPS with own trusted TLS certificate is selected, follow instructions in **Section 7.2.1**
- Click the Save button.

Appendix C.4.2. Edit the Certificate Loaded onto the FieldServer

NOTE: A loaded certificate will only be available if the security mode was previously setup as HTTPS with own trusted TLS certificate.

- Click Security in the Navigation panel.

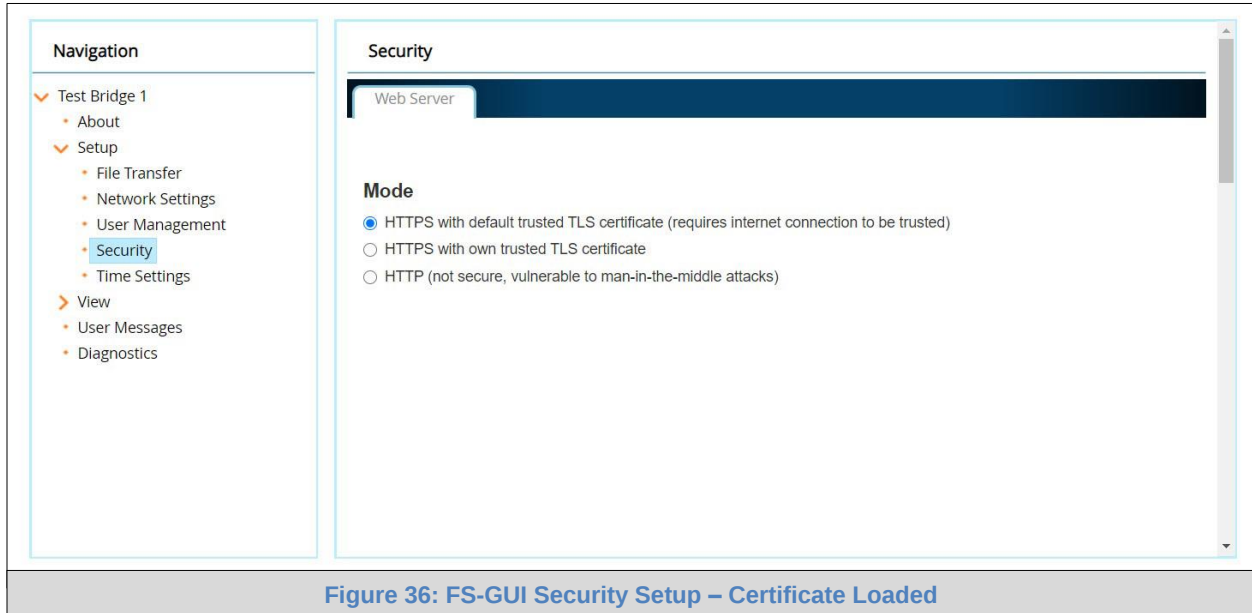


Figure 36: FS-GUI Security Setup – Certificate Loaded

- Click the Edit Certificate button to open the certificate and key fields.
- Edit the loaded certificate or key text as needed.
- Click Save.

Appendix C.5. Change User Management Settings

- From the FS-GUI page, click Setup in the Navigation panel.
- Click User Management in the navigation panel.

NOTE: If the passwords are lost, the unit can be reset to factory settings to reinstate the default unique password on the label. For QuickServer FS-QS-1xxx, ProtoNode, ProtoCessor or ProtoCarrier recovery instructions, see the [FieldServer Recovery Instructions document](#). For QuickServer 2xx0, ProtoNode FPC-N54 or ProtoAir recovery instructions, see the [FieldServer Next Gen Recovery document](#). If the default unique password is lost, then the unit must be mailed back to the factory.

NOTE: Any changes will require a FieldServer reboot to take effect.

Appendix C.5.1. User Management

- Check that the Users tab is selected.

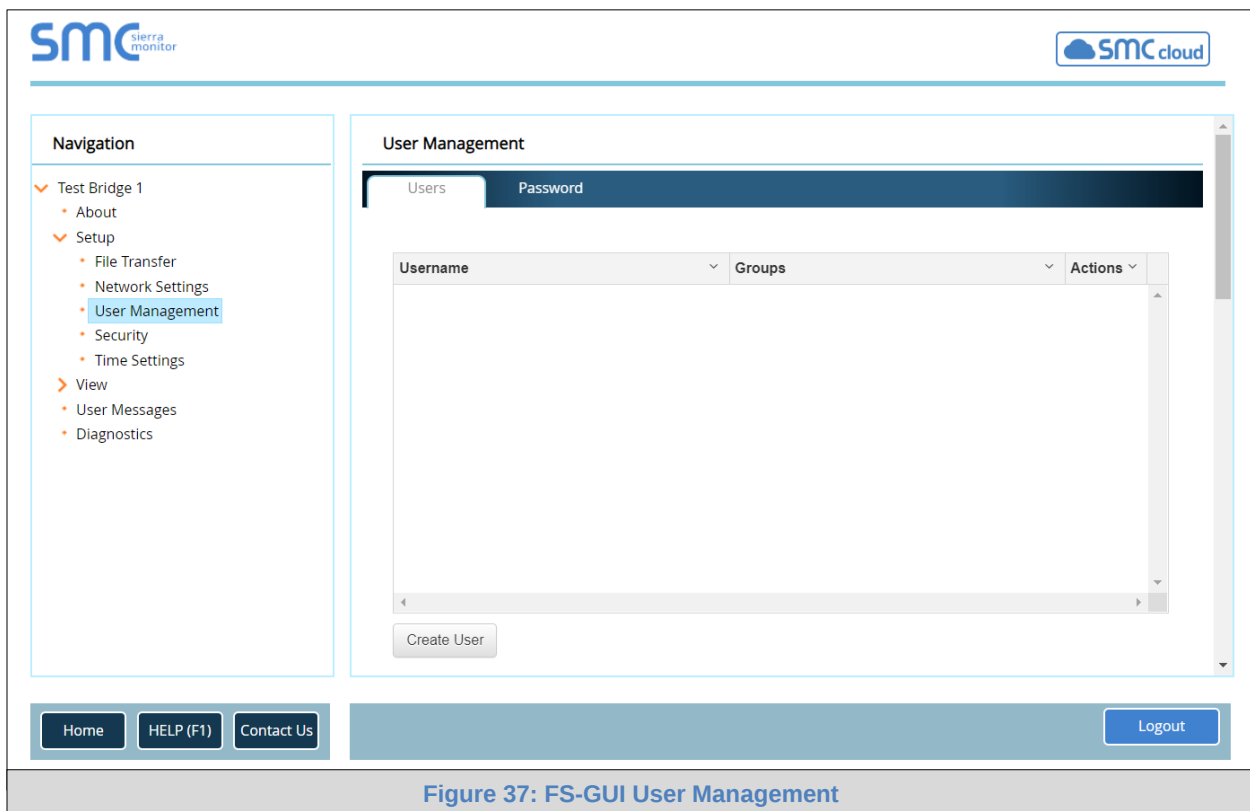


Figure 37: FS-GUI User Management

User Types:

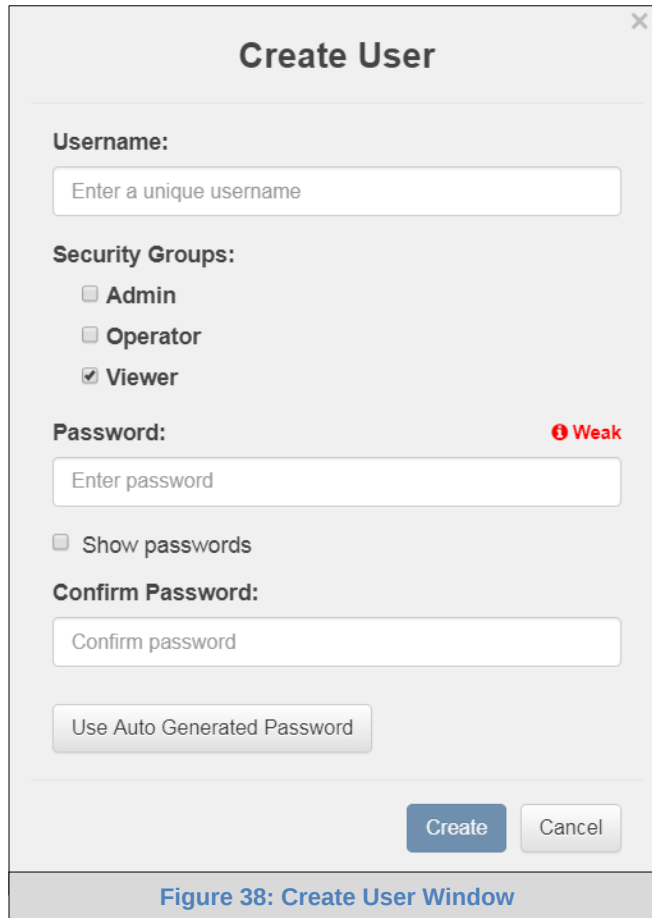
Admin – Can modify any settings on the FieldServer.

Operator – Can modify and view any data in the FieldServer array(s).

Viewer – Can only view settings/readings on the FieldServer.

Appendix C.5.1.1. Create Users

- Click the Create User button.



The 'Create User' dialog box contains the following fields and controls:

- Username:** A text input field with the placeholder text 'Enter a unique username'.
- Security Groups:** A section with three checkboxes:
 - ☐ Admin
 - ☐ Operator
 - ☒ Viewer
- Password:** A text input field with the placeholder text 'Enter password'. To the right of the field is a red indicator 'Weak'.
- ☐ Show passwords
- Confirm Password:** A text input field with the placeholder text 'Confirm password'.
- A button labeled 'Use Auto Generated Password'.
- At the bottom right, two buttons: 'Create' (highlighted in blue) and 'Cancel'.

Figure 38: Create User Window

- Enter the new User fields: Name, Security Group and Password.
 - User details are hashed and salted

NOTE: The password must meet the minimum complexity requirements. An algorithm automatically checks the password entered and notes the level of strength on the top right of the Password text field.

- Click the Create button.
- Once the Success message appears, click OK.

Appendix C.5.1.2. Edit Users

- Click the pencil icon next to the desired user to open the User Edit window.

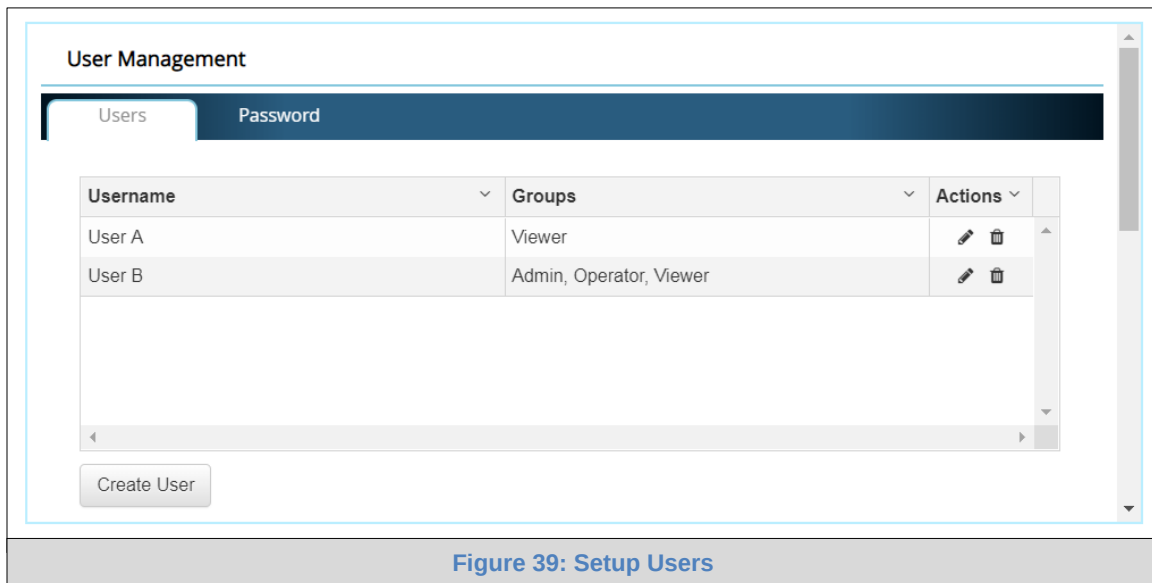


Figure 39: Setup Users

- Once the User Edit window opens, change the User Security Group and Password as needed.

Edit User

Username:
User A

Security Groups:
☐ Admin
☐ Operator
☒ Viewer

Password:
Optional

☐ Show passwords

Confirm Password:
Optional

Use Auto Generated Password

Confirm Cancel

Figure 40: Edit User Window

- Click Confirm.
- Once the Success message appears, click OK.

Appendix C.5.1.3. Delete Users

- Click the trash can icon next to the desired user to delete the entry.

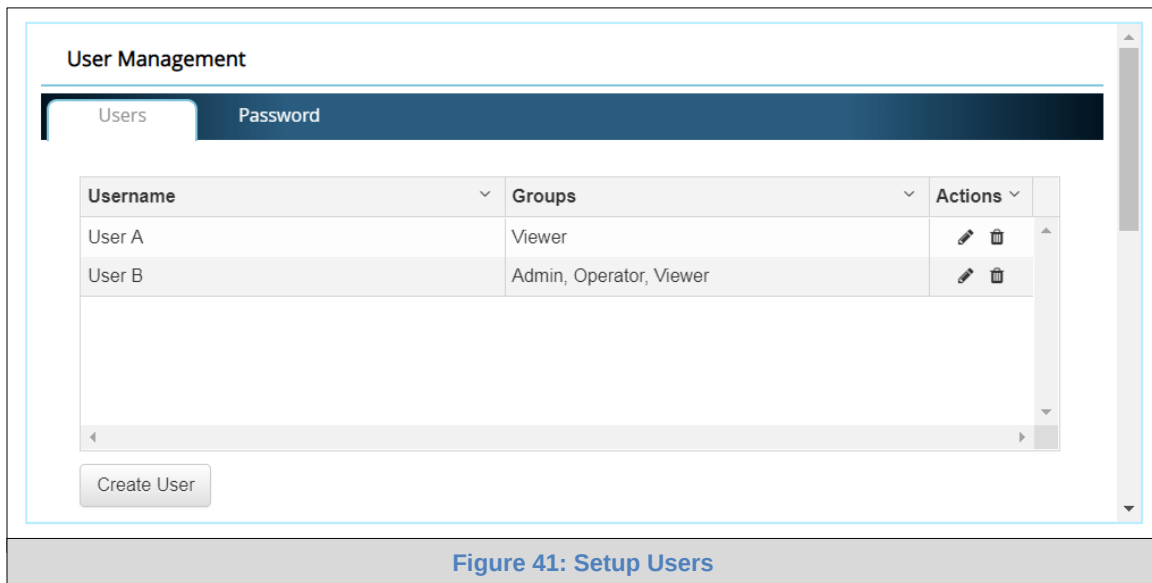


Figure 41: Setup Users

- When the warning message appears, click Confirm.

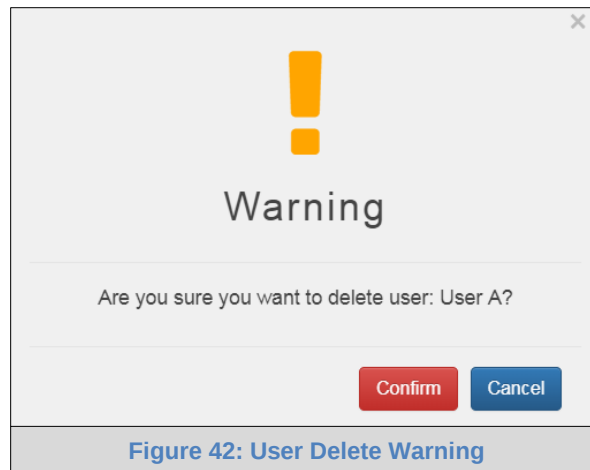


Figure 42: User Delete Warning

Appendix C.5.2. Change FieldServer Password

- Click the Password tab.

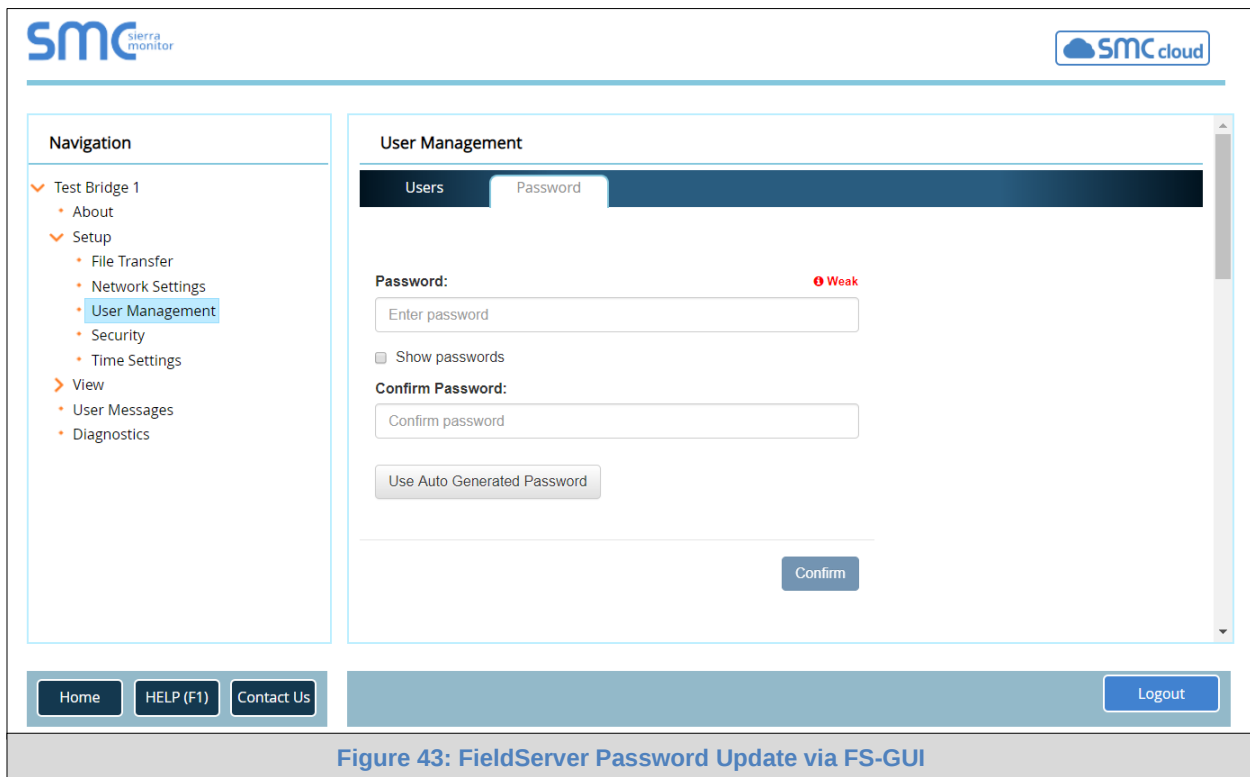


Figure 43: FieldServer Password Update via FS-GUI

- Change the login password for the FieldServer as needed.

NOTE: The password must meet the minimum complexity requirements. An algorithm automatically checks the password entered and notes the level of strength on the top right of the Password text field.

NOTE: If a gateway in the field is updated to a secure gateway, the password will change to "admin". This change will still occur if the gateway was already setup with a unique password that was loaded in the factory and printed on the label.

APPENDIX D REFERENCE

Appendix D.1. LED Functions

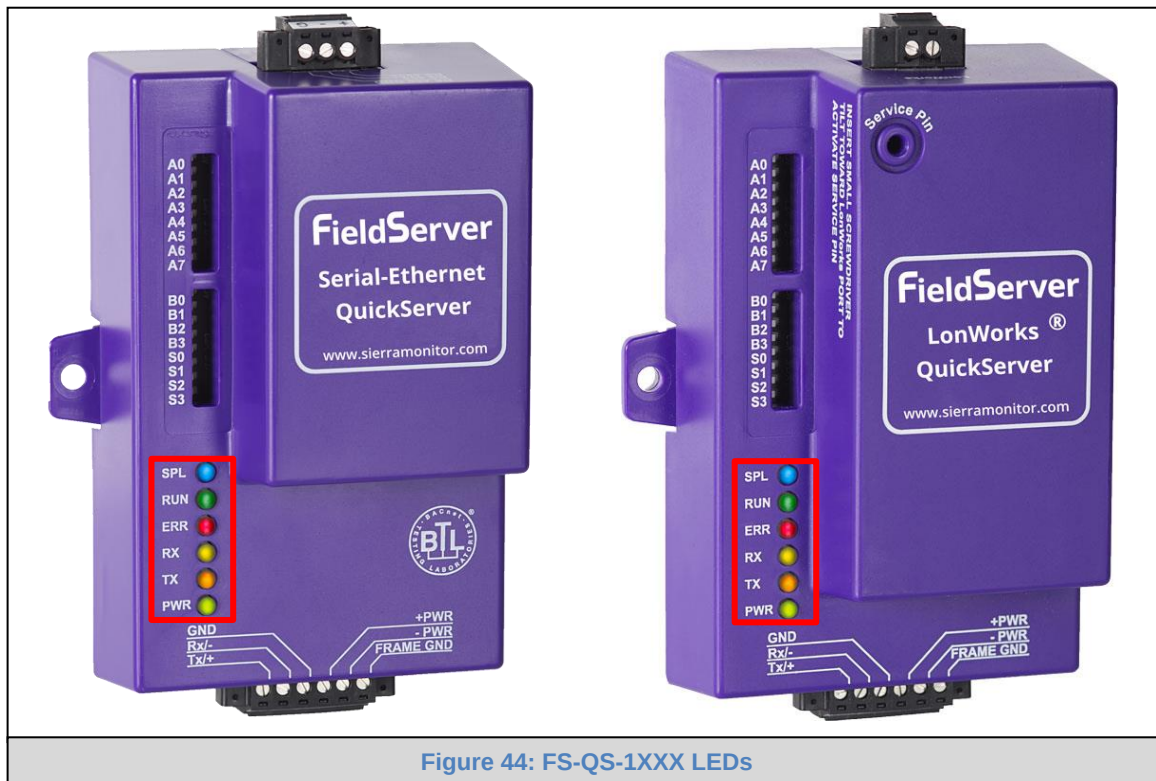


Figure 44: FS-QS-1XXX LEDs

Light	Description
SPL	SPL LED will be on when a configured node in the QuickServer is detected as being offline. See Node overview screen of the FS-GUI for further details. For LonWorks units , LED will light until the unit is commissioned on the LonWorks network.
RUN	RUN LED will flash 20 seconds after power up, signifying normal operation. The QuickServer will be able to access FS-GUI (refer to Section 6.3 for more information) once this LED starts flashing. During the first 20 seconds, the LED should be off.
ERR	The ERR LED will go on solid 15 seconds after power up. It will turn off after 5 seconds. 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 FS-GUI interface to the FieldServer for evaluation.
RX	On normal operation of FS-QS-1XXX, the RX LED will flash when a message is received on the field port of the QuickServer.
TX	On normal operation of FS-QS-1XXX, the TX LED will flash when a message is sent on the field port of the QuickServer.
PWR	This is the power light. It should always show a steady green light when powered.

Appendix D.2. QuickServer FS-QS-101X DCC

Driver	Code
BACnet/IP – BACnet MS/TP	0285
BACnet/IP – LonWorks	0131
JCI Metasys N2 ³ – LonWorks	0097
JCI Metasys N2– BACnet MS/TP	0309
JCI Metasys N2– BACnet/IP	0122
Modbus RTU – BACnet MS/TP	0367
Modbus RTU – BACnet/IP	0104
Modbus RTU – JCI Metasys N2	0038
Modbus RTU – LonWorks	0085
Modbus TCP/IP – BACnet/IP	0237
Modbus TCP/IP – LonWorks	0154
Modbus TCP/IP – BACnet MS/TP	0419
Modbus TCP/IP – JCI Metasys N2	0117
SNMP – BACnet/IP	1047
SNMP – LonWorks	1178
SNMP – JCI Metasys N2	1154
SNMP – BACnet MS/TP	1200
BACnet MS/TP - LonWorks	0345

Appendix D.3. QuickServer 1XXX Part Numbers

Field Connections									
		Interface Connections							
		RS-232 ¹	RS-485 ²	RS-422 ³	KNX ⁶	RS-485	M-Bus	Ethernet ⁴	LonWorks ⁵
QuickServer	FS-QS-1011		1					1	1
	FS-QS-1211		1					1	1
	FS-QS-1221	1						1	1
	FS-QS-1230		1	1				1	
	FS-QS-1231			1				1	1
	FS-QS-1240		1		1			1	
	FS-QS-1241				1			1	1
	FS-QS-1A50					1	1	1	
	FS-QS-1A51						1	1	1
	FS-QS-1B50					1	1	1	
	FS-QS-1B51						1	1	1
	FS-QS-1C50					1	1	1	
	FS-QS-1C51						1	1	1

¹ TX/Rx/GND

² +/-Frame Ground

³ See Manual

⁴ 10/100 Base T

⁵ FTT10

⁶ KNX/EIB TP1

³ Metasys is a registered trademark of Johnson Controls Inc.

Appendix D.4. Compliance with UL Regulations

For UL compliance, the following instructions must be met when operating QuickServer.

- The units shall be powered by listed LPS or Class 2 power supply suited to the expected operating temperature range.
- The interconnecting power connector and power cable shall:
 - Comply with local electrical code
 - Be suited to the expected operating temperature range
 - Meet the current and voltage rating for QuickServer/Net
- Furthermore, the interconnecting power cable shall:
 - Be of length not exceeding 3.05m (118.3")
 - Be constructed of materials rated VW-1, FT-1 or better
- If the unit is to be installed in an operating environment with a temperature above 65 °C, it should be installed in a Restricted Access Area requiring a key or a special tool to gain access.
- This device must not be connected to a LAN segment with outdoor wiring.

Appendix D.5. Specifications⁴


	FS-QS-12X0-XXXX/ FS-QS-1X50-XXXX ⁵	FS-QS-1011-XXXX/FS-QS-12X1-XXXX/ FS-QS-1X51-XXXX ⁵
Available Ports	6-pin Phoenix connector: RS-485 or RS-232 or RS-422 +/- ground port, power +/- frame ground port 3-pin RS-485 Phoenix connector: RS-485 +/- ground port Ethernet-10/100 port	6-pin Phoenix connector: RS-485 or RS-232 or RS-422 +/- ground port, power +/- frame ground port 2-pin FTT-10 LonWorks port Ethernet-10/100 port
Power Requirements	Input Voltage: 9-30VDC or 12-24VAC Input Power Frequency: 50/60 Hz. Power Rating: 2.5 Watts Current Draw: @ 12V, 150 mA	Input Voltage: 9-30VDC or 12-24VAC Input Power Frequency: 50/60 Hz. Power Rating: 2.5 Watts Current Draw: @ 12V, 279 mA
Approvals	UL 916 approved RoHS3 compliant FCC part 15 compliant DNP compliant CE certified BTL certified WEEE compliant	UL 916 approved, RoHS compliant, FCC part 15 compliant, DNP compliant, LonMark certification, WEEE compliant SPID: 80:00:95:46:00:84:04:01 Profiles: 0000 - Node object (1) 0001 - Open Loop Sensor Object (5) 0003 - Open Loop Actuator Object (5)
Physical Dimensions ⁶	5.05 x 2.91 x 1.6 in. (12.82 x 7.39 x 4.06 cm)	
Weight	0.4 lbs (0.2 Kg)	
Operating Temperature	-40°C to 75°C (-40°F to167°F)	
Surge Suppression	EN61000-4-2 ESD EN61000-4-3 EMC EN61000-4-4 EFT	
Humidity	5 - 90% RH (non-condensing)	
Figure 45: Specifications		

"This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his expense. Modifications not expressly approved by FieldServer could void the user's authority to operate the equipment under FCC rules."

⁴ Specifications subject to change without notice.

⁵ XXXX at the end of the part number identifies the code for the specific drivers included in the QuickServer. ([Appendix D.2](#))

⁶ (WxDxH); Excluding mounting tabs.

APPENDIX E LIMITED 2 YEAR WARRANTY

MSA Safety warrants its products to be free from defects in workmanship or material under normal use and service for two years after date of shipment. MSA Safety will repair or replace 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 MSA Safety 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 MSA Safety's 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 MSA Safety'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, MSA Safety 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 MSA Safety for damages including, but not limited to, consequential damages arising out of/or in connection with the use or performance of the product.

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[FS-QS-1011-0085](#) [FS-QS-1011-0097](#) [FS-QS-1011-0131](#) [FS-QS-1011-0154](#) [FS-QS-1011-1178](#) [FS-QS-1211-0085](#)
[FS-QS-1211-0097](#) [FS-QS-1211-0131](#) [FS-QS-1211-0154](#) [FS-QS-1211-0345](#) [FS-QS-1211-0823](#) [FS-QS-1211-1032](#)
[FS-QS-1211-1078](#)