

Cellular Gateway Modem

Model: FSMODEM-CELLBASE



Description, Specification, Installation, and Program Manual

Limited Warranty

This product is subject to and covered by a limited warranty, a copy of which can be found at www.fedsig.com/SSG-Warranty. A copy of this limited warranty can also be obtained by written request to Federal Signal Corporation, 2645 Federal Signal Drive, University Park, IL 60484, email to info@fedsig.com or call +1 708-534-3400.

This limited warranty is in lieu of all other warranties, express or implied, contractual or statutory, including, but not limited to the warranty of merchantability, warranty of fitness for a particular purpose and any warranty against failure of its essential purpose.



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Safety Messages

⚠ WARNING

It is important to follow all instructions shipped with this product. This device is to be installed by trained personnel who are thoroughly familiar with the country's electric codes and will follow these guidelines as well as local codes and ordinances, including any state or local noise-control ordinances. Listed below are important safety instructions and precautions you should follow.

Important Notice

Federal Signal reserves the right to make changes to devices and specifications detailed in the manual at any time to improve reliability, function, or design. The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for any inaccuracies.

Publications

Federal Signal recommends the following publications from the Federal Emergency Management Agency for assistance with planning an outdoor warning system:

- The "Outdoor Warning Guide" (CPG 1-17)
- "Civil Preparedness, Principles of Warning" (CPG 1-14)
- FEMA-REP-1, Appendix 3 (Nuclear Plant Guideline)
- FEMA-REP-10 (Nuclear Plant Guideline).

Planning

- If suitable warning equipment is not selected, the installation site for the siren is not selected properly, or the siren is not installed properly, it may not produce the intended optimum audible warning. Follow Federal Emergency Management Agency (FEMA) recommendations.
- If sirens are not activated promptly when an emergency condition exists, they cannot provide the intended audible warning. It is imperative that knowledgeable people, who are provided with the necessary information, be available at all times to authorize the activation of the sirens.
- When sirens are used out of doors, people indoors may not be able to hear the warning signals. Separate warning devices or procedures may be needed to warn people indoors effectively.
- The sound output of sirens is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan siren placement, post warnings, and restrict access to areas near sirens. Review and comply with any local or state noise control ordinances and OSHA noise exposure standards, regulations, and guidelines.
- Activating the sirens may not result in people taking the desired actions if those to be warned are not properly trained about the meaning of warning sounds. Users should follow FEMA recommendations and instruct those to be warned of corrective actions to be taken.

- After installation, service, or maintenance, test the siren system to confirm that it operates properly. Test the system regularly to confirm that it will be operational in an emergency.
- If future service and operating personnel do not have these instructions to refer to and are not properly trained, the system may not provide the intended audible warning, and service personnel may be exposed to hazards that could result in death, permanent hearing loss, or other bodily injuries. File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to recruits and trainees.

Installation and Service

- Electrocutation or severe personal injury can occur when performing various installation and service functions such as making electrical connections, drilling holes, or lifting equipment. Therefore, only experienced and qualified electricians should install this product in compliance with national, state, and any other applicable codes, ordinances, and regulations. Perform all work under the direction of the installation or service crew safety foreman.
- The sound output of sirens is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan siren placement, post warnings, and restrict access to areas near the sirens. Sirens may be operated from remote control points. Whenever possible, disconnect all siren power, including batteries, before working near the siren. Review and comply with any local or state noise control ordinances and OSHA noise exposure regulations and guidelines.
- After installation or service, test the siren system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.
- If future service personnel do not have these instructions to refer to and are not properly trained, the system may not provide the intended audible warning, and service personnel may be exposed to hazards that could result in death, permanent hearing loss, or other bodily injuries. File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to recruits and trainees. Give a copy to anyone who is going to service or repair the sirens.

Operation

Failure to understand the capabilities and limitations of your siren system could result in permanent hearing loss, other serious injuries, or death to persons too close to the sirens when you activate them or to those you need to warn. Carefully read and thoroughly understand all safety notices in this manual and all operations-related items in all instruction manuals shipped with the equipment. Thoroughly discuss all contingency plans with those responsible for warning people in your community, company, or jurisdiction. A well-written contingency plan document is recommended.

Hazard Classification

Federal Signal uses signal words to identify the following:

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Read and understand the information contained in this manual before attempting to install or service the siren.

Pay careful attention to notices located on the equipment.

Software Safety Messages

Listed below are important safety instructions and precautions you should follow:

Programming Warning

- Precautions for PC security must be followed. Administrative rights are required.
- Program after reading this manual.
- Only personnel thoroughly familiar with Commander® operating instructions and the intended method of use should perform the programming.
- Correctly program Commander® per the user's specific application before placing it into use.
- If programmed incorrectly, Commander® may fail to operate as intended.
- Test Commander® for proper operation after programming and before placing into use.

General Description

Overview

A cellular modem provides a secure method to activate and monitor sirens. Using the Cellular Gateway Modem eliminates the need to maintain your own communication network.

The Cellular Gateway Modem (FSMODEM-CELLBASE) connects your computer running Commander® software or an SS2000+ Series C to the cellular network. You can make these connections to the modem via a USB port or serial port. Status LEDs on the modem enable you to monitor the cellular signal strength, connection to the network, power status, CPU status, and when transmitting and receiving data.

Features

The Cellular Gateway Modem has the following features:

- LTE Cat M1 module with global hardware support
- USB and Serial port for interface
- Can be powered from a USB port or wide input voltage power port
- On board LED indicators for Signal Strength, Power, Connection to network, CPU, Transmitting and Receiving Data

Ordering Information

Table 1 Ordering Information

Part Numbers	Description
FSMODEM-CELLBASE	Cellular Modem Kit, includes cables, mounting hardware, and rubber duck antenna.
CP-FS1	FS IoT data plan one year (per device charge)
Q-FSCCELLKIT-FCT	FCT Kit
Q-FSCCELLKIT-FC	FC Kit
Q-FSCCELLKIT-UVT	UV Kit
CP-FSSETUP	FS IoT account setup (one time charge)
Q20000544C-01	RTU modem service part
CELL-ANT1	Omni antenna kit with 35-foot cable and pole mounting bracket
CELL-ANT2	Yagi antenna kit with 35-foot cable and pole mounting bracket

NOTE: Each base station or RTU modem will require an antenna. If the supplied antenna does not provide an adequate signal, add the antenna kit that best suits your installation.

Qualifications

Intermediate PC skills are required to install and configure this product. An individual familiar with PC hardware and software is recommended.

Specifications

Table 2 Specifications

Electrical	
Input Voltage	10-60 Vdc
DC Current from +12 V	Peak Current: 537 mA <ul style="list-style-type: none"> • Connecting to the cloud via cell: 100 mA typical, 254 mA max • Connecting to the cloud via Ethernet: 105 mA typical • Connected but idle via cell : 65 mA typical, 155 mA max • Connected but idle via Ethernet: 125 mA typical • Connected and transmitting: 111 mA typical, 231 mA max
Serial / USB Ports	
Serial Port Protocol	RS232C 9600, N, 8, 1
USB Port Protocol	Micro USB 2.0 full speed (12 Mbps)
Communications	Version - 3 GPP Release 13 LTE Cat M1 Cat M1 bands - 2, 3, 4, 5, 8, 12, 13, 20, 28 800/850/900/1900/2100 MHz
Size (Width x Hight x Depth)	4.1 x 1.3 x 6.4 inches (10.3 x 3.4 x 16.4 cm)
Weight	1.4 lb (635 grams)
Shipping Weight	2.5 lb (1134 grams)
Operating Temperature for modem in the siren cabinet	-22°F to 149°F (-30°C to +65°C)
Operating Temperature for the modem with power supply	32°F to 104°F (0°C to +40°C)
Humidity	0-95% Non-condensing
Elevation Angle	0° to 90°
Approvals	LTE (Cat M1) RoHS. CE. PTCRB. FCC ID: 2AEMI-BRN402. IC: 20127-BRN402

Required Equipment

Unpacking the Kit

Ensure that the parts listed in the following table are included in the package. If you are missing any parts, contact Customer Support. See Getting Service.

Table 3 Kit Contents

Quantity	Description	Part Number
1	Cellular Modem	FSMODEM-CELLBASE
1	USB cable	17502784A
1	Serial cable	1751190A
1	Power adapter	120272B
1	Rubber Duck Antenna	240185A

Required Hardware

You need the following equipment:

- Computer running Windows® 10 or higher with a USB port.

Required Software

The following software is required:

- Commander® software V15.10.0.42 or greater if connecting using a computer
- SS2000+ V2.1.0.46 or greater and SSLoader+ software if connecting using an SS2000+ Series C

Installing the Cellular Gateway Modem

The modem is programmed at the Federal Signal factory before shipment. Minimum setup is required.

The Yagi and Omni Antennas Installation manual is available for download at <http://www.fedsig.com>.

Locating the Cellular Gateway Modem

Place the modem on a stable level surface away from moisture and electrical interference. Place within 6 feet from the computer if using a USB or up to 30 feet if using a serial cable. (These are the maximum recommended lengths for customer-provided cables.)

Connecting the Cellular Gateway Modem

The following section describes the connections on the back of the Cellular Gateway Modem.

Figure 1 Cellular Gateway Modem Connections

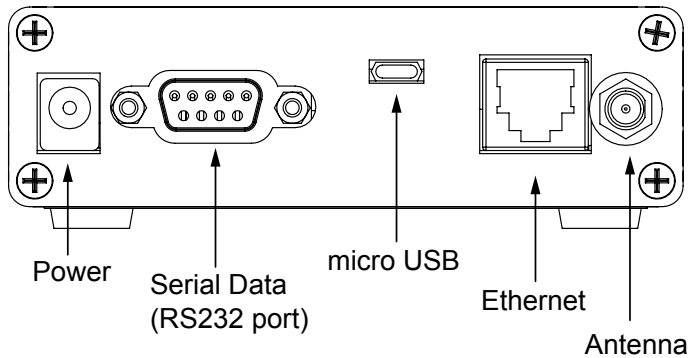


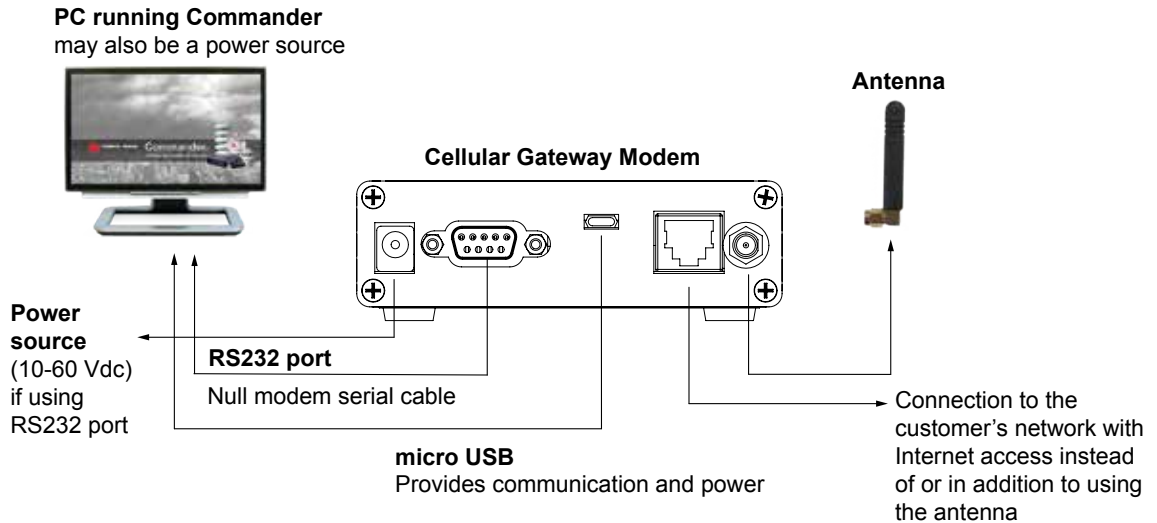
Table 4 Connections on the back of the Modem

Parts	Description
Power Connection	Power is supplied to the modem either through the Power or USB connection. The Power connection requires a DC power source between 10 and 60 Vdc. The center pin is + and the outside pin is ground.
Serial Data (RS232) Connection	The modem connects to the computer via an RS232 port at the back of the modem. For the serial port connection, use a standard 9 pin, null modem serial cable.
USB Connection	Use a USB cable with a micro USB connection to connect your computer and the USB port on the modem.
Ethernet Connection	In situations where antenna cable runs are inconvenient, or there is an insufficient signal, or additional redundancy is desired, you can connect the modem to the customer's network to interface with the Federal Signal IoT service. (The customer's network connects to the FS IoT cloud service via the Internet.)
Antenna Connection	For antenna options, see "Ordering Information" on page 8.

Connecting with a PC

To connect using a PC running Commander® software, connect the modem using a micro USB or serial port to your computer.

Figure 2 Modem Connections with a PC



Connecting with an SS2000+ Series C (with or without a PC)

When your setup does not include a PC, use the SS2000+ Series C with the modem to create a cellular network. To connect using an SS2000+ Series C, connect a serial cable from the modem to COM2 on the back of the SS2000+ Series C and configure COM2 the SS2000+ to be a "Radio Modem" using a 9600 baud rate.

In the case of a redundant system, where your setup uses a PC running Commander® software and the SS2000+ Series C as a backup, use COM1 to connect to the PC and COM2 to connect to the modem.

Figure 3 Modem Connections using an SS2000+ Series C

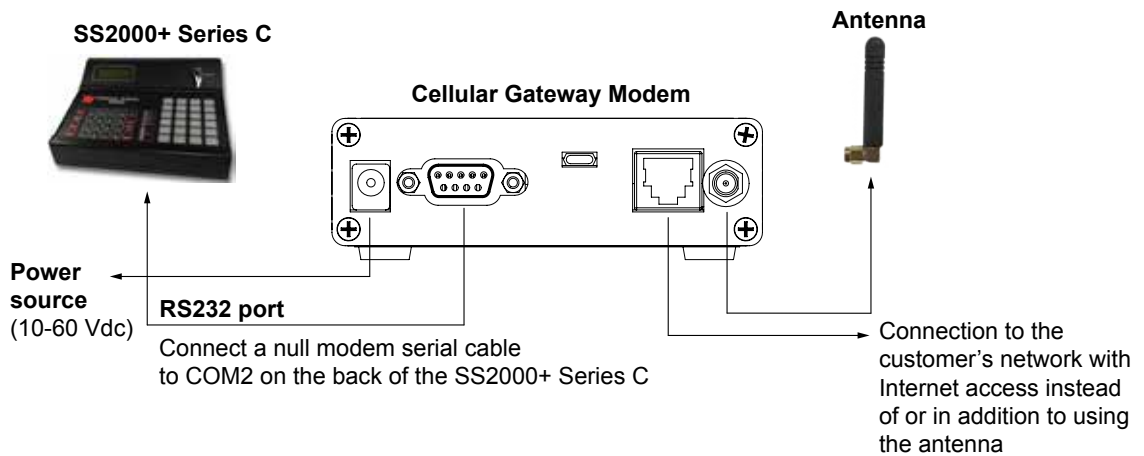
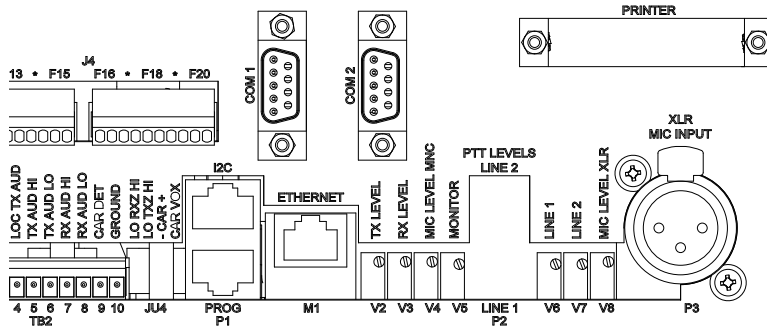


Figure 4 Back of the SS2000+ Series C



Describing the Front of the Cellular Gateway Modem

The following section describes the controls on the front of the Cellular Gateway Modem.

Figure 5 Front of Cellular Gateway Modem

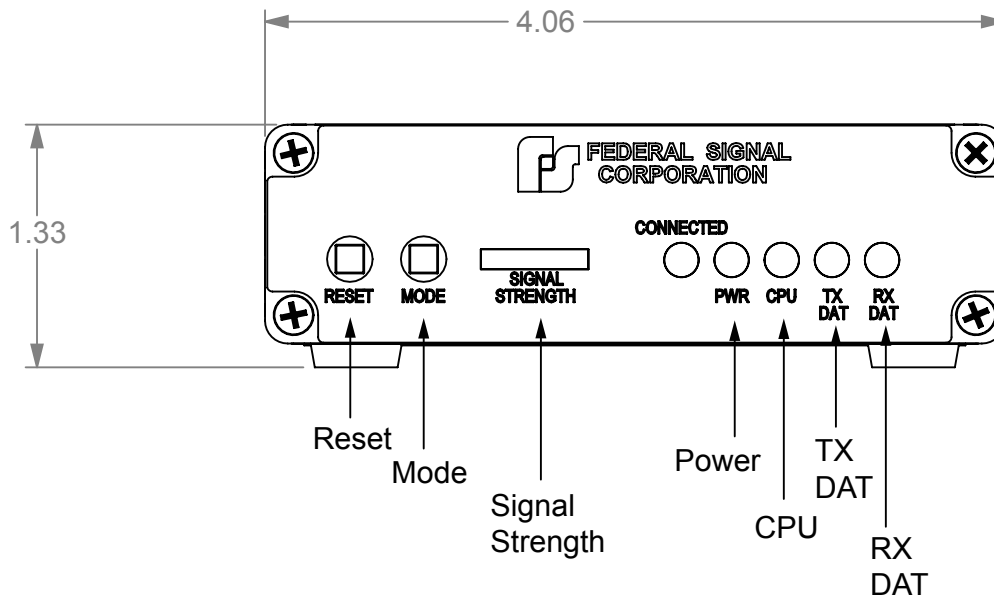


Table 5 Controls on the front of the Modem

Parts	Description
Reset	Press the Reset button to reboot the modem.
Mode	For Federal Signal use only. Contact Federal Signal Technical Support for more information
Signal Strength	The strength of the cellular signal being received. Strong signal strength results in more reliable connections and higher speeds. You want the unit to display at least two or three bars on the modem.
Connected	Lights when the modem is connected to the network.
PWR (Power)	Lights when the modem is connected to power.
CPU	Flashing indicates the CPU is running.
TX DAT	Lights when the modem is transmitting data.
RX DATA	Lights when that the modem is receiving data.

Configuring Commander Software for Cellular Mode

To configure Commander® software for cellular mode:

1. Open the Commander® software.
2. From the Commander® main window, click System Setup. The System Setup dialog box appears.
3. In the Mode list, select FSModem-Cellbase.
4. In the Comm Port list, select the desired communication port for the modem.

The screenshot shows the 'Communication' dialog box with the following settings:

- Channel: 1
- Mode: FSModem-Cellbase
- Comm Port: COM3
- Polling Mode: Sequential
- Sequential # Tries: 3
- Sequential Retry Delay: 5
- Broadcast # Tries: 1
- Broadcast Retry Delay: 0
- Repeat All Call 3 times: Interval (sec): 1
- Security Keys button:

NOTE: If using the USB interface, the modem connection must be made before the modem's Comm Port option populates in the drop-down list box. Do not configure more than one channel per modem. A 15-second Retry Delay is recommended.

IMPORTANT: All systems should use a unique Security Key. See the Commander manual for Security Key configuration instructions.

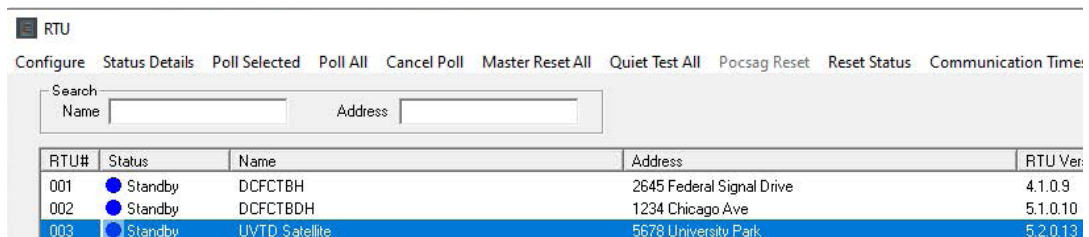
5. Click Save to save the configuration changes.
6. Connect the modem to the cell antenna and/or Ethernet port and verify the modem displays connected on the bottom right side of the status bar.

Testing

Verify that all LEDs are operating correctly on the modem. The power LED should remain on when power is applied to the modem, and the CPU LED should be blinking. The connected LED will be on when connected to the FS IoT cloud service. The TX DAT LED will flash when data is being sent to the PC. The RX DAT LED will flash when receiving data over the RS232 port (if used).

Poll a Remote Terminal Unit from the control point and verify the RTU responds to the poll correctly. Repeat this polling sequence at least ten times sequentially and verify that communications are consistent.

From the Commander® RTU dialog box, select the RTU, and click Poll Selected.



A red or green dot indicates good communication. A violet or purple dot indicates the failure of communications.

Getting Service

If you are experiencing any difficulties, contact Federal Signal Customer Support at 800-548-7229 or 708-534-3400 extension 7511 or Technical Support at 800-524-3021 or 708-534-3400 extension 7329 or e-mail at techsupport@fedsig.com. For instruction manuals and information on related products, visit <http://www.fedsig.com>.



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