FEDERAL SIGNAL
Safety and Security Systems

SS2000+ Series C

Local Hardware Activation Point

Description, Specifications, SSLoader+ Software, and Operation Manual

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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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⚠ 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 in order 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 in a timely manner 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 can cause 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 as well as 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 siren sounds. Siren users should follow FEMA recommendations and instruct those to be warned of the corrective actions to be taken.

- After installation, service, or maintenance, 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 and operating personnel do not have these instructions to refer to, the siren system may not provide the intended audible warning, and service personnel may be exposed to 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. Also give a copy to anyone who is going to service or repair the siren.

Installation and Service

- Electrocution 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 electricians should install this product per national, state, and any other electrical codes having jurisdiction. 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 as well as 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 shipped with the equipment to refer to, the siren system may not provide the intended audible warning, and service personnel may be exposed to 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. Also 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 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 deploy or service the siren.

Pay careful attention to notices located on the equipment.

General Description

Introduction

The SS2000+ Series C web-enabled controller is Federal Signal's most advanced stand-alone control unit. The SS2000+ typically interfaces to an analog or digital radio system to provide radio activation of sirens across a county, municipal, campus, or industrial facility. The SS2000+ has 24 programmable activation buttons secured with a keylock switch and 20 contact closure inputs for interfacing with remote control systems. HotKeys can provide specific types of warnings or test activations to notify residents, employees, or students.

The 24 HotKeys are accessible from various interfaces using a web interface. The web interface provides improved redundancy, allowing multiple SS2000+ units to be used as online backups. Advanced networking features enable the SS2000+ to be connected to Federal Signal's Commander® control and status monitoring software. In addition, the SS2000+ can connect directly to Federal Signal's CommanderOne® cloud service for secure web access to HotKeys, messaging, and automated activation from NOAA® EAS events.

The SS2000+ can be used as an encoder for one-way siren control. Previously, an SS2000+ allowed activation only from the front panel HotKeys, the physical interfaces, or a connected PC. The SS2000+ provides siren activation from CommanderOne® NOAA EAS events/polygons, from a mobile app, or a web browser over the Internet.

Features

The SS2000+ has the following features.

- Twenty-four activation buttons on the front panel with keylock protection
- Twenty optically isolated remote activation inputs built in (activated by dry contact closure)
- Integrated web server allows users to activate and configure the SS2000+ from standard web browsers
- Can be controlled and monitored from multiple Commander® computer control points over a LAN
- Optional web interface to CommanderOne® for automatic activation by NOAA and secure remote control from standard web browsers over the Internet
- Modbus® interface allows the SS2000+ to be controlled by Industrial Controllers
- External Mic Input VOX (which simulates push-to-talk through audio level)
- Redundant source of command and control
- Streams WAV files from Commander® PC
- Compatible with Commander® software
- Two serial ports: one for control and one for extra peripheral devices or control
- Multiple codes/functions are stackable under each button, including Relay Outputs
- Two-Tone, MSK Packet Digital, EAS, and DTMF encode

- FLASH/Programming Port
- Three programmable Relay Outputs
- I^2C port for external relays or keyboard for additional activation buttons
- Status LEDs and LCD display
- Level Meter for Setting Receive Level
- Two Line Inputs for Transmission of External Audio Sources (3.5 mm)
- XLR Input for a microphone, phantom power supply for amplified microphones
- High or Low Impedance for the radio interface
- Carrier Detect from Radio/Transceiver or VOX with selectable polarity
- Monitor Speaker to monitor incoming and outgoing traffic
- Powered from 12 to 30 Vdc, runs on standard 12 or 24 V backup power
- Offered in 120 and 240 Vac, with EU or UK versions available

Web Browser Activation

The SS2000+ has a built-in web interface that you can use to activate and configure the SS2000+ from a standard Chrome®, Edge®, or Firefox® browser over your local area network (LAN). Digest Authentication is used for security.

CommanderOne® Cloud Service

You can configure the SS2000+ to connect to Federal Signal's CommanderOne® cloud service for automated activation from NOAA® EAS events. CommanderOne® also enables users to securely activate their SS2000+ devices from a web browser over the Internet.

Modbus Interface

The SS2000+ has a Modbus® interface to easily interface with Industrial Control Systems. Modbus® TCP is used to provide activations into an SS2000+ for specific warning announcements across an industrial plant. You can activate the system using the SS2000+, or industrial control systems can activate the HotKeys.

Encoding

Program up to three codes under each activation input. There are sixty programmable functions available. These codes can be Two-Tone, Single-Tone, EAS, DTMF, Federal Signal Digital Codes (FSK), and activating the three Relay Outputs, or calling another activation key. Send each activation code from one to three times.

Modes of Operation

You can set the SS2000+ in either standalone or computer mode. In either mode, any poll request or activation command from Commander® updates the clock in the SS2000+ to match the Commander® software's time and date. In computer mode, all reports, status, and activations are logged within the Commander® software.

The SS2000+ can also receive streamed audio and encode activations from Commander® and transmit them out as audio.

Standalone Two-way Operation

Use the SS2000+ in standalone mode, that is, without a host computer application. In standalone mode, the SS2000+ does not function as a two-way radio modem for the Commander® software applications.

In standalone mode, the SS2000+ acknowledges incoming status reports and alarms from remote devices. Acknowledgments confirm message receipt and keep remote devices from repeating transmissions.

The SS2000+ is configured with two lists of unit numbers: one for digital units and one for DTMF units. Both types can exist in the same system. When a Report – All is executed, the SS2000+ polls the active units in the digital list first, logging each poll and response. When complete, the SS2000+ polls the units in the DTMF list, logging each poll and response. The DTMF status or alarm messages are converted to the same format as the digital information. The incoming DTMF and digital messages are decoded and displayed on the LCD.

Computer Mode Operation

The SS2000+ keypad and display are still operational in computer mode, but the SS2000+ does not acknowledge incoming digital messages. It passes all messages to the host computer application.

Automatic Logging

The SS2000+ displays all incoming and outgoing messages on its LCD display. If COM2 is configured for printer messages, the statuses and alarms are sent there. The SS2000+ also logs each time it is powered up, all manual encode activations, outgoing poll requests, and the results of each step in the self-test procedure.

Testing and Alignment

The SS2000+ has a calibrate function and an LED bar graph to aid in setting receive and transmit levels. It also incorporates a comprehensive built-in test routine to test every circuit of the unit. The internal monitor speaker allows the user to hear all incoming and outgoing transmissions to aid in system setup and troubleshooting.

Audio Inputs

The SS2000+ has two line-level inputs, each with its own PTT line, a local mic input with PTT, and an XLR balanced input incorporating a VOX PTT for balanced or distant mics. The XLR input can provide a ghost supply for amplified mics. Use an amplified or non-amplified microphone.

Serial Ports

The SS2000+ has two serial ports. Use COM1 to interface with Commander® or Encoder software. Use COM2 to send printer messages or receive text messages to a display or peripheral device. Use COM2 to interface with Commander® software, Encoder software, or an external radio modem.

Relay Outputs

The SS2000+ has three Relay Outputs you can program to activate when an activation button is pressed. Each relay has an off time and an on time. Alternatively, configure each relay to activate when the unit has not been polled in 30 minutes, when an RTU reports a fault, or when PTT or Carrier Detect is active.

Activation Buttons

Located on the front panel of the SS2000+ are twenty-four programmable activation buttons that activate functions one through twenty-four.

Configure each activation function for Auto Prompt Send or Auto Send. Auto Prompt Send prompts you to press the SEND button after an activation button has been pressed before initiating the activation. Auto Send sends the code out when you press the activation button without being prompted to press SEND. The same method is used with Auto Prompt Send Auto Report and Auto Send Auto Report modes, which include an automated system-wide poll after activation.

Remote Activation Inputs

Located on the back of the SS2000+ are twenty external activation inputs that can be driven by a momentary contact closure. These inputs are optically isolated and activate buttons one through twenty. The debounce time for remote inputs is 250 ms. Inputs should be closed > 250 ms and released after the activation. An input held closed for an extended time will not generate multiple activations, but it will prevent other inputs from activating until the input is released. These twenty external (rear mount) inputs are factory set to activate activation inputs one through twenty. Modify the jumpers on the internal PCB to allow the inputs to be used for additional functions. For example, use the remote inputs as inputs twenty-one through forty or forty-one through sixty. See “Table 5 Input Board Addressing” on page 19.

Transceiver Interface

The transceiver interface features a balanced 600-ohm input and output (optional 10 kΩ) and can accept a wide range of transceiver types and levels. The transmit audio from other encoding equipment can be interrupted during the transmissions of the SS2000+ by the PTT relay. The unit also monitors if other equipment is currently transmitting before attempting to transmit. Carrier detect can work with either polarity or from a VOX.

Ordering Information

Table 1 Ordering Information

Part Numbers	Description
SS2000+	Desk Mount Local Activation Point, US
SS2000+R	Rack Mount Local Activation Point, US 19-inch
SS2000+EU	Desk Mount Local hardware activation point, EU
SS2000+UK	Desk Mount Local hardware activation point, UK
MNC-MNS*	Noise Canceling Microphone
SSLOADER+ Operating System	Windows® based program used to configure and active functions on the SS2000+ Compatible with • Desktop Operating Systems: Windows 10 • Server Operating Systems: Server 2012 and Server 2016
COMMANDER1LE	CommanderOne® Cloud Service

*The noise-canceling microphone model MNC-MNS replaces the microphone on early revision models of SS2000+. Model MNC-MNS is supervised for compatibility with UL2572.

The SS2000+ power supply can be ordered with US 120 Vac or UK/EU 240 Vac power cables.

Specifications

Table 2 Product Specifications

Electrical	
Power Supply Input Voltage	12-30 Vdc (12 Vdc, typical)
Input Current	< 300 mA (Standby, < 700 mA max)
Distortion	< 3.0%
Signaling Formats	
MSK Digital encode/decode	1200 Baud Decode Sensitivity </= 21 dB SINAD for highest modem tone
DTMF encode/decode	35 ms/5 ms-100 ms/100 ms timing
Two-Tone encode	282-3000 Hz, Timing, 0.5 sec min to 8 sec max
Serial Ports	
Protocol, RS232C	9600/115200 Baud, N, 8, 1 (Baud rate is configurable.)
FLASH Programming Port	
For programming	9600 Baud, N, 8, 1
Tranceiver Interface Port	
Receive Audio Input	Audio Input Level 50-10,000 mV_{P-P} for Low Z, 600 Ω 500-10,000 mV_{P-P} for High Z, 10 kΩ Set to 1 V_{P-P} at TP11 MOV and Transorb surge protection 600/10 kΩ, jumper selectable Balanced 600 Ω, -35 dbm to 0 dbm
Transmit Audio Output	Audio Output Level 200-1800 mV_{P-P} for Low Z, 600 Ω 200-1800 mV_{P-P} for High Z, 10 kΩ MOV and Transorb surge protection 600/10 kΩ, jumper selectable Balanced 600 Ω, -55 dbm to 0 dbm
Decode Sensitivity	< 8-10 dBc S/N or 12 dBc SINAD
Relay Outputs	2 A at 30 Vdc, 0.5 A at 120 Vac
PTT Sense Input	100 K input impedance < 100 kΩ or < 1.0 Vdc relative for active state
Carrier Detect Input	< 100 kΩ or < 1.0 Vdc relative for active state
VOX Carrier Detect	Active in 50 ms, at 15% of maximum deviation
AUX Relay Outputs	2 A at 30 Vdc, 0.5 A at 120 Vac
Speaker	
Monitors	Transmit and receive audio
Power	1 watt
Impedance	8 Ω

Microphone	
Input Levels	10-150 mV_{P-P} nominal input
Input Impedance	10 kΩ
Input Jack	XLR Male
Type	Dynamic, non-amplified mic
External Mic Input	
Balanced, Low Impedance Dynamic mic. Sensitivity adjustable from	10-150 mV_{P-P} for non-amplified 30-570 mV_{P-P} for amplified 10 kΩ Impedance with VOX or Jumper Selectable for Amplified mic, 48 Vdc Phantom power
Line Input	120 or 240 Vac wall transformer power supply
Levels	0.25-5.0 V_{P-P}, 894 mV_{P-P} nominal input, with PTT closure input, active with < 3 kΩ
Remote Activation Inputs	
Momentary contact closure for activation	
Debounce 250 ms	
Active with	< 1.5 K to ISO GND (2 mA)
I^2C/Keyboard Expansion Port	
I^2C Port Protocol	Philips Standard I^2C
Ethernet Network Connection	
Ethernet:	
Standard	IEEE 802.3
Physical Layer	10/100 Base-T
Data Rate	10/100 Mbps (auto-sensing)
Mode	Half-duplex and full-duplex support (auto-sensing)
Connector	RJ-45 port, TCP/IP
Environmental	
Operating Temperature	0°C to +60°C (32°F to +140°F)
Humidity	0-95% Non-Condensing
Dimensions	
Desk Mount (H x W x D)	3.59 x 11.59 x 9.53 inches (91.8 x 294.4 x 242.1 mm)
3U Rack Mount (H x W x D)	5.19 x 19 x 10.10 inches (131.8 x 482.6 x 256.5 mm)
Shipping Weight	
Desk Mount	6 lb (3 kg)
Rack Mount	8 lb (4 kg)

Connectors, Indicators, Controls, and Jumpers

Grounding the SS2000+ Rack Mount

If you are installing the SS2000+R in a radio room and your installation standards require you to ground the unit, bond the SS2000+R chassis to earth ground using the 1/4 x 20 grounding stud on the rear of the enclosure.

Figure 1 Back of the SS2000+ Rack Mount

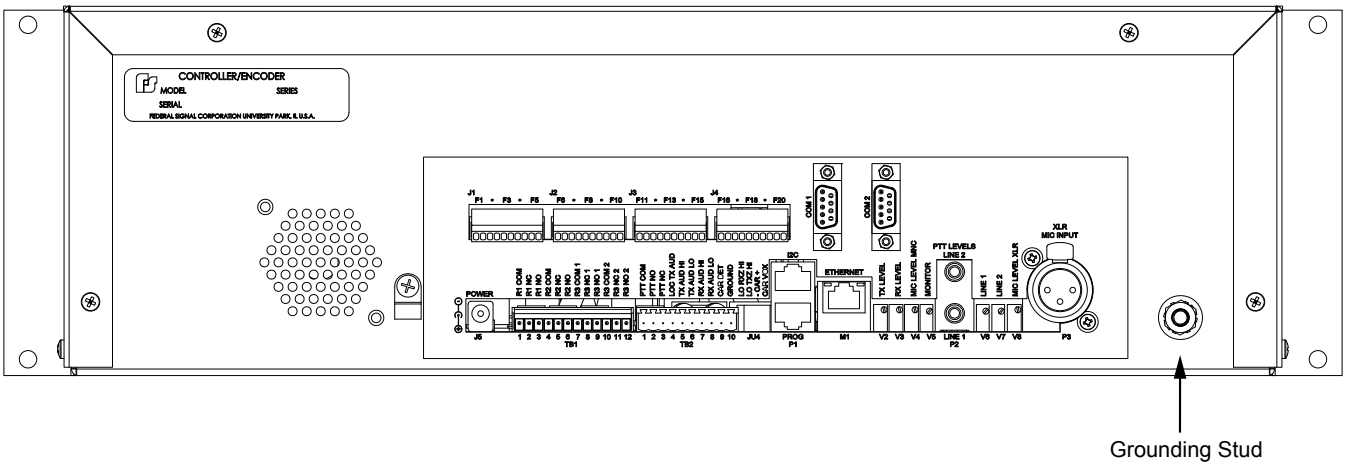
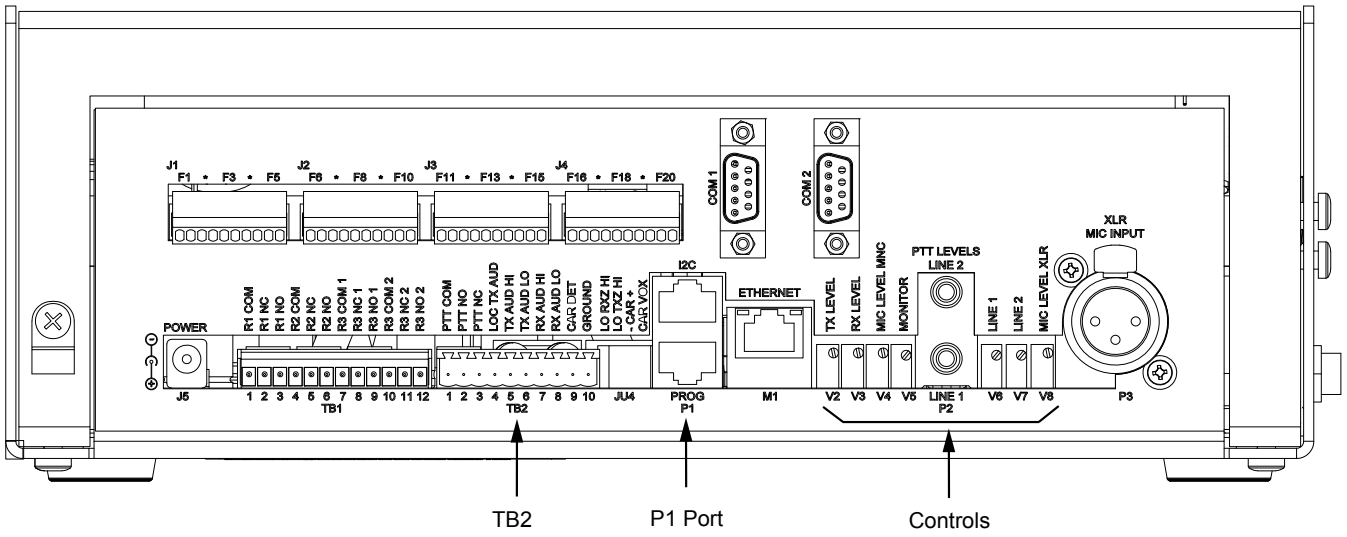


Figure 2 Back of the SS2000+ Desk Mount

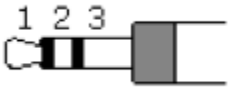


The following tables describe the connectors.

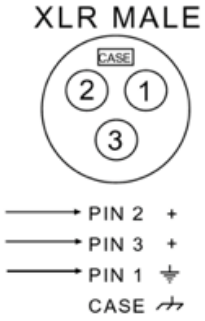
Table 3 Connectors

J5	DC Power In Center – 12-30 Vdc input Outside – GND
J6	Local Mic Input 1 – Mic audio 2 – PTT active low 3 – Ground

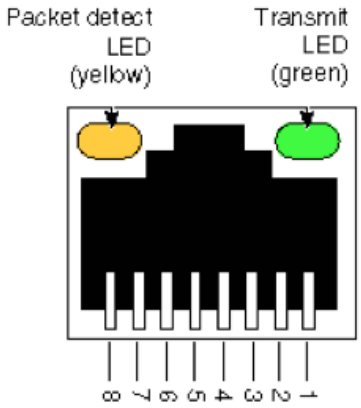
J6 is located on the side of the SS2000+ desktop and in front on the 19-inch rack.



P1 Upper	I^2C Port
P1 Lower	Programming / FLASH Port
P2	Line Level Inputs Top Tip – Input # 2 Top Ring – Input #2 PTT not Top Shield – GND Bottom Tip Input # 1 Bottom Ring – Input # 1 PTT not Bottom Shield – GND 1 – Mic audio 2 – PTT active low 3 – Ground
P3	Balanced Mic Input 1 – GND 2 – Balanced Input 3 – Balanced Input



M1	Ethernet Module Top Left Yellow LED – Network link status Off – No link has been detected On – A link has been detected Top Right Green LED – Serial port activity/Network activity Off – The serial channel is idle Blinking – Serial data is transmitted or received



TB1	Relay Outputs 1 – Relay 1 Common 2 – Relay 1 Normally Closed 3 – Relay 1 Normally Open 4 – Relay 2 Common 5 – Relay 2 Normally Closed 6 – Relay 2 Normally Open 7 – Relay 3 Common 1 8 – Relay 3 Normally Closed 1 9 – Relay 3 Normally Open 1 10 – Relay 3 Common 2 11 – Relay 3 Normally Closed 2 12 – Relay 3 Normally Open 2
TB2	Transceiver Interface 1 – PTT Common 2 – PTT Normally Open 3 – PTT Normally Closed 4 – Local TX Audio, audio is disconnected when SS2000+ transmits 5 – TX Audio Hi 6 – TX Audio Low 7 – RX Audio Hi 8 – RX Audio Low 9 – Carrier Detect 10 – GND

Table 4 Remote Activation Inputs

J1	Remote Activation Inputs 1-5 Pins: 1, 3, 5, 7, 9 Isolated Ground

Pin	2	4	6	8	10
Function	F1	F2	F3	F4	F5

J2	Remote Activation Inputs 6-10 Pins: 1, 3, 5, 7, 9 Isolated Ground

Pin	2	4	6	8	10
Function	F6	F7	F8	F9	F10

J3	Remote Activation Inputs 11-15 Pins: 1, 3, 5, 7, 9 Isolated Ground

Pin	2	4	6	8	10
Function	F11	F12	F13	F14	F15

J4	Remote Activation Inputs 16-20 Pins: 1, 3, 5, 7, 9 Isolated Ground

Pin	2	4	6	8	10
Function	F16	F17	F18	F19	F20

Table 5 Input Board Addressing

Buttons	JU3	JU2	JU1
01 - 20	cut	in	cut
21 - 40	cut	cut	in
41 - 60	cut	cut	cut

Indicators

Table 6 LEDs

LEDs	Description
AUX	Watchdog poll or RTU fault
TX DATA	Serial data being transmitted
TRANSMIT	Radio transmit Press-To-Talk (PTT)
RX DATA	Serial data being received
RECEIVE	Receive audio carrier detects (CD)
LEVELS	Transmit and receive audio level

Audible Tone in monitor speaker with key presses.

Controls

The following table describes the controls on the back of the SS2000+.

Table 7 Controls

V2 (TX LEVEL)	Transmit Audio Level
V3 (RX LEVEL)	Receive Audio Level
V4 (MIC LEVEL MNC)	Local Mic Input Level
V5 (MONITOR)	Monitor Speaker Level
V6 (LINE 1)	Line #1 Input Levels
V7 (LINE 2)	Line #2 Input Levels
V8 (MIC LEVEL XLR)	External Mic Input Level

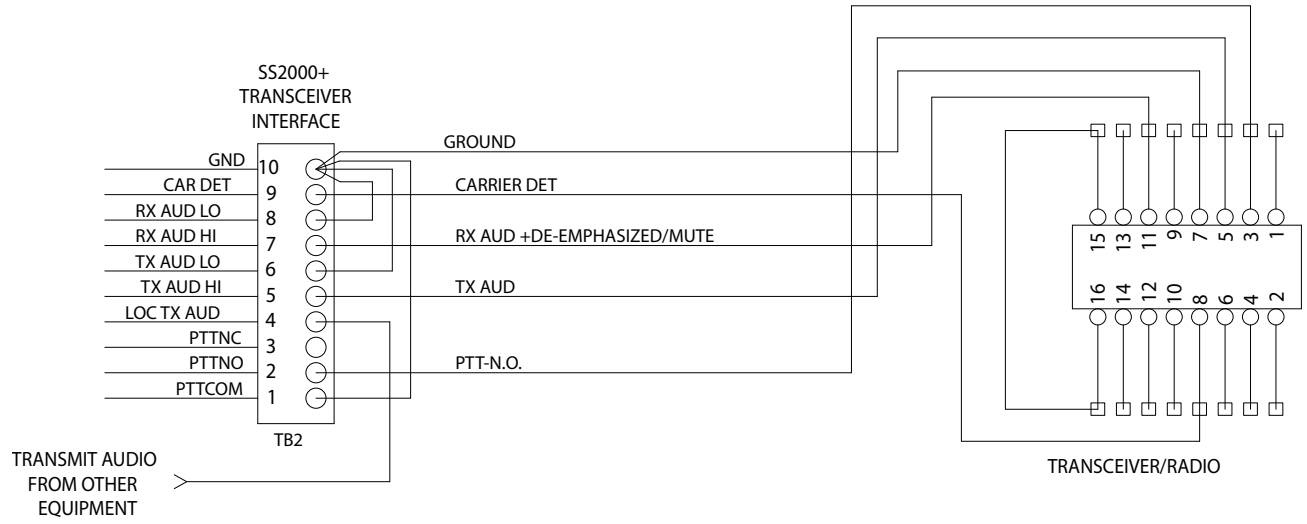
Connecting the Transceiver Interface

Unbalanced Interface (TB2)

To connect an unbalanced interface:

1. Connect the PTT relay COM output (TB2 pin 1) to TB10 - Ground.
2. Connect the PTT relay N.O. output (TB2 pin 2) to the transceiver and PTT input.
3. Connect the Carrier detect ground (TB2 pin 10) to the transceiver's ground.
4. Connect the Carrier detect (TB2 pin 9) to the transceiver's Carrier detect output. Jumper the unit to accept either active low or active high Carrier detect. If the Carrier detect is not available, jumper the unit for VOX.
5. If other equipment is using this transceiver, connect its transmit audio to TB2 pin 4. When the SS2000+ is transmitting, it interrupts this TX audio.
6. Connect the Transmit audio Hi output (TB2 pin 5) to the transceiver's transmit audio input.
7. Connect the Transmit audio Low (TB2 pin 6) to TB10 - Ground.
8. Connect the Receive audio input Hi (TB2 pin 7) to the transceiver's receive audio output.
9. Connect the Receive audio Low (TB2 pin 8) to TB10 - Ground.

Figure 3 Unbalanced Interface Connections (TB2)



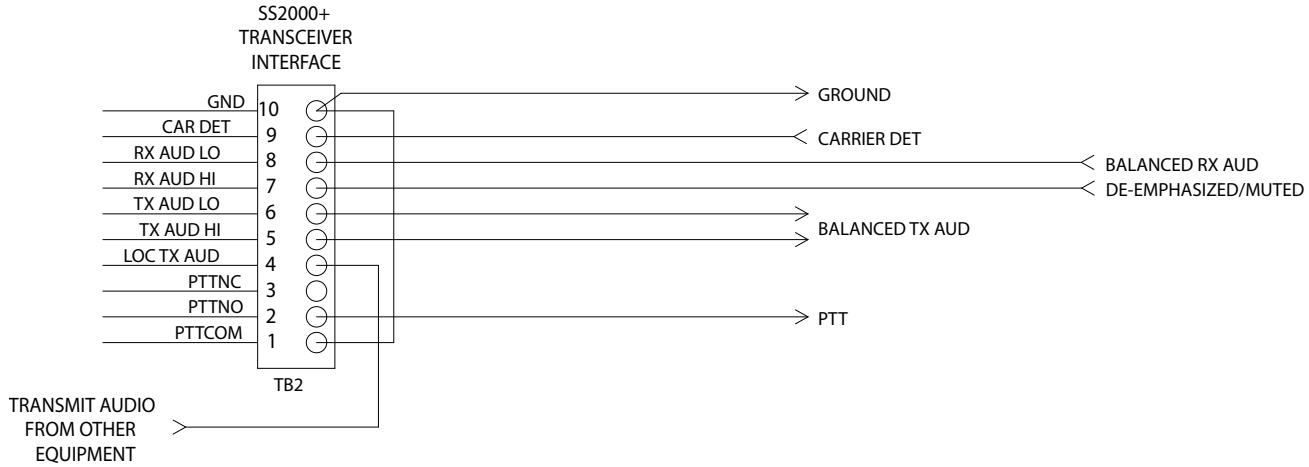
Balanced Interface

To connect a balanced interface:

1. Connect the PTT relay COM output (TB2 pin 1) to TB10 - Ground.
2. Connect the PTT relay N.O. output (TB2 pin 2) to the transceiver and PTT input.
3. Connect the Carrier detect ground (TB2 pin 10) to the transceiver's ground.
4. Connect the Carrier detect (TB2 pin 9) to the transceiver's Carrier detect output. Jump the unit to accept either active low or active high Carrier detect. If the Carrier detect is not available, jump the unit for VOX.

5. If other equipment is using this transceiver, connect its transmit audio to TB2 pin 4. When the SS2000+ is transmitting, it interrupts this TX audio.
6. Connect the Transmit audio Hi and Low outputs (TB2 pins 5 and 6) to the transceiver's transmit audio input.
7. Connect the Receive audio inputs Hi and Low (TB2 pins 7 and 8) to the transceiver's receive audio output.

Figure 4 Balanced Interface Connections (TB2)



Setting the Jumpers

Use the following tables to set the jumpers.

Table 8 Jumpers

Internal Jumpers	
JU1	Internal - DTMF Decode Speed, Jumpered = 35 ms/5 ms, Open = 50 ms/50 ms or greater. The default is open.
JU3	Internal - External Mic Amplified or not Jumpered for amplified mics. The default is open.
JU5	Internal - Ghost Power to balanced Mic Input, Jumpered applies +46 Vdc. The default is open.
External Jumpers	
JU4A	Receive Audio Input Impedance Center and Upper pins Jumpered = 10 kΩ Center and Lower pins Jumpered = 600 Ω (typical)
JU4B	Transmit Audio Output Impedance Center and Upper pins Jumpered = 10 kΩ Center and Lower pins Jumpered = 600 Ω (typical) Usually Low Z (600 Ω) will drive any type of input.
JU4C	Carrier Detect Polarity Center and Upper pins Jumpered = Active High Center and Lower pins Jumpered = Active Low (typical)
JU4D	Carrier Detect or VOX Center and Upper pins Jumpered = VOX Center and Lower pins Jumpered = Carrier Detect Input (typical)

Setting the Levels

Setting the Transmit Levels

To set the levels on the SS2000+:

1. On the SS2000+, press the MENU button.

   NOTE: The SS2000+ menu is backwards compatible with legacy units with a Printer port.


```
1. Printer Status
2. Send Calibrate
3. Set Date and Time
4. Test Mode
```

2. Press 2 to send calibrate.
3. Press the SEND button to generate a calibration tone from the SS2000+.
4. Using V2, set the Transmit Audio output level for 1.5 kHz (3 kHz for wideband) deviation from the transmitter.
5. Confirm that the first three LEDs on the LEVEL display are on.
6. Choose one of the following:

   a. Using a local microphone;

      While holding the microphone against the lower lip and speaking in a normal voice, hold the word four while adjusting V4 until 4 to 5 LEDs on LEVEL display.

   b. Using an external balance microphone;

      While holding the microphone against the lower lip and speaking in a normal voice, hold the word four while adjusting V8 for 4 to 5 LEDs on the LEVEL display.

   c. Using line inputs;

      Activate the Line input's PTT line and inject an audio signal.

      Adjust V6 for the level of Line Input #1 or V7 for the level of Line Input #2 for 3 to 4 LEDs on the LEVEL display.

Setting the Receive Level

Inject a radio signal modulated by a 1 kHz tone at 1.5 kHz (3 kHz for wideband) of deviation into the transceiver.

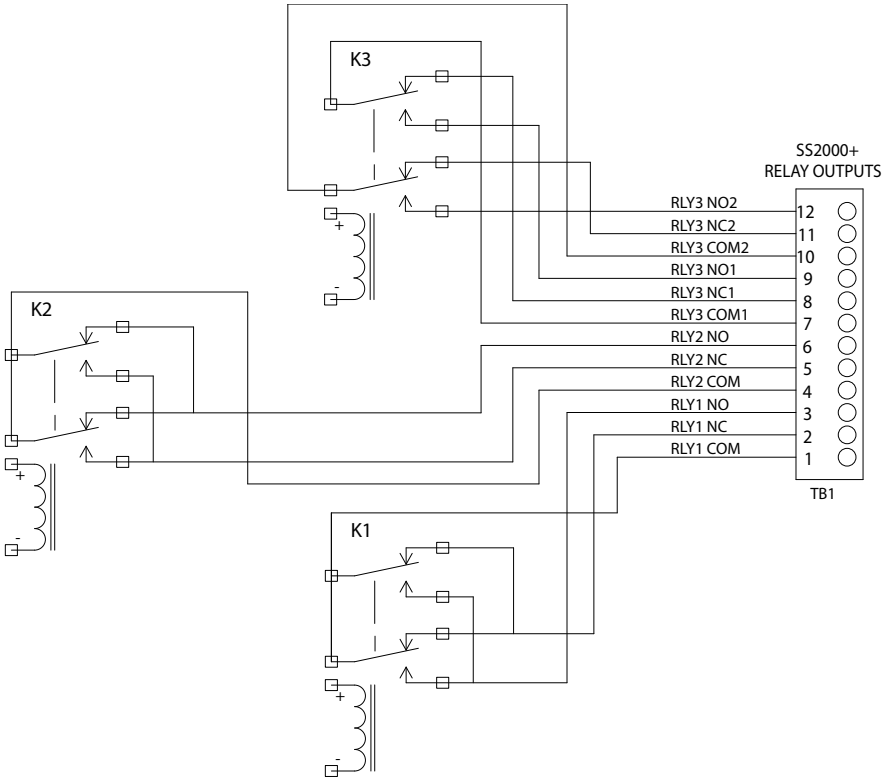
Using V3, set the level on the level meter until the first two LEDs are on, and then slowly increase the level until the third LED just comes on or set TP11 for 1 V_{P-P} (354 mV_{RMS}).

NOTE: Configure RTUs in the field with at least a 500 ms front porch to use with the SS2000+.

Connecting the Relay Outputs (TB1)

All Relays are shown in the open state.

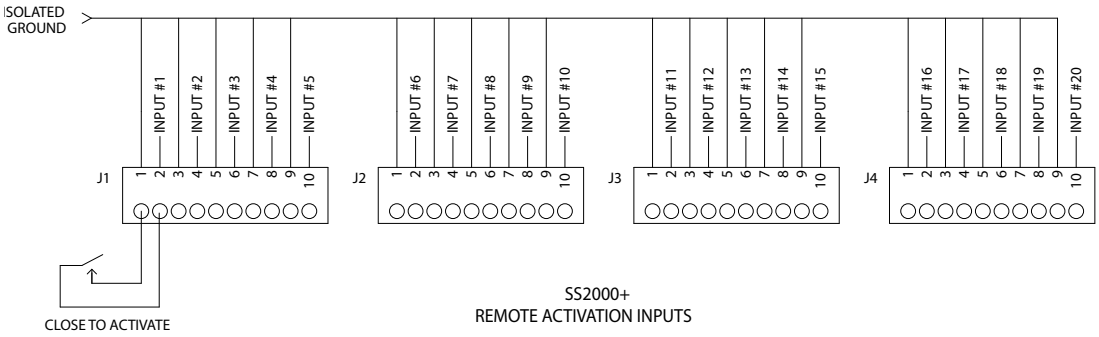
Figure 5 Connecting the Relay Outputs (TB1)



Connecting the Remote Activation Inputs (J1, J2, J3, J4)

Each input requires a separate momentary dry contact closure.

Figure 6 Connecting the Remote Activation Inputs (J1, J2, J3, J4)



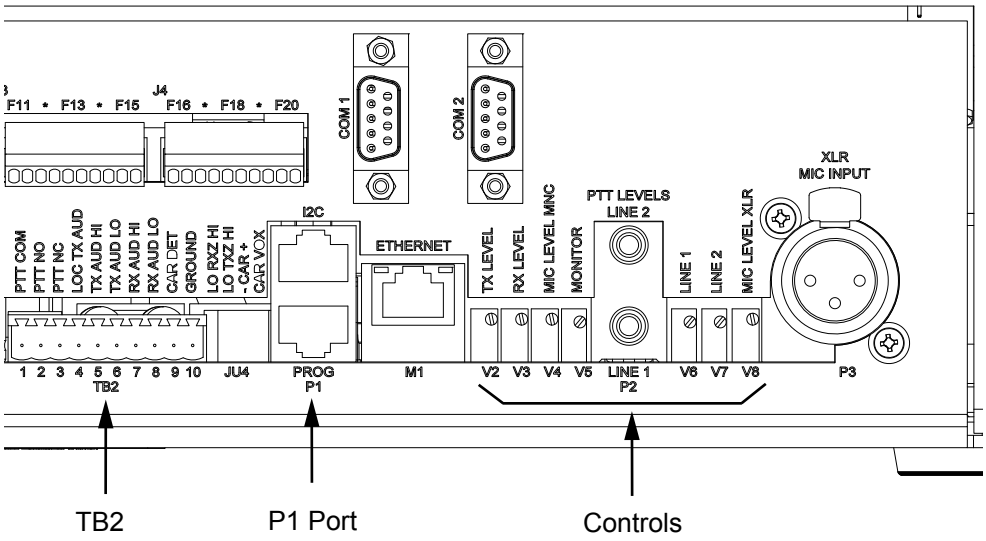
Installing the SSLoader+ Software

Programming the SS2000+

To program the SS2000+:

1. Connect a serial cable between your computer and the port labeled P1 on the SS2000+ with the plug adaptor. (Use the serial port adaptor with part number 2005204 and the six-conductor telephone cable with part number 1751134.)

Figure 7 Location of P1 Port



2. Load the INI configuration file into the SS2000+ using SSLoader+.

Operating Requirements

The SSLoader+ operates in a Windows®-based server environment. Ensure Hardware meets minimum standards.

The most current version of SSLoader+ is compatible on:

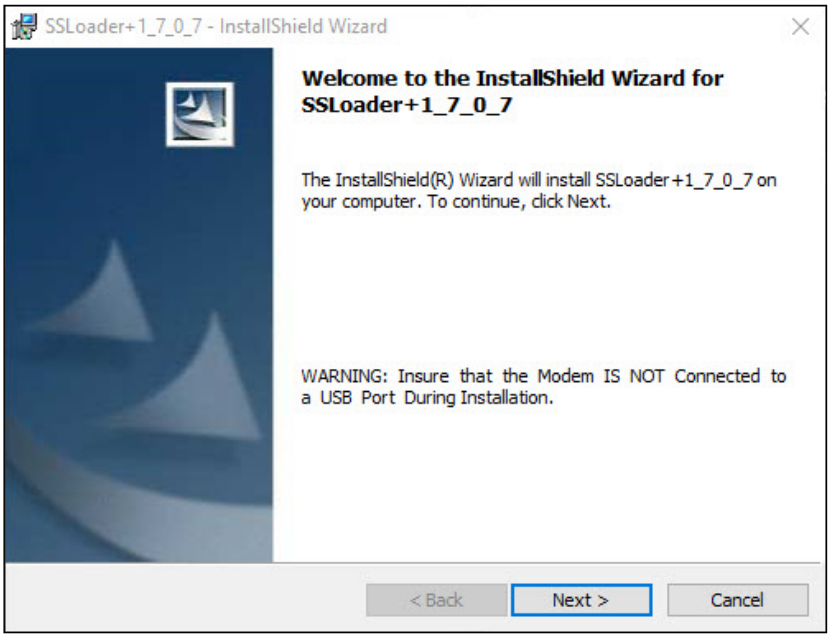
- Desktop Operating Systems: Windows® 10
- Server Operating Systems: Server 2012, Server 2016, and Server 2019

Installing the SSLoader+ Software

The following are the dialog boxes that appear when you go though the installation program.

1. Double-click the EXE file to launch the automatic installation program

   The following dialog appears.

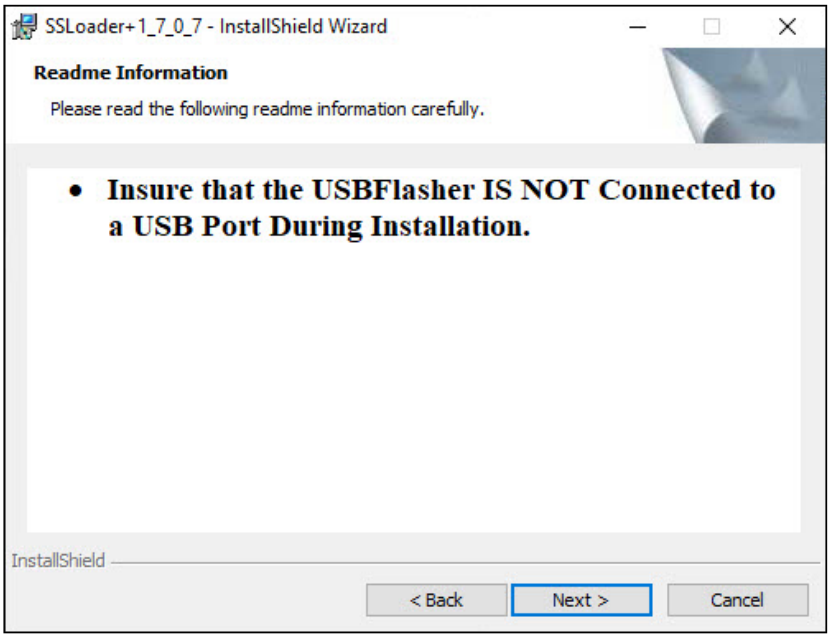


2. Read the information, and then click Next to continue.

   The following dialog appears.

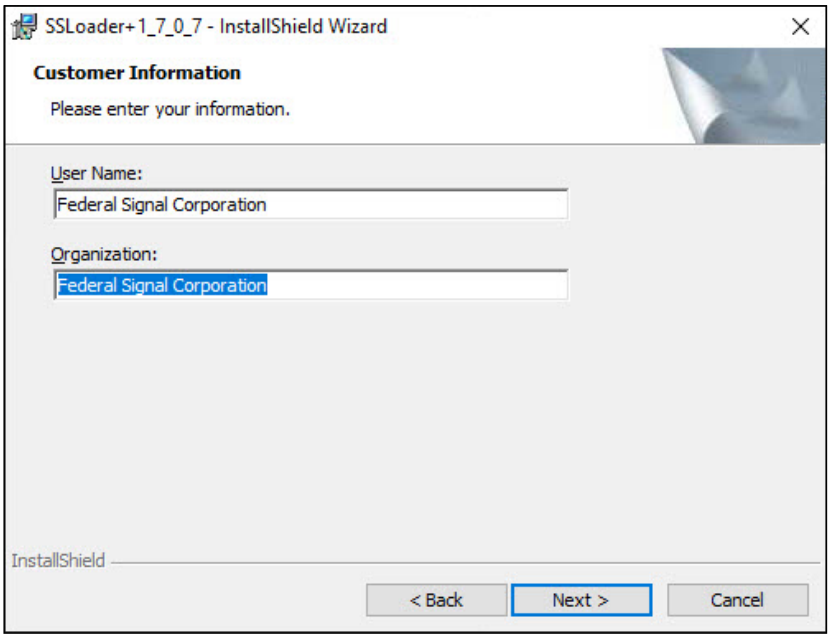
3. Select the I accept the terms in the license agreement option button, and then click the Next button.

The following dialog appears.



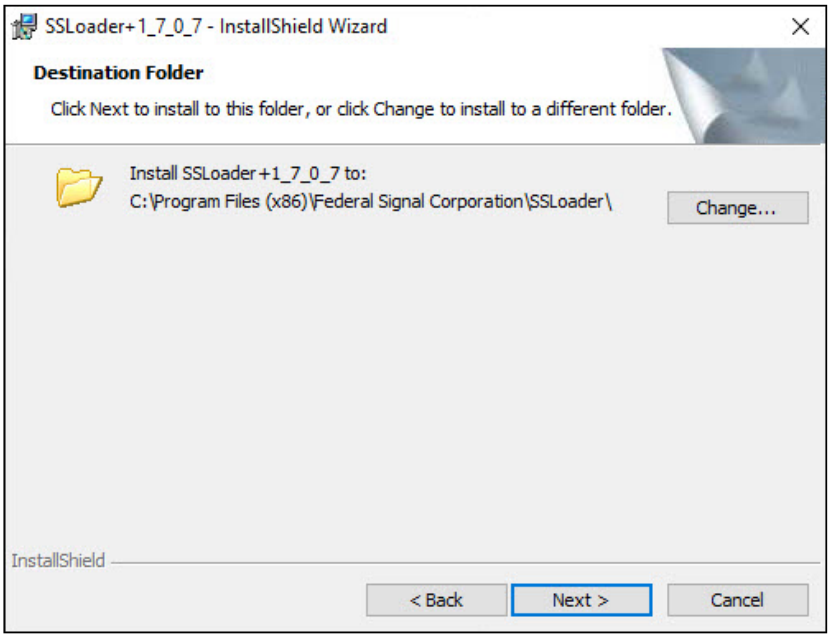
4. Ensure that the USBFlasher is not connected to the USB port during installation, and then click the Next button.

The following dialog appears.



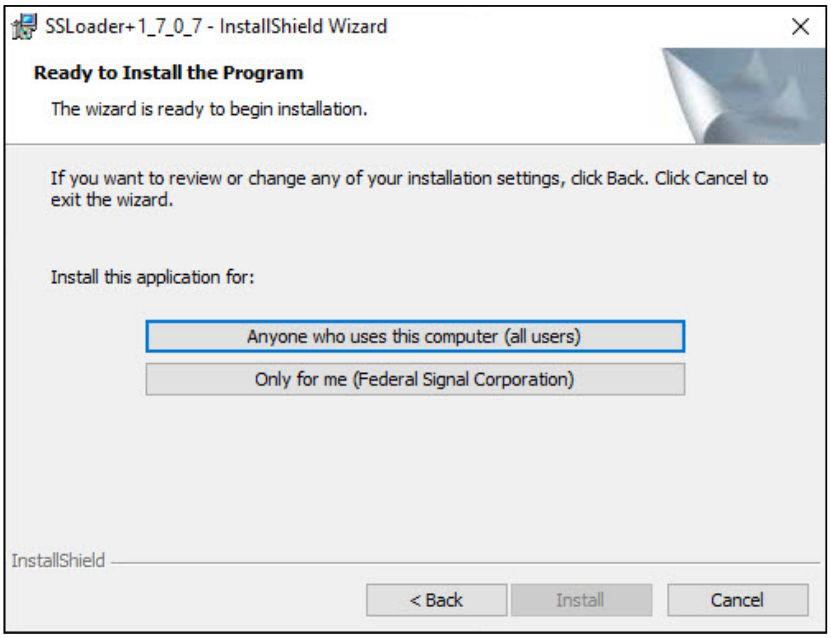
5. Enter the User Name and Organization, and then click the Next button.

The following dialog appears.



6. Click Next to install to this folder, or click the Change button to install to a different folder.

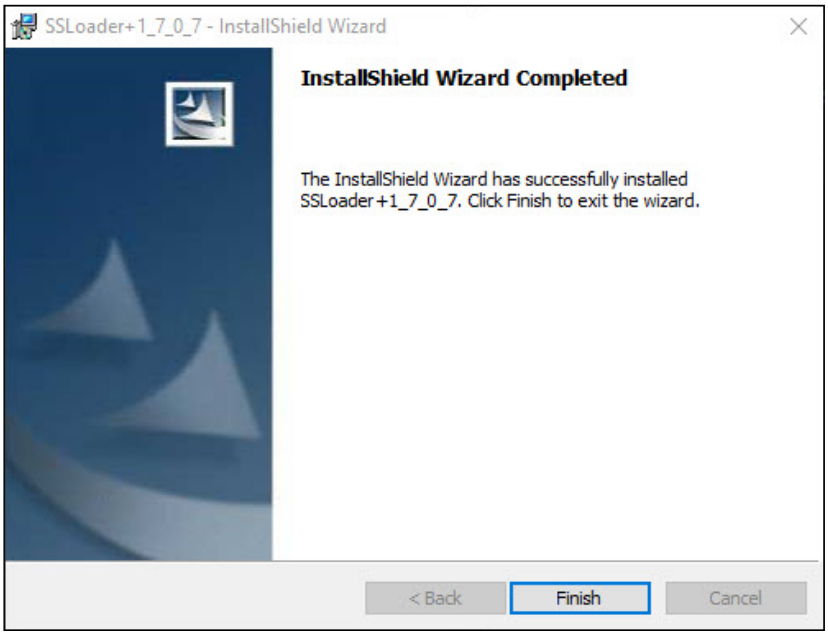
The following dialog appears.



7. Click either the Anyone who uses this computer button or the Only for me button.

You will see a progress bar that indicates the status of the installation.

The following dialog box appears when the installation is complete.



8. Click the Finish button.

Describing SSLoader+ Software

Use the SSLoader+ Software to configure and activate functions on the SS2000+.

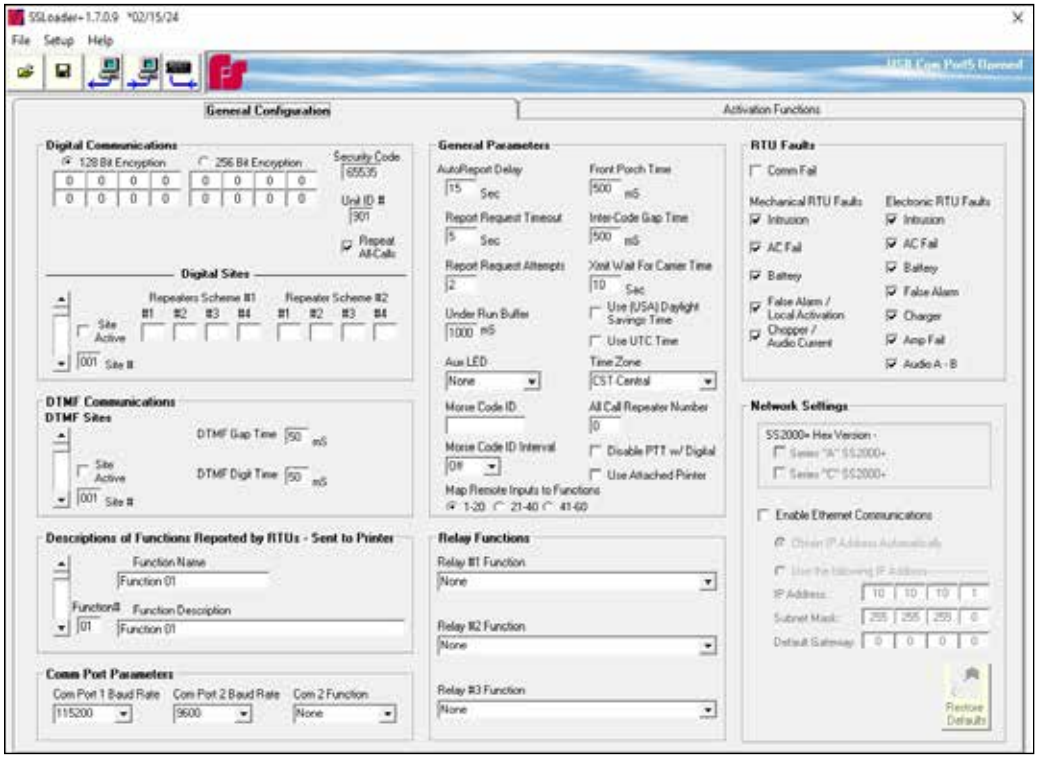


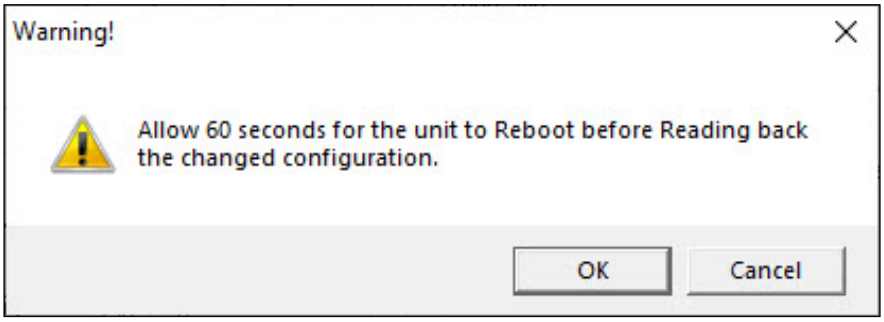
Table 9 SSLoader+ Icons

Icons	Description
	Opens a dialog box where you can select an INI file on your computer.
	Opens a dialog box where you can save an INI file to your computer.
	Sends an INI file to the SS2000+.
	Reads an INI file from the SS2000+ to your computer.
	Updates the Hex Code of the SS2000+.

Uploading INI File to the SS2000+

To upload the INI configuration file to the SS2000+ using SSLoader software:

1. Click the Send Ini File to SS2000 button to upload a file to the SS2000+. The following warning appears.

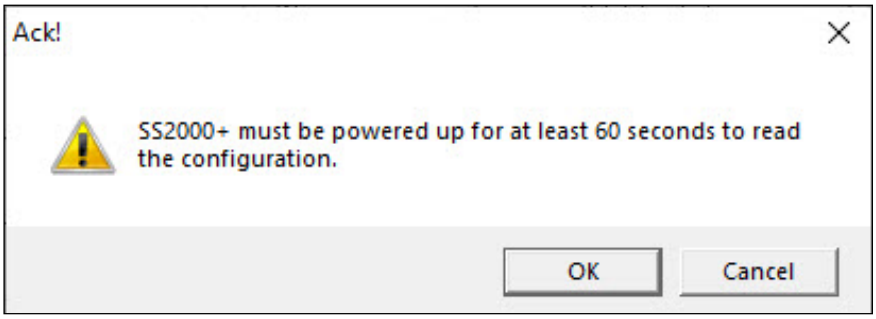


2. Click OK. The SSLoader+ sends the INI file to the SS2000+. If successful, a File Transfer successful dialog box appears.

Reading INI file from SS2000+

To read the INI configuration file from the SS2000+ using SSLoader software:

1. Click the Read Ini File to SS2000 button to send the INI file to the SSLoader+. The following warning appears.



2. Click OK. The SS2000+ begins sending the INI file to the SSLoader+. Once downloaded, edit and save the program and upload back to the SS2000+.

Updating the Hex Code

To update the Hex Code using SSLoader software:

1. Click the Update SS2000 Hex Code button to update the Hex Code. The Open dialog box appears.
2. Select the Hex file. Click the Open button. An information dialog box appears.
3. Click OK. The SSLoader+ uploads the new HEX code.

   When the firmware has finished downloading, a prompt appears that the file transfer was successful.
4. Wait for the SS2000+ configuration to complete.

Using the SSLoader+ Software

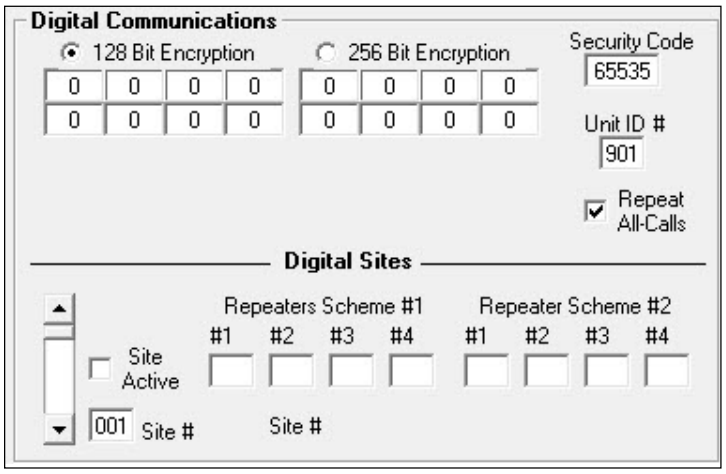
The following sections describe the options on the SSLoader+ tabs:

- General Configuration
- Activation Functions

Using the General Configuration Tab

Digital Communications

The following shows the Digital Communications group box of the General Configuration tab.

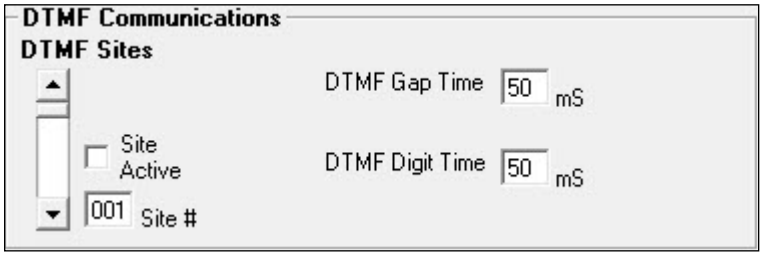


Field	Description
128 Bit Encryption button	Click to enter your Encryption key to secure your SS2000+. The default Encryption key is all zeros.
256 Bit Encryption button	Click to enter your Encryption key to secure your SS2000+. The default Encryption key is all zeros.
Security Code	By default, the security code is 65535, which means that the security code is open.
Unit ID#	Enter the unit ID number. Possible selections range from 900 to 999.

Field	Description
Repeat All-Calls	Sets the SS2000+ to send All-Call commands three times.
Spin box—Site #	Selects the RTU (siren site number).
Site Active	Check if the unit is active.
Repeaters Scheme #1	Enter repeater numbers if used for this site. The SS2000+ attempts to reach this site through Repeater Scheme #1, if entered. If that fails, the SS2000+ attempts through Repeater Scheme #2. **NOTE**: Enter Site Active and repeater schemes for each site if used.
Repeater Scheme #2	Enter repeater numbers if used for this site.

DTMF Communications

The following shows the DTMF Communications group box of the General Configuration tab.



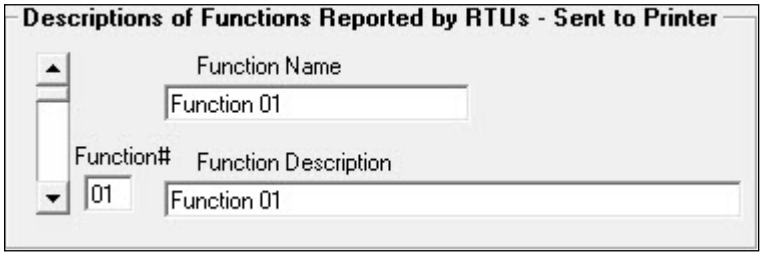
Field	Description
Spin box—Site #	Selects the RTU (siren site number).
Site Active	Check if the unit is active.
DTMF Gap Time	Enter DTMF gap time ranging from 5 to 100 ms.
DTMF Digit Time	Enter Digit time ranging from 35 to 100 ms.

Descriptions of Functions Reported by RTUs–Sent to Printer

When a site is polled, it reports back the last function number that was run. This is where the name and description for the functions are entered. These names and descriptions are sent to the printer when the site reports back.

The following shows the Descriptions of Functions Reported by RTUs–Sent to Printer group box of the General Configuration tab.

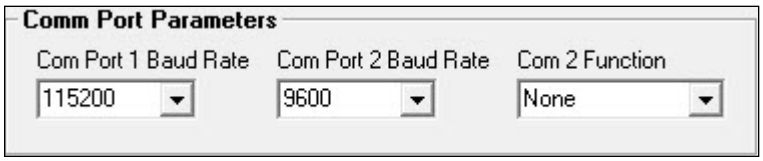
NOTE: The SS2000+ menu is backwards compatible with legacy units with a Printer port.



Field	Description
Spin box—Function #	Selects the function number.
Function Name	Enter the name.
Function Description	Enter the description.

Comm Port Parameters

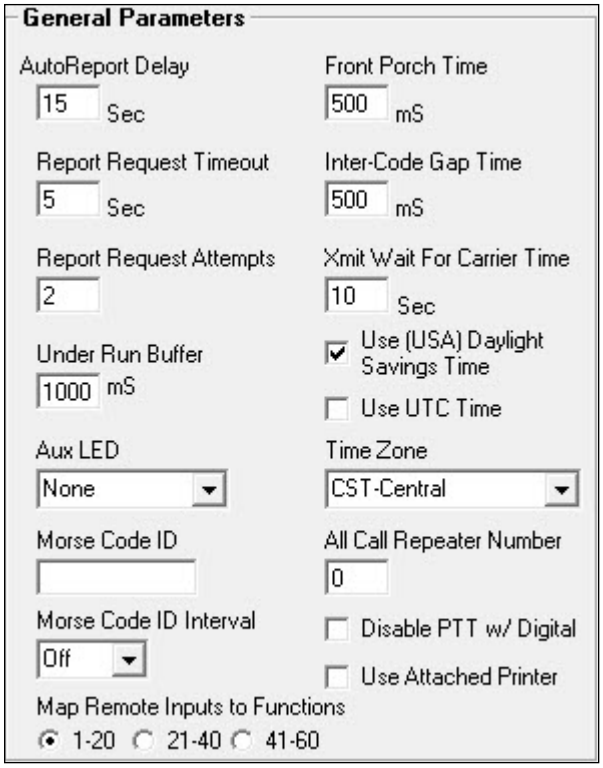
The following shows the Comm Port Parameters group box of the General Configuration tab.



Field	Description
Com Port 1 Baud Rate	Click the baud rate for Com Port number 1, which is the Commander® software com port.
Com Port 2 Baud Rate	Sends the baud rate for Com Port number 2, which is the accessory com port.
Com 2 Function	Click one of the following: • None: Not used. • Text Message: SS2000+ sends text messages from Commander® software to an attached display sign. • Printer Message: SS2000+ sends the messages that are sent to the printer to a serial printer on COM2. • Control: COM2 is used as a control port to Commander® software. • Radio Modem: SS2000+ sends and receives Federal Signal Digital traffic over the radio interface and Com Port 2.

General Parameters

The following shows the General Parameters group box of the General Configuration tab.

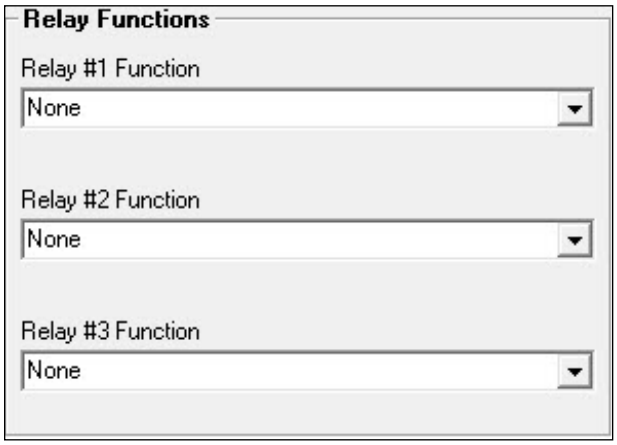


Field	Description
AutoReport Delay	Enter the number of seconds to wait after activating a function before requesting a report. The range is 0 to 99 seconds.
Report Request Timeout	Enter the number of seconds to wait for a response from a Report Request before trying again or moving onto another site. The range is 1 to 30 seconds.
Report Request Attempts	Enter the number of times to attempt a request for a Report from a site. The range is 1 to 3.
Under Run Buffer	Enter the number of milliseconds of streaming VoIP data the SS2000+ saves in reserve. This is used to provide the SS2000+ with data to spare if the data is momentarily interrupted.
Aux LED	Click one of the following: • None: The relay does not respond to any of these conditions. Use for Activation Codes. • WatchDogPoll: Activates when there has been no poll request to this unit in 30 minutes. • RTU Fault: Activates when an RTU siren site reports a fault.
Morse Code ID	Enter up to 10 characters.
Morse Code ID Interval	Click one of the following: • Off: Morse Code is off. • 15 Min: Transmits Morse Code every 15 minutes. • 30 Min: Transmits Morse Code every 30 minutes.

Field	Description
Front Porch Time	Enter the number of milliseconds between when the SS2000+ keys up a transmitter and when it begins sending the codes. The range is 100 to 9999 milliseconds (0.1 to 9.9999 seconds).
Inter-Code Gap Time	Enter the number of milliseconds the SS2000+ waits between the end of one transmitted code and the beginning of the next. (Pause Duration)
Xmit Wait For Carrier Time	Enter how long the SS2000+ waits for Carrier to transmit. The range is 0 to 60 seconds.
Use (USA) Daylight Savings Time	Check for the SS2000+ to use Daylight Savings Time.
Use UTC Time	Check for the SS2000+ to use Coordinated Universal Time.
Time Zone	Select the time zone the SS2000+ will operate in.
All Call Repeater Number	Enter the number of the repeater that is to be used as an All Call repeater.
Disable PTT w/ Digital	Check to disable the PTT relay during a digital transmission.
Use Attached Printer	Check to use the printer with the SS2000+. **NOTE**: The SS2000+ menu is backwards compatible with legacy units with a Printer port.
Map Remote Inputs to Functions	Click to map the 20 remote inputs to Functions 1-20, 21-40, or 41-60.

Relay Functions

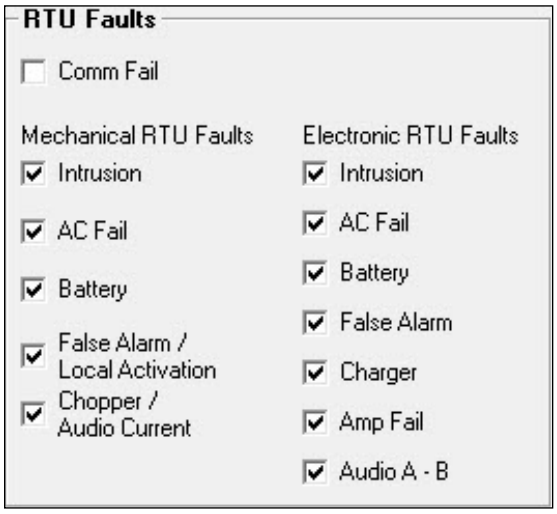
The following shows the Relay Function group box of the General Configuration tab. This is where you select the functions of the three relays.



Field	Description
Relay #1, #2, or #3	Click one of the following: • None: The relay does not respond to any of these conditions. Use for Activation Codes. • WatchDogPoll: Relay is usually closed and opens when there has been no poll request to this unit in 30 minutes. • PTT: Relay is closed during any transmissions. • CD: Relay closes when Carrier Detect is present or if selected, VOX is active. • RTU Fault: Activates when an RTU siren site reports a fault.

RTU Faults

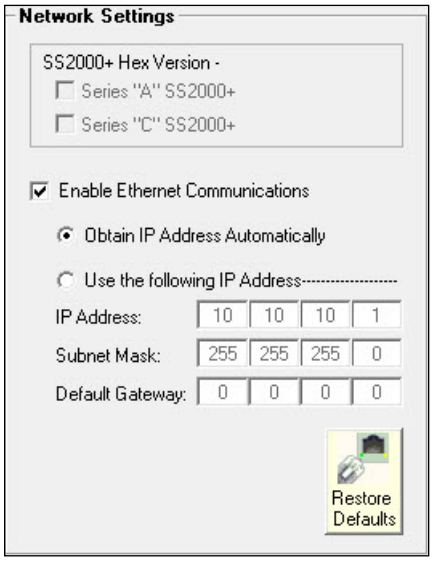
The following shows the RTU Faults group box of the General Configuration tab. The RTU Faults group box lets you select the conditions considered a fault by the SS2000+. The columns are divided into mechanical and electronic type sirens.



Field	Description
Comm Fail	Check when a command is sent to an RTU from the SS2000+ or Commander®, and it does not acknowledge.
Mechanical RTU Faults	• Intrusion: Control Cabinet or Battery Cabinet is open. • AC Fail: AC failed at the Control Cabinet. • Battery: Battery failed. • False Alarm/Local Activation: Siren activation sensed without an activation being received. • Chopper/Audio Current: Failure of audio-making motor.
Electronic RTU Faults	• Intrusion: Control Cabinet or Battery Cabinet is open. • AC Fail: AC failed at the Control Cabinet. • Battery: Battery failed. • False Alarm: Siren activation sensed without an activation being received. • Charger: Charger failed. • Amp Fail: An amp failed. • Audio A-B: Audio failed at the UV controller card.

Network Settings

The following shows the Network Settings Frame group box of the General Configuration tab. The Network Settings group box allows you to configure how the SS2000+ connects to an Ethernet network.



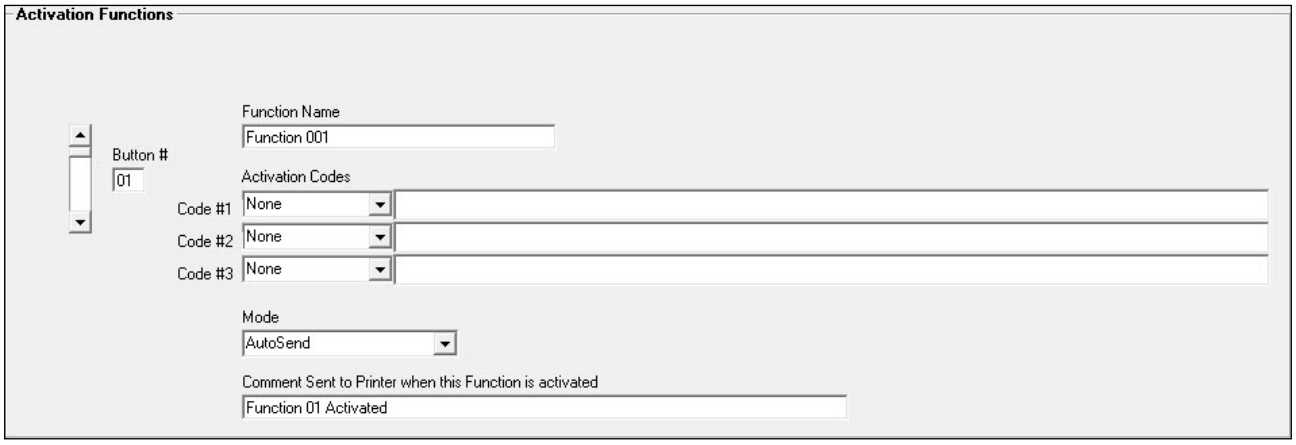
Field	Description
SS2000+ Hex Version	
Series “A” SS2000+ Series “C” SS2000+	Informational only. When the INI file is read from the SS2000+, either Series A or Series C check box is selected. You cannot change this option.
Enable Ethernet Communications	Check to enable this group box setting.
Obtain IP Address Automatically	Click to obtain an automatic address (DHCP) from the network.

Field	Description
Use the following IP Address	Click to specify an IP Address, Subnet Mask, and Default Gateway obtained from the System Administrator. **IMPORTANT**: These fields must be filled in if the Automatic IP address (DHCP) option is not selected.
Restore Defaults	Opens a warning dialog box. If you click OK, this action deletes the Ethernet setting and restores them to the factory defaults.

Using the Activation Function Tab

Activation Function

The following shows the Activation Functions group box of the Activation Function tab.

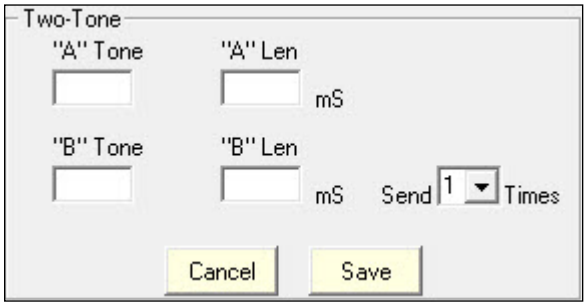


Field	Description
Spin box—Button #	Select the button to configure.
Function Name	Enter the name of the function. Symbols such as the equal sign (=) and the semicolon (;) are not allowed.
Activation Codes	Select the activation code. • None: No activation code. • TwoTone: Displays the TwoTone group box. • DTMF: Displays the DTMF group box. • EAS: Displays the EAS group box. • Federal Digital (FSK): Displays the Federal Digital group box. • Relay Outputs: Displays the Relay Outputs group box. • HotKey: Displays the HotKey group box. Only available with Code #3. Activates Commander® HotKey. • SendRemoteInput: Displays the SendRemoteInput group box. Only available with Code #3. Sends activation via radio to another Commander® encoder base station, which activates a function dependent upon custom programming within the ss_input.ini file. • Call Function Key#: Displays the Call Function Key# group box. Only available with Code #3. Activates another activation HotKey on the SS2000+.

Field	Description
Mode	Select the mode of operation. • AutoPromptSend: Activation is sent after the user presses the activation button and then the SEND button. • AutoSend: Activation is sent after the user presses the activation button. • AutoPromptSendAutoReport: Prompts the user to press the SEND button after an activation button has been pressed before initiating the activation. After the activation, the SS2000+ waits the number of seconds indicated by Auto Report Delay and polls the sites. • AutoSendAutoReport: Initiates the activation immediately. After the activation, the SS2000+ waits the number of seconds indicated by Auto Report Delay and polls the sites.
Comment Sent to Printer when this Function is activated	Enter a description that is sent to the printer during the activation. **NOTE**: The SS2000+ menu is backwards compatible with legacy units with a Printer port.

Two-Tone

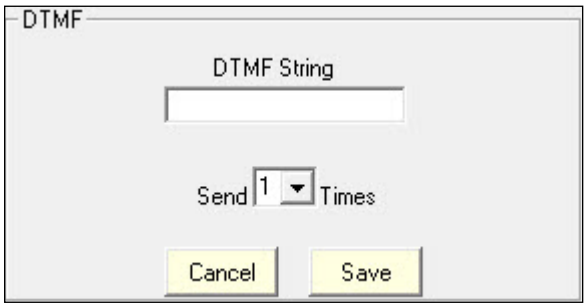
Select TwoTone from Activation Codes to display the Two-Tone group box. To save, click Save.



Field	Description
"A" Tone	Enter the tone frequency of the A tone.
"A" Len	Enter the length of the A tone. Duration is in milliseconds.
"B" Tone	Enter the tone frequency of the B tone.
"B" Len	Enter the length of the B tone. Duration is in milliseconds.
Send Times	Select the number of times this code is sent. Options are from 1 to 3 times.

DTMF

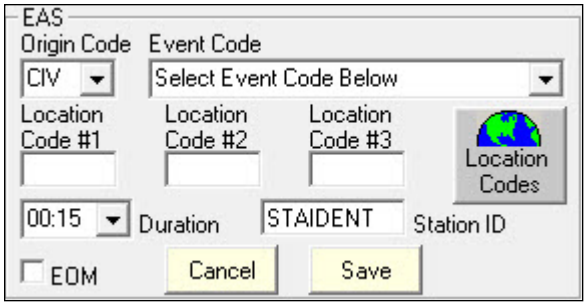
Select DTMF from Activation Codes to display the DTMF group box. To save, click Save.



Field	Description
DTMF String	Enter the DTMF string that is sent out. The range is from 1 to 12 digits.
Send Times	Select the number of times this code is sent. Options are from 1 to 3 times.

EAS

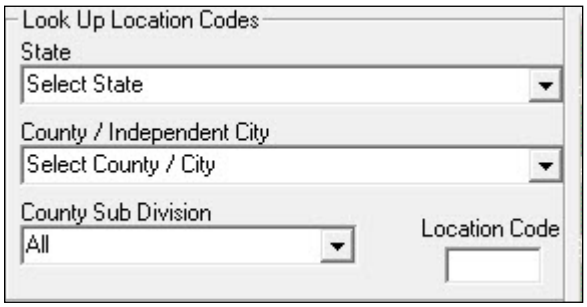
Select EAS from Activation Codes to display the EAS group box. To save, click Save.



Field	Description
Origin Code	Click one of the following: EAN: Emergency Action Notification Network PEP: Primary Entry Point System WXR: National Weather Service CIV: Civil authorities EAS: Broadcast station or cable system
Event Code	Select an event code from the list.
Location	Enter the location codes for the area that this alert is intended for. You may enter one to three location codes.
Duration	Select the duration of the code from the list.
Station ID	Enter the station ID.
EOM	Check EOM to indicate End of Message.
Location Codes	Click the Location Codes button to find the location code for an area. The Look Up Location Codes group box appears. See the next section.

Look Up Location Codes

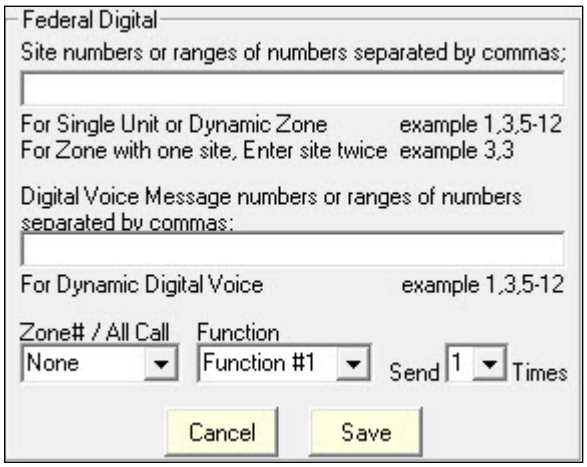
Click the Location Codes button to display the Look Up Location Codes group box.



Field	Description
State	Select a state from the list by typing the first letter of the state and then clicking the drop-down arrow to select the state.
County/Independent City	Select a county or independent city from the list.
County Sub Division	Select a county's subdivision.
Location Code	Displays the location code from the information selected. Enter this code in one of the Location Code text boxes.

Federal Digital

Select Federal Digital from Activation Codes to display the Federal Digital group box. To save, click Save.



Field	Description
Site numbers or ranges of numbers separated by commas	Enter the site numbers or ranges for numbers separated by commas. For example: 1, 3, 5-12 activates sites 1, 3, and sites 5 through 12. For Dynamic Zone with one site, enter site number twice: 3,3.
Digital Voice Message numbers or ranges of numbers separated by commas	Enter the site numbers or ranges of numbers separated by commas. For example: 1, 3, 5-12.
Zone#/All Call	Select the zone number the activation is intended for or select All Call if the activation is for all sites.
Function	Select the function number, Reset, Quit Test, or Cancel code from the list.

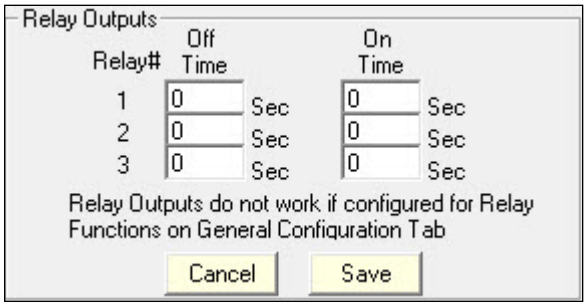
Field	Description
Send Times	Select the number of times this code is to be sent from 1 to 3.

Relay Outputs, HotKey, Send Remote Input, and Call Function Key codes are only available with activation Code #3.

Relay Outputs

Select Relay Outputs from Activation Codes to display the Relay Outputs group box. To save, click Save.

NOTE: Relay Outputs functions do not work if the relays were configured for other tasks on the General Configuration tab.



Field	Description
Off Time	Enter how many seconds the relay waits after the activation to close. The range is 0-999.
On Time	Enter how many seconds the relay stays close. The range is 0-999.

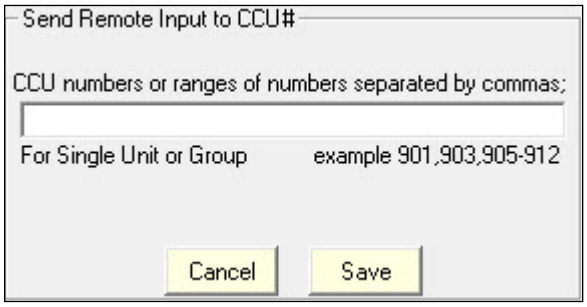
HotKey

Select HotKey from Activation Codes to display the Hot Key group box. To save, click Save.

Field	Description
Activate Commander Hot Key #	Select the organization code from the list.

Send Remote Input to CCU#

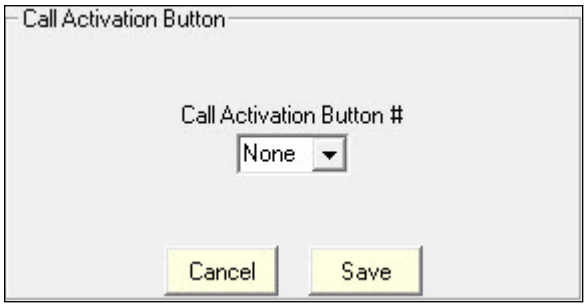
Select SendRemoteInput from Activation Codes to display the Send Remote Input to the CCU# group box. To save, click Save.



Field	Description
CCU numbers or ranges of numbers separated by commas	Enter the site number or ranges of numbers separated by commas; for example: 901, 903, 905-912.

Call Function Key#

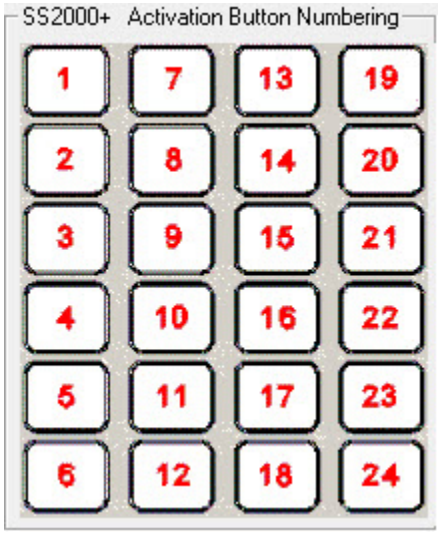
Select Call Function Key# from Activation Codes to display the Call Activation Button group box. To save, click Save.



Field	Description
Call Activation Button #	Select the organization code from the list.

SS2000+ Activation Button Numbering

The following graphic shows the numbering of the activation buttons on the SS2000+.



SS2000+ HotKey Activation

The following section describes how to activate from the front panel HotKeys on the SS2000+ unit.

Unlocking the System

The SS2000+ keypad is secured with a key lock switch. When the key is in the LOCK position, the LCD displays Keypad Locked message, time, and date.

```
** Keypad Locked **
     SS2000+

07:29 06/19/2019 (c)
```

When the key is turned to the UNLOCK position, the keypad is enabled, and the standby screen displays on the LCD. The unit is ready to accept commands.

```
 Press Function Key
 F1..F2 to Activate

07:29 06/19/2019 (c)
```

When the unit is powered up,

When the SS2000+ is on, the printer prints SS2000+ On Line.

NOTE: The SS2000+ menu is backwards compatible with legacy units with a Printer port.

Automatic Logging

The SS2000+ displays all incoming and outgoing messages on the LCD display. If enabled in the configuration, the SS2000+ logs any incoming statuses and alarms DTMF or Digital to the printer. If COM2 is configured for Printer Messages, the status and alarms are sent there. The SS2000+ logs each time it powered up, all manual encode activations, outgoing poll requests, and the results of each step in the self-test procedure.

The SS2000+ decodes and displays on the LCD any incoming DTMF of Digital status or alarm messages. A typical message includes the site number, siren type, and alarm or status, depending on the message type.

```
Press Function Key
F1..F2 to Activate
Site# 001 FCD Alarm
07:29 06/19/2019 (s)
```

Whenever the SS2000+ attempts to transmit, the following occurs:

a. If the radio channel is busy and Carrier Detect is active, the LCD displays the following.

```
F01: Function Name

Waiting for Carrier
```

The SS2000+ waits ten seconds for the channel to clear before transmitting.

b. If other equipment is currently transmitting, the LCD displays the following.

```
F01: Function Name

Waiting for PTT
```

The SS2000+ waits for other transmissions to end before transmitting.

Communication Mode

You can use the SS2000+ in either standalone or computer mode. The mode the SS2000+ is in is indicated by the character at the end of the fourth line on the LCD panel. The (s) stands for standalone mode and (c) stands for computer mode.

To switch between modes, from the STANDBY screen, press MODE. The SS2000+ LCD displays the following:

```
About to change Mode
to: standalone
Press SEND to Change
Or CLEAR to Cancel
```

Standalone Mode

In standalone mode, the SS2000+ acknowledges any incoming Digital Alarms and logs them. Any incoming DTMF alarms are converted to Federal Signal digital and are logged as well.

Requesting Reports and Polling

The SS2000+ is configured with two lists of unit numbers:

- One for digital units
- One for DTMF units

When a Report - All is executed, the SS2000+ polls the units in the Digital list and logs each poll and response. When complete, the SS2000+ polls the units in the DTMF list, converting the DTMF reply to the same format as the Digital information and logs each poll and response.

Requesting a Report from All Sites

To request a report from all of the sites:

1. Press the REPORT key from the STANDBY screen.

   The SS2000+ LCD displays the following.

```
Select:
       ALL or SITE

REPORT            STANDBY
```

2. Press ALL, and the SS2000+ polls the sites in its site lists.
3. Press CLEAR to stop the process and return to the STANDBY screen.

Requesting a Report from Individual Sites

To request a report from an individual site:

1. Press the REPORT key from the STANDBY screen.
2. Press MODE/SITE.

   The SS2000+ LCD displays the following:

```
Enter Site:
Sites = 1 to 256

REPORT SEND to START
```

3. Enter the site number.
4. Press CLEAR to clear the site number for re-entry.
5. Pressing CLEAR again or MENU stops the process and returns you to the STANDBY screen.
6. Press SEND, and the SS2000+ polls the site and logs the results.

   The SS2000+ LCD displays the following:

```
Site#001
Requesting Report
REPORT            STANDBY
```

Computer Mode

Requesting Reports and Polling

Any poll requests or activation commands from Commander® software are examined by the SS2000+ for time and date. The SS2000+ updates its internal clock to match and then sends the Digital message.

When Commander® sends a poll request, the SS2000+ LCD displays the following.

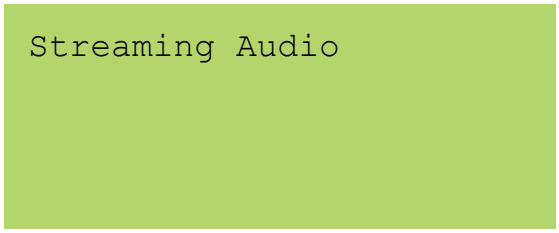
```
Requesting Report:
Site# 001

REPORT            STANDBY
```

The resulting reports are logged and sent to the Commander® software. Incoming DTMF messages are converted to Digital format, logged, and sent to Commander® as well. These transmissions are not acknowledged by the SS2000+.

Streaming Mode

In computer mode, the SS2000+ can also receive streamed audio/encode data from Commander® software and transmit it out as audio.

When the SS2000+ is transmitting streamed audio encode data, the SS2000+ LCD displays the following:



Encoding

You can program up to three codes under each of the 60 activation functions. These can be as follows:

Two-Tone/Single-Tone codes

- 282 Hz to 3000 Hz, Timing, 0.5-second min to 8-second max

DTMF codes up to 16 characters

- 35 ms/5 ms to 100 ms/100 ms timing

Federal Signal one-way Digital Codes

- 1 to 255 Individual site, 300=All Call, 1 to 16 for zones 1 to 16
- 1 to 512 Individual site, 800=All Call if extended site numbers are used
- Function Number 1 to 50, 97=Cancel, 98=Quiet Test, 99=Reset

Cycling the three Relay Outputs

- Off times and on times 0 to 999 seconds

Calling another activation key

The 24 activation buttons activate functions 1 to 24. You can use the rear-mounted activation to activate functions 1 to 20, or you can modify jumpers to use the rear-mounted inputs as additional activation inputs.

You can configure each activation function for the following:

- Auto Prompt Send
- Auto Send

Auto Prompt Send Auto Prompt Send prompts you to press the SEND button after an activation button has been pressed. The SS2000+ LCD displays the name of the function activated.

```
F01:


SEND to Transmit
```

Once done, the unit sends out the codes for that function.

Auto Send Auto Send sends the codes out when you press an activation button or closes a remote activation input without prompting you to press SEND. The SS2000+ LCD displays the name of the function activated.

```
Sending:
Function Name
```

Auto Prompt Send Auto Report prompts you to press the SEND button after an activation button has been pressed. After the activation, the SS2000+ polls the sites it is configured for.

Auto Send Auto Report sends the codes out when you press an activation button or closes a remote activation input without prompting you to press SEND. After the activation, the SS2000+ polls the sites it is configured for.

You can program activation buttons as Manual. When you press a button, the SS2000+ prompts you for where the message is to be sent: All, Zone, or Site. You can only use Manual with Digital functions.

Press CLEAR to stop the process and return to the STANDBY screen.

Manual Activation

From the STANDBY screen, press the MANUAL ACT button.

The SS2000+ LCD displays the following.

```
Manual Activation
Select:
ALL ZONE or SITE
MANUAL ACTIV STANDBY
```

Activating All Sites

To activate all sites:

1. Press the MANUAL ACT button.
2. Press the ALL button.

   The SS2000+ prompts for the desired function number.

```
Enter Function:
1-50, 97=Cancel
98=QuietTest 99=Rset
MANUAL SEND to START
```

3. Press the SEND button.

   Press the CLEAR button to stop the process and return to the STANDBY screen.

Activating a Zone

To activate a zone:

1. Press the MANUAL ACT button.
2. Press the ZONE button.

   NOTE: Your site may have customized buttons.

   The SS2000+ prompts for the desired zone number.

```
Enter Zone:
Zones = 1 to 16

Press SEND to ENTER
```

3. Enter the zone number.

   Enter the ***zone number*** where the zone number is a variable that changes with your site's zone numbers.

4. Press the SEND button.

The SS2000+ prompts for the Function.

```
Enter Function:
1-50, 97=Cancel
98=QuietTest 99=Rset
MANUAL SEND to START
```

5. Enter the function number.

   Press the CLEAR button to stop the process and return to the STANDBY screen.

Activating an Individual Site

To activate an individual site:

1. Press the MANUAL ACT button.
2. Press the MODE/SITE button.

   The SS2000+ prompts for the desired site number.

```
Enter Site:
Sites = 1 to 255

Press SEND to ENTER
```

3. Enter the site number.
4. Press the SEND button.

   The SS2000+ prompts for the Function.

```
Enter Function:
1-50, 97=Cancel
98=QuietTest 99=Rset
MANUAL SEND to START
```

5. Enter the function number.

   Press the CLEAR button to stop the process and return to the STANDBY screen.

6. Press the SEND button.

Menu Selection

The following section explains how the use the SS2000+ menu section.

To view the menu selection, press the MENU button.

The SS2000+ LCD displays the following.

```
1. Printer Status
2. Send Calibrate
3. Set Date and Time
4. Test Mode
```

The following table describes the menu features.

Menu Number	Description
1. Printer Status	Displays the current printer status: Printer Off, No Paper, Printer Offline, Printer Error, or Printer OK.
2. Send Calibrate	Sends the calibration tone.
3. Set Date and Time	Sets the date and time.
4. Test Mode	Begins the self test.

Sending the Calibration Tone

To send the calibration tone:

1. Press the MENU button.
2. Press 2.

   The SS2000+ LCD displays the following:

```
SEND to Transmit


CAL                STANDBY
```

3. Press SEND. The SS2000+ transmits a 10-second, 1-kHz sinewave. This sets transmitter deviation.

   The SS2000+ LCD displays the following.

```
SEND to Transmit


Sending
```

After 10 seconds, the SS2000+ LCD displays the following.

```
SEND to Transmit


CLEAR to Quit
```

4. Press SEND to send the tone for another 10 seconds, or press CLEAR or MENU to return to the STANDBY screen.

Setting the Date and Time

To set the date and time:

1. Press the MENU button.
2. Press 3.

   The SS2000+ LCD displays the following.

```
'+' or '-' to Change
SEND to move to Next
|
16:24:38    6/01/2019
```

Press	Action
SEND	Moves the Pointer | to the next field.
+	Increases the number in the field
-	Decreases the number in the field.

3. Press CLEAR or MENU to save the date and time on the display and return to the STANDBY screen.

Executing the Self Test

To execute the self test:

1. Press the MENU button.
2. Press 4.

   The SS2000+ LCD displays the following.

```
LCD Message Test;
Press (+) if OK.
Press (-) if Failed
CLEAR Key to quit.
```

Web Browser Activation

The following section describes how to activate from a built-in web server that allows the SS2000+ to be controlled and configured over a LAN using standard web browsers.

The SS2000+ must be configured with the SSLoader+ software to enable Ethernet communications and configure IP settings before the SS2000+ can be used on a LAN.

The System Administrator identifies the server IP address, Subnet Mask, Default Gateway, and the IP addresses for all SS2000+ devices.

If the configuration details are lost or changed incorrectly, and restoring the SS2000+ to factory default settings becomes necessary, see the Restoring Configuration to Factory Defaults section.

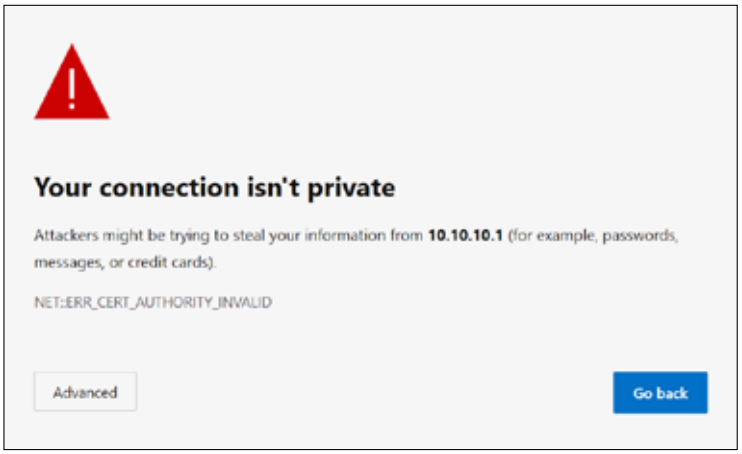
Logging In the Web Interface

To configure the network interface through the web interface:

1. Before installing SS2000+ devices on an IP network, use the SSLoader+ software to activate the Ethernet port and configure the IP settings for your network.
2. If the SS2000+ is configured to automatically obtain an IP address using (DHCP), use the SSLoader+ software to read the SS2000+ configuration to obtain the IP address. Type the IP address into your Chrome®, Edge®, or Firefox® browser to navigate to the SS2000+ web page.

   Your browser displays a security warning screen.

   NOTE: Your screens may look different depending on the browser selected. The following example is from using Microsoft® Edge.



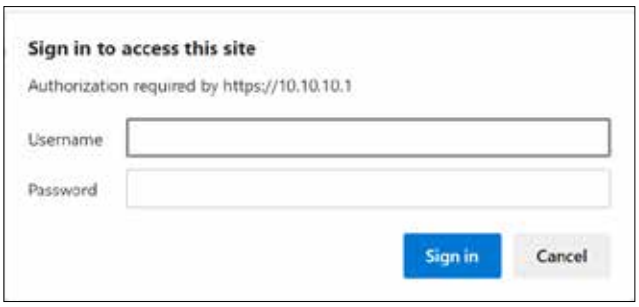
   HTTPS is a secure, encrypted connection.

3. Click Advanced. The following dialog box appears.

Your connection is secure, encrypted, and digitally signed. The server issued the certificate. Certificates issued by the server are referred to as self-signed certificates. See “Uploading Certificates” on page 68 for information on how to install your own certificate if required.

4. Click the Continue link at the bottom of the screen.

   The Login window appears.



5. Enter the Username:

   `admin (or preconfigured Username)`

   NOTE: If you change the Username or Password, record them in “Appendix B Forms” on page 76.

6. Enter the Password:

   `fedsig (or preconfigured Password)`

   NOTE: The password is case sensitive.

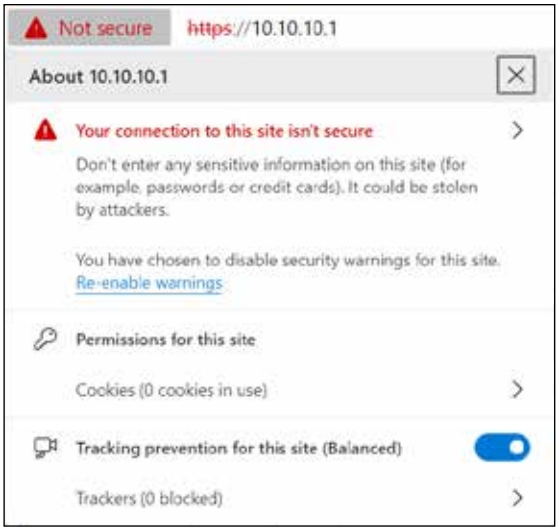
7. Click Sign in.

   The Home page appears.

8. View your search bar.

   NOTE: Depending on the browser you are using, your dialog boxes may look different.

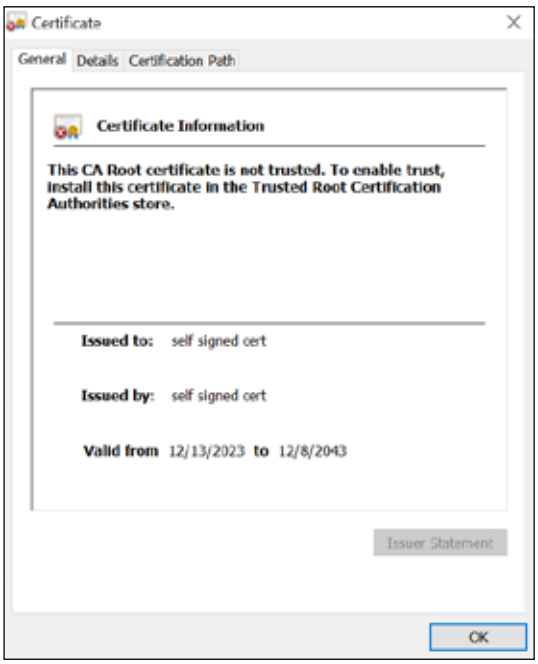
9. Click the Not secure icon to open a menu about the site. The following is a typical example.

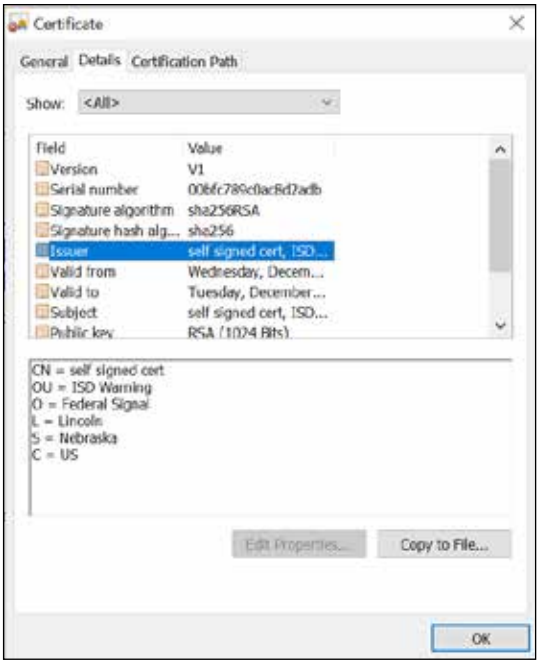


An error occurs when a web browser cannot verify the certificate installed on a site. Rather than connect users to your website, the browser displays an error message.

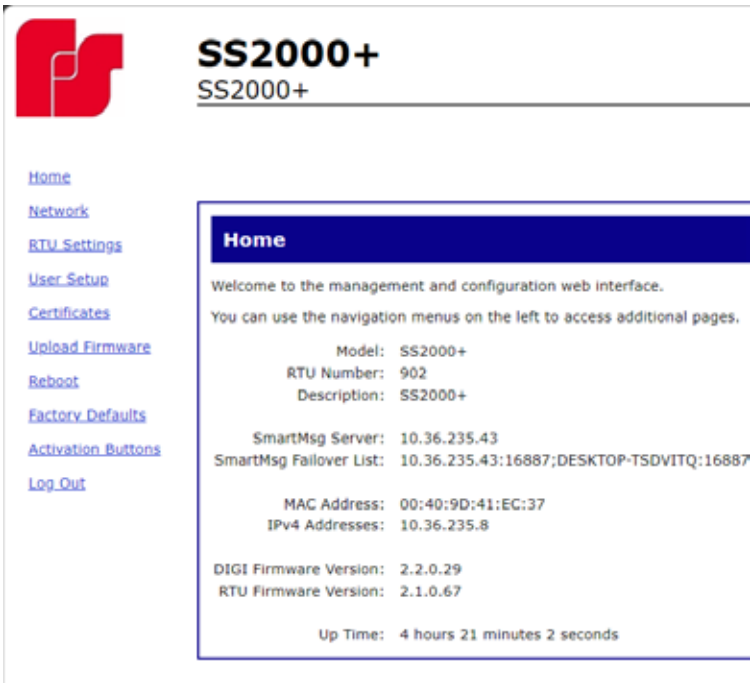
10. Click the arrow to display the next dialog box.

11. Click the certification icon. The following displays the General and Details tabs. The Details tab shows a self-signed certificate, making this a secure connection.





The following describes the Home page.



The Home page displays a summary of the current configuration settings for the RTU. The Navigation Menu (blue hyperlinks on the left) is used to access other System Management web pages. Use the Help hyperlink to access the Help screen from any web page.

Field	Description
Model	The RTU model of the device. This field will be blank for a few minutes following power up or master reset.
RTU Number	The RTU's assigned identity.
Description	The text field used to describe the RTU.
SmartMsg Server	The RTU's assigned default SmartMsg server.
SmartMsg Failover List	The RTU's SmartMsg Failover List. This field will be blank until the unit successfully connects to the server and retrieves the failover list.
MAC Address	The MAC Address of the device.
IPv4 Addresses	The RTU's assigned IPV4 address or its DNS name.
DIGI Firmware Version	The firmware version of the DIGI Connect ME 9210 module.
RTU Firmware Version	The firmware version of the RTU.
Up Time	The elapsed time since power up or reboot.

12. Record the MAC and IP address to ensure the device can be managed in the future.

Changing the Network Settings

You can configure the RTU to obtain an IP address automatically using DHCP and AutoIP, or you can assign a Static IP address. Coordinate the static IP addresses with the system Network Manager to prevent address duplication.

You cannot leave the Default Gateway blank when a static IP address is assigned. A valid IP address is required. Use the server's IP address as the gateway if making a direct Ethernet connection to the device.

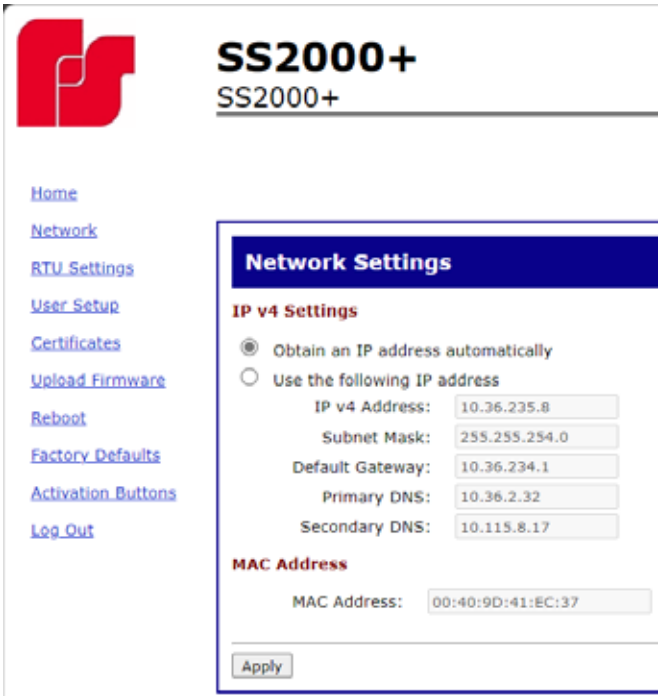
After changes are made, click the Apply button and reboot the RTU to begin using the new configuration settings. Reboot the RTU by cycling power or from the Reboot web page.

If the SS2000+ is configured for DHCP, use the SSLoader+ software program to read the SS2000+ configuration to obtain the IP address. Type the IP address into your Chrome®, Edge®, or FireFox® browser to navigate to the SS2000+ web page.

To change the Network Settings of the SS2000+:

1. Select Network.

The Network Settings page appears.



Field	Description
Obtain an IP address automatically	When the device is rebooted, it will obtain new network settings automatically from the network DHCP server.
Use the following IP address	Choose this option to supply static settings. You must enter an IP address, Subnet mask, and Gateway. A DNS server address is only required if domain names are used instead of IP addresses.
IP Address or Domain Name	The RTU's assigned IPV4 address or its DNS name in the IP address field.

Field	Description
Subnet Mask	The RTU's assigned subnet mask.
Default Gateway	The RTU's network gateway for routing IP traffic.
Primary DNS	The Primary Domain Name Server for the network (must be entered if the RTU is required to connect to a server by its domain name).
Secondary DNS	The Secondary Domain Name Server for the network.
Apply	Click Apply to save your settings. You must reboot for changes to take effect.

2. Select the Use the following IP address option button.
3. Enter the static IP Address, Subnet Mask, and Default Gateway for the Informer device.
4. Click Apply.
5. Reboot the device for the IP address change to take effect.

NOTE: The factory default IP settings must be changed to work with the IP network that the product will be connected to. Consult with your Network Manager to ensure the settings adhere to your network policy.

Once the IP address is changed, configuration is only possible when the SS2000+ and the configuration computer are placed on the live network together. Reconfigure the configuration computer's IP settings before returning to the live network. You now need to log in to the web page with the new IP address after the address is changed.

NOTE: You can use DHCP to simplify SS2000+ deployment, but MAC address discovery tools may not traverse routers and maintenance may be more difficult.

Configuring the RTU Settings

When the RTU is used with Commander®, the device's RTU Number and Description need to be entered, and SmartMsg must be enabled. The default SS2000+ RTU address is 999. Every SS2000+ and every Commander® control unit requires a unique RTU number between 900 and 999.

SmartMsg

Use the SmartMsg check box to enable or disable the SmartMsg network interface. To use the interface, check the box and enter the IP address of the SmartMsg server. The port is preconfigured to 16887. When applied, the RTU attempts to log in to the SmartMsg server. If a server connection is lost for over 10 minutes, the unit performs a hardware and software reset; therefore, to prevent interruption of other system services, disable the interface if not in use. Before the SS2000+ can be remotely controlled over the LAN by Commander®, SmartMsg must be enabled, and a SmartMsg server must be installed. Follow this link: http://codespear.com/Smartmsg.aspx to download SQL Express, SmartMsg server, and installation instructions.

CCU Access

Use the CCU Access options buttons to determine which CCUs are able to communicate with the SS2000+ Ethernet interface. This feature enables one or more Commander® software control points and other SS2000+ controllers to use the SS2000+ radio interface over a LAN to transmit and receive data from siren sites using the SS2000+ radio modem. SmartMsg must be enabled, and the SS2000+ must be connected to a SmartMsg server to enable the SS2000+ to communicate with other CCUs. If you select No CCUs, the SS2000+ will not respond to any other CCUs that try to communicate over the network interface. Selecting All CCUs allows all other CCUs with a CCU ID of 900-999 to communicate with the SS2000+. When Individual CCUs are selected, only the CCU numbers entered in one or more of the ten slots are able to communicate with the SS2000+. Enter up to ten individual CCU IDs.

NOTES:

- When more than one SS2000+ is connected to a radio on the same frequency, CCU access must be restricted to prevent a CCU from talking to two SS2000+ radio modems at the same time.
- When an SS2000+ Hotkey Activation Button is configured with a Code#3 Hotkey, CCU access must be restricted to prevent multiple Commander® CCUs from processing the command at the same time.

FSConnect

Use FSConnect to enable or disable FSConnect access and to select the FSConnect environment. FSConnect must be enabled to communicate with the Federal Signal CommanderOne® cloud server.

NOTE: The UUID, Authentication, and Encryption keys must be set to values specified for your FSConnect environment. Contact Federal Signal Integrated Systems Technical Support to obtain these settings.

Modbus

Use the Modbus® check box to enable or disable the Modbus® interface. You can change the default port number if needed. You can use this interface in conjunction with the

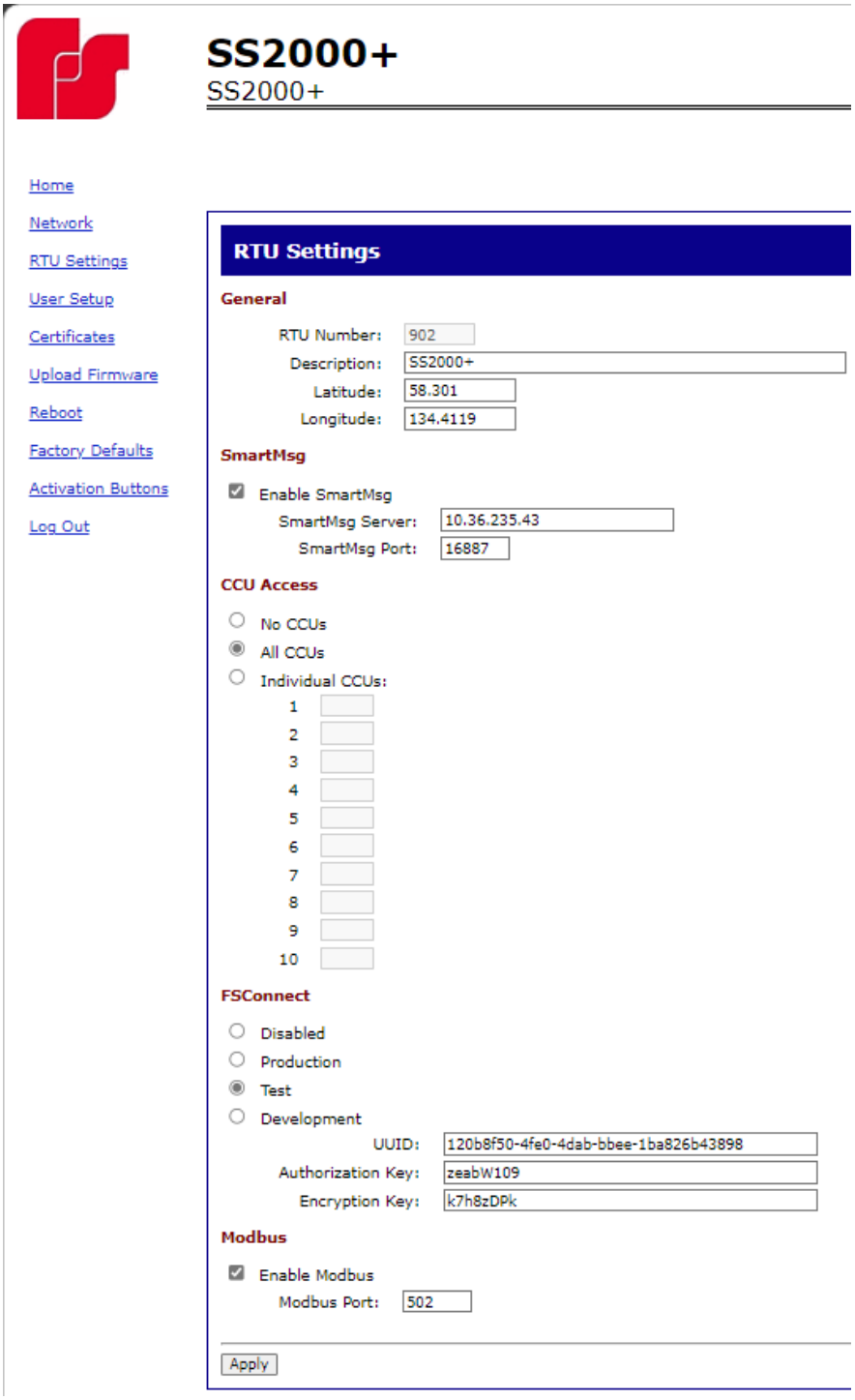
SmartMsg interface, but disable the interface if not required for system operation.

After changes are made, click the Apply button, and then reboot the RTU from the Reboot web page to begin using the new configuration settings.

To change the configure the RTU Settings of the SS2000+:

1. Select RTU Settings.

The RTU Settings page appears.



Field	Description
General	
RTU Number	The RTU's assigned identity. All devices in the system must have a unique RTU Number. The number must be a positive integer. (Commander® only)
Description	This 48-character text field is used to describe the RTU. This can be the physical address of the site or any other text string. The description field has a 255 character limit and can be scrolled to view additional characters.
Latitude	Enter the Latitude of the device in decimal degrees format.
Longitude	Enter the Longitude of the device in decimal degrees format.
SmartMsg	
Enable SmartMsg	Check the Enable SmartMsg box to enable the SmartMsg interface. (Commander® only)
SmartMsg Server	The RTU's assigned default SmartMsg Server IP Address or DNS name. (Commander® only)
SmartMsg Port	The port is preconfigured to 16887. (Commander® only)
CUU Access	
No CCUs	No other CCUs will be a able to communicate with the SS2000+.
All CCUs	All CCUs will be able to communicate with the SS2000+.
Individual CCUs	Enter individual CCU IDs that will be able to communicate with the SS2000+.
FSConnect	
Disabled	Choose this option to disable FSConnect connectivity.
Production	Choose this option to enable FSConnect connectivity in the production environment.
Test	Choose this option to enable FSConnect connectivity in the test environment.
Development	Choose this option to enable FSConnect connectivity in the test environment.
UUID	Enter the UUID for this device.
Authentication Key	Enter the FSConnect Authentication Key for your system.
Encryption Key	Enter the FSConnect Encryption Key for your system.
Modbus	
Enable Modbus	Check the Enable Modbus® box to enable the Modbus® interface.
Modbus Port	The RTU's assigned Modbus® TCP port number. The default is 502.
Apply	Saves your settings. You must reboot for changes to take effect.

2. Enter the RTU Number. (Commander® only)
3. Enter a description of the RTU. (Commander® only)
4. Click Enable SmartMsg to enable the SmartMsg interface. (Commander® only)

5. Select one of the CCU options.
6. Click Enable Modbus® to enable the Modbus® interface.
7. Click Apply.
8. Reboot the device for the IP address change to take effect.

Configuring the User Setup

User Setup allows Admin privileged users to create users, passwords, and assign security privileges.

Enter up to five usernames. Each username requires a password and can be assigned security privileges.

Three privileges are available to control access:

- The Configuration privilege grants access to all configuration pages with the exception of the User Setup and the Factory Defaults pages, which require the Admin privilege. The Configuration and Activation Button privileges can be granted at the same time.
- The Activation Button privilege grants access to the Activation Button page only. When the Activation Button privilege is the only privilege granted, no other pages will be accessible.
- The Admin privilege grants access to all pages, including User Setup, Factory Defaults, and the Activation Button page. When the Admin privilege is selected, the Configuration and Activation Button privileges become unselected.

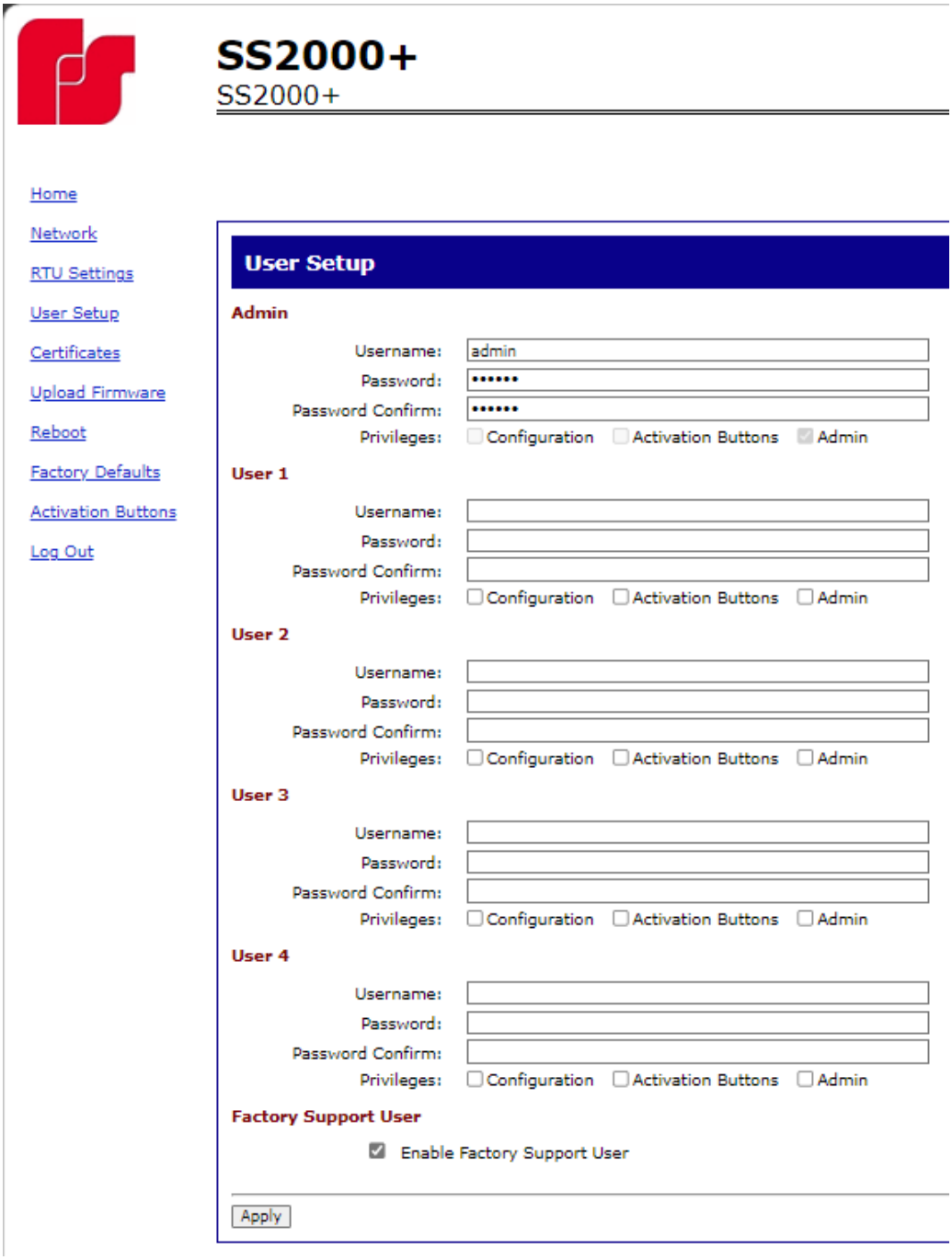
If no privileges are granted, only the Home and Logout pages are accessible. The Configuration and Activation privileges can both be granted at the same time.

You cannot delete the Admin user or change the security privilege for the Admin user. You can change the Admin user's username and password.

To create users and enable the to factory support users:

1. Select User Setup.

   The User Setup page appears.



Field	Description
Username	Enter the name of the user (case sensitive).
Password	Enter the user's password (case sensitive).
Password Confirm	Enter the user's password again. The Password Confirm must match the Password.

Field	Description
Privileges	Select one or more Privileges for the user. • Configuration: Grants access to all configuration pages with the exception of the User Setup and the Factory Defaults pages. • Activation Buttons: Grants access to the Activation Button page only. • Admin: Grants unrestricted access to all pages, including User Setup, Factory Defaults, and the Activation Button page.
Enable Factory Support User	Check the box to enable the factory support user.
Apply	Saves your settings. You must reboot for changes to take effect.

2. For the Admin fields, enter the default Username:

   `admin (This is the default username.)`

3. For the Admin fields, enter the Password:

   `fedsig (This is the default password.)`

   NOTE: The password is case sensitive.

4. Enter the fields for Users 1 through Users 4 to create optional users. Each username requires a password and a security privilege.

5. Click Enable Factory Support User to enable a hidden static user and password for Federal Signal Technical Support.

6. Click Apply to save changes.

7. Reboot the device to load the changes into the RTU.

Uploading Certificates

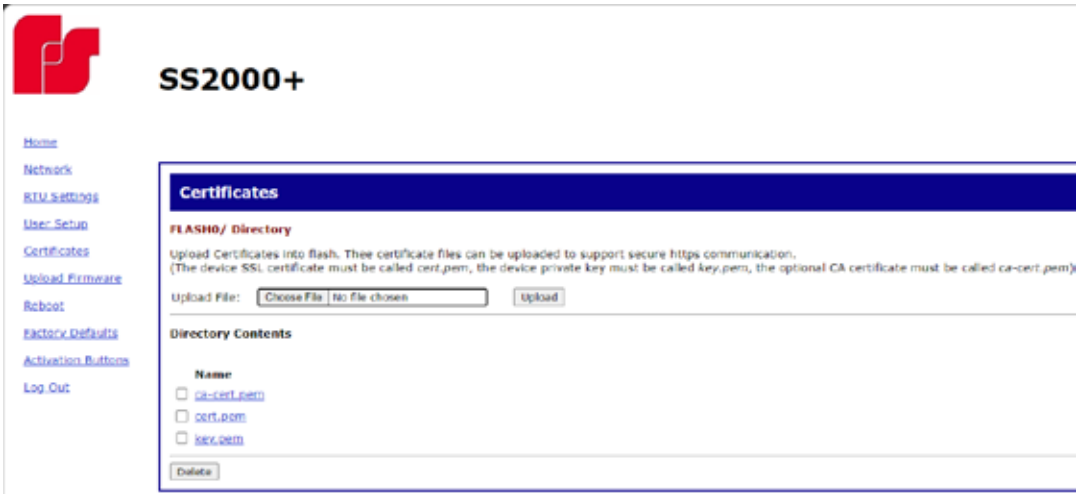
Use the Certificates page to upload certificates and key files to support secure https. Certificate files are optional; if not provided, the device will generate its own self-signed certificate. Three certificate types are supported. The device SSL certificate must be called cert.pem, the device key must be called key.pem, and the CA certificate must be called ca-cert.pem. If you provide certificate files you must provide both the cert.pem and key.pem files. The ca-cert.pem is optional.

File type	Filename
Device SSL certificate	cert.pem
Device private key	key.pem
CA certificate	ca-cert.pem

To upload a certificate file:

1. Select Upload Certificates.

   The Upload Certificates page appears.



Field	Description
Choose File	Click Choose File to open a dialog box. Select the new file to upload.
Upload	Upload the new file by clicking the Upload button. You must reboot for changes to take effect.

2. Click Choose File to open a dialog box to select the new ca-cert.pem, cert.pem, or key.pem file to upload.
3. Click the Upload button to upload the new file.
4. Reboot the device for the changes to take effect.

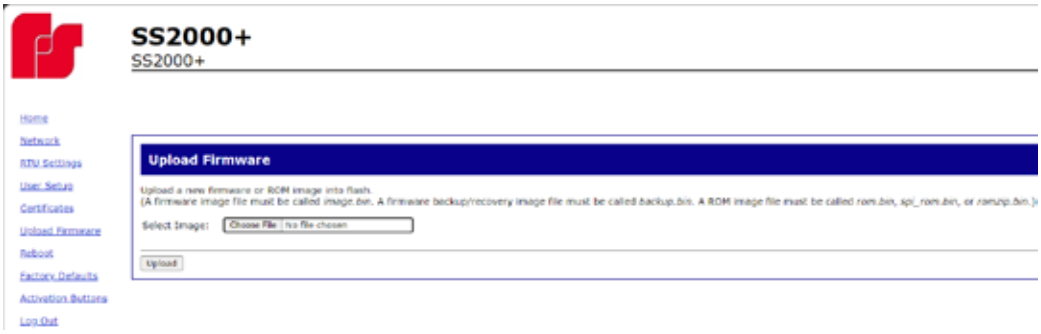
Uploading Firmware

Use the Upload Firmware page to load a new operating system into the Digi Ethernet module. The Home page displays the current version of the firmware.

To upload new firmware:

1. Select Upload Firmware.

   The Upload Firmware page appears.



Field	Description
Select Image	Click Choose File to open a dialog box. Select the new image.bin file to upload.
Upload	Upload the new image.bin file by clicking the Upload button. You must reboot for changes to take effect.

2. Click Choose File to open a dialog box to select the new image.bin file to upload.

File type	Filename
Firmware image file	image.bin
Firmware backup or recovery image	backup.bin
ROM image	rom.bin, spi_rom.bin, or romzip.bin

3. Click the Upload button to upload the new image.bin file.

   NOTE: To prevent operating system corruption, power must not be interrupted during the upload and reboot process.

4. Reboot the device for the changes to take effect.

Rebooting Device and Loading Configuration Settings

Use the Reboot page to reboot the device and load new configuration settings.

To reboot the device and load new configuration settings:

1. Select Reboot.

   The Reboot page appears.

2. Click the Reboot button to reboot the device and load the new configuration settings.

   The login prompt appears within 20 seconds after the reboot.

Restoring Configuration to Factory Defaults

You can restore the factory default settings with or without restoring the network parameters. The Activation Button configuration will not change when a Factory Default is performed.

The RTU must reboot to begin using the new settings. Use the Reboot web page to reboot the RTU.

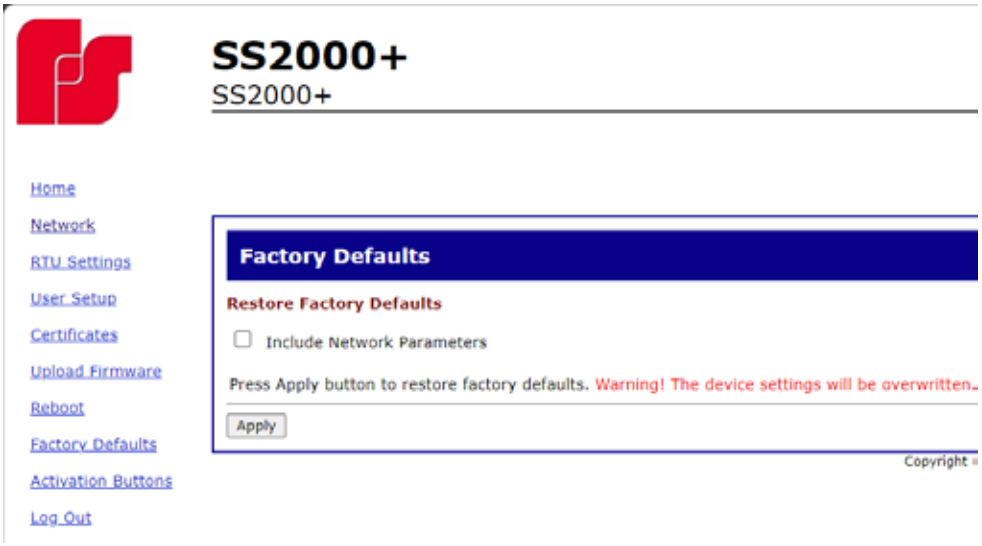
Default Settings

RTU Number: 900
Description: my description
SmartMsg disabled
Modbus disabled
Smartmsg Server: 10.10.10.10
IP Address: 10.10.10.1
Subnet Mask: 255.255.0.0
Default Gateway: 10.10.10.10
Primary/Secondary DNS: 0.0.0.0/0.0.0.0
Admin user name: admin
Admin user password: fedsig
User 1 - User 4 username/password: blank
Factory Support User: Enabled

To restore the configuration to factory defaults:

1. Select Factory Defaults.

   The Factory Defaults page appears.



Field	Description
Include Network Parameters	Check the box to include network parameters. **IMPORTANT:** This changes the IP address of the RTU to factory default settings and makes the device inaccessible over a production network.

Field	Description
Apply	Restores factory defaults. **NOTE:** Your current settings will be overwritten.

2. Click Apply to restore your settings to the factory defaults.
3. Reboot the device for the changes to take effect.

Activating the System

To activate the SS2000+.

1. Select Activation Buttons.

   NOTE: Activation buttons are also referred to as Hotkeys in CommanderOne®.

   The Activation Buttons page appears.

2. Click an Activation Button to activate the system. A confirmation message will appear.
3. Click OK to activate or Cancel to abort.

   NOTE: Buttons that have not been named appear as an error message “Error: Button not configured!” and will not activate the button.

⚠ CAUTION

Clicking OK activates the system. If you are not sure or do not have the authorization to activate the system, click Cancel. When the command is received a "Button Sent" status message displays in the blue caption bar at the top of the screen. This confirms the SS2000+ received the command but does not verify siren operation. To verify siren operation, the system must be polled from a the Commander® station.

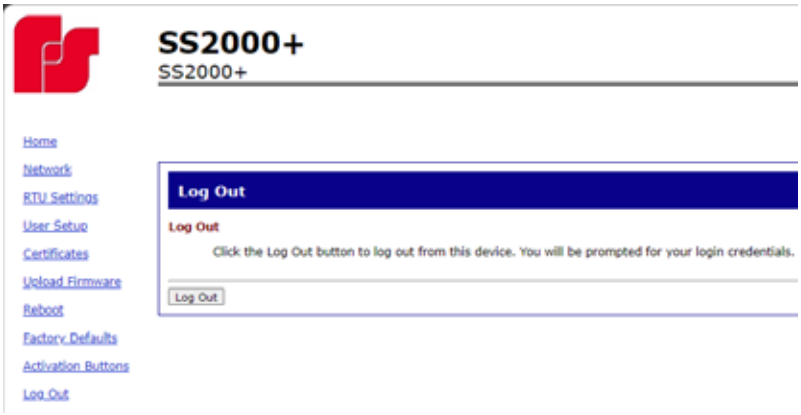
Logging Out of the Web Interface

Use the Log Out page to log out before the five-minute session timer expires.

To log out of the web interface:

1. Select Log Out.

   The Log Out page appears.



2. Click the Log Out button to logout.

Replacement Parts

To order replacement parts, see Getting Service.

Table 10 Replacement Parts

Description	Part Number
SS2000+ Power Supply with US Cable	Q-SSPWR
UK 240 Vac Power Cable*	Q17501252A
EU 240 Vac Power Cable*	Q17501253A
SS2000+ Kenwood® Radio Cable for NX-1000 Radios	Q17502708A
SS2000+ Kenwood® Radio Cable for NX-5000 Radios	Q17500863B

*While there are no EU/UK rack mount models, the rack mount SS2000+R can be ordered with the appropriate replacement power cable if needed.

Getting Technical Support and Service

For technical support, contact:

Federal Signal
Technical Support
Phone: 800-524-3021 or 708-534-4790
Email: techsupport@fedsig.com
www.fedsig.com

For customer support, contact:

Federal Signal
Customer Support
Phone: 800-548-7229 or 708-534-3400 extension 367511
Email: customersupport@fedsig.com
www.fedsig.com.

Appendix A Modbus Activation

The SS2000+ has a Modbus® interface to easily interface with Industrial Control Systems. Modbus® TCP is used to provide activations into an SS2000+ for specific warning announcements across an industrial plant. Users can activate the system using the SS2000+, or industrial control systems can activate the HotKeys.

The software version listed below is the minimum version that supports the Modbus® interface. A firmware upgrade is required to use the Modbus® interface if the RTU firmware is below these minimum requirements.

- SS2000+ v2.1.0.2

Table 11 Coil Registers (1-9999) Read-Write

Coil data address	Coil number (0x)	Function	Value
0 - 59	1 - 60	Activate HotKey (HotKey number = coil number)	Write 1 to activate HotKey (can write another 1 without writing a 0 to activate again)

Notes

Arming unit clears attenuation values (full volume). If attenuation is desired when activating digital voice messages (address 1) or tones (address 2), the attenuation values (address 4, 5) must be set after the unit is armed.

Activating digital voice (address 1) and tone (address 2) clears the activation status. Unit reports local activation and reports the last function RTU as Digital Voice or Siren Tone to Commander® (v15.6.0.3+). Commander® reports the Last Activation fault.

Table 12 Analog Output Holding Registers (40001-49999+) Read-Write

Analog Output data address	Register Number (4x)	Function	Value
0	40001	Activate HotKey	HotKey number to activate (1 = 60)

Appendix B Forms

Table 13 SS2000+ Network Configuration

Domain Name	
IP Address	
Subnet Mask	
Default Gateway	
Primary DNS Server	
Alternate DNS Server	
SMTP Server Name (optional)	
SMTP Server Address (optional)	
SmartMsg Parent Server Name	
SmartMsg Parent Server Name/Address	
Failover Server 1 Name/Address	
Failover Server 2 Name/Address	
Failover Server 3 Name/Address	
Failover Server 4 Name/Address	
SS2000+ Config Username	
SS2000+ Config Password	

Table 14 Network Device

Name/Location	**IP Address x.x.x.x**	**Site ID# xxx**	**MAC xx:xx:xx:xx:xx:xx**
Control Station 1		900	
Control Station 2		901	
Control Station 3		903	
Device Name		001	
		002	
		003	
		004	
		005	

Table 15 Network Device

Name/Location	IP Address x.x.x.x	Site ID# xxx	MAC xx:xx:xx:xx:xx:xx

Table 16 Digital Voice Messages

Digital Voice Message Number	Name	Message and Description	Length

Table 17 Programed Functions

Function Number	Program Entries	Definition
Function Name		
Function Number		
Function Name		
Function Number		
Function Name		
Function Number		
Function Name		

Table 18 Programed Zones

Zone Number A/B	Zone Name	Sites in this Zone

Table 19 Programed Activation Templates

Template Number	Template Name	Action

Table 20 Input Programming SS2000+

RTU #	Name	Call Request	Audible	SmartMsg Template	Activation Template

Table 21 HotKeys

HotKey Number	Name	Action
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		

HotKey Number	Name	Action
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		

HotKey Number	Name	Action
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		

Table 22 SS2000+ Input Configuration

Input __	Mode	Polarity	Commands	Function
	☐ Momentary ☐ Continuous	☐ Normally Open ☐ Normally Closed		

Input __	Mode	Polarity	Commands	Function
	☐ Momentary ☐ Continuous	☐ Normally Open ☐ Normally Closed		

Input __	Mode	Polarity	Commands	Function
	☐ Momentary ☐ Continuous	☐ Normally Open ☐ Normally Closed		

Input __	Mode	Polarity	Commands	Function
	☐ Momentary ☐ Continuous	☐ Normally Open ☐ Normally Closed		

Input __	Mode	Polarity	Commands	Function
	☐ Momentary ☐ Continuous	☐ Normally Open ☐ Normally Closed		

Input __	Mode	Polarity	Commands	Function
	☐ Momentary ☐ Continuous	☐ Normally Open ☐ Normally Closed		