



Field Service Unit 4.0

User Guide

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Regulatory Statements

United States Class A Manual Statement

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

European Union and Australian Class A Manual Statement

WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Radio Frequency Radiation Exposure Information

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Safety Warning Statements

Connect the USB cable only to a certified source of power.

Sicherheitshinweise

Verbinden Sie das USB-Kabel ausschließlich mit einer zertifizierten Stromquelle.

Avertissements de sécurité

Connectez le câble USB uniquement à une source d'alimentation certifiée.

Declarações de aviso de segurança

Somente conecte o cabo USB a uma fonte de alimentação certificada.

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1 Field Service Unit 4.0

This document describes the features, uses, hardware, certifications, and specifications the Silver Spring Networks Field Service Unit (FSU):

1.1 Introducing the Field Service Unit

WARNING: Do not hold the FSU 4.0 in your hand. Keep it at least 20 cm (about 8 inches) away from your body.

The Field Service Unit (FSU) is a portable device that uses radio frequency to communicate with Silver Spring Networks devices. These are the devices in Silver Spring Neighborhood Area Network (NAN), Advanced Metering Infrastructure (AMI), and Distribution Automation (DA) networks. When used with the Silver Spring Networks field tool applications described in [Field Tool Application and Web Service Operations Using the FSU](#) on page 5, the FSU can perform a full range of radio frequency, configuration, and network diagnostic tests, including register reads and firmware upgrades.

Use the FSU:

- In the field to assist with configuration, troubleshooting, and other operations near the device installation site. Since the FSU does not depend on an internet connection, it can be used anywhere in the deployment area—from a vehicle or on foot—to communicate with any Silver Spring Networks device.
- In the lab or meter shop to test and pre-configure devices before installation at customer sites.

Power the FSU by plugging it into a laptop USB port or using an external power supply. For more information, see [Power](#) on page 9.

1.2 New Features and Enhancements

The FSU 4.0 includes the following new features and enhancements:

- Faster Gen4 technology with improved security
- External antenna option
- Improved support for multiple smart cards
- Support for Windows 7, 64-bit

1.3 Field Tool Application and Web Service Operations Using the FSU

The FSU communicates with devices through commands issued by the Silver Spring Networks field tool applications described in this section. Each tool performs specific operations that allow you to maintain devices on the Silver Spring Networks.

1.3.1 Communications Tester

The Communications Tester enables technicians to transmit and receive messages to and from devices, log the data, and analyze the results. For example, the Communications Tester can perform firmware upgrades on devices, read meter tables, check configuration options, and collect radio frequency statistics data. The Communications Tester is a key tool for all types of device troubleshooting.

1.3.2 Contingency Reader

The Contingency Reader reads meter data from nearby Silver Spring Networks-enabled meters and uploads the read data to the Advanced Metering Manager. This tool can read meters that have been provisioned in AMM but are unable to communicate with the mesh network.

1.3.3 Electricity Communications Module Tester

The Electricity Communications Module Tester (ECMT) tests the operational status of electricity meters equipped with Silver Spring Network Communications Modules. When combined with any method of powering an electricity meter, such as a meter test board, this tool enables a utility meter shop to conduct quality sample testing of inbound meters and to assess field return meters.

1.3.4 Gas IMU Configurator

The Gas IMU Configurator automates gas meter reads and controls the basic functionality of gas Interface Management Units (IMUs) fitted with Silver Spring Networks RF wireless Communications Modules. Using commands issued through the FSU, this tool joins and unjoins gas IMUs to meters, checks IMU read operations, and updates FSU and IMU firmware images.

1.3.5 FSU Service and Tray Application

The FSU service and tray application allows any supported FSU to work with Windows services and share the FSU service with other Silver Spring Networks field tools. This application can be installed with field tool installers.

1.3.6 FSU Secure Access Manager

FSU Secure Access Manager, or FSU-SAM, is a web service that lets an administrator limit the number of secure commands, represented by credits, each FSU can issue. When the configured number of credits an FSU has to create secure associations (encrypted requests from FSU to meter) expires, its credits must be refreshed by an authorized user. Secure associations occur by means of a cryptographic handshake that authenticates the privileges of that FSU against the command received and either authorizes or denies permission to send the command to the meter.

1.4 Related Documentation

You can find all Silver Spring Networks product documentation at <https://springboard.silverspringnet.com> in the Documentation & Release Notes section.

You may also refer to the following documentation:

- *Infrastructure Hardware Guide*
- *Field Tools Installation Guide*
- *Communications Tester User Guide*
- *Gas IMU Configurator User Guide*
- *Contingency Reader User Guide*
- *Electricity Communications Module Tester User Guide*
- *FSU-Secure Access Manager User Guide*

2 Hardware

2.1 FSU 4.0 Hardware

The FSU 4.0 hardware includes Gen4 technology to speed secure network communication, support for multiple smart cards, an external antenna option, USB and power ports, and an LED to indicate operations and status. For identification purposes, the FSU MAC address, part number, and compliance information is on the back of the FSU 4.0.

Figure 1. FSU 4.0 Hardware



You can switch between the on-board antenna and external antenna using commands in Communications Tester field tool.

2.2 Power

The FSU supports both high and low power transmissions:

- When powered with the USB cable, the FSU transmits in low power mode.
- When powered with the external power supply, the FSU transmits in high power mode.

2.2.1 Low Power Mode

Low power mode is ideal for mobile operations. The FSU automatically operates in low power mode when powered via a USB cable, which attaches to a computer. In low power mode, the FSU RF transmission is approximately 10 dBm or 10 mW.

2.2.2 High Power Mode

When powered by the external power supply, the FSU automatically operates in high power mode, where the power level of the FSU RF transmissions is approximately 30 dBm or 1 W. The FSU high power performance is identical to that of the Silver Spring residential electricity meter Communications Module and compares favorably to the low power performance of the FSU.

The external power supply is user-configurable to fit a variety of receptacles, including those in the US, Australia, New Zealand, and the EU. The external power supply is also compatible with AC/DC converters (such as cigarette lighter plug-ins). See [External Power Supply](#) on page 10 for more information.

2.2.3 Switching Power Modes

To switch power modes:

1. Close the Silver Spring field tool application. See [Field Tool Application and Web Service Operations Using the FSU](#) on page 5 a list of these applications.
2. Power down: unplug the power cable and USB cable.
 - For low-power operation:
Reconnect the USB cable to the computer and the FSU, and restart the application.
 - For high-power application:
 - Reconnect the USB cable to the computer and the FSU.
 - Reconnect the power cable (one end to the FSU and the other end to the power source).
3. Restart the field tool application.

2.2.4 External Power Supply

The external power supply is rated for 110-240 VAC, 50/60 Hz. It is an optional unit except when using the FSU in high power mode. The male end of the power-supply connector is user-configurable.

Figure 2. FSU Power Supply



2.3 FSU LED

The LED on the FSU device is located on the right side of the cable connectors (see [Figure 1](#) on page 8). [Table 1.](#) describes the operations and statuses associated with specific LED sequences.

Table 1. FSU LED

Sequence	Description
Off-On	After the operator energizes the FSU, it executes its power up process. The LED lights for approximately 4 to 5 seconds.
Off	The LED goes dark for approximately 30 seconds.
Fast blink	The FSU is discovering neighbor nodes.
Slow blink	The FSU has discovered neighbor nodes, and remains in slow blink until de-energized.

3 Specifications and Certifications

3.1 Specifications

[Table 2](#) lists the specifications for FSU 4.0:

Table 2. FSU 4.0 Specifications

Category	Specification
NAN Communications	<ul style="list-style-type: none"> • Data rate: 100-300 kbps • Frequencies: <ul style="list-style-type: none"> Australia: 915-928 MHz Brazil: 902-907.5, 915-928 Luxembourg: 870-876 New Zealand: 921.5-928 MHz North America: 902-928 MHz Portugal: 870-873 United Kingdom: 870-876 • Spread spectrum technology: FHSS • Transmitter power modes: <ul style="list-style-type: none"> Low power (via USB) High power (via AC power adapter) • Receiver sensitivity: -97 dBm for 1% PER
Protocols/Security	<ul style="list-style-type: none"> • Addressing: IPv6 • Encryption: Advanced Encryption Standard (AES-128 or AES-256) • Security: Secure Hash Algorithm 256-bit (SHA-256) and RSA-1024 or ECC-256
External AC Power Supply	<ul style="list-style-type: none"> • Voltage: 110-240 VAC • Frequency: 50/60 Hz
Physical	Dimensions: 1.0" (2.5cm) x 3.2" (8 cm) x 4.75" (12 cm), excluding the exterior antenna.
Certifications	See Certifications on page 11.

3.2 Certifications

AS/NZS CISPR 22:2006

AS/NZS 4268: 2008

IEC 60950

FCC part 15

FCC part 15, subpart B

Radiation Protection Series Publication No. 3 (ARPANSA)

Radiocommunications Notice 2010 - <http://www.rsm.govt.nz/cms/policy-and-planning/spectrum-policy-overview/legislation/gazette-notices/product-compliance/radiocommunications-radio-standards-notice-2010>

4 Ordering Information

4.1 Shipping Components and Ordering Information

The following components are included with the FSU 4.0:

- Assembly, FSU 4.0 HAN, Secure
- Cable, USB 2.0, 4-pin A to 5-pin Mini-B, 6' (about 1.8 m)
- Power Supply, Field Service Unit 2.0

To order an FSU 4.0 for your region from Silver Spring Networks, reference the catalog numbers in [Table 3](#).

Table 3. FSU Ordering Information

Item	Region	Catalog Number
FSU 4.0, AUS	Australia	240-010022
FSU 4.0, BRA	Brazil	240-010021
FSU 4.0, LUX	Luxembourg	240-010020
FSU 4.0, NZ	New Zealand	240-010019
FSU 4.0, PRT	Portugal	240-010013
FSU 4.0, UK	United Kingdom	240-010018
FSU 4.0, US	United States	240-010010

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