



SMS-Lite Mobile Base Station Technical Manual

Version A3

February 2013

RV-SML



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1. General Information about the RV-SM

1.1 Congratulations!

Congratulations on your purchase of the **SMS-Lite** Mobile Base Station.

Please take a few minutes to read this manual carefully. The information presented here will allow you to achieve maximum performance from your base station. After reading it, keep the manual handy for quick reference, in case questions arise later on.

1.2 NOTICE

There are no user-serviceable parts inside this unit. All service work must be referred to your Authorized Service Center or Raveon Technologies Service Department.

1.3 Safety / Warning Information

Cautions

- The unit is not waterproof. Do not operate in inclement weather conditions, namely in the presence of precipitation.
- Do not operate the SMS-Lite unit in the presence of flammable liquids or gases.
- Do not operate the SMS-Lite unit if liquid has been spilled in or on it.
- Do not operate the SMS-Lite with any power cable other than the cable that was supplied.
- Switch off the main power to the unit when not in use.

Blasting Caps and Blasting Areas

To avoid possible interference with blasting operations, turn off this radio or remove the battery pack when you are near electrical blasting caps, in a blasting area, or in areas posted: **“Turn off two-way radio.”** Obey all signs and instructions.

Potentially Explosive Atmospheres

Turn off your radio prior to entering any area with a potentially explosive atmosphere. Do not install this product for use in areas with potentially explosive atmospheres. Do not remove, install, or charge batteries in such areas. Sparks in a potentially explosive atmosphere can cause an explosion or fire resulting in bodily injury or even death.

Note: *The areas with potentially explosive atmospheres referred to above include fueling areas such as below decks on boats, fuel or chemical transfer or storage facilities, areas where the air contains chemicals or particles, such as grain, dust or metal powders, and any other area where you would normally be advised to turn off your vehicle engine. Areas with potentially explosive atmospheres are often but not always posted.*

1.4 Lithium-Ion Battery Notice

This product contains a Lithium Ion battery.

U.S. Postal regulations, Federal Regulations, and other common carriers restrict the shipment of products containing Lithium-Ion batteries. Consult your carrier before shipping this product.

When sending the product by US mail, it should be mailed using surface carriers, and the outside of the shipping container should have a notice:

Package Contains Primary Lithium Batteries

Never mail or ship damaged batteries.

When shipping this product, properly label the shipping container per current regulations. Regulations regarding shipment of products containing Li-Ion batteries changes frequently, so consult your carrier and regulatory bodies. USPS requires a "*Surface Mail Only*" label in addition to DOT's "*Primary Lithium Batteries--Forbidden for Transportation Aboard Passenger Aircraft*" label.

1.5 Safety Training information

Always use this radio with the antenna supplied with it. This radio is restricted to occupational use.

Work related operations are permitted only when the radio operator has the knowledge to control the exposure conditions of its passengers and bystanders by maintaining the minimum separation distance.

Failure to observe these restrictions may result in exceeding the FCC RF exposure limits.

2. Overview

The **SMS-Lite** is portable base-station that accommodates a laptop computer running the appropriate tracking software to create a lightweight, portable, Tactical Operations Center (TOC). It is a component of the Soldier Monitoring System (SMS). The **SMS-L** communication subsystem is a portable base station in a transit case configured to be rapidly deployed from a vehicle. It has a VHF radio modem integrated inside the case which connects to a computer via included USB cable (running serial protocol). The unit also has a backup battery for temporary mobile use. The RF signals (GPS and VHF) are cabled to connectors on the outside of the case to provide the option of hooking up external components to the system.

2.1 Features

- Rugged and self-contained, with double throw latches and pad-lockable lid.
- Light weight (under 30lbs with laptop), with retractable handle for convenient transport and deployment.
- Raveon M7 RF Transceiver built in for wireless connectivity.
- Radio power: Three sources. AC power supply built in. DC battery back-up built in. DC charger input.
- Backlit ON/OFF switch for radio.
- On-board GPS antenna. Hot-swappable with external GPS antenna through external TNC port.
- Custom brackets designed specifically for a Dell Latitude E6420 XFR to secure laptop and protect from dropping.



3. Specifications

All measurements made per TIA-603-B

3.1 General

Model	RV-SML-VA
Size.....	9" x 17" x 20"
Color	Black
Weight	29 lbs (13.15kg)
Environmental (closed).....	IP64
AC Power	100-240VAC
DC Power	12-15VDC
Internal backup battery for radio	5A/hr, 11.1V Li-Ion
Run time for internal radio off battery	20 hrs
Power consumption.....	20W average, 30W peak
External GPS Antenna	3V powered, <30mA current draw
RF connector	N-type female
GPS connector	TNC female

3.2 Transmitter

GPS connector	TNC female
RF power output.....	½ - 5 Watts
Maximum duty cycle	10%
Maximum transmit frequency deviation	± 2.25kHz (12.5kHz channels)
.....	± 3.0kHz (25kHz channels)
RF Bandwidth.....	8 mHz no-tune
Occupied bandwidth.....	11kHz (12.5kHz channels)
.....	15.3kHz (25kHz channels)
TX spurious outputs	< -70dBc
Emissions designator	11K0F1D (12.5kHz channels)
.....	15K3F1D (25kHz channels)

3.3 Receiver

Typical RX Sensitivity (1% BER)	
9600bps, 2-level, 25kHz channel	-111dBm

4800bps, 2-level	-116dBm
No-tune bandwidth	8 MHz
RX Selectivity	-50dB (12.5kHz channel spacing)
.....	-65dB (25kHz channel spacing)
Spurious and image rejection	-75dB
RX intermodulation rejection	-70dB
Conducted spurious emissions	< -53dBm

3.4 Model Numbers

The model number of the *RV-SML* modem identifies its operating frequency band, rf power level, and bandwidth. The models are: **RV-SML-ab** where:

a = The band (V=136-174MHz, U=406-512MHz)

b = Sub band (A,B,C,...)

Other frequency bands, power levels, and channel spacing are available. Contact the factory for your specific needs. Note, the SMS-L uses the SMS base station version firmware, and the no-tune RF bandwidth is an 8MHz window within the sub-band range.

Sub-Bands

<i>Sub-Band Letter</i>	<i>VHF (RV-M7-V...)</i>	<i>UHF (RV-M7-U...)</i>
A	138-154MHz	403-434MHz
B	150-174MHz	419-440MHz
C		450-480MHz

4. Mechanical Elements

Enclosure

The transit case is a B&W International Type 61 Hard Shell Case w/ Foam - 19.7" x 16.7" x 9.1"



Features:

- Case shells made of Ultra High-Impact ABS Plastic
- Air pressure compensation valve
- Two locks
- One Handle
- Includes carrying strap
- Sturdy & stackable

Dimensions:

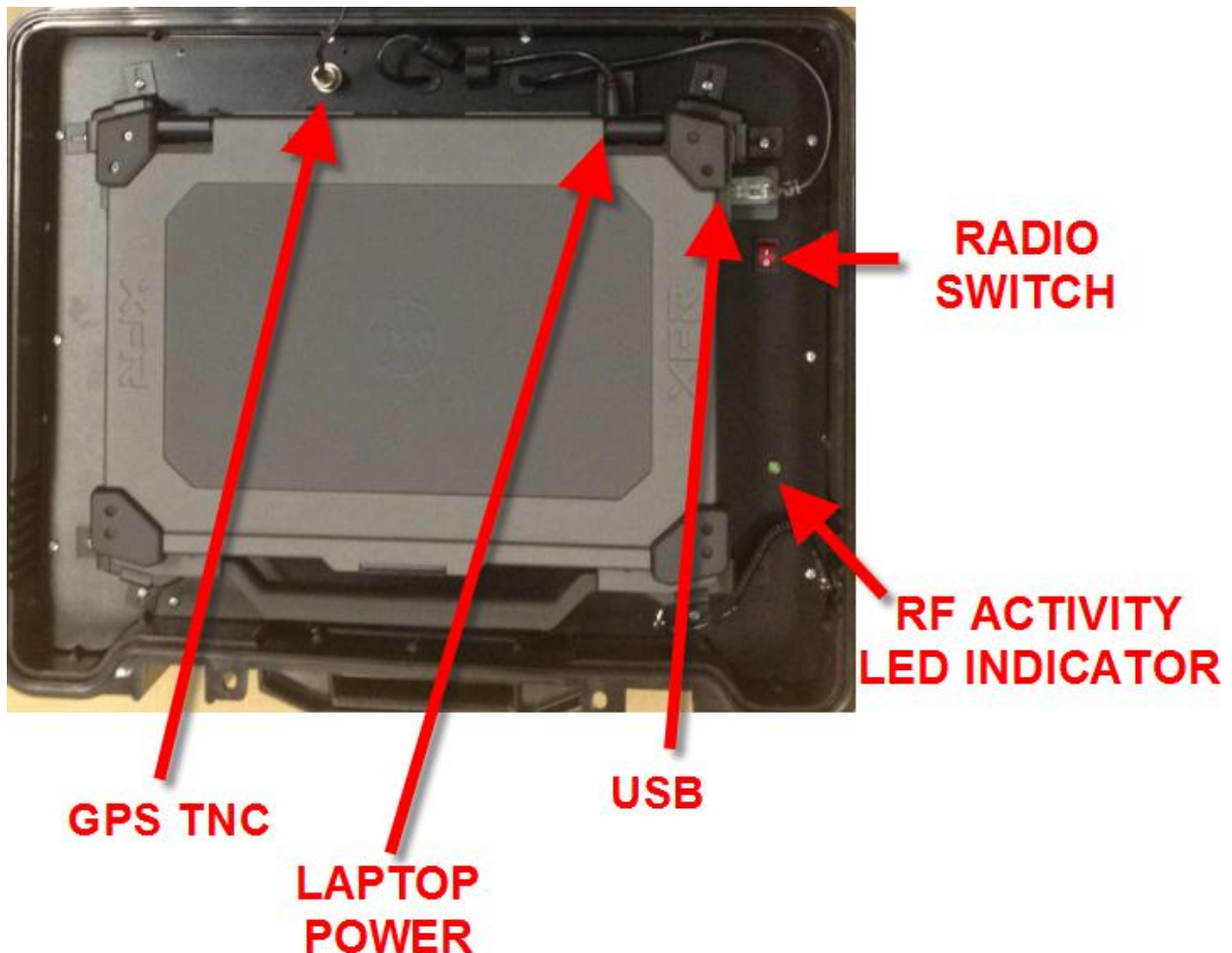
- Inside dimension: 18.88" x 14.17" x 8.27" / 480 x 360 x 210 mm
- Outside dimension: 19.69" x 16.73" x 9.06" / 500 x 425 x 230 mm
- Weight: 10.14 lbs / 4.6 kg
- Volume: 36 L
- Color: Black

Laptop Brackets

There are 8 brackets securing the laptop to the top panel. A single Phillips screw secures each bracket down so a Phillips screwdriver is required to remove the laptop. The laptop has a built-in feature to hold the screen closed when transporting the SMS-Lite Base Station.

5. Electrical Inputs and Outputs

5.1 Top Panel Connections and Features



RF Activity LED Indicator

A green LED indicator is mounted to the top panel to indicate the presence of RF energy at the frequency which the radio is programmed. This LED is normally off and will flicker when the internal RF radio detects the presence of an RF carrier.

USB Cable

The radio communicates with the laptop by way of a USB-serial converter cable assembly. The serial (DB9) side plugs into the radio's DB9 connection and the other side of the cable, the USB end, plugs into any port on the laptop. The system was designed to use one of the USB ports on the right side of the laptop, preferably the one closest to the back right corner of the case. The USB connector on this cable has 2 integrated LEDs, green for receive and red for transmit, which indicate the presence of communications between the laptop and radio. When the green LED appears, the laptop is receiving a message from the radio and when red lights up the laptop is sending a command to the radio. These

LEDs cannot be disabled.

Laptop Charging Cable

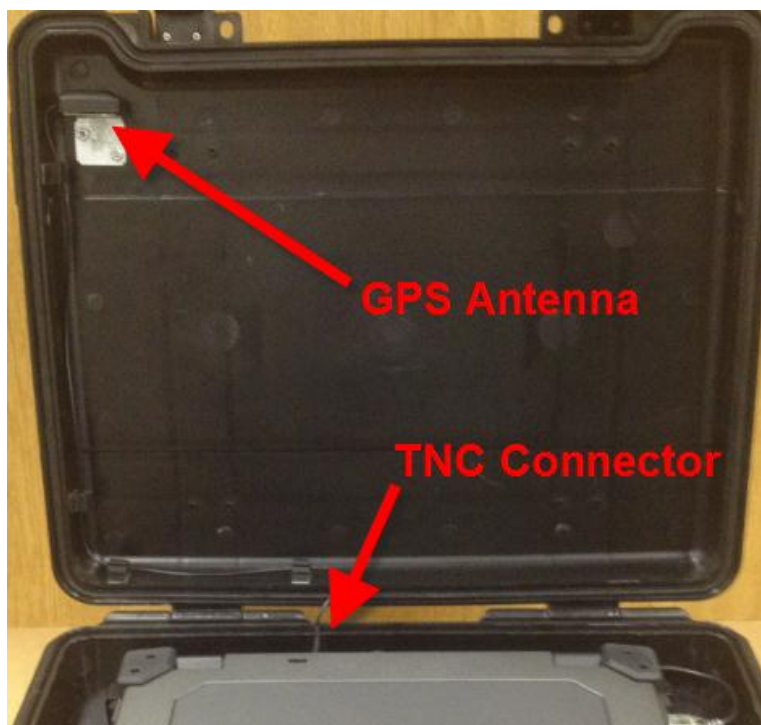
An AC power supply for the Dell XFR laptop is integrated inside the case of the SMS-Lite. The DC side is fed through a grommet on the top panel and is meant to attach to the laptop from the rear.

Power Switch

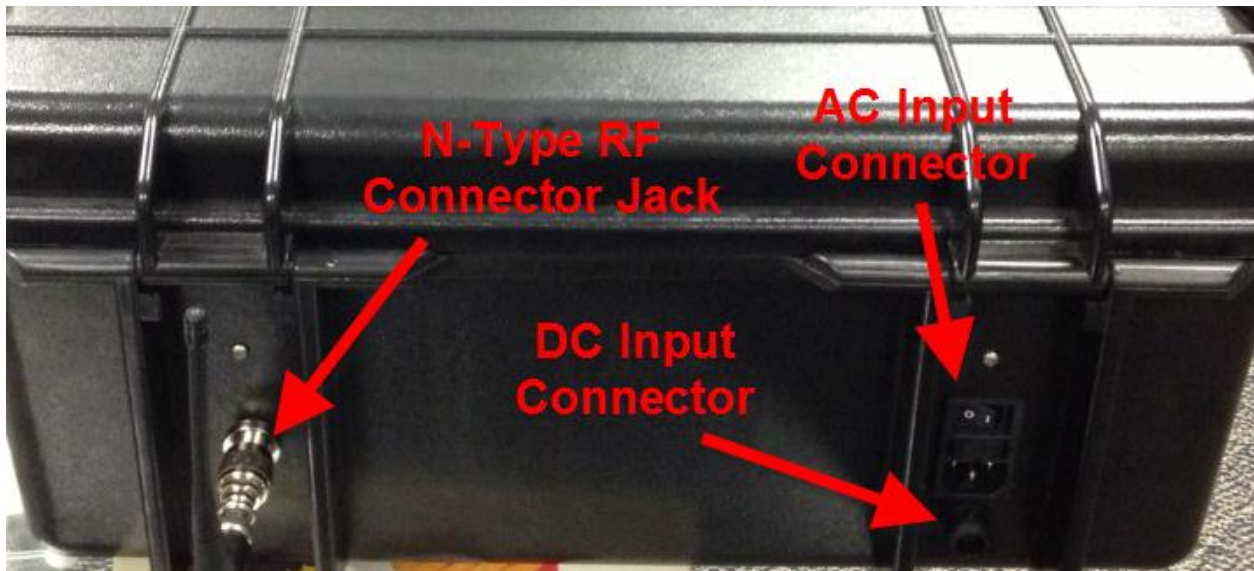
The power switch for the integrated radio modem is located on the right side of the top panel. This switches power to the modem in all power scheme scenarios including when the base station is running off of DC power input, AC power and battery power. This switch has an integrated LED which indicates the status of radio modem power.

GPS Input Connector

The SMS-Lite base station requires GPS functionality for TDMA. There is an integrated GPS antenna located on the cover of the enclosure shown below. This cable is terminated with a male TNC connector to attach to the external female TNC connector on the top panel that is run internally to the modem's GPS connector. The user can opt to use an external GPS antenna which would require disconnecting the integrated cable and attaching an external antenna to the TNC connector.



5.2 Back Panel Connections



AC Power Input Connector

The AC input connector is located on the right rear of the enclosure. This accepts a typical AC power cable used on many industrial devices that take an AC power input. This input box has an integrated switch to control power connection. There is also an internal fuse on this input.

DC Power Input Connector

The DC input is a Bulgin Px0412/03P and is located on the right-rear of the enclosure. This is used for powering the radio specifically and does not charge the radio's backup battery or the laptop. The custom cable used for this input is described below in the Cable Options section (5.3). The pinout of the DC input connector is shown below in the cable options section.

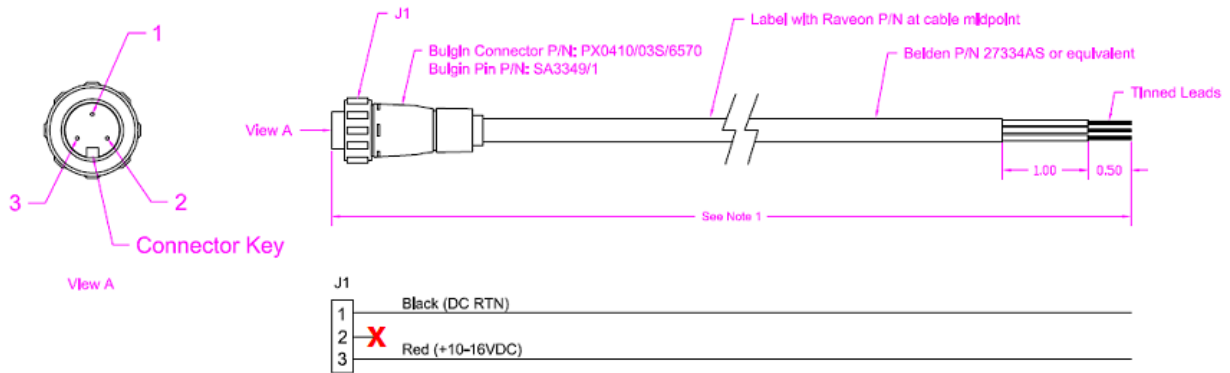
RF Antenna Connector

The RF antenna connector is an N-type female with standard (not reverse) thread. This is internally routed to the M7 radio inside the case. It is recommended that the user has some kind of additional strain relief cable to protect this connector from wear.

5.3 Cable Options

Automotive Charge Cable


These cables will allow an SMS-L to be connected to an automotive cigarette lighter plug, and charged from the vehicle. The SMS-L shall be designed to use the same automotive cable as the RV-SM series of radios (SWDs). The automotive charger cable charges and operates the internal data radio, not the lap-top.



The part number of this cable is **4C901-1-6**.

5.4 RF Cables

This is an example of a suitable N-type RF connector that can be used to terminate a custom cable to plug into the rear of the SMS-Lite base station:

Product Description	Specifications																
 <p>Part Number: RFN1005-3C Manufacturer: RF Connectors</p> <p>QTY: <input type="text" value="1"/> Add to Cart</p> <p>Email</p> <p>Conn, Silver Plated N-Male Crimp for RG58 & LMR195</p>	<table border="1"> <tr> <td>Body Attachment</td> <td>Crimp</td> </tr> <tr> <td>Body Plating</td> <td>Silver</td> </tr> <tr> <td>Pin Attachment</td> <td>Crimp</td> </tr> <tr> <td>Pin Plating</td> <td>Gold</td> </tr> <tr> <td>Insulator Plating</td> <td>Teflon</td> </tr> <tr> <td>Connector Type</td> <td>N-Male</td> </tr> <tr> <td>Impedance</td> <td>50 Ohm</td> </tr> <tr> <td>Cable Type</td> <td>RG58, LMR195</td> </tr> </table>	Body Attachment	Crimp	Body Plating	Silver	Pin Attachment	Crimp	Pin Plating	Gold	Insulator Plating	Teflon	Connector Type	N-Male	Impedance	50 Ohm	Cable Type	RG58, LMR195
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Insulator Plating	Teflon																
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Impedance	50 Ohm																
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6. Power Schemes

6.1 Normal Fixed Operation

AC Powered (SMS-L AC power cord plugged into AC power source)

- A. The radio is operating off of an AC power supply inside the case
- B. The laptop is operating off an AC power supply inside the case.
- C. The internal battery for the radio which is inside the case is being charged.
- D. The laptop's battery is being charged.

6.2 Normal Mobile Operation

Inverter Powered (SMS-L AC plugged into an external DC/AC inverter which is connected to a vehicle)

- A. The radio is operating off of an AC power supply inside the case
- B. The laptop is operating off an AC power supply inside the case.
- C. The internal battery for the radio which is inside the case is being charged.
- D. The laptop's battery is being charged.

6.3 Alternate Mobile Operation

DC and Inverter Powered (SMS-L AC plugged into an external DC/AC inverter, DC plugged into vehicle power)

- A. The radio is running off of the DC input.
- B. The laptop is running off an AC power supply inside the case, which is powered from the external inverter.
- C. The internal battery for the radio is being charged.
- D. The laptop's battery is being charged.

6.4 Temporary Operation

DC Powered (SMS-L AC not plugged in, DC input connected to a cigarette lighter or other DC source)

- A. The radio is running off of the DC input.
- B. The laptop is running off its internal battery inside the laptop.
- C. The internal battery for the radio is not being charged.
- D. The laptop's battery is not being charged.

6.5 Fail-safe Operation

Power Failure / Power Lost (No AC input. No DC input)

- A. The radio is running off of the internal battery inside the case.
- B. The laptop is running off its own internal battery inside the laptop.
- C. The internal battery for the radio is not being charged.
- D. The laptop's battery is not being charged.

7. **Configuring the Atlas SML Internal Modem**

See manual for RV-M7-GX Wireless Modem.

8. **Troubleshooting**

8.1 **Symptom: Unit will not power on from AC source**

Solution #1: Make sure the AC input switch on the rear of the unit is in the on position.

Solution #2: Verify that the AC power cable has the necessary voltage on the line.

Solution #3: Verify that the AC source can source the required amount of current.

8.2 **Symptom: Unit will not power up from DC source**

Solution #1: Verify that the DC cable has the required voltage/current handling capabilities.

8.3 **Symptom: RF activity LED is always off, even when expected to be receiving an RF signal**

Solution #1: Check the frequency with the **ATFX** command.

Solution #2: Check the RF activity threshold level with the **ATCD** command. See M7 manual for more information.

8.4 **Symptom: Laptop will not connect to internal radio modem**

Solution #1: Open device manager on the laptop by going to Start->(right click) computer->manage. Verify that the correct port is assigned to the USB-serial converter data cable.

Solution #2: Make sure the Riptide software (or any terminal program) is assigned to the correct port and BAUD rate.