



StreamCaster Lite SL4200 OEM Integration Manual

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Silvus Technologies, Inc.

10990 Wilshire Blvd, #1500

Los Angeles, CA 90024

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Revision History

Version	Date	Changes
0.1	June 5, 2020	Initial preliminary draft
0.2/0.3/0.4	June 5, 2020	Minor edits
0.5	February 26, 2021	Updated I/O tables, power management and accessory sections
0.6	March 31, 2021	Updated power management section
0.7	June 07, 2021	Corrected VBAT pin-out information in Table 4

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1 Overview

This document describes the SL4200 OEM module and how to integrate the unit into end-user configurations.

The SL4200 OEM module is simplified mechanically and utilizes standardized connectors for power, control and input/output connections when compared with the SC4200E OEM unit.

Figure 1 illustrates the OEM module that consists of a single printed circuit board (PCB) assembly that is sandwiched between a bottom and top metal plate. These plates provide both EMI shielding and thermal heat conductivity for the PCB.

The remaining sections provide details regarding mounting the unit, providing power and connectivity to the unit and details concerning heat management.

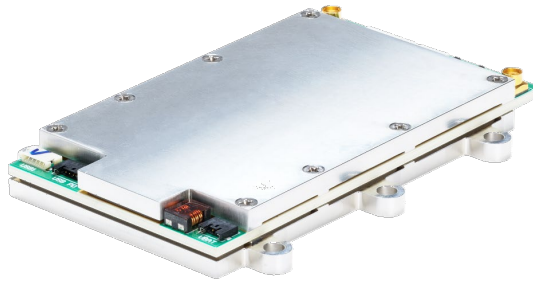


Figure 1. SL4200-OEM Module

2 Mounting and Dimensions

Figure 2 through Figure 4 show the key dimensions of the OEM module necessary to facilitate mounting. Please refer to Section 4 for guidance in providing proper heat management when mounting the module in embedded configurations.

For more detailed dimensions of the OEM unit, users may refer to the 3D step mechanical design file that will be included in the forthcoming OEM integration guideline package.

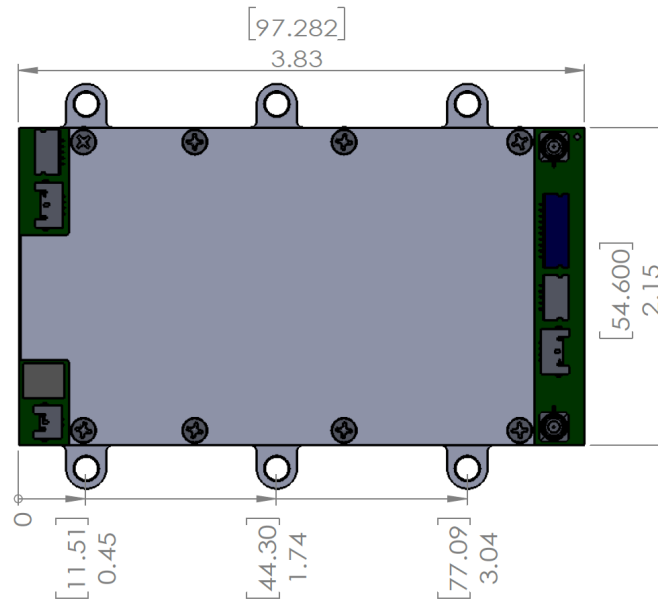


Figure 2. SL4200 OEM Top View (Dimensioned)

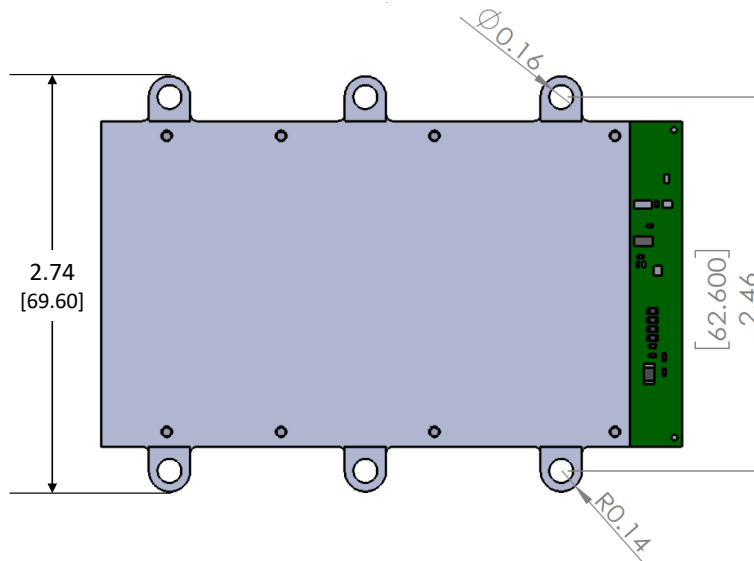


Figure 3. SL4200 OEM Bottom View (Dimensioned)

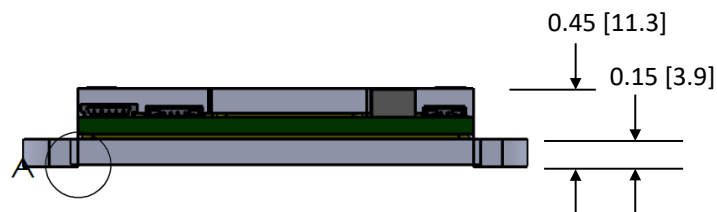


Figure 4. SL4200 OEM End View (Dimensioned)

3 Interface Connections

Figure 5 below illustrates the interface connection locations for the OEM unit. Table 1 maps the locations against the PCB reference nomenclature, provides interface descriptions and details the connector type, manufacturer, and manufacturer part number.

Tables 2 through Table 7 detail the individual pinouts for each connector except for the SMP RF connectors (RF1 and RF2).

Either the VBAT (J8000) interface or the USB-PD (J5002) interface can be used for externally powering the unit. However, do NOT connect supply sources to both interfaces at the same time or damage may occur to the OEM module or the supplies.

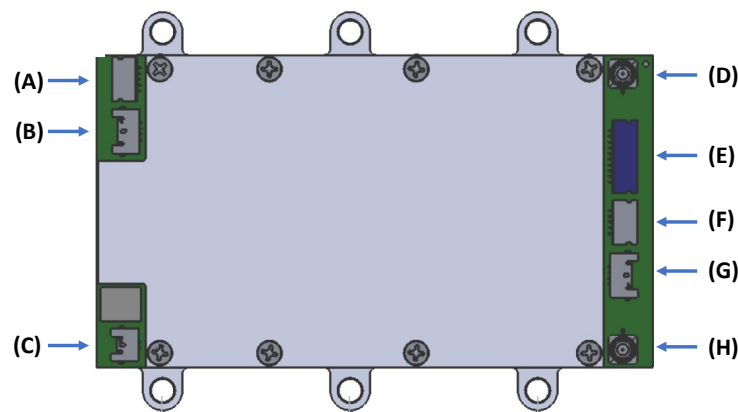


Figure 5. SL4200-OEM Interfaces

Fig 5 Ref	PCB Nom	Description	Connector Type	Vendor	MPN Mating Connector ¹
A	USB1	USB1	Header RA 5-POS (1mm)	JST Sales	SHLP-05V-S-B ²
B	USB PD	USB-PD (9V only)	Header RA 4-POS (1mm)	Molex	5037640401 ³
C	VBAT	VBAT (9V - 32V)	Header RA 3-POS (1mm)	Molex	5037640301 ³
D	1	RF-1	SMP Straight Jack (Male)	Amphenol	See accessories
E	RS232	Serial & Misc	Header RA 10-POS (1mm)	JST Sales	SHLP-10V-S-B ²
F	USB0	USB0	Header RA 5-POS (1mm)	JST Sales	SHLP-05V-S-B ²
G	ONOFF	Status LED/Power Switch	Header RA 4-POS (1mm)	Molex	5037640401 ³
H	2	RF-2	SMP Straight Jack (Male)	Amphenol	See accessories

Table 1. SL4200 Interfaces and Connector Types

Table 1 Notes:

¹ Mating connectors and crimp contacts available in OEM connector kit, MPN SL42-OEM-CK

² JST crimp contact MPN is SSHL-003T-P0.2

³ Molex crimp contact MPN is 503765-0098

Pin #	Description	Comments/Notes
1	V _{BUS}	500 ma max current (in Host mode)
2	D-	
3	D+	
4	ID	Open for USB 2.0 Client Mode Ground for USB 2.0 Host Mode
5	GND	

Table 2. USB1 (USB 2.0) Interface (A: USB1)

Pin #	Description	Comments/Notes
1	USB PD Power +	9 VDC only input; 2.5 A peak current
2	CC2	Config Chan 2
3	CC1	Config Chan 1
4	GND	

Table 3. USB-PD (Power Delivery) Interface (B: USB-PD)

Pin #	Description	Comments/Notes
1	V _{BAT} +	9 to 32 VDC Input; 2.5 A peak current
2	n/c	Reserved, do not connect
3	GND	DC power source return / ground

Table 4. VBAT (External Battery) Interface (C: VBAT)

Pin #	Description	Comments/Notes
1	RS232 TXD	Output
2	RS232 RXD	Input
3	RS232 CTS	Input
4	RS232 RTS	Output
5	n/c	Reserved/Do not connect
6	GPIO1	Input/Output
7	GND	
8	VCC 5V0 OUT	5VDC @ 500 ma max
9	n/c	Do not connect
10	n/c	Do not connect

Table 5. Serial & Misc. Interfaces (E: RS232)

Pin #	Description	Comments/Notes
1	V _{BUS}	500 ma max current (in Host mode)
2	D-	
3	D+	
4	ID	Connect to Ground for USB 2.0 Host Mode;
5	GND	

Table 6. USB0 (USB 2.0 Host) Interface (F: USB0)

Pin #	Description	Comments/Notes
1	GND	
2	On/Off-	Connect to ground (GND) to turn unit OFF; Leave open (floating) for ON
3	LED-1	
4	LED-2	

Table 7. Status LED / Power Switch Interface (G: ONOFF)

4 Power Consumption and Heat Management

The SL4200 OEM stack has a maximum native RF output power of 500 mW/antenna. Power consumption varies from 4.8 Watts (not transmitting) to 17 Watts depending on the transmit duty cycle, transmit power, frequency band used and if USB devices are connected. Average power consumption will be proportional to the transmit duty cycle.

This is a very short duration (100 usec) peak in power/current demand that occurs during the beginning of burst transmissions. For the SL4200, peak power is 25 Watts (2.8A @ 9VDC, 2.1A @ 12 VDC).

When using a USB-C PD power source, the source must be rated to supply 3.0A @ 9 VDC. The external power source must be sized to meet this peak requirement. When using VBAT input the voltage range is 9.0 to 32.0 VDC. However, the radio is most power efficient when operating at 15VDC.

Silvus radios have internal sensors for temperature monitoring that limits the transmission duty cycle to prevent equipment damage if the operating temperature become excessive. These levels are set at the factory but can be reconfigured within the radio as detailed in the radio manual (e.g., if internal temperature sensors read 75°C, transmit back-off begins with no transmissions allowed once 85°C is reached). We recommend that the default settings be used unless mission profiles demand otherwise.

For the SL4200 OEM modules, we recommend that the case temperature not exceed 70°C so as to keep internal temperatures below the transmitter limiting thresholds (as discussed above). Use

of high-efficiency thermal conductive pads from [TennVac](#) or their equivalent, or using thermal conductive paste, in attaching properly sized and designed heat sinks will greatly assist in removing heat from the radio module.

Silvus recommends that heat sinks (or an equivalent flat thermal conductive mounting surface) be applied to both sides of the SL4200 OEM unit (if possible). The dimensions of the heat sink, height, and shape of the fins, the spacing between fin channels, the thickness of the base material, as well as the thermal conductivity of the metal, all play a role in determining thermal dissipation efficiency. Of course, air movement through and around the heat sink can significantly increase cooling effectiveness.

Silvus recommends thermal management using a combination of the following techniques:

- Firmly mounting the unit on a large heat-conductive metal surface that draws heat away from the bottom of the unit
- Remove heat by attaching heat-sinks or heat-spreaders to the top of the unit
- Augment (b) with convection cooling air flow—either naturally occurring (e.g. surrounding air in a moving vehicle) or with forced air (e.g., electric fan)

Once a thermal design is implemented, monitor the case temperature as environmental and operational conditions are reached to ensure that the design provides sufficient thermal cooling indicated by the measured case temperature not exceeding 70°C.

5 OEM Accessories

Accessories for the SL4200 OEM unit are detailed in Table 8 below.

Silvus PN	Description
SC42E-OEM-2	RF connector, right angle SMP (f) to TNC (f); 38 mm length
SC22-OEM-6	RF connector right angle SMP (f) to SMA (f); 21 mm length
SC22-OEM-6-75mm	75 mm length
SC22-OEM-6-150mm	150 mm length
SC22-OEM-6-155mm	155 mm length
SC22-OEM-6-240mm	240 mm length
SC22-OEM-6-750mm	750 mm length
SL42-OEM-CK	Mating connector kit (6 connectors, less RF, with extra crimp pins)
SL42-OEM-L200	Status LED (200 mm wire leads; Red/Green color)
SL42-OEM-S0	2-pos On/Off rotary switch (no wires, contacts only)

Table 8. SL4200 OEM Accessories List