



## **M100 – USB Cellular Adapter Installation guide**



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## Version history

Revision	Date	Description
19_09	01/09/2019	Emission
20_01	20/01/2020	First revision



## Table of contents

Safety.....	4
Regulatory Notices.....	6
Warranty.....	7
Care recommendations.....	8
General description.....	9
Package content.....	9
Product identification and version information.....	9
Mechanical installation.....	10
Electrical installation.....	12
Status.....	15

## Safety

### Important safety notes



Read this user guide carefully before mounting, installing and operating the device.



Do not operate the device in any other environmental conditions than it is designed for.

### Before using this device

Read this manual completely and gather all information on the device. Make sure that you understand it fully. Check that your application does not exceed the safe operating specifications for this device.

### Before installation

This device should only be installed by qualified personnel.

### GSM specific safety

Please read and follow the guidelines listed below. The precautions must be observed during all phases of the operation. Breaking these rules may be dangerous, illegal or affect performance of the unit and/or invalidate the unit's approval and/or warranty.

#### General

Remember to follow any special regulations and warnings in force in any area and never use the unit whenever it's forbidden to use it. Do not use the unit when it may cause interference or danger. A wireless device exposed to interference above specified limits could result in deteriorated performance.

#### Hospitals or other Medical environment

Do not use the unit in a medical environment such as health care facilities. Follow any regulations or rules that instruct you to not use the unit.

#### Vehicle

If the unit is incorrectly installed in a vehicular environment, the operation of the unit could interfere with the vehicle electronics. Faulty installation and/or operation can constitute a safety hazard.

#### Blasting areas

Do not use the unit where blasting is in progress or in "blasting areas". Observe restrictions and follow any regulation or rules.



### **Explosive atmospheres**

Do not use the unit in any area with a potentially explosive atmosphere. Potentially explosive areas are often, but not always, clearly marked. They include fueling areas such as petrol stations, below decks on boats, fuel or chemical transfer or storage facilities, and areas where the air contains chemicals or particles, such as grain, dust, or metal powder.

### **RF energy**

The unit is a low power radio transmitter and receiver. When it is ON, it receives and also sends out radio frequency (RF) signals. Most modern electronic equipment is shielded from RF signals. However, certain electronic equipment may not be shielded against the RF signals from the wireless unit. All radio-transmitting devices send signals, which may cause interference in different electronic devices. To avoid interference, place the unit's antenna sufficiently far from other electronics.

### **Critical applications**

Cellular units operate using radio signals and cellular networks cannot be guaranteed to connect in all conditions. Therefore you should never rely solely on a wireless device for essential communications, for example medical emergencies.

### **Antenna care**

Use only the supplied or an approved replacement antenna. Unauthorized antennas, modifications, or attachments could damage the unit and may violate current regulations.

Do not touch the antenna unnecessarily when the unit is in use. Contact with the antenna affects communication quality and may cause the unit to operate at a higher power level than otherwise needed.



## Regulatory Notices

### Simplified EU declaration of conformity

Hereby, Sevio Srl declares that the equipment is in compliance with EU directives. The full EU declaration of conformity and other detailed information are available at the respective product page at <https://sevio.it/>.

### United States (FCC)

The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1. this device may not cause harmful interference. 2. this device must accept any interference received, including interference that may cause undesired operation.

Contains FCC ID: XMR201903EG25G

**RF Exposure requirements:** To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operations at closer distances than this are not recommended.

### Canada (IC)

This device complies with Industry Canada's license-exempt RSS. Operation is subject to the following two conditions: 1. This device may not cause interference. 2. This device must accept any interference, including interference that may cause undesired operation of the device.

*“Le présent appareil est conforme aux CNR d’Industrie Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes: 1. l’appareil ne doit pas produire de brouillage. 2. l’utilisateur de l’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.”*

IC Certification Number of the implemented radio communication module: 10224A-201903EG25G

## Agency approvals and standards compliance

Type	Description	Approval/Compliance
Article 3.1a - Directive 2014/53/UE	Health and Safety	Assessment for conformity EN 62311:2008
Article 3.1b - Directive 2014/53/UE	EMC	ETSI EN 301 489-19 V2.1.0 ETSI EN 301 489-1 V2.2.1 ETSI EN 301 489-52 V1.1.0
Article 3.2 - Directive 2014/53/UE	FWL	ETSI EN 301 511 V12.5.1 ETSI EN 301 908-1 V11.1.1 ETSI EN 301 908-2 V11.1.2 ETSI EN 301 908-13 V11.1.2
Article 4 - Directive 2011/65/EU	RoHS	EN 50581:2012

## Warranty

Any guarantee claim must be received before the end of the 2 years guarantee period and is to be enclosed with the returned claimed defective product within this same period, and must include Sevio return authorization number (RM No.).

## Care recommendations

Follow the care recommendations below to maintain full operation of device and to fulfill the warranty obligations.

This device must not be operated with covers or lids removed.

Do not drop, knock or shake the device, rough handling beyond the specification may cause damage to internal circuit boards.

Do not use harsh chemicals, cleaning solvents or strong detergents to clean the device.

Do not paint the device. Paint can clog the device and prevent proper operation.

Do not expose the device to any kind of liquids (rain, beverages, etc). The device is not waterproof. Keep the device within the specified humidity levels.

Do not use or store the device in dusty, dirty areas, connectors as well as other mechanical parts may be damaged.

If the device is not working properly, contact the place of purchase, nearest Sevio distributor office or Sevio technical support.

**Note:** Do not use damaged equipment and/or accessories such as damaged power cord.

**Note:** Do not open the device. There are no serviceable parts inside.

**Note:** Product warranty gets void and any liability will be disclaimed when opening the device.

**Note:** Never unplug equipment from the electrical outlet by holding the cord only, always disconnect the cable by applying force directly to the plug.

## Symbols



CE marking, the product complies with the requirements of the applicable EU directives.



Direct current, DC



This symbol means that the product shall not be treated as unsorted municipal waste when disposing of it. It needs to be handed over to an applicable collection point for recycling electrical and electronic equipment.

By ensuring this product is disposed of correctly, you will help to reduce hazardous substances and prevent potential negative consequences to both environment and human health, which could be caused by inappropriate disposal.





## General description

Sevio M100 is an USB Cellular Adapter with GNSS receiver used to provide cellular connectivity to Sevio routers.

Sevio routers are typically installed in industrial environments within electrical cabinets.

Sevio M100 connects via a USB port and provides IP connectivity where other networks are missing or not usable. Furthermore a GNSS receiver provides a precise time source and location to the Sevio routers.

**Note:** The GNSS functionality is provided to *R* series routers.

## Package content

The package contents of following main components:

- 1 M100 device
- 2 straight dipole LTE antennas
- 1 USB A-B cable with screw lock
- 1 quick guide

If any components are missing or damaged or if you have any questions regarding the contents, contact us at [support@sevio.it](mailto:support@sevio.it).

## Product identification and version information

Identification information is available on the left side of the device:

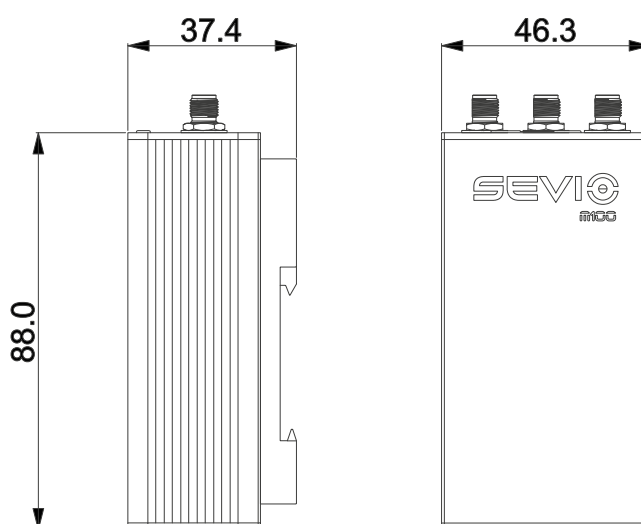


Specification	Value	Notes
MODEL	M100	USB Cellular Adapter
MFGD	YYYYMMDD	Manufacturing date
SERVICE TAG	XXXXXXXX	7-characters alphanumeric unique code given to the device
BAR CODE		Service Tag barcode

## Mechanical installation

### Mechanical overview

<b>Maximum dimensions, without antennas and without USB cable</b>	88 x 46 x 37 mm (H x L x D)
<b>Space needed for installation</b>	Approx. 190 x 50 x 100 mm
<b>Enclosure</b>	Aluminum
<b>Weight</b>	140 g
<b>Protection</b>	IP40



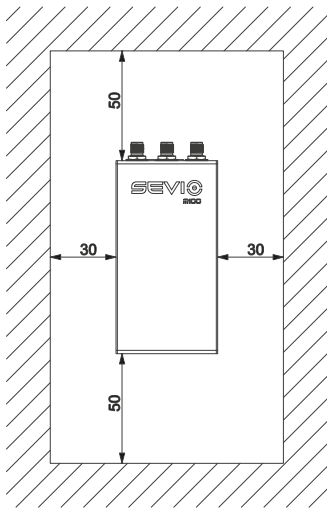
**Note:** Measurements are stated in millimeters.

Mechanical drawings files are available at <https://sevio.it/>.

### Environmental

<b>Operating temperature</b>	-20 °C to 65 °C
<b>Storage and transport temperature</b>	-40 °C to 85 °C
<b>Operating humidity</b>	10% to 90% RH (non condensing)
<b>Storage and transport humidity</b>	10% to 90% RH (non condensing)
<b>Operating altitude max.</b>	2000 m

## Cooling



This device uses passive convection cooling. For this reason sufficient air circulation should be guaranteed.

The amount of cooling needed depends on the ambient temperature, the transmission power and the intensity of data traffic.

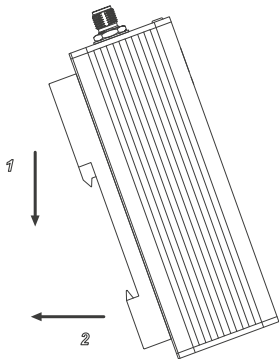
If operating at extremes ensure that proper clearances, as shown in drawing, are given.

## Temperature alarms

This product has integrated temperature sensors for monitoring the internal device temperature. The limits for the sensors are set so, that operation without alarm is ensured for ambient temperatures as specified for the product assuming correct installation.

Whenever the sensed temperature exceeds the specified limit the operation will be suspended and resumed automatically when the temperature decreases under a safe value.

## Mounting

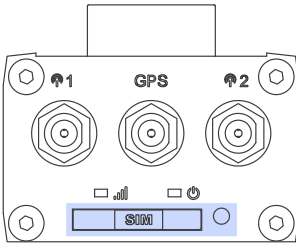


This device is equipped with a spring-loaded clip to hold the device on a standard 35 mm DIN rail.

The device is intended to be mounted vertically.

The top of the hook must first be set on the DIN rail. Then just press down (step 1) and at the same time rotate the device until it is flush with the rail (step 2). Finally, release the force on the spring and check that it gets properly seated.

### SIM card socket



<b>Form factor</b>	Mini-SIM (2FF)
<b>Voltage</b>	1.8 V, 3.3 V
<b>Dimension</b>	25 x 15 x 0.76 mm

1. To remove the card tray, press the eject yellow button using a suitable tool.
2. Pull out the tray.
3. Insert the SIM card into the SIM card tray with the contacts facing up, check that the card rotation matches the tray shape.
4. Slide the card tray into the device ensuring that it locks into place.

**Note:** micro-SIMs and nano-SIMs may be used with proper adapters.

## Electrical installation

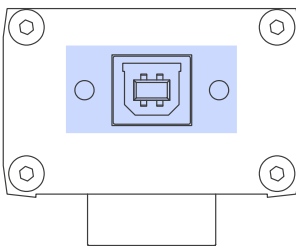
### USB power supply

This device is powered through the type “B” USB port.

The device draws up to 1 A which exceed the standard USB maximum current. Make sure that you connect the device to the dedicated USB port (if any) of the router.

The connector is provided with locking screws that may be useful to prevent accidental disconnection.

Do not exceed 3 m of cable length.



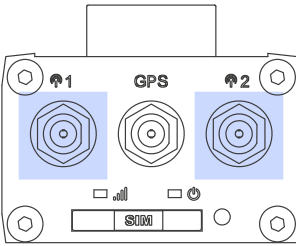
	Min.	Typ.	Max.
<b>Voltage</b>	+4.4 Vdc	+5 Vdc	+5.25 Vdc
<b>Current</b>			1 A
<b>Power</b>			5.25 W
<b>USB connector</b>	USB B with screw lock		

**Note:** This Device should be powered by an USB compliant supply with proper current limiting.

## Cellular interface

Sevio M100 is a LTE category 4 module. It is optimized specially for M2M and IoT applications, and delivers 150 Mbit/s downlink and 50 Mbit/s uplink data rates.

Sevio M100 is backward-compatible with 2G and 3G networks ensuring that it can be connected even in areas lacking 4G coverage.



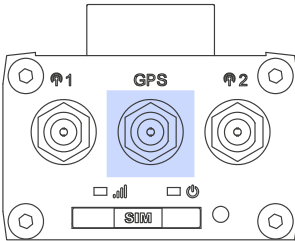
Parameter	Value
Type of radio interface	GSM, UMTS, LTE
Category	LTE Cat.4
Operating frequency bandwidth/s	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28 LTE-TDD: B38/B39/B40/B41 UMTS: B1/B2/B4/B5/B6/B8/B19 GSM: B2/B3/B5/B8
Antennas connectors	2 x SMA female (MIMO)
Antennas type	external provided, gain max: 5.86 dBi

Depending on antenna type, the antennas may be screwed directly to the connectors or relayed via proper coaxial cables. Use only approved antennas and cables.

## GNSS receiver

Sevio M100 includes a fully integrated global navigation satellite system solution that supports Gen8C-Lite of Qualcomm (GPS, GLONASS, BeiDou, Galileo and QZSS).

Sevio M100 supports standard NMEA-0183 protocol, and outputs NMEA sentences at 1Hz data update rate via USB interface by default.



Parameter	Value
Type of radio interface	GPS/GLONASS/BeiDou/Galileo/QZSS
Operating Frequency	GPS: 1575.42 ± 1.023 MHz GLONASS: 1597.5 ± 1605.8 MHz Galileo: 1575.42 ± 2.046 MHz BeiDou: 1561.098 ± 2.046 MHz QZSS: 1575.42 MHz
Antenna connectors	SMA female
Antenna type	Active (2.7 V) or passive GNSS antenna. Passive antennas must not be DC shorted. Frequency range: 1559 MHz - 1609 MHz Polarization: RHCP or linear VSWR: < 2 (Typ.) Passive antenna gain: > 0 dBi Active antenna noise figure: < 1.5 dB Active antenna gain: > 0 dBi Active antenna embedded LNA gain: < 17 dB

**Note:** GNSS feature is available with *R* series routers.

## Status



<b>OFF</b>	Device has no power
<b>ON</b>	Power supply present



<b>OFF</b>	Device has no power
<b>200ms ON / 1800ms OFF</b>	Network searching
<b>1800ms ON / 200ms OFF</b>	Idle
<b>125ms ON / 125ms OFF</b>	Data transfer is ongoing



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