

Installing the Mobile Subscriber Unit

Broadband Wireless Access System

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FCC information

NOTICE: This equipment has been tested and found to comply with the FCC guidelines as found in 47CFR1.1310 for Radio Frequency Radiation Exposure Limits as detailed below. A minimum of 20 centimeters (8 inches) separation between the MSU antenna and the operator and all other persons must be maintained.

Radio Frequency Radiation Exposure Limits

Table 1 Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500	—	—	f/300	6
1500-100,000	—	—	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	.2	30
300-1500	—	—	f/1500	30
1500-100,000	—	—	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Note: NOTE 1 to Table 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure.

Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

Note: NOTE 2 to Table 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Declaration of Conformity Compliance Information

Class B computer peripheral

This 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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: Modification of this device may void the user's authority to operate the equipment.



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Welcome

This guide describes how to install and use the Expedience mobile subscriber unit (MSU). The MSU maintains contact with base stations in order to provide wireless high-speed Internet access to subscribers in moving vehicles, such as cars, trucks, and vans.

This guide is intended for use by professional equipment installers. Service providers should not attempt to install the MSU.

Installation overview

This section provides an overview of the tasks you will perform when installing the MSU.

To install the MSU:

- 1** Determine where the MSU will be mounted inside the vehicle.
- 2** Install the antenna in the desired location.
- 3** Run the antenna cable to where the MSU is mounted and plug the cable into the MSU.
- 4** Determine the appropriate length for the MSU power cable.
 - a If using the full length of the cable, go to step 5.
 - b If you want to change the location of the fuse holder, cut the cable and use the crimps to insert fuse holder at the desired location on the power cable.
- 5** Power the MSU by preparing the cable and attaching the MSU power cable to the battery or to an unused, positive fuse block terminal.
- 6** Ground the MSU to a screw that goes to chassis ground.
- 7** Connect the MSU cable harness to the connector on the back of the MSU.
- 8** Connect the MSU to the laptop computer using the RJ-45 cable.

For further information about these tasks, refer to the sections that follow.

Determining where to install the MSU

The MSU is installed inside the vehicle. Cables on a cable harness connect the MSU to a power source, to the frame of the vehicle for grounding, and to the subscriber's laptop computer. Also, a separate antenna cable connects the antenna to the TNC antenna connector on the MSU.

When choosing a location for the MSU in the vehicle, be sure the antenna cable and the cable harness can reach the MSU.

Cabling overview

Figure 1 illustrates how the antenna connects to the MSU. It also shows how the cables connect the MSU to a power source, to the vehicle's frame for grounding, and to the subscriber's computer.

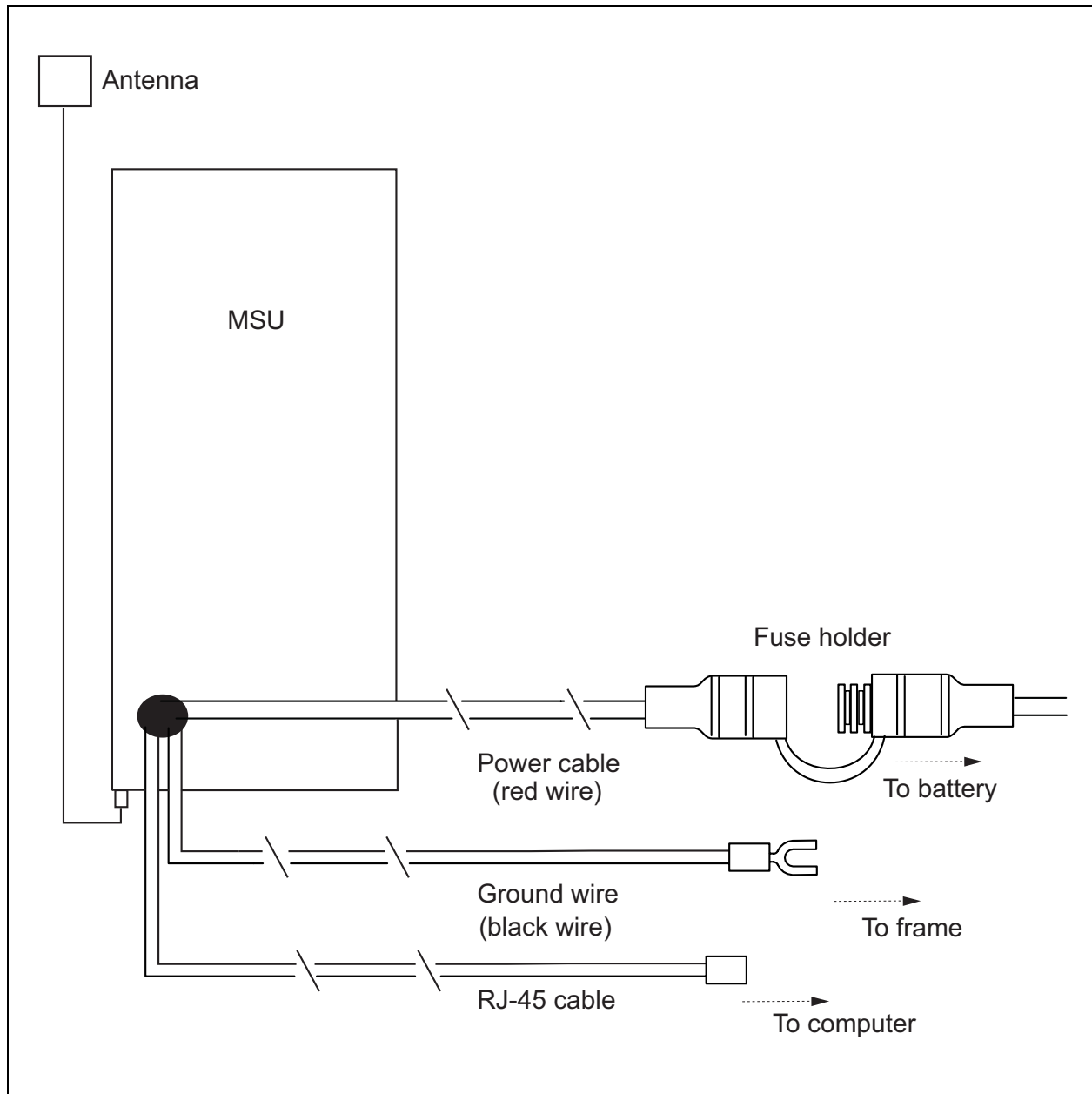


Figure 1 MSU cabling diagram

Installing the MSU inside the automobile

The back of the MSU is a mounting plate with 4 holes. The MSU can be mounted on an equipment shelf in the vehicle or on the side of the automobile.

The mounting holes on the back of the MSU are vertically spaced $9 \times \frac{5}{8}$ inches apart center to center. The horizontal holes are spaced $3 \times \frac{1}{2}$ inches apart.

Figure 2 shows the back of the MSU.

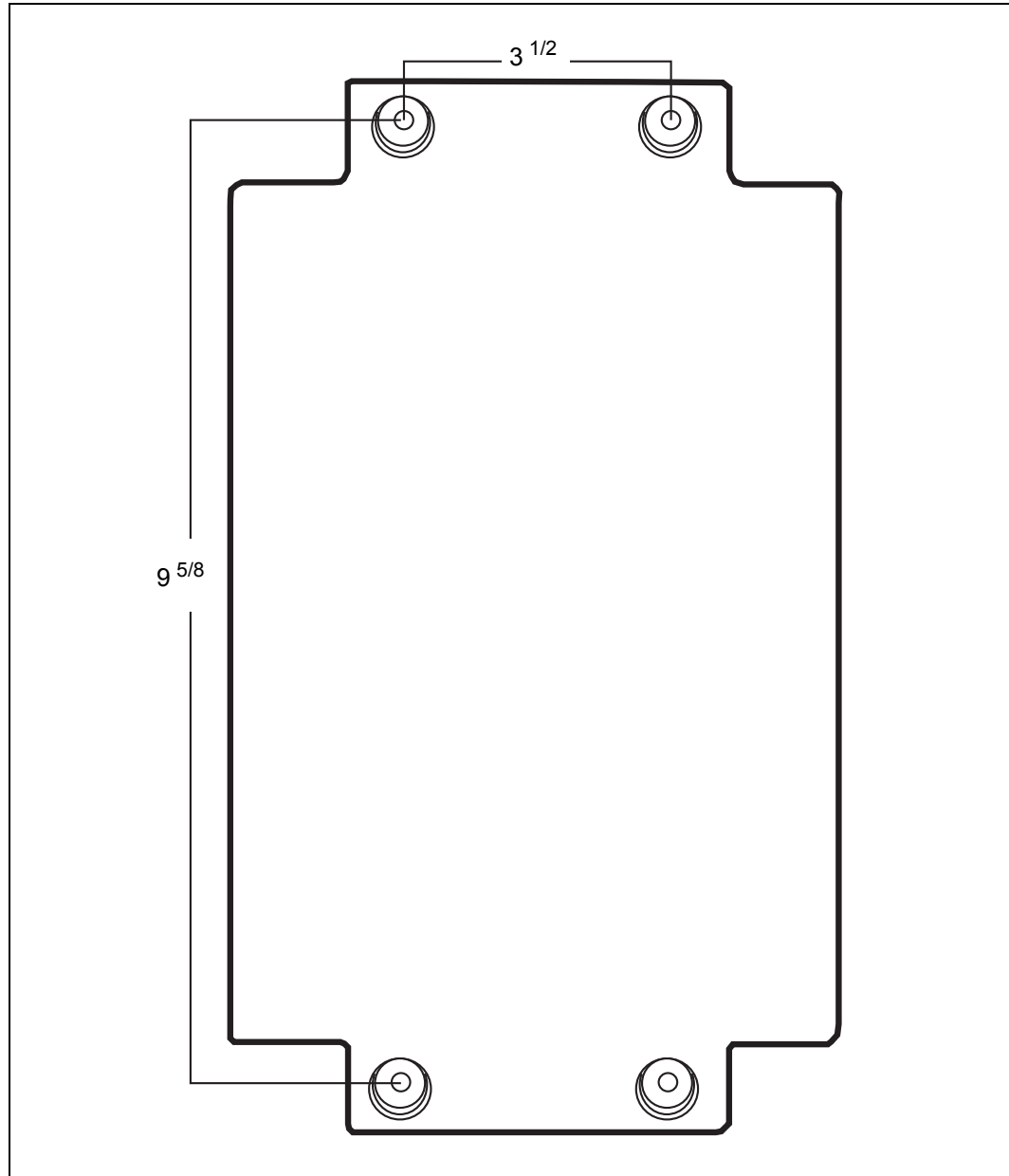


Figure 2 Mounting bracket on the back of the MSU

Installing the antenna

You should only use the antenna that NextNet has approved for use with the MSU.

The antenna is installed on a horizontal surface on the exterior of the vehicle, usually on the trunk or on a roof. To secure the antenna to the vehicle, you can use one of the following mounting options:

- You can use a magnetic mount to secure the antenna to the vehicle.
- You can use a regular mount, which requires you to drill or use an existing hole through the exterior of the vehicle.

After you install the antenna, run the antenna cable and connector to where the MSU is installed.

Antenna requirements

This section explains which antennas can be used with the MSU.

Note: The antenna used with the MSU depends on the Effective Isotropic Radiated Power (EIRP) requirements of the particular country in which the MSU is operated.

In the United States, the antennas approved for use with an MSU operating at 2.6 GHz are:

- The BMMG2400ML195C antenna from Maxrad, which is magnetically mounted to the vehicle
- The IMAGO-2600 antenna from Mobilemark, which is magnetically mounted to the vehicle.

Powering the MSU

You must prepare the power cable for installation before you attach the power cable to the battery.

Preparing the power cable for installation

The power cable is 21 feet long. You must insert an 5 Amp, normal blow fuse from the assembly kit into the power cable's fuse holder in order to protect the MSU from power surges.

You can use the cable at its full length, or you can cut the power cable down to the desired length.

Installing the fuse

Install the fuse:

- 1 Pull apart the fuse holder and push the fuse into the holder. The fuse must be a 5 Amp normal blow fuse, AGC style.
- 2 Push the fuse holder back together. Make sure no space appears between each half of the fuse holder.

Using the cable at full length

To use the cable at full length:

- 1 To prepare the cable to be attached to the battery or terminal block, strip the end of the power cable. The red wire is then exposed.
- 2 Coil the excess cable.

Changing the length of the cable

To change the length of the cable:

- 1 Determine the distance from the battery or other power source to the MSU.
- 2 Cut the power cable to an appropriate length. Use a wire crimp to crimp the end of the inline fuse holder back onto the power cable at the desired location on the cable.

Attaching MSU's power cable to the battery

Note: Make sure the fuse is installed on the inline cable before attaching the MSU to power.

The MSU can be powered by a regular car battery or a deep cycle battery such as a marine battery used on a boat.

When selecting a battery, note that the MSU draws about 2 Amps of power when the MSU is continuously transmitting data in the heaviest downlink configuration.

To power the MSU, connect it to a positive (+) battery source. Depending on the vehicle's battery or the availability of a fuse block, you can accomplish this by using the power cable's wire, a flat spade connector, or a quick disconnect connector (female connector, tab connector).

The connectors are included in an assembly kit that ships with the MSU.

Grounding the MSU

The grounding cable is 2 feet long.

On vehicles, the grounding cable must be connected to the **frame** (ground) of the car. For example, it is NOT acceptable to attach the ground cable to the frame of a seat, unless the frame also connects to chassis ground.

Attaching the cable harness to the MSU

The cable harness plugs into the lower corner of the MSU.

To plug in the cable:

- 1** Make sure the connector on the cable harness is fully seated to the MSU connector.
- 2** Turn the outer shell of the cable harness connector clockwise until the connector locks into place.

Figure 3 shows the connector and its pins.

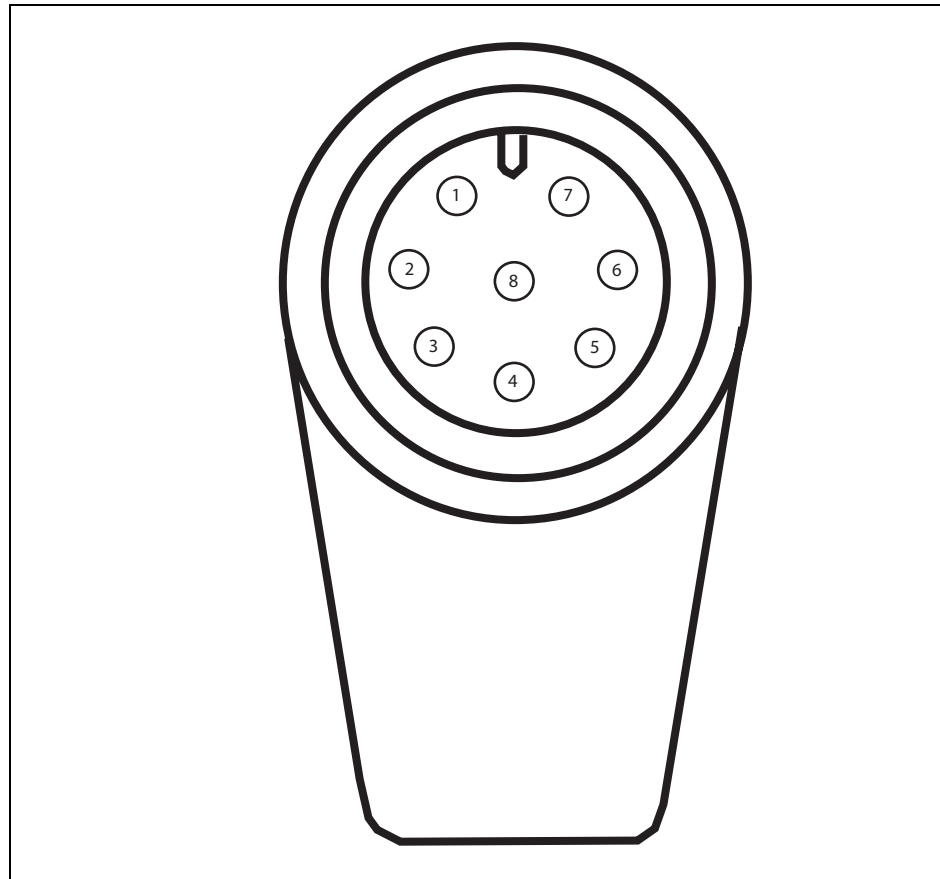


Figure 3 MSU connector

Table 1 describes the MSU connector's pins.

Table 1 Wiring diagram for MSU connector

Pin number	Purpose
1	EN TX+
2	EN TX-
3	EN RX+
4	EN RX-
5	power
6	n/c
7	ground
8	n/c

Connecting the MSU to the computer

To connect the MSU to the computer:

- 1 Use the RJ-45 plug on the cable harness into the RJ-45 coupler which is supplied in the installation kit.
- 2 Connect an RJ-45 cable from the computer into the other end of the coupler.

Figure 4 illustrates the pins for the RJ-45 connector on the cable harness.

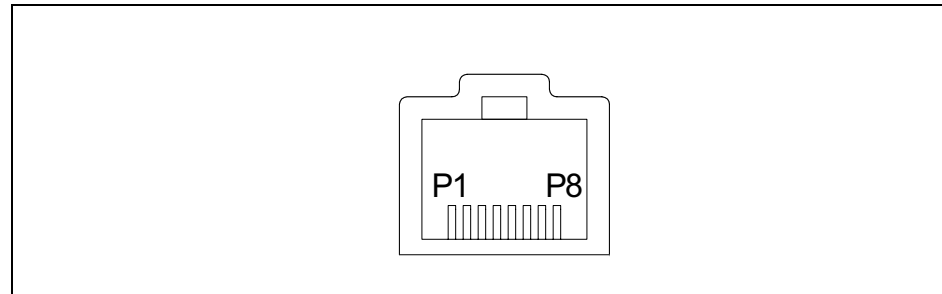


Figure 4 Cable harness — RJ-45 connector's pins

Table 2 describes the function of the pins.

Table 2 Function of pins on RJ-45 connector

Pin	Function
1	EN RX + (white/orange)
2	EN RX - (orange)
3	EN TX+ (white/green)
4	n/c
5	n/c
6	EN TX- (green)
7	n/c
8	n/c

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