TOPCON

SL-100

Installation and Setup Guide

TOPCON
POSITIONING SYSTEMS

SL-100
Upgrade Kit
Installation and Setup Guide

Part Number 1000226-01
Rev. A
ECO XXXXXX

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Table of Contents

Introduction

Developed as an add-on component to a standard Topcon 3D system, the SL-100 is a rugged housing for the SL-R3 SiteLINK radio modem, providing a SiteLINK-ready solution on the job site for a variety of construction machines.

This manual describes how to install the SL-100, radio antenna, and cables, and how to configure your unit.

Figure 1. SL-100

1000221-01 KIT, SL-100 Upgrade

- 1 ea. ASSY, SL-100 W/ SL-R3
- 1 ea. Power Cable - SL-100 to MC-R3, 9 ft. 11 in. (3000mm)
- 1 ea. Ethernet Cable - SL-100 TO MC-R3, 9 ft. 11 in. (3000mm)
- 1 ea. Kit, Antenna Config SL-R3
- 1 ea. SL-100 Upgrade Kit Installation and Setup Guide
- 1 ea. #20 Deutsch Removal Tool

1000222-01 KIT, SL-100 - MC-R3 Breakout B Connector (Optional)

- 1 ea. SL-100 – MC-R3 Breakout B Connector
- 1 ea. DRC26-40 MC-R3 Breakout B Connector Dust Boot

1000220-01 SL-100 Mag Mount Kit (Optional)

Additional Parts Required

- 3DMC upgrade to:
  - 7050-1106 Password, 3DMC Standard + SiteLINK
  - 7050-1106 Password, 3DMC Standard + SiteLINK Advanced
- SIM Card (SIM APN, Username, Password)

Installation

SL-100 SIM Card

1. Remove the eight (8) retaining screws from the base of the SL-100.

Figure 2. Remove Screws

2. Remove the base.

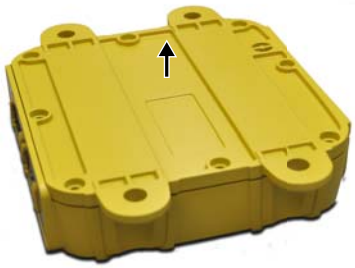

Figure 3. Remove Base

3. Insert the SIM card into the SIM card slot.

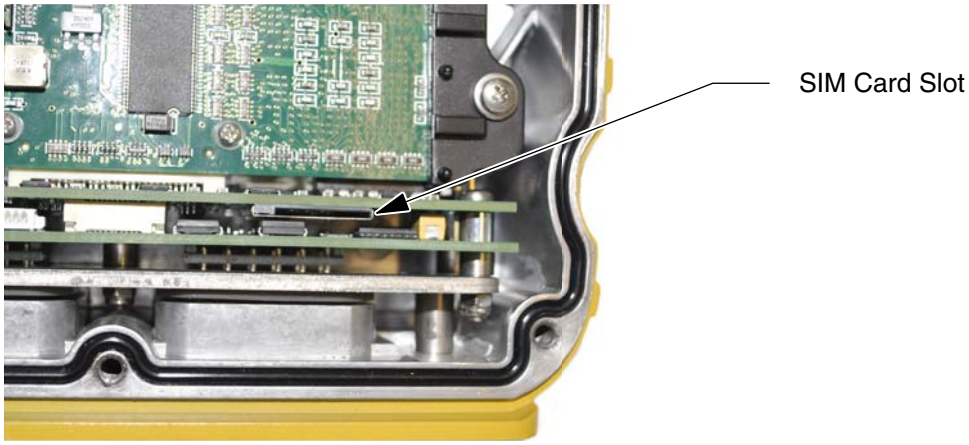

Figure 4. Insert SIM Card

4. Reinstall the eight (8) retaining screws onto the SL-100 base using Blue Loctite (not included), and torque to 12 in-lbs.

Mag Mount Kit (Optional)

If you are installing the optional Mag Mount Kit (P/N: 1000220-01), refer to the ***Mag Mount Installation Instructions*** (P/N: 7010-1026).

9911-1014 Ethernet Cable to MC-R3 Breakout B Cable Connection

1. Locate the existing installed MC-R3 Breakout B cable attached to Conn B of the MC-R3.

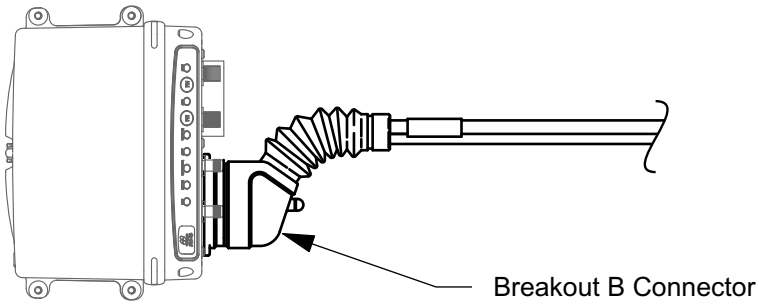

Figure 5. Breakout B Cable

2. Disconnect the Breakout B cable from the MC-R3.

NOTICE

If the existing system does not have a Breakout B cable attached to Conn B, you must have the SL-100 MC-R3 B Connector Kit (P/N: 1000222-01) to complete the install.

3. Pull back the rubber boot on the Breakout B cable to expose the wire comb.

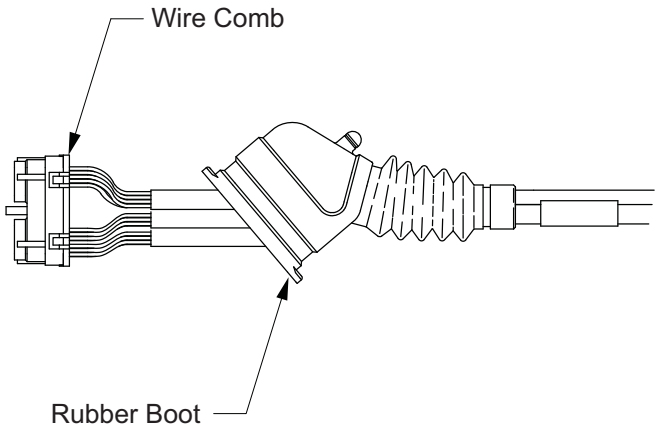

Figure 6. Expose Wire Comb

4. To remove the sealing plugs from pins 6, 16, 26, and 36 from the wire comb (see Figure 7), insert a large paper clip, or something similar into the mating end of the connector, and push out the sealing plug.

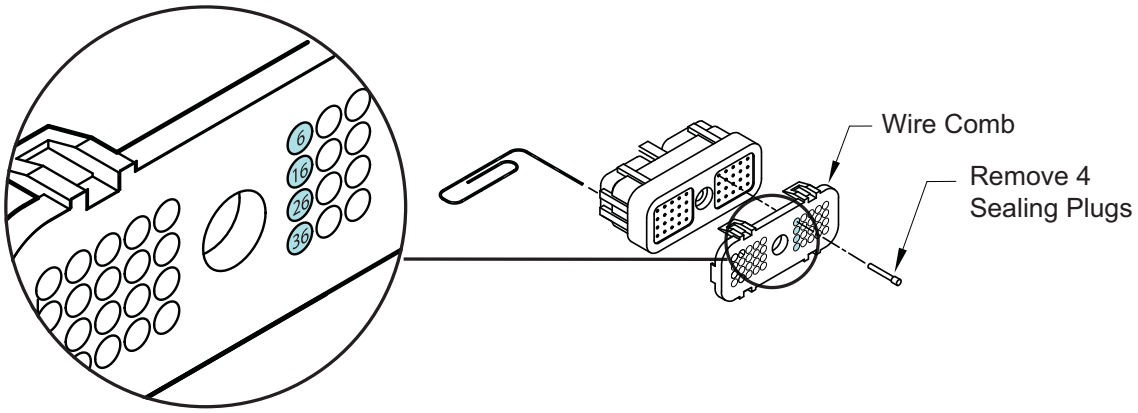

Figure 7. Remove 4 Sealing Plugs

5. Route the new Ethernet cable through the rubber boot.

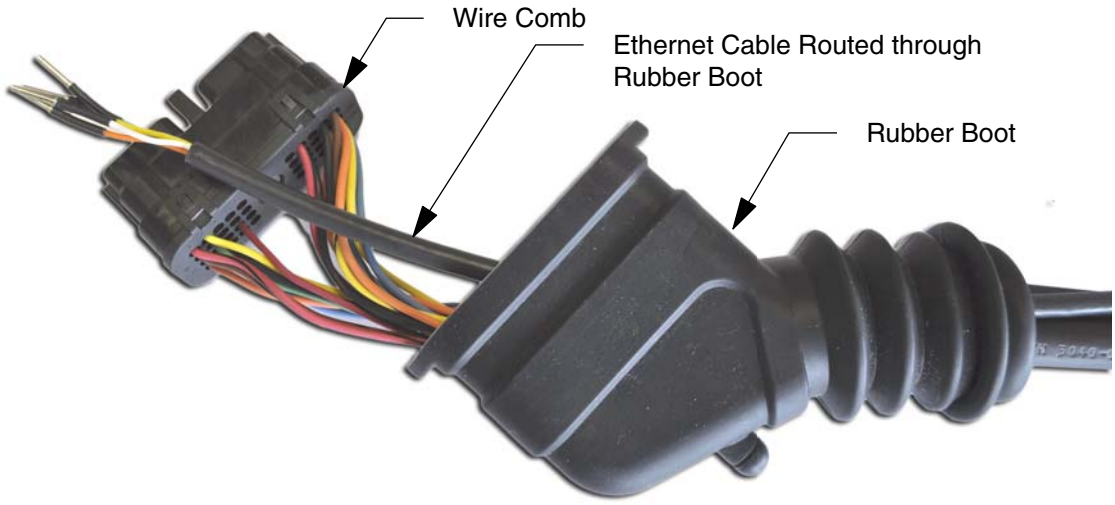

Figure 8. Route Ethernet Cable through Boot

6. Install the wires according to the colors noted in the wiring diagram (Figure 9). Slide the wires/contacts into the connector until they lock in place.

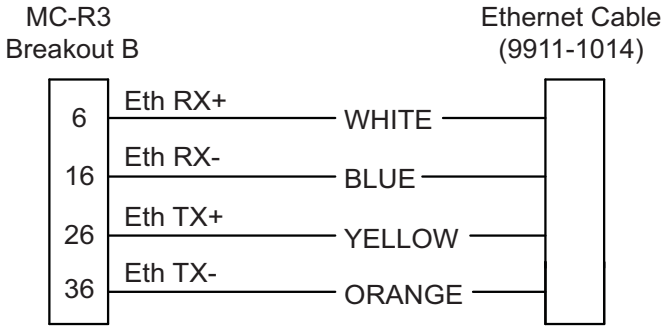

Figure 9. Ethernet to MC-R3 Breakout B Cable Wiring Diagram

7. Connect the MC-R3 Breakout B cable to the MC-R3 Controller, slide the rubber boot back into place, and tighten the Breakout B Connector screw.

9911-1015 Power and Serial Cable to MC-R3 Breakout A Cable Connection

1. Locate the existing installed MC-R3 Breakout A cable attached to Conn A of the MC-R3.

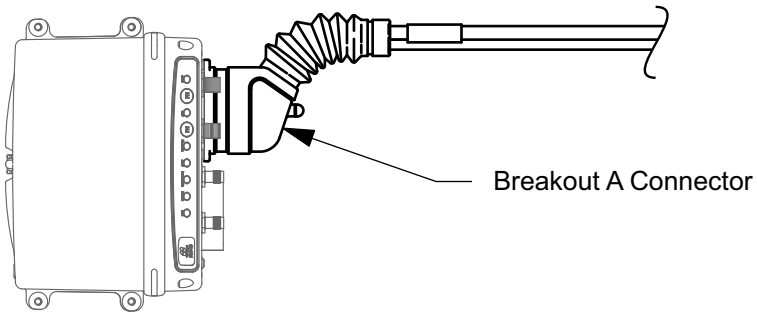

Figure 10. Breakout A Cable

2. Disconnect the cable from the MC-R3.

3. Pull back the rubber boot on the Breakout A cable to expose the wire comb.

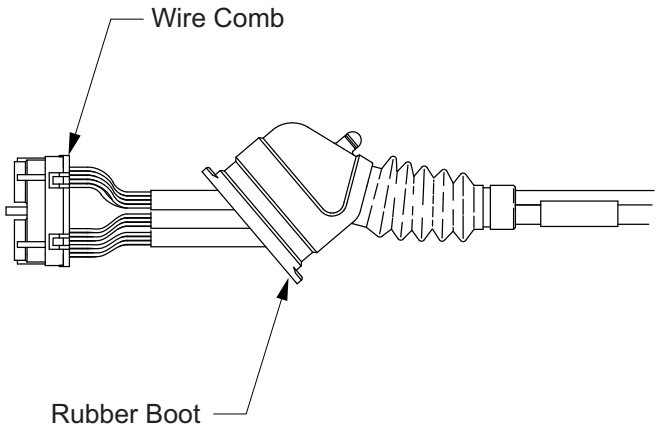

Figure 11. Expose Wire Comb

4. To remove the sealing plugs from pins 5, 17, 27, 34, 37 & 39 from the wire comb, insert a large paper clip, or something similar, into the mating end of the connector, and push out each sealing plug.

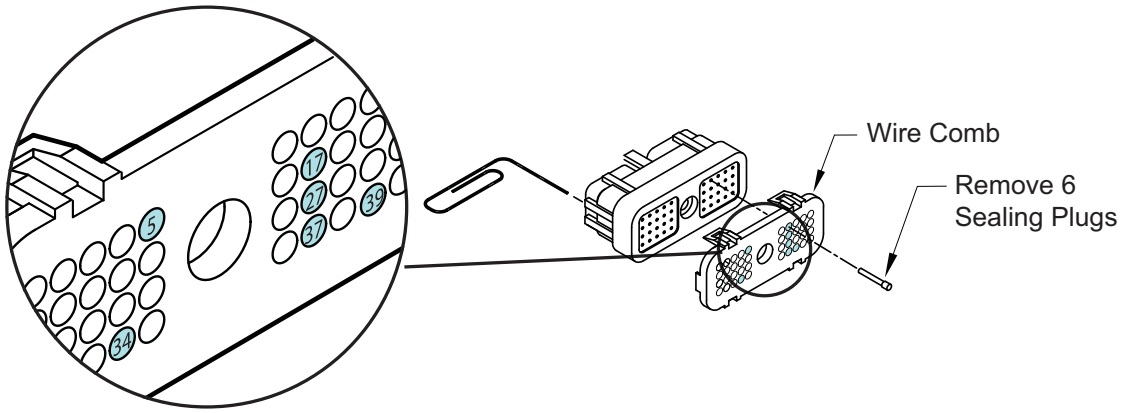

Figure 12. Remove 6 Sealing Plugs

5. Route the new Power/Serial cable (9911-1015) through the rubber boot.

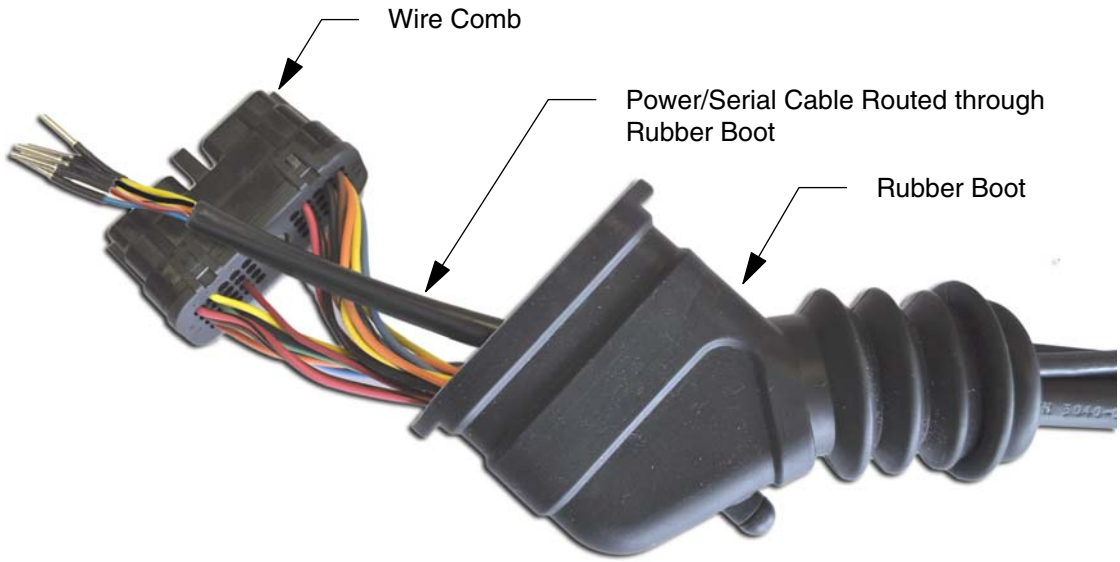

Figure 13. Route Power/Serial Cable through Boot

6. Install the wires according to the colors noted in the wiring diagram (Figure 14). Slide the wires/contacts into the connector until they lock in place.

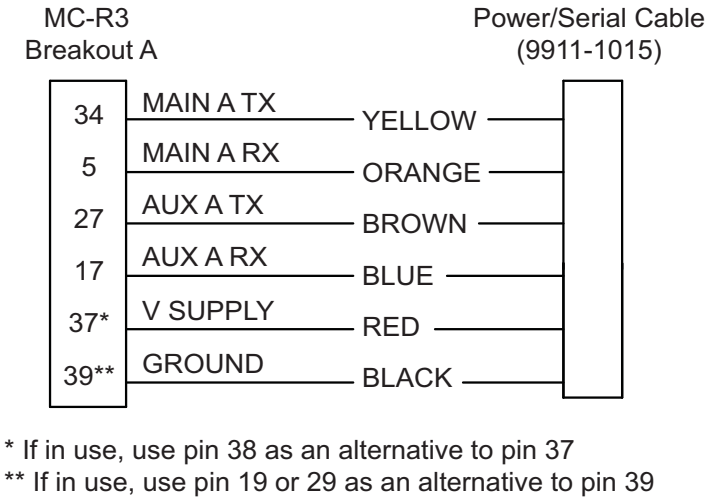

Figure 14. Power/Serial to MC-R3 Breakout A Cable Wiring Diagram

7. Connect the MC-R3 Breakout A cable to the MC-R3 Controller, slide the rubber boot back into place, and tighten the Breakout B Connector screw.

SL-100 and SL-R3 Antenna Installation

Install the SL-100 and the SL-R3 antenna on your machine where appropriate.

SL-100 Cable Connection

Connect the following cables to the SL-100

From the MC-R3 Controller Cable

- 9911-1014 - Ethernet Cable (Black Connector)
- 9911-1015 - Power Cable (Grey Connector)

From the SL-R3 Antenna

- 9050-18 - SL-R3 Antenna

Notes:

SL-100 Configuration

To use the GX-60 Display to configure the SL-100:

Enter SiteLINK Configuration Tool Web Interface

1. Power up your 3DMC SiteLINK system by turing on the GX-60 display. The SL-100 and MC-R3 controller powers up with the GX-60.
2. Start Windows® Internet Explorer on the GX-60 Display.
3. Using the on-screen keyboard, type 192.168.0.1 into Internet Explorer's address bar to connect to the SiteLINK Configuration Tool web interface.

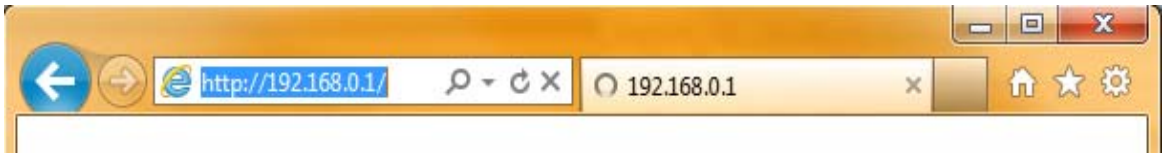

Figure 1. Access SiteLINK Configuration Tool Web Interface

4. When prompted for the user name and password, enter "**admin**" for both.

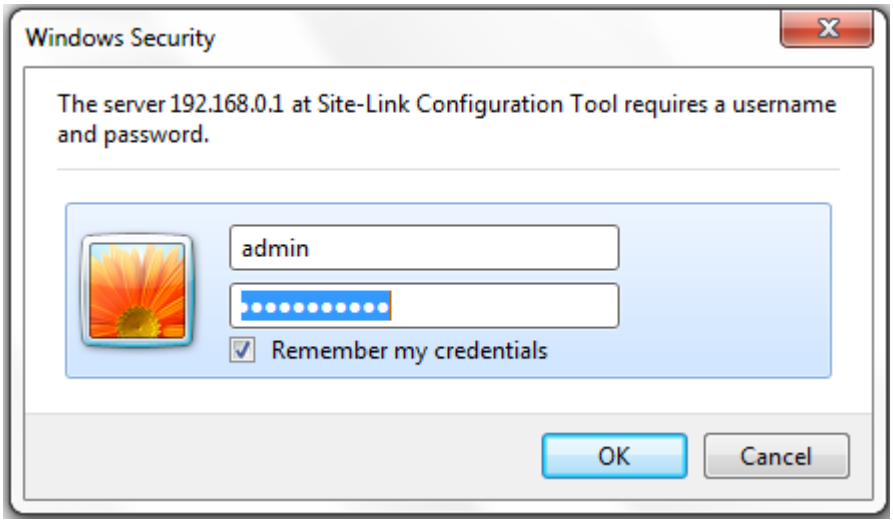

Figure 2. Enter SiteLINK Username and Password

Check SL-R3 Firmware

The firmware version is listed at the top of every page (Figure 3).

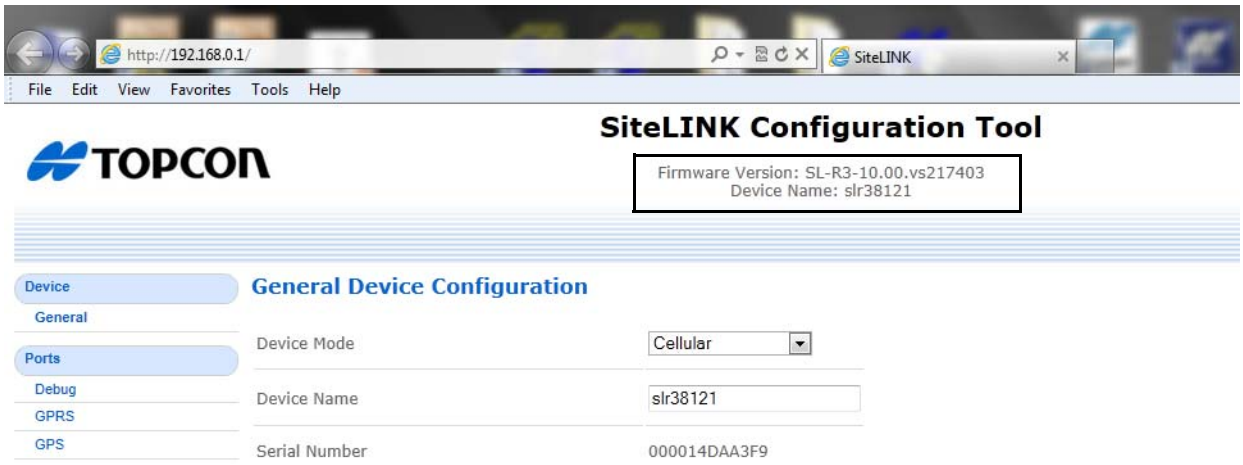

Figure 3. Firmware Version

If the firmware needs upgrading, click **Admin** --> **Firmware** on the left side of the page and load the new firmware (Figure 4).

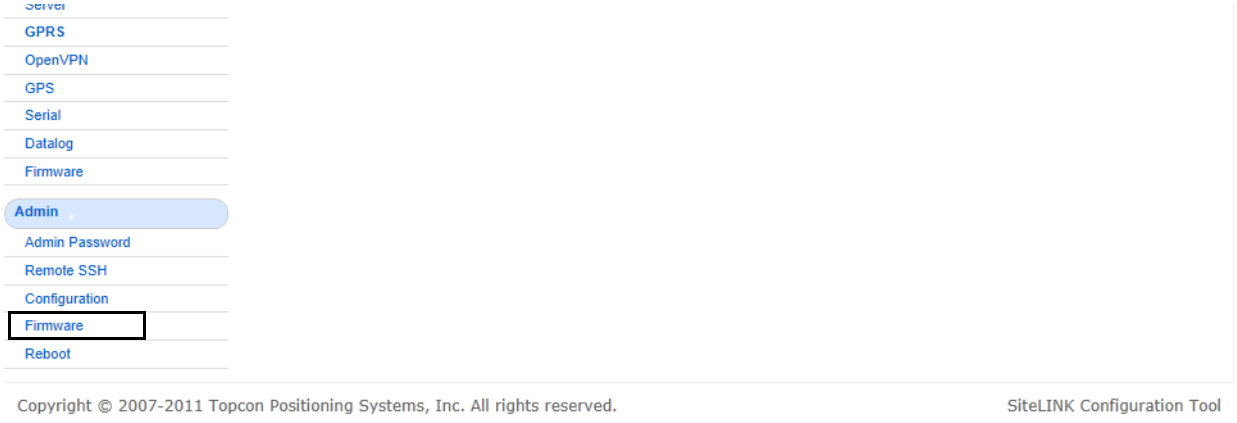

Figure 4. Load New Firmware

Configure SL-100 for Cellular

1. Click **Device --> General** on the left side of the page to enter the ***General Device Configuration*** page (Figure 5).

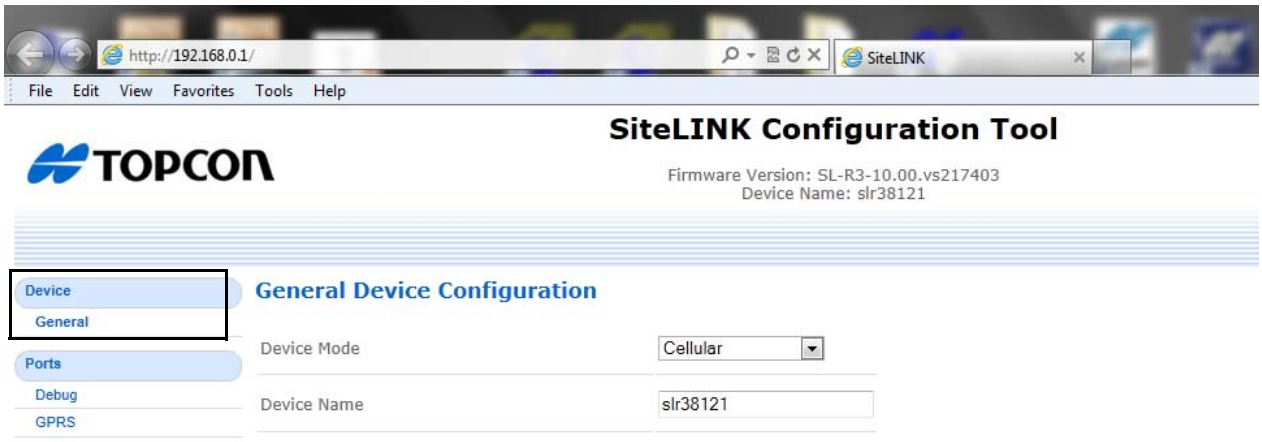

Figure 5. Configure Device Mode to Cellular

2. Check that the ***Device Mode*** is set to **Cellular** (factory default). See Figure 6.
   - If the ***Device Mode*** is set to **Cellular**, skip step 3 and go to "Configure SIM Card (GPRS)" on page 1-15.
   - If the ***Device Mode*** is not set to **Cellular**, select **Cellular** from the ***Device Mode*** drop-down menu, and press **Save**.

NOTICE

Do not choose any option other than cellular.

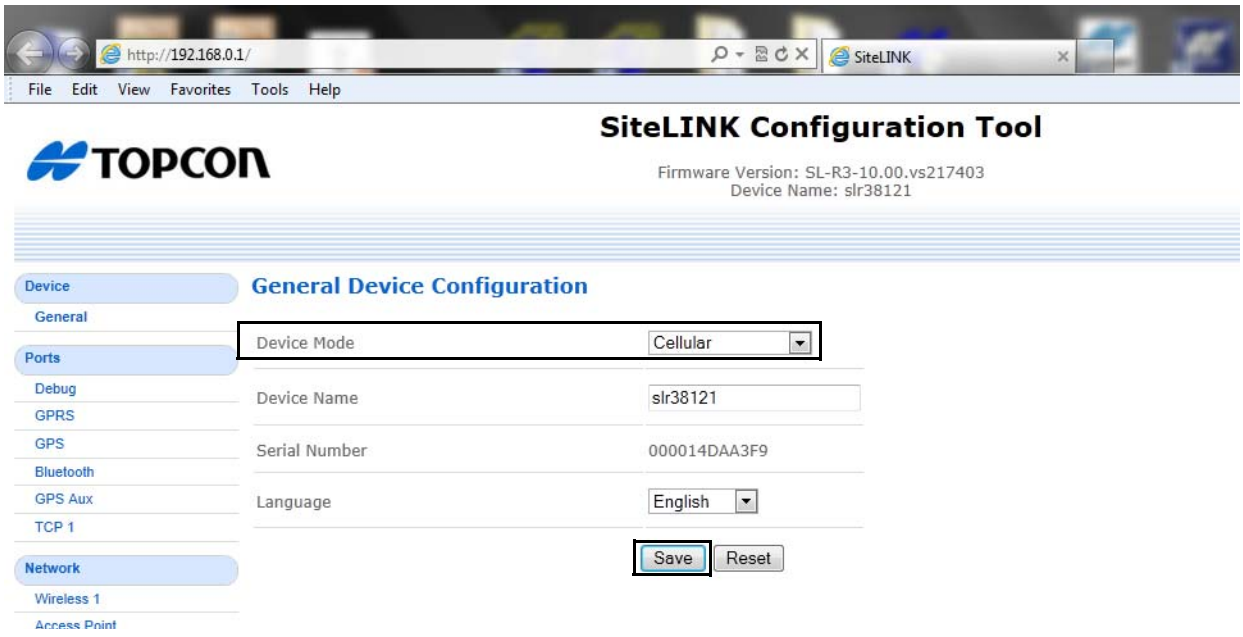

Figure 6. Device Mode - Cellular

3. Click **Admin** --> **Reboot** on the left side of the page to enter the ***Reboot*** page, and press **Reboot**.

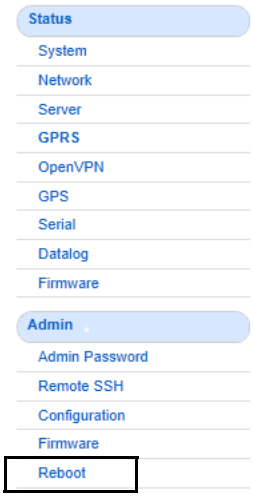

Figure 7. Reboot

Configure SIM Card (GPRS)

1. Click **Ports** --> **GPRS** to enter the ***GPRS Port Configuration*** page (Figure 8).
2. Set the ***Function*** to **GPRS Dialup.**
3. Set the ***APN***, ***Username***, and ***Password*** as required by the SL-100's SIM card. Your cellular carrier provides this information.

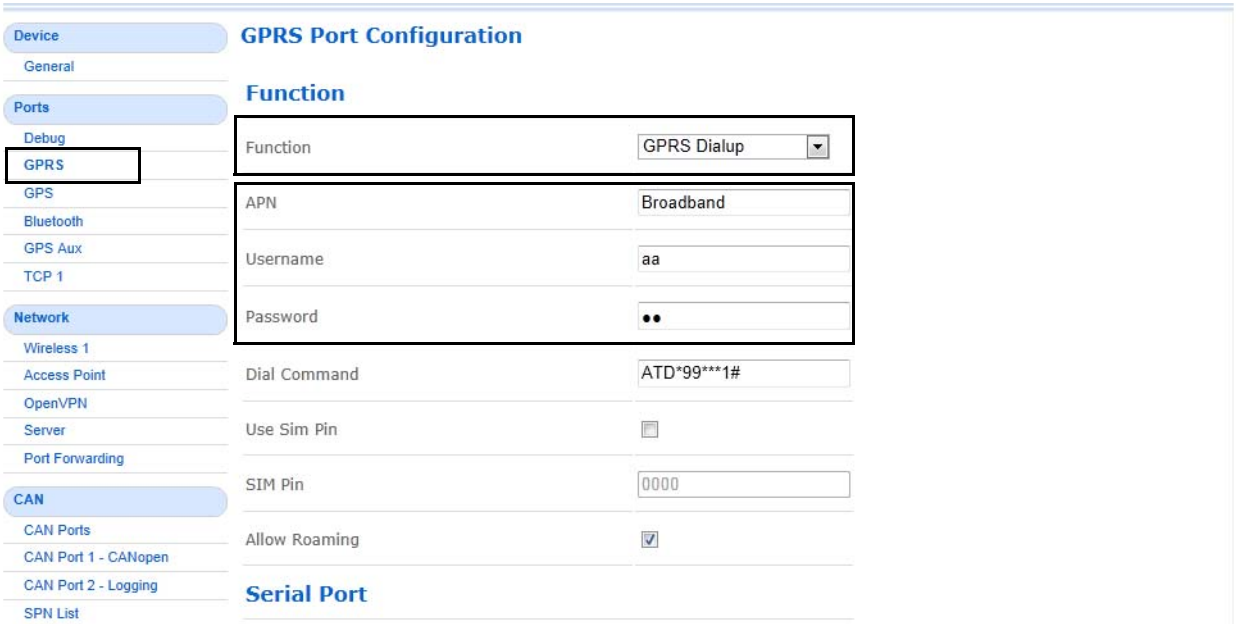

Figure 8. Configure SIM Card

4. To confirm the cellular connection, click **Status** --> **GPRS** to enter the ***GPRS Status*** page (Figure 9).
5. Check that the ***SIM Status*** displays **Ready**, and monitor that, after a few minutes, the ***Status*** displays **Connected**.

NOTICE

As the ***GPRS Status*** page does not automatically update, it is necessary to press the refresh button on the browser from time to time while waiting for the ***Status*** to display **Connected**.

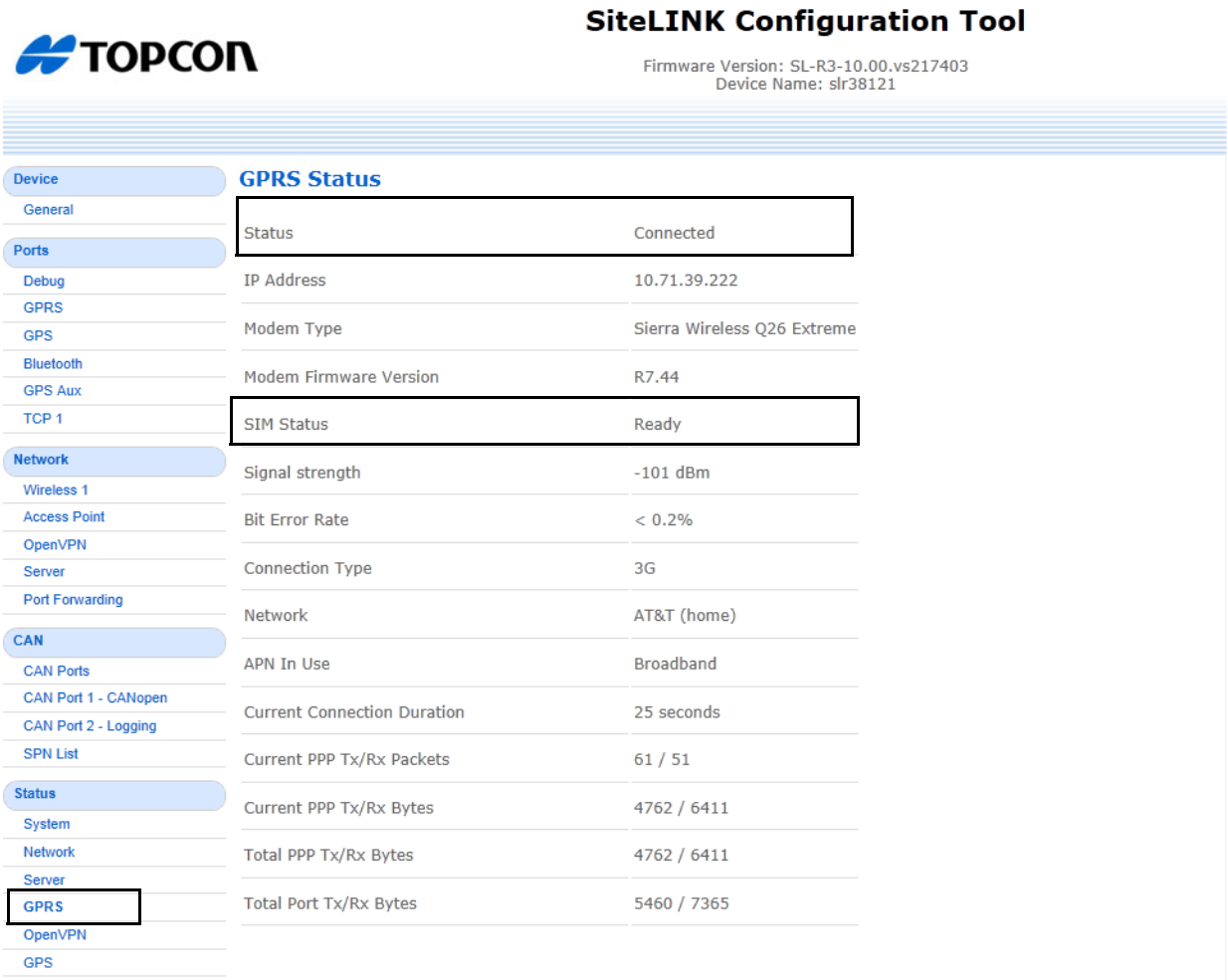

Figure 9. Confirm Cellular Connection

Configure VPN (If Running VPN on the SiteLINK Server)

1. Click **Network** --> **OpenVPN** to enter the ***Open VPN Status Connection*** page (Figure 10).
2. Check the ***OpenVPN Enabled*** and Check box.
3. Press **Browse** to select the VPN Configuration file supplied by the SiteLINK Server administrator.

4. After selecting the VPN Configuration file, press **Save**.

NOTICE

If you are not running VPN, do not check the ***OPENVPN Enabled*** check box.

Figure 10. VPN Configuration

Configure SiteLINK Server

1. Click **Network** --> **Server** to enter the ***SiteLINK Server Configuration*** page, and enter the information as given by the SiteLINK Server Administrator.

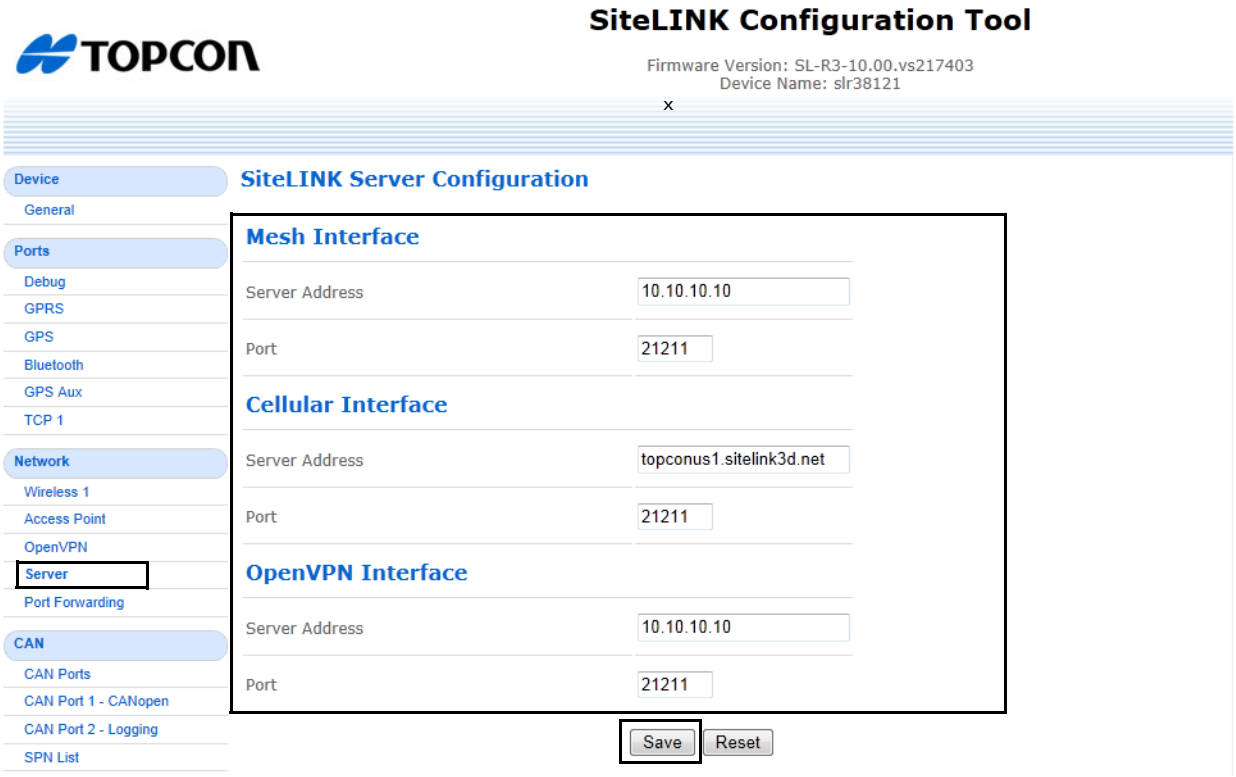

Figure 11. SiteLINK Server Configuration

2. To check the SiteLINK server status, click **Status** --> **Server** to enter the ***Server Status*** page, and confirm that the ***Connection Status*** displays **Connected**.

NOTICE

If you plan to use GPS corrections from the SiteLINK Server, your SiteLink Administrator must configure the server to output GPS corrections.
The GPS Status on the ***Server Status*** page should be OK.

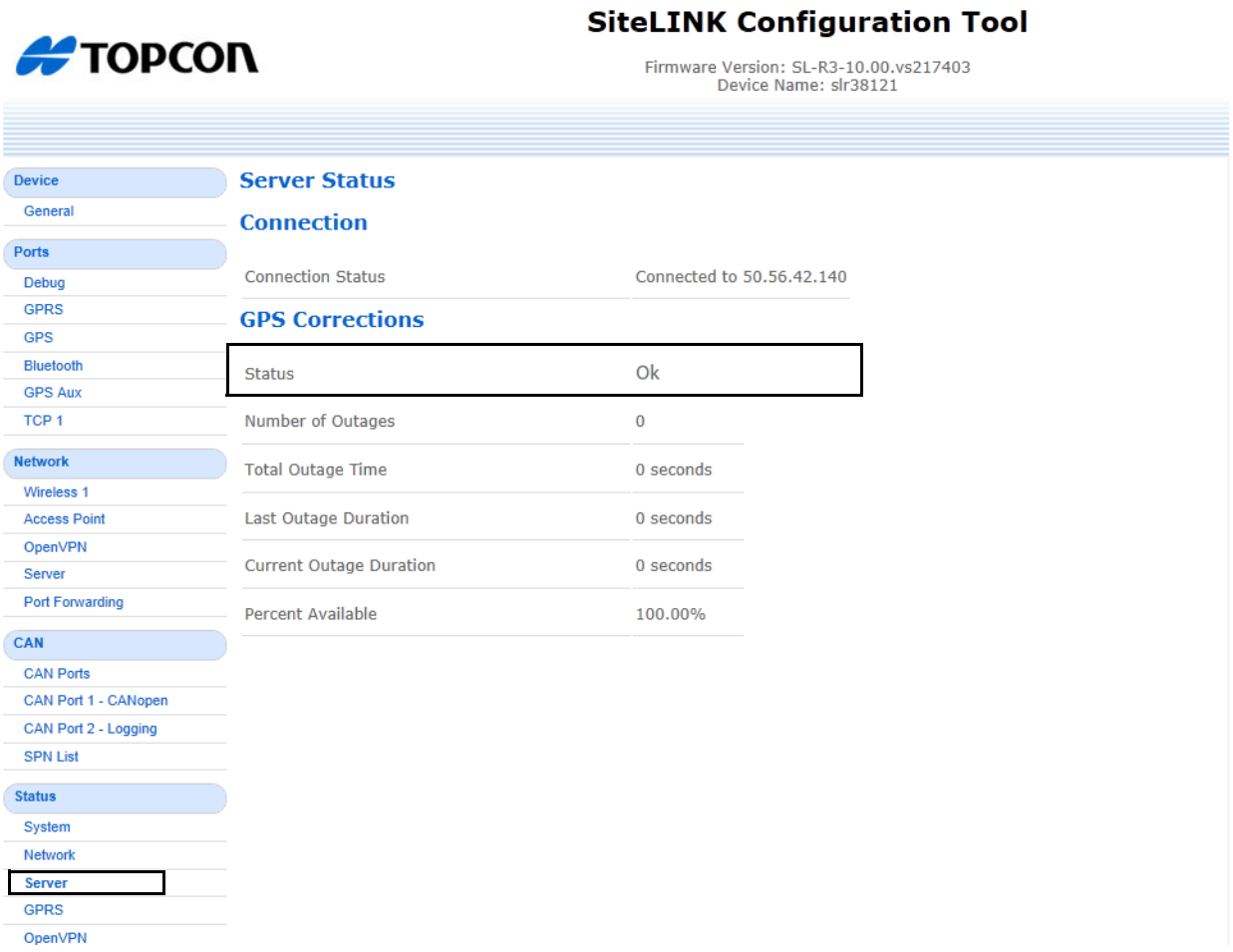

Figure 12. SiteLINK Server Status

Check OpenVPN Status (If Running VPN)

Click **Status** --> **OpenVPN** to enter the ***OpenVPN Status*** page.

Check that the ***Connection Status*** displays **Connected**.

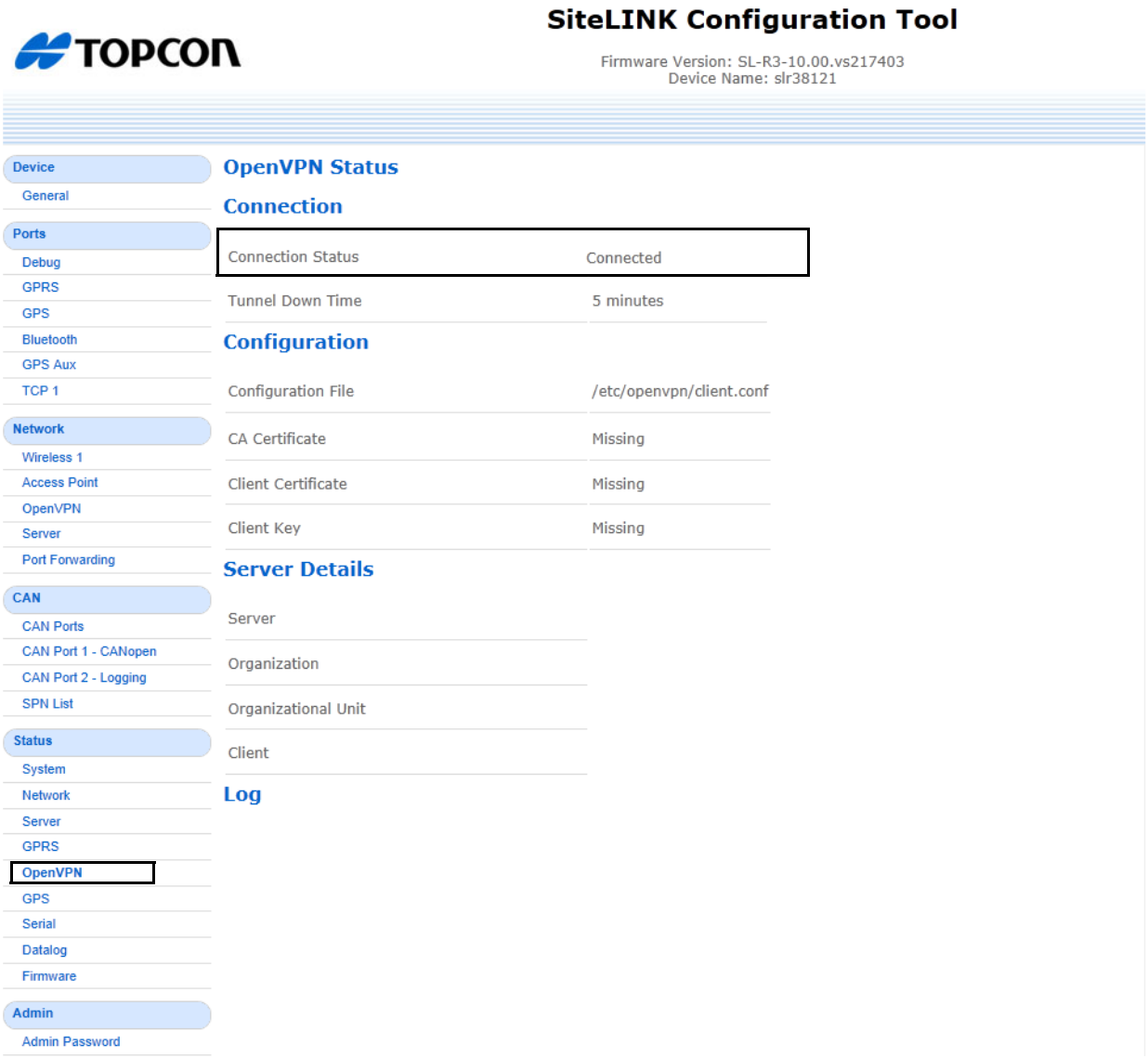

Figure 13. OpenVPN Status

3DMC Configuration

Install 3DMC SiteLINK Authorization Codes

1. Tap **Topcon Logo** --> **View** --> **About 3DMC**.

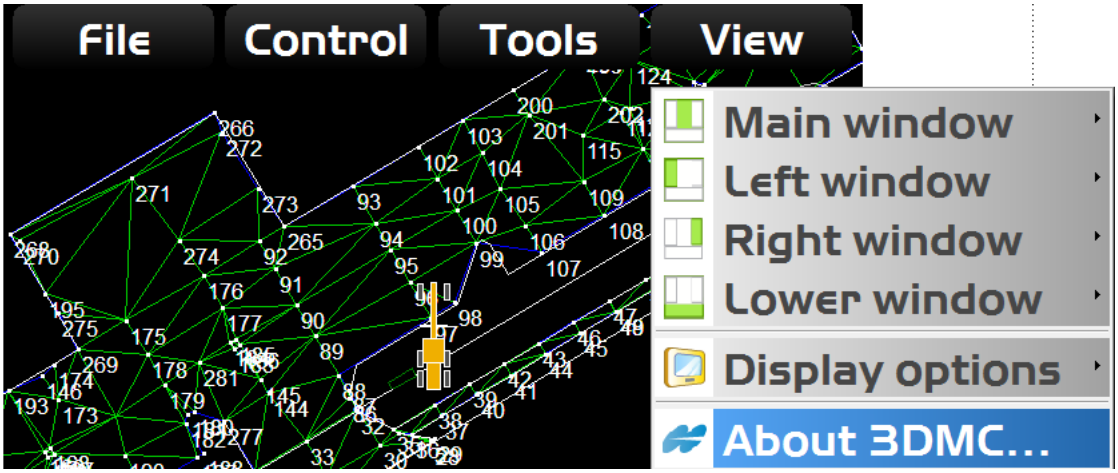

Figure 14. About 3DMC Menu Selection

2. Tap **Options** --> **Modify** to display the ***Site-Link Connection*** **screen**

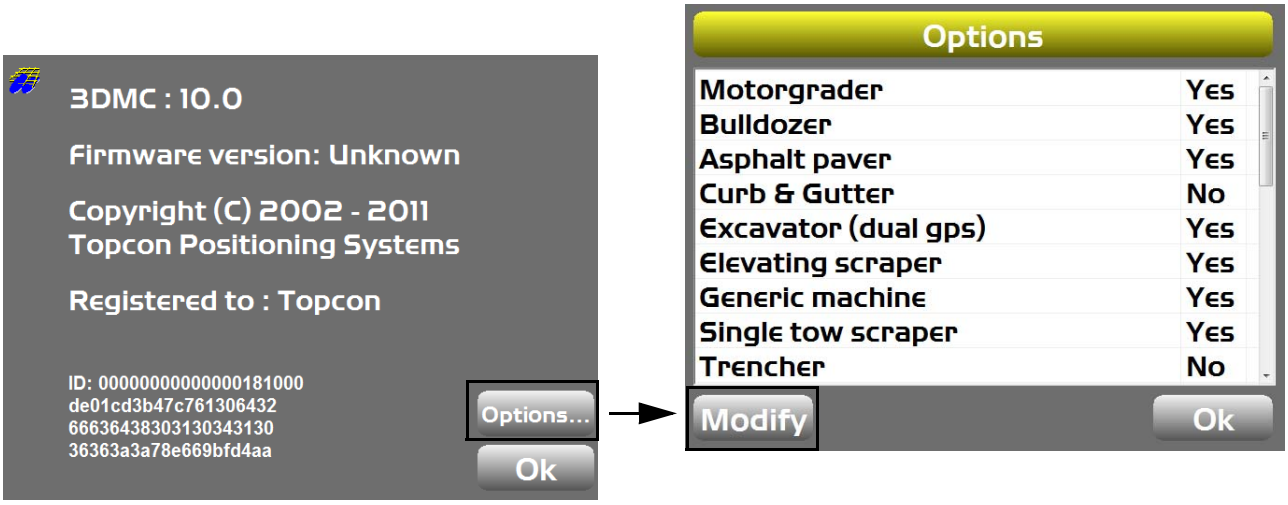

Figure 15. About 3DMC and Options Screens

3. Enter the ***Authorization code*** provided by your dealer or SiteLINK administrator, and press **Ok** (Figure 16)

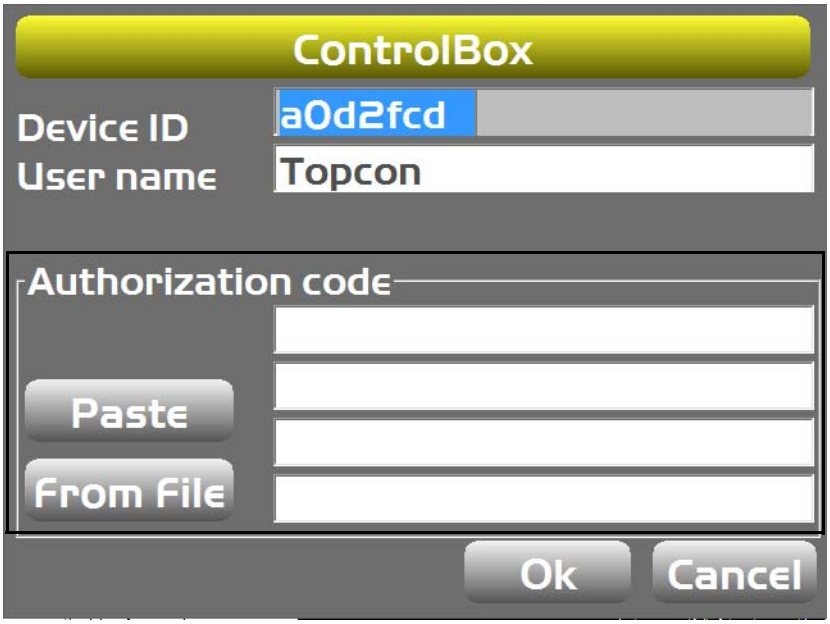

Figure 16. 3DMC SiteLINK Server Connection

Connecting to the SiteLINK Server

1. Tap **Topcon Logo** --> **Tools** --> **Site-Link** --> **Network connection**.

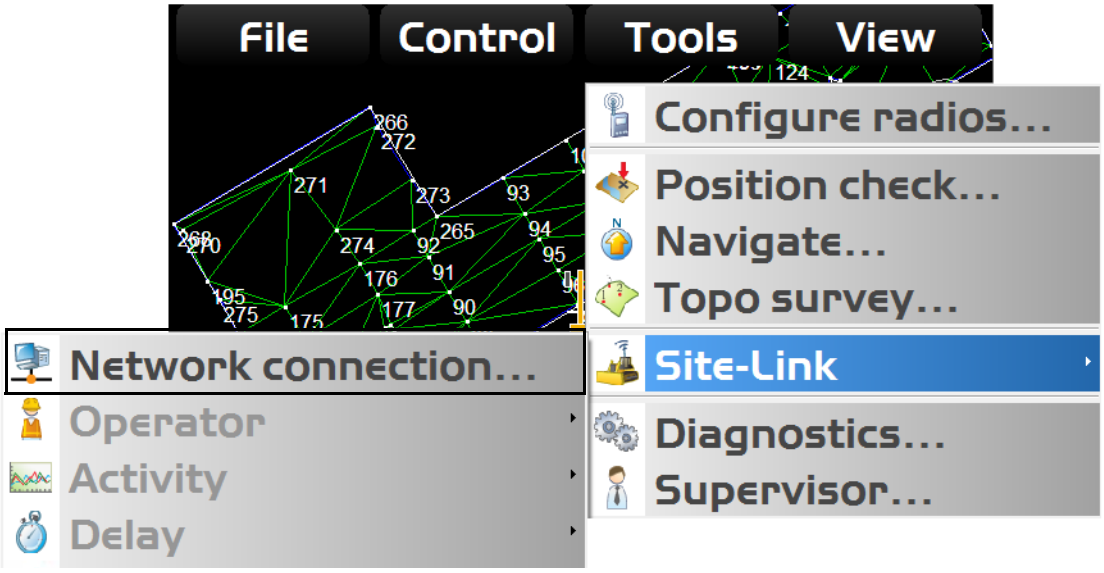

Figure 17. 3DMC SiteLINK Server Connection

2. Tap the **Wrench** icon  to the right of the ***Server*** field, and use the on-screen keyboard to enter the SiteLINK Server IP address and Port in the format XXX.XXX.XXX.XXX/ PPPPP where X is the IP address and P is the Port Number as provided by the SiteLINK server administrator (Figure 18). Press **Ok**.

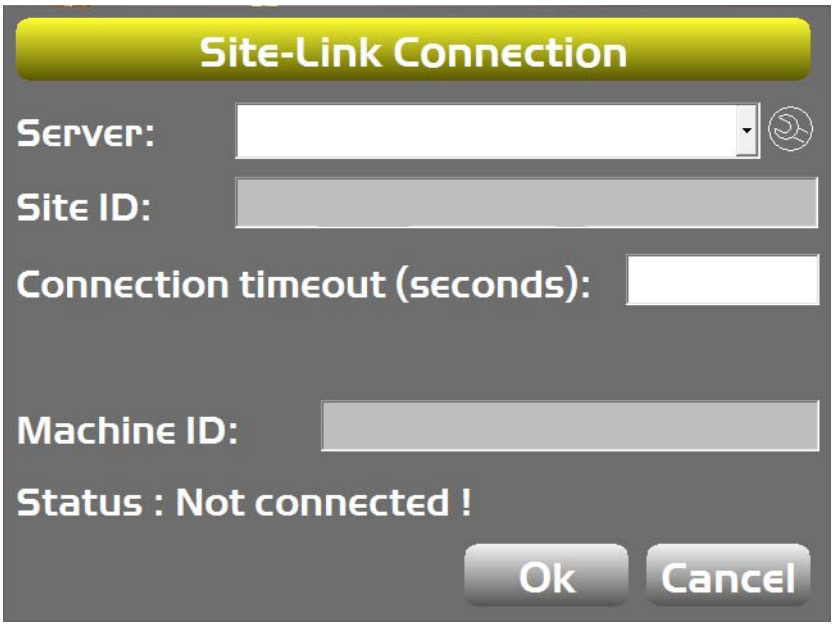

Figure 18. 3DMC SiteLINK Server Connection

SiteLINK Direct

If the SiteLINK server is configured to output RTK corrections (by your SiteLINK administrator), you can configure 3DMC to use RTK corrections from the SiteLINK Server.

1. In 3DMC, in the machine builder ***GPS radio configuration*** screen, select **SiteLINK Direct** as the ***Radio type***.
2. For ***Connected to***, select **Serial Port B**.
3. Set the ***Format*** to match format that the SiteLINK server is configured to output (**CMR**, **CMR+**, or **RTCM 3.x**).

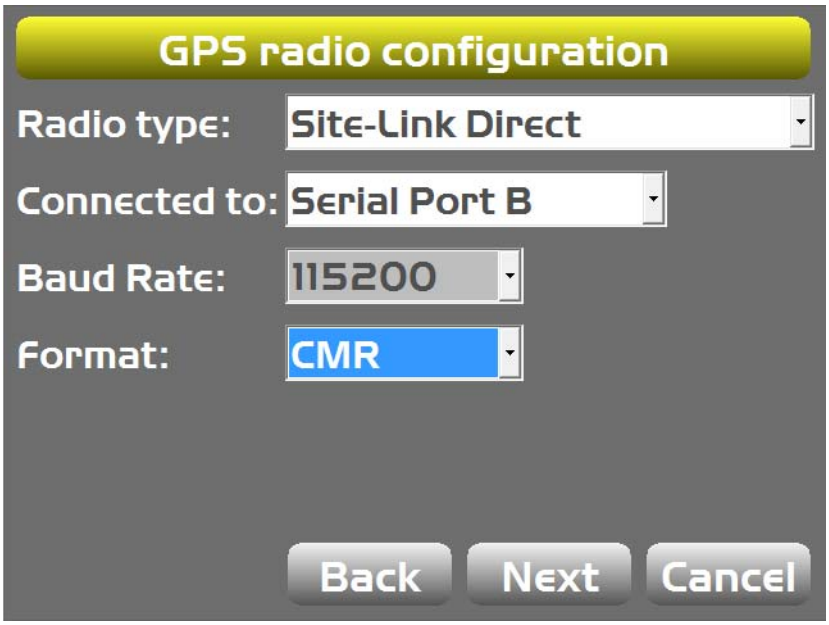

Figure 19. 3DMC SiteLINK Server Connection

Direct Network Connection

Direct network connection is another option to establish a network connection through the SL-100.

1. In 3DMC in the machine builder ***GPS radio configuration*** screen, select **Direct Network Connection** as the ***Radio type*** (Figure 19).
2. For ***Connected to***, select **Serial Port B**.
3. The ***Format*** field automatically updates when the net mount point is selected in a later step.
4. Press the Set and enter the Ntrip server IP address and port in the format xxx.xxx.xxx.xxx/pppp (provided by your Topnet [NTRIP] Server administrator).
5. Press the **Net** and enter in the NTRIP User name and Password (provided by your Topnet [NTRIP] Server administrator). The network type if you are running off Topnet is VRS.
6. Connect to the GPS.
7. Press **Tools** --> **Configure radio** --> **Configure,** and then press the **Wrench** icon to download the mount points.
8. Select the required mount point, and 3DMC will connect to the NTRIP Server and begin receiving GPS corrections.

SL-100 LED Status

POWER LED (GREEN)		
ICON	COLOR	STATUS
	Solid Green	On
	No Light	No power

TRANSMITT LED (GREEN/RED/AMBER)		
ICON	COLOR	STATUS
	No Light	No power
	Amber	Booting
	Green Flash	Not connected to SiteLINK Server (No GPRS connection information)
	Solid Green	Connected to SiteLINK Server but not receiving RTK corrections
	Solid Green w/Red Flash	Connected to SiteLINK Server and receiving GPS corrections

BLUETOOTH® LED (BLUE)		
ICON	COLOR	STATUS
	Solid Blue	Bluetooth connection enabled and operational
	No Light	Bluetooth connection unavailable

Safety Warnings

RF Radiation Hazard Warning

To ensure compliance with FCC and Industry Canada RF exposure requirements, this device must be installed in a location where the antennas of the device will have a minimum distance of at least 20 cm from all persons. Using higher gain antennas and types of antennas not certified for use with this product is not allowed. The device shall not be co-located with another transmitter.

Installez l'appareil en veillant à conserver une distance d'au moins 20 cm entre les éléments rayonnants et les personnes. Cet avertissement de sécurité est conforme aux limites d'exposition définies par la norme CNR-102 at relative aux fréquences radio.

Regulatory Information

IC Statements

This Class (A or B) digital apparatus complies with Canadian ICES-003.

The term “IC:” before the radio certification number only signifies that Industry Canada technical specifications were met.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to thefollowing two conditions: (1) this device may not cause interference, and (2) this device must accept anyinterference,including interference that may cause undesired operation of the device.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio

interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Déclaration de conformité IC:

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

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Ce matériel respecte les standards RSS exempt de licence d'Industrie Canada. Son utilisation est soumise aux deux conditions suivantes:

(1) l'appareil ne doit causer aucune interférence, et

(2) l'appareil doit accepter toute interférence, quelle qu'elle soit, y compris les interférences susceptibles d'entraîner un fonctionnement non requis de l'appareil.

Selon la réglementation d'Industrie Canada, ce radio-transmetteur ne peut utiliser qu'un seul type d'antenne et ne doit pas dépasser la limite de gain autorisée par Industrie Canada pour les transmetteurs. Afin de réduire les interférences potentielles avec d'autres utilisateurs, le type d'antenne et son gain devront être définis de telle façon que la puissance isotrope rayonnante équivalente (EIRP) soit juste suffisante pour permettre une bonne communication.

REV	Description	ECO

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ISO 9001:2000
FM 68448

SL-100 Installation and Setup Guide
P/N: 10000226-01 Rev A