INTRODUCTION

The purpose of this kit is to be able to effectively retrofit a 20330x Series Turnkey enclosure, currently utilizing a Storm3 datalogger with internal 3G modem, to use an external 4G-LTE compatible modem.

ADDITIONAL MATERIALS REQUIRED

• Paper towels/rags
• Industrial adhesive remover such as Goo Gone
• Putty knife
• Possible additional tools required
• Step-drill bit with 1- inch or 25.4-26mm step
  • Lennox 30882VB2 or similar
• Drill driver
• Shop vac
• Masking paper
• Masking tape

CAUTION
Before beginning any physical rework, remove the battery from the enclosure and open all fused connections. If the system has AC Mains power, also disconnect the mains power.

INSTALLATION GUIDE CONTENTS:

1. Safety Precautions
2. Additional Materials Required
3. Actual Steps to Retrofit Enclosure
6 Steps to Perform:

**STEP 1: OBTAIN THE STORM CENTRAL REGISTRATION ID**

Go to [https://stormcentral.waterlog.com/index.php](https://stormcentral.waterlog.com/index.php) and log in with your credentials. Click on Administration at the top of the page. Copy down the Registration Id, Be Careful this is a case sensitive code. The alphanumeric code will be used to re-register the system to your storm central account.

**STEP 2: ASSESS THE CURRENT ANTENNA**

The 203225 retrofit kit includes a replacement antenna. If your Turnkey enclosure has the optional 203292-xx external antenna assembly installed, antenna element replacement is not required. Disconnect the antenna connector from the Storm datalogger and proceed to install the modem in step 4.

If your enclosure utilizes the 360062 black puck antenna supplied with Storm3-0x datalogger, replace this antenna with the Antenna provided in the 203225 kit by following step 3.
STEP 3: ANTENNA REMOVAL PROCEDURE (if required)

a
Remove the Antenna connector from the Storm datalogger and then remove the nut securing the Antenna to the enclosure. The cable may be cut as the antenna will be discarded.

b
There is a foam gasket adhered to the enclosure. To remove the antenna from the enclosure, use a putty knife to carefully split the foam between the antenna body and enclosure wall.

DO NOT ALLOW THE KNIFE TO GOUGE THE ENCLOSURE SURFACE.

Leave the portion of the gasket attached to the enclosure, it is removed in a later step.
Locate the red plastic washer supplied with the antenna. Check the size of the mounting hole using this washer. It should pass through the hole in the enclosure. If it does not, the hole must be opened as shown below.

**Hole opening procedure (if required)**

1. Apply masking tape and paper to protect the electronics from any drilling debris.

2. Use the step drill to open the hole to 1.0 inches (25.4mm).

3. Vacuum all debris from inside and outside enclosure.

The old antenna gasket must be removed for proper sealing of the new antenna.
e. Install the new antenna
   i. The red washer should sit recessed into the hole to center the antenna.
   ii. The oversize stainless steel washer lies just below the red washer.
   iii. The lock washer and nut secure the antenna to the enclosure.
   iv. Once the modem is installed, connect the antenna to the RV-50 modem “cellular” port

STEP 4: INSTALL THE MODEM

a. Verify Installation of the activated sim card (sold separately with activation service or provided by customer)
Pre mount the RV-50 modem onto the Din Rail Mount as shown. The screws to assemble this are provided with the Din Rail Mount. Ensure the release clip is oriented as shown.

Remove the two screws in the Top-right of the enclosure, 1 on the back panel and 1 on the battery bracket. Set these aside, they will be reinstalled.

Place the supplied aluminum bracket as shown and reinstall the two screws.
e  Attached the short section of din rail to the aluminum bracket using the provided #6 screws and #10 washers.

f  Clip the Pre-assembled modem to the DIN rail as shown

g  Place the provided DIN rail clamps on either side of the modem and tighten using the central screw.

h  Attach the antenna cable to point 1 the "Cellular" port on the RV-50 modem. Point 2 will accept the power cable.
Connect the Ribbon cable from the 9-pin port on the RV-50 (point 3) to the RS-232-COM port on the STORM3 Datalogger. If the RS-232 port is not available, the instrument on the port must be reallocated to the RS-485 port either through settings or with a signal adapter.

Secure the connections with the provided #4 screws.

Wire the modem power cable and install the supplied 2A slow-blow fuse.

Wiring diagram overview
ii. Wiring diagram Detail, modem power connection at datalogger

iii. Wiring diagram Detail, modem power connection at terminal block

Reinstall system battery and startup system by closing the fuse
Log into the Storm 3 Datalogger via Wifi or direct connect through the USB mini B port. For details on connecting to the Storm, see the Storm 3 Getting Started Guide. Go to the Outputs tab on the left and click the Communications Port Setup. Make sure the RS-232 Com mode is set to “Modem” and that all the settings match these values:

RS-232 Com settings
i. Baud Rate: 115200
ii. Data Bits: 8
iii. Parity: None
iv. Stop Bits: 1

Go to Modem Setup. For COM port select RS-232, Under Model choose: “LS300(CDMA)” (the LS-300 is Sierra wireless immediate predecessor to the RV-50i). Set the Power control to “+12Vswd”, Set Power mode to “Automatic”, change the Timeout Length to 40 then press Begin Test. If the test fails, refresh the page, check settings, and try again.

Once the test passes you should see
i. Connection Status: Active
ii. Signal Strength
iii. Network Status: Network Ready
iv. An IP address should be displayed
To monitor system power consumption, verify that the “System Battery” is setup in the Defined Sensors list, system temperature is also recommended.

Go to Storm Central Setup under configuration.

1. Set Transmit Rate according to your data management plan (usually set to 15 mins)
2. Transmitting: Enabled
4. Enter in the Storm Central Registration ID obtained in step 1 then click “Verify Registration”.

You are now registered to Storm Central. Ensure two Transmit Rate periods have passed and verify data on Storm Central.

**STEP 6: VERIFY THE PROGRAMMING OF THE MODEM**

Activate power for the modem: Access the Storm3 datalogger and go the Outputs tab and Modem Setup section. Under troubleshooting change +12Vswd power to “ON”

**THIS STEP MUST BE REVERSED AS SHOWN AT THE END OF THIS PROCEDURE TO PREVENT EXCESSIVE POWER DRAIN**
NOTE: Modem purchased from YSI Integrated Systems come preconfigured. If section 5 fails or the modem has to be factory reset for any reason, follow the procedure below to establish connection.

**b** Connect the RV-50 to your PC via USB, Ethernet or wireless


iii. Wireless connection method: Type http://XXX.XXX.XXX.XXX:9191 into your web browser. (where the X is the IP Address of the modem assigned by the wireless provider)
   - username(default): user
   - password(default): 12345

**c** Do not leave the default password active. Immediately change your password!

**d** On the status tab make sure you have an active WAN IP Address and the Network State says “Network Ready”. If it is not then establishing coms to Storm Central will not work.

**e** Go to the Services tab and select Disable from the Remote Access drop down list.
Go to the Serial tab and check Serial Port Settings on RV50 modem. Most if not all settings are default and should match to the screen shot to the left.

“Configure Serial Port” row should match (115200,8N1) and breaks out as follows.
iv. Baud Rate: 115200
v. Data Bits: 8
vi. Parity: None
vii. Stop Bits: 1

Verify the Additional settings under Advanced, TCP, and UDP. If these setting are not visible, Scroll through selection on left side panel to view.
If any changes are made the field, they will highlight in yellow, click Apply in the right upper corner then Reboot.

Access the Storm3 datalogger and go the Outputs tab and Modem Setup section. Under troubleshooting change +12Vswd power to “OFF”.

Return to step 5 to test the modem connection and power controls through the Storm3 logger. The Modem should now activate, transmit, and shutdown with each transmit cycle.

For more information:

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