

Installation Guide Modem Kit • D116-03 October 1, 2019

203228 Modem Kit for 20330x Turnkey Enclosures

INTRODUCTION

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



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.

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



Figure 1: 20330x Series Turnkey Enclosure with Storm 3 Data Logger and Modem Kit

INSTALLATION GUIDE CONTENTS:

- 1. Safety Precautions
- 2. Additional Materials Required
- 3. Actual Steps to Integrate Enclosure



6 Steps to Perform:

OBTAIN THE STORM CENTRAL REGISTRATION ID

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Go to <u>https://stormcentral.waterlog.com/index.</u> <u>php</u> and log in with your credentials. Click on 'Administration' at the top of the page, then 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.

CENT	RAL
TER	
	SITES NETWORKS ALARMS REPORTS C
Sites	
Registration ID: Public URL: ht	tp://stormcentral.waterlog.com/public/

Figure 2: Log in to Storm Central with your credentials



ASSESS THE CURRENT ANTENNA

The 203228 modem 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.



Figure 3: Showing the optional 203292-xx external antenna assembly installed



Figure 4: Replace the 360062 black puck antenna with the antenna provided in the 203228 kit

If your enclosure utilizes the 360062 black puck antenna supplied with Storm3-0x datalogger, replace this antenna with the antenna provided in the 203228 kit by following step 3.

ANTENNA REMOVAL PROCEDURE (if required)

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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.



Figure 5: Remove the antenna connector

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.



Figure 6: Showing the foam gasket adhered to the enclosure



Figure 7: Showing portion of gasket still attached to the enclosure



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.



Figure 8: Locate the red plastic washer supplied with the antenna



Hole opening procedure (if required)

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

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

iii. Vacuum all debris from inside and outside enclosure.



Figure 9: Hole opening procedure (if required)

The old antenna gasket must be removed for proper sealing of the new antenna.



Figure 10: Remove the remains of the old antenna gasket

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-50X modem "cellular" port.



Figure 11: Install the new antenna



Figure 12: Secure the antenna to the enclosure

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INSTALL THE MODEM

Verify installation of the activated sim card (sold separately with activation service or provided by customer)



Figure 13: Verify the installation of the activated sim card



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Pre mount the RV-50X 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.



Figure 14: Ensure the release clip is oriented as shown





Figure 15: Remove the two screws in the top-right of the enclosure



Place the supplied aluminum bracket as shown and re-install the two (2) screws.



Attach the short section of din rail to the aluminum bracket using the provided #6 screws and #10 washers.



Figure 17: Attach the din rail to the aluminum bracket



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Clip the pre-assembled modem to the DIN rail as shown (figure 18).





Figure 18: Clip the pre-assembled modem to the DIN rail

Attach the antenna cable to point 1 the "Cellular" port on the RV-50X modem. Point 2 will accept the power cable.



Figure 19: Attach the antenna cable to point 1 on the modem



Connect the ribbon cable from the 9-pin port on the RV-50X (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. <u>Contact ISS for</u> <u>an adapter kit.</u>



Secure the connections with the provided #4 screws

Wire the modem power cable and install the



Figure 20: Connect the ribbon cable



Figure 21: Wiring diagram overview

supplied 2A slow-blow fuse.

i. Wiring diagram overview

ii. Wiring diagram detail, modem power connection at datalogger.



Figure 22: Wiring diagram detail - modem power connection at datalogger



Figure 23: Wiring diagram detail - modem power connection at terminal block



Figure 24: Re-install the system battery

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

Re-install system battery and startup system by

closing the fuse.

SET UP THE STORM



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Log into the Storm 3 Datalogger via Wi-Fi 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



Note: If the test fails, refresh the page, check settings, and try again.



Figure 25: Make sure the RS-232 Com mode is set to 'Modem', and that all the settings match the listed values

	Storm 3
	Modem Setup
Home Sensors	Modem Settings COM Port: R5-232 Com Power Control: +12Vswd *
🕼 Outputs	Model: LS300 (CDMA) V Power Mode: Automatic V
Connectivity Communication Ports Setup Statilitie Communication Setup Undermited Setup Undermited Setup Unders Statup Storm Central Setup Storm Central Setup Modbur Save	CDMA Settings NOTE: CDMA modem sreuid@ one-time activation prior to first use. Please refer to the modem manufacturer's documentation for proper activation. Connection Information Timeout Length: I Test Connection: Last Connection Status: Idle Last Connected Signal Strength X+III /VA N/A IP Address: N/A N/A Signal Strength and status here
	Troubleshooting
	+12Vswd Power: Off Send Modem Command:
	Command Timeout (sec): 15

Figure 26: Modem setup in the Storm 3



Figure 27: Values shown when the test passes



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.

i. Set Transmit Rate according to your data management plan (usually set to 15 mins)

- ii. Transmitting: Enabled
- iii. Connect using: Modem.

iv. 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.





Storm Central Setup	
Storm Central Settings	
Transmit Rate: 00	0:15:00
Transmitting: Enal	bled 🗸
Connect Using: Mo	dem 🗸
Storm Central Commu	nication
Server Type:	Storm Central 🗸
Server Address:	stormcentral.waterlog.cor
Registration ID:	
Registration Status:	Success - Site registered successfully with Storm Central
Registration Options:	Verify Registration
-	

Figure 29: Storm Central Setup located under Configuration



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.

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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

Connection Information
Timeout Length: 40
Test Connection: Begin Test
Connection Status: Idle
Last Connected: N/A
Signal Strength: 🕺 N/A
Network Status: N/A
IP Address: Connection Failed
Troubleshooting
+12Vswd Power: On 🔻
Send Modem Command: AT Send

Figure 30: Change +12Vswd power to 'ON'



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

i. Direct connection method (USB Cable): Type http://192.168.14.31:9191 into your web browser. Internet Explorer is preferred.

ii. Ethernet Port: Type http://192.168.13.31:9191 into your web browser.

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



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



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.

LOGIN			
User Name:	user		
Password:		Log In	

Figure 31: Wireless connection method of RV-50X to PC

Status WAN/Cellular	LAN VPN Securit	/ Services	Location	Events Reporting	Serial	Applications	I/O		
Last updated time : 1/7/2019 2:2	8:15 PM					Expand A	.] 4		
Home	110-001								
Cellular	[-] General	-				_			
Ethernet	AT Network State	ouress		N	Network Ready				
LAN IP/MAC Table	IPv4 Network Inter	IPv4 Network Interface							
VPN	AT Customer Device I	AT Customer Device Name					LT54270227021025		
Security	Device Uptime	Device Uptime							
Services	[+] Advanced (DNS)	[+] Advanced (DNS)							

Figure 32: Active WAN IP Address and that the Network State says 'Network Ready'



Go to the Services tab and select 'Disable' from the 'Remote Access' drop down list.



Figure 33: Select 'Disable' from the 'Remote Access' drop down list



Go to the 'Serial' tab and check the serial port settings on RV-50X modem. Most if not all settings are default and should match to the screen shot to the left.

Status	WAN/Cellular	LAN	VPN	Security	Services	Location	Events Reporting	Serial	Applications	I/O
Last updal	ted time : 1/7/2019 2	:32:19 PM							Expand A	I A
R\$232 (Configuration		[1] B\$222							
Gener	al		R\$232	Port			1	nable 🗙		
PAD			AT Startup Mode Default					lormal (AT c	ommand) 🗸	
Reven	se Telnet		[-] RS232	Port Configura	ition					
PPP			AT Configu	ire RS232 Por	t			115200,8	N1	
SLIP			AT Flow C	ontrol				lone	~	
MODE	US		AT DB9 Se	erial Echo				Disable V		
LED Ind	licator		[-] Advand	ed						
			AT Assert	DSR			2	lways	~	
			AT Assert	DCD				n Data Mode	×	
			AT DTR M	ode				nore DTR	~	
			AT Quiet N	lode				lisable 🗸		
			AT AT Ver	bose Mode			Ŀ	erbose 🗸		
			AT Call Pr	ogress Result	Mode			lisable 🗸		
			AT Conver	t 12 digit Num	ber to IP Addr	855		lse as Name	• •	
			AT Disable	ATZ Reset			3	× ₩		
			Serial \	Vatchdog				lisable 🗸		
			Serial \	vatchdog Dela	iy (minutes)			U		

Figure 34: Check the serial port settings on the RV-50X modem

"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



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Verify the additional settings under Advanced, TCP, and UDP. If these setting are not visible, Scroll through selection on left side panel to view.

[-] General	
AT Device Port	12345
AT Serial MTU	1304
AT Destination Port	0
AT Destination Address	0.0.0.0
AT Default Dial Mode	UDP 🗸
AT Data Forwarding Timeout (.1 second)	1
AT Data Forwarding Character	0
LITCR	
[] TOP	
AT TCP Auto Answer	Enable 💙
TCP Persistent Connection	Disable 🗸
AT TCP Connect Timeout (seconds)	30
AT TCP Idle Timeout	5
AT TCP Idle Timeout Unit	Minutes 🗸
AT TCP Connect Response Delay (seconds)	0
Include Device ID on TCP Connect	Disable 🗸
[-] UDP	
AT UDP Auto Answer	Enable V
AT UDP Idle Timeout (seconds)	50
AT UDP Connect Last	Do not change S53 🗸
AT Allow Any Incoming IP	Allow only S53 🗸
AT Allow All UDP	No effect 🗸
AT UDP Auto Answer Response	No Response 🗸
AT Dial UDP Always	Disable 🗸
AT UDP Serial Delay (.1 second)	0
UDP Keepalive (seconds)	0
UDP Recovery Ping	0.0.0.0

Figure 35: Verify the additional settings under Advanced, TCP, and UDP

If any changes are made the field, they will highlight in yellow, click Apply in the right upper corner then Reboot

N	Security	Services	Location	Events Reporting	Serial	Applications	1	
						Expand A		
sage	from web	page				×		
Changes applied successfully. Please reboot the device when all changes are complete								
						ОК		

Figure 36: Click reboot after applying changes



Access the Storm3 datalogger and go to 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.

Troubleshooting		1	
+12Vswd Power:	Off 🔻		
Send Modem Command:		AT Send	
Command Timeout (sec):	15		
Command Response:			

Figure 37: Under the 'Modem Setup' section of the 'Outputs' tab, change +12Vswd power to 'Off'

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