Raven XT-Rogers Sierra Wireless Cellular Modem

INSTRUCTION MANUA

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Raven XT-Rogers Sierra Wireless Cellular Modem

1. General Description

This manual provides information for interfacing the Sierra Wireless Raven XT-Rogers cellular modem to Campbell Scientific dataloggers. A Sierra Wireless CD ships with the modem that includes Sierra Wireless manuals and software utilities. Sierra Wireless manuals referenced in this manual include:

Raven_XT_Quickstart.pdf Raven_XT_UserGuide.pdf

The Raven XT-Rogers digital cellular modem is manufactured by Sierra Wireless for use on the Rogers General Packet Radio Service (GPRS) network. The modem is accessed through the Internet using TCP/IP communications protocol using a Static or Dynamic IP address.

- A Static IP address is permanently assigned to a particular account and will always be used whenever the Raven connects to the Internet.
- A Dynamic IP address is assigned on a "need to have" basis. A dynamic IP address is used with a DDNS service (Section 5) to translate a dynamic IP address to a domain name, so that the Raven can be contacted as if it had a static IP.

A Rogers GPRS account can be setup for a Dynamic or static IP address. A data account with the VPN.COM APN as described in Section 2.1 is required for public access to the modem.

2. Establish Cellular Service

2.1 Raven XT-Rogers Cellular Coverage/Service Requirements

What you need:

Rogers GPRS coverage at the datalogger site (for a coverage map refer to: http://your.rogers.com/Store/Wireless/coverage/info.asp).

GPRS account established with Rogers.

Rogers will provide a SIM card for each modem. In most cases the SIM can be picked up at a local Rogers store. The SIM card must be installed inside of the modem as described in Appendix B.

Contact Rogers to setup an account. Ask for an "unrestricted data account for a GPRS modem". After the account has been setup, mobile termination will need to be configured onto the account, which is done by adding the "VPN.COM APN" to the account. Mobile termination makes the modem accessible through the internet. The APN name must be programmed into the modem as described in Section 5.1. When completed Rogers should provide you with the following information:

10-digit MSISDN number (used for billing) IP Address and APN for GPRS service

3. Specifications

3.1 Raven XT-Rogers Specifications

Sierra Wireless RavenXT, model G2212-C GPRS modem

Technology:	GPRS (MS-12)
Bands:	Quadband, 1900/850 MHz and 1800/900 MHz
Transmit Frequency:	1850 to 1910 MHz and 824 to 849 MHz
Transmit Power:	1.0 W for 1900 MHz; 0.8 W for 850 MHz
Receiver Frequency:	1930 to 1990 MHz and 869 to 894 MHz
GPRS Throughput:	up to 70 kbps
RS-232 Data Rates:	1200 bps to 115.2 kbps
Serial Interface:	RS-232, DB9-F
Serial Protocols:	AT Commands, PPP, SLIP, UDP, TCP
RF Antenna Connector:	50 Ohm SMA (female)
Input Current Range:	40 to 250 mA
Typical Current Drain (at 12 Vdc):	50 mA dormant (idle for 10 to 20 seconds), 120 mA transmit/receive
Input Voltage Range:	6 to 28 Vdc
Operating Temperature Range:	-30° to +65°C
Operating Humidity Range:	5% to 95% RH non-condensing
Status LEDs:	Power, Network, Signal, Activity
Dimensions:	3"W x 1"D x 4"L (7.6 x 2.5 x 10 cm)
Weight:	<1 lb (<0.5 kg)

4. Configuration

4.1 Base Station Requirements for Raven XT-Rogers

• A PC running Campbell Scientifics' LoggerNet or PC400 software, with access to the internet.

4.2 Datalogger Site Equipment

- Raven XT-Rogers modem with power cable (included with modem).
- Datalogger—21X, CR510, CR10(X), CR23X, CR7, CR1000, CR5000, CR3000, CR800.
- SC105 or SC932A Interface—connects the modem to the 21X, CR510, CR10(X), CR7, or other dataloggers' CS I/O port.

The SC105 must be configured for use with the modem using the Device Configuration Utility. Settings should be:

CS I/O Mode: SDC Address 7 RS-232 Mode: Modem Baud Rate: 115.2K or 9600 baud depending on datalogger model 8 data bits, 1 stop bit, no parity

• PN L18663 Null Modem Cable—connects the modem to the CR23X, CR3000, CR800, CR200-series, CR1000 or CR5000 RS-232 port.

NOTE If you have a black SC12 cable that is not Rev 1 or newer (as indicated on cable), it is a CS I/O cable only and will not work for RS-232. Connect the black SC12 cable between the datalogger and the SC932A. Use a 9-pin serial cable or a blue ribbon cable between the phone and the SC932A.



PN 18663 Null Modem Cable—connects the modem to the CR23X, CR3000, CR800, CR2XX, CR1000 or CR5000 RS-232 port (not compatible with the 21X, CR510, CR10X, or CR7 dataloggers).



SC105 Settings:

CS I/O Mode: SDC Address 7 RS-232 Mode: Modem Baud Rate: 115.2K or 9600 baud depending on datalogger model 8 data bits, 1 stop bit, no parity

SC105 interface connects the modem to a datalogger's CS I/O port; recommended for dataloggers with the Pakbus Operating System.



SC932A interface connects the modem to the CS I/O port; recommended for dataloggers with the Mixed-Array Operating System.

FIGURE 4.2-1. Modem Interface Options.

- PN L14394 Raven Mounting Kit—includes mounting hardware for securing the modem to below referenced environmental enclosure and a 9pin male to 9-pin female cable.
- Antenna—the following antennas are available from Campbell Scientific. Contact a Campbell Scientific Applications Technician for help in determining the best antenna for your application.
 - The **C2446** is a dual-band, omnidirectional antenna for our digital-cellular modems. This antenna is recommended for locations where cellular coverage is strong.

The C2446 includes a mount/u-bolt assembly that allows the antenna to be mounted to a mast, crossarm, or user-supplied pole (outer diameter of up to 1.5" (3.8 cm)).

- The L18285 1 dBd omnidirectional antenna. This antenna is dual band, covering both the 800 MHz and 1.9 GHz bands, and is strongly recommended where cellular coverage is strong. The L18285 includes a mount/u-bolt assembly for attaching the antenna to a mast, post, or crossarm up to 1.5" (3.8 cm) in diameter.
- The **C2445** 9dBd Yagi Antenna is a higher gain antenna that should be "aimed" at the service provider's antenna. The C2445 is an 800 MHz antenna and bracket/u-bolt assembly for attaching the antenna to a mast or post. The antenna comes with 10' of cable. This antenna is recommended for fringe areas that require a higher gain antenna.
- The L21831 Half-Wave Dipole Whip Antenna is a lower gain antenna used in transmitting short distances. It is an 800 MHz cellular antenna that terminates in a SMA Male connector for attachment to the modem. This antenna is intended for use inside the enclosure. Please note that the backplate of the enclosure is a grounded plane. If it is interposed between the antenna and the cell tower, it may attenuate the strength of the transmission signal. Simply turning the enclosure 90 to 180 degrees on its mounting mast may solve weak transmission issues.



PN L18285 1 dBd Omni Directional Antenna



PN C2445 9dBd Directional Yaggi Antenna



PN L21831 Half-Wave Dipole Whip Antenna

FIGURE 4.2-2. Antennas for Use with the Raven Modems

- Power Supply (see power considerations).
- Environmental Enclosure— ENC 10/12, ENC 12/14, or ENC 16/18.

4.3 Power Considerations

- A power cable included with the modem connects to the datalogger's 12 V or switched 12 V terminal. Connection to the switched 12 V terminal allows the datalogger to switch power to the modem during scheduled transmission intervals if desired.
- When using the switched 12 V terminal, the modem can typically be powered with a BP12 battery, CH100 charger/regulator, and MSX10 solar panel.

5. Program the Raven XT-Rogers Modem

It is recommended that the modem be provisioned and tested in the office (assuming there is cellular coverage) rather than in the field.

The AceManager software utility is used to configure settings in the modem and to load the Raven XT template file. The AceManager utility can be found on the CD included with the modem, or can be downloaded from Sierra Wireless's website: www.SierraWireless.com/support.

Campbell Scientific's "Raven XT Template 115200" file for dataloggers that support 115200 baud (e.g. CR1000), or "Raven XT Template 9600" file for dataloggers that support a maximum baud rate of 9600 (e.g. CR10X). The template file configures the modem to be compatible with CSI dataloggers.

The template files are available from Campbell Scientific's Website: http://www.campbellsci.ca/download.

5.1 Using AceManager to Configure the Modem

To install AceManager from the Sierra Wireless CD, click on the "AceManager" link under "Modem Utilities" and follow the prompts. Once the application has been installed, it can be run from the Windows Start menu or from the icon on the desktop.

Connect the Raven XT-Rogers to a serial RS232 port on the PC with a direct RS-232 cable. Also connect the antenna, and 12 V power.

166.154	1.54.26	- Sierra Wi	reless AceN	lanager	r								
File Modem	Template	e Tools Hel	p										
Dg Connect	😰 Refresh	🛟 Refresh All	X Disconnect	/ Write	! Reset	🚔 Load	L Save	🔒 Сору	$\mathbf{x}_{\mathrm{Clear}}$	내 Update PRL	Auto	Refresh:	Disabled 💙
													<u>^</u>

Run AceManager to get the following screen:

Click the **Connect** icon in the Configuration Panel to open the connection options dialogue box. Select PPP, and the COM port the modem is connected to. Do not change the Password (the default password is 12345). Click OK to continue.

Connect t	o Modem				
UDP TCP SMS PPP	Port: Password:	СОМ1	~	Use SOS Mode	
Ethernet		ОК	Cancel		

If the modem has been configured for "PPP" (see appendix B), then you may have to check the "Use SOS Mode" box.

Click the **Load** icon in the Configuration panel. When prompted for a template file name, select the appropriate .xml file for the datalogger that you are using. The template file configures the modem to be compatible with CSI dataloggers.

Template files are available from Campbell Scientific's Website: <u>http://www.campbellsci.ca/download</u>.

e Modem Templ	ate Tools Hel	P										
🕒, 🥻 🚺 onnect Refres	🚺 h Refresh All	0 Disconnect	/ Write	! Reset	🗃 Load	L. Save	🗈 Сору	imesClear	Update PRL	Auto Refre	sh: Disable	d
mplate "C:\AirLink'	.ravengprs_1152	00.xml" loaded										
GROUPS	MODEM DA	TA								PRINTAB	LE VIEW	
INFO	AT	Name			v	alue					^	
STATUS	*NETIP	Network	IP			66.213	8.213.1	76				
COMMON	*NETSTAT	E Network	: State		[N	letwork	Ready					
USB	*NETRSSI	RSSI (d	Bm)		Ē	81						
TCP	*NETOP	Current	Networ	k Opera	tor	Cingula	r, 3104	10			=	
DNS	+ICCID	SIM ID			s	90141	042112	496991	77			
Dynamic IP PPP/Ethernet	+CIMI	IMSI]3	310410	124969	917				
PassThru SMTP		Host Mo	ode	al						TOU PTS. HIGH		
Other Friends	*NETERR	Network	: Error F	Rate	- 6)					-	
LOGGING		Network	Bytes	Sent	[c)						
TELEMETRY		Network	: Bytes	Revd	1	758						
		Host Se	rial Byt	es Sent	9	344						
ADDK LIST		Host Se	cial But	or Royd	6	506						

COM1 SC	OS - Sier	ra Wireless	AceManage	er -									
ile Modern	Template	Tools Help)										
Donnect	💰 Refresh	👔 Refresh All	S Disconnect	/ Write	! Reset	😅 Load	L Save	E Copy	× Clear	Update PRL	Auto R	efresh: Disat	oled 🔽
emplate "C:\	AirLink\rav	/engprs_11520	0.xml" loaded										
CI		MODEM DAT	га								PRIN	TABLE VIEW	
01		MODEM DA									I KUU	MDLL VILW	
	INFO	AT	Name					Va	lue	New Value		^	
ST	ATUS	S23	Configure	Serial I	Port			11	5200,8N	1 115200,8N1			
		١Q	Serial Port	Flow C	ontrol			0		0-None	▼		
cor	Misc	S50	Data Forw	arding 1	limeout			1		1			
	USB Serial	S51	Data Forwa	arding (Characte	er		0		0			
	TCP	E	DB9 Serial	Echo				0			-		
Dura	DNS	E	USB Serial	Echo				1			-		
PPP/Et	hernet	E	Telnet Ech	0				1			_		
Pa	SMTP	v	AT Verbos	e Mode						1-Verbose			
F	Other	8D	DTR Mode					_ 0		0-Ignore DTR	-		
	CINC	5211	DTR Mode					- 1		1-Ignore DTB	-		
		85	Assert DS	2		_	_	- 1		1-In Data Mode			
TELEM	ETRY		Asset DO	`				_		1 In Data Mode			
ADDR	LIST	ac.	Assert DC				-			a pi alla Mode			
EDGE/H	SDPA	*CISE	Enable CI	S to In	licate N	etwork	Covera	ge 0		0-Disabled			
		Q	Quiet Mod	e				_ 0		0-OFF			
		x	Call Progr	ess Res	ult Mod	e		0		0-OFF			
		*NUMTOIP	Convert 1	2 digit I	lumber	to IP		0		0-Use as Name	_	~	

NOTE

Baud rate can be changed from 9600, to a higher baud rate supported by the datalogger (e.g., 115200 for a CR1000).

												_	
🐓 COM1 S	SOS - Sier	ra Wireless .	AceManage	97									
File Moden	n Template	Tools Help											
Dy - Connect	. 😰 Refresh	💰 Refresh All	(2) Disconnect	/ Write Re	eset Load	📕 Save	Сору	$\underset{_{\rm Clear}}{\times}$	Update F	RL	Auto Refr	esh: Disa	bled 🔽
G	GROUPS	MODEM DAT	A								PRINTAL	BLE VIEW	~
	INFO	АТ	Name					Value	•	New Value			
	TATUS	*NETAPN	Set APN					INTE	RNET	I2GOLD.COM			
		+CGDCONT	Define PD	P context				1,IP,	INTERNET	1,IP,I2GOLD.COM	Λ		
	Misc	+COPS	Set Carrie	er [operato	r] Selection	1		0					
	USB Serial	+CGOREQ	Set Quali	ty of Servic	e Profile			<u> </u>					
	TCP	+CGOMIN	Minimum	Acceptable	Quality of	Service	a Profile	· —					
	DNS	Troogenin	1	/ cccpcobic	quanty of			1		1			
PPP/E	thernet												
P	assThru SMTP												
	Other Friends												
	CCINC												
	GGING												
TELE	METRY												
ADD	R LIST												
EDGE/I	HSDPA												
													/ ~

Click on EDGE/HSDPA Group to get the following screen:

For a data account with the VPN.COM APN, enter the APN as shown in the following screen. The example is for an APN = "I2GOLD.COM".

After the template file has been loaded, and the APN entered, click the **Write** icon to save the changes in the modem.

Click the **Reset** icon to restart the modem. The other ways to reset the modem are by pressing the reset button on the front of the modem or removing the power from the modem.

Click the **Disconnect** icon to terminate communications with the modem.

NOTE Unless you click the **Write** command, changes made in the New Value field will not be sent to the modem. For some changes (e.g., baud rate) you must also **Reset** the modem before the changes will take effect.

5.2 Dynamic IP Address

Dynamic IP addresses are granted only when a modem or other device is connected and can change each time the modem or device reconnects to the network.

IP Manager is a free service provided by Sierra Wireless for the Raven to translate a dynamic IP address into a fully qualified domain name so it can be contacted directly on the Internet. IP Manager translates a dynamic IP address to a fully qualified domain name so you can contact your Raven by name as if it had a static IP.

If the Raven is configured for Dynamic IP, when the Raven first connects to the Internet, it sends an IP change notification to IP Manager. IP Manger will acknowledge the change and update the DNS record. The changed IP address will then be the address for the Raven's configured name. Once the Raven's IP has been updated in IP Manager, it can be contacted via name.

AceManager is used to configure the Dynamic IP settings in your Raven so that it will use IP Manager as described below.

Connect with modem using AceManager. Select the Dynamic IP group to configure your modem to use IP Manager.

To configure your Sierra Wireless modem to be addressed by name, the modem needs to have four elements configured.

Enter names in the New Value fields for MODEMNAME, DOMAIN, IPMANAGER1, IPMANAGER2, and IPMGRUPDATE1.

💅 COM1 - Sierra	Wireless AceManag	er									
File Modern Templa	ite Tools Help				~		lan				
Connect Refresh	ı Refresh All Discon	nect Write Reset	Load Sav	e Copy	Clear	Upd	ate PRL	Aut	o Refresh:	Disable	ed 💙
Write successful											
GROUPS	MODEM DATA							PR	NTABLE	VIEW	^
INFO	AT	Name		Value			New Value				
STATUS	*MODEMNAME	Modem Name		435555	1212		4355551212				
COMMON	*DOMAIN	Domain		eairlink	.com		eairlink.com				
Misc	*IPMANAGER1	IP Manager Server	1 (IP Adrs)	edns2.e	airlink.c	om	edns2.eairlink.com				
Serial	*IPMGRUPDATE1	IPMServer1 Update	(Minutes)	0			30				
UDP	*IPMGRKEY1	IPMServer1 Key		*****	**						
Dynamic IP	*IPMANAGER2	IP Manager Server	2 (IP Adrs)	eairlink	.com		edns2.eairlink.com				
PassThru	*IPMGRUPDATE2	IPMServer2 Update	(Minutes)	0			0				
Other	*IPMGRKEY2	IPMServer2 Key		*****	**						
Friends											
LOGGING											
1X/EV-DO											
TELEMETRY											
ADDR LIST										ار ا	~

- 1. Modem name: A unique name for the modem (the 10-digit MSISDN number is recommended).
- 2. Domain: The domain name to be used by the modem (eairlink.com).
- 3. IP Manager IP Address: The IP or domain name of the dynamic DNS server which is running IP Manager.

IPMANAGER1: edns2.eairlink.com IPMANAGER2: edns2.eairlink.com

4. IP Manager update interval: How often you want the address sent to IP Manager. If this is set to zero, the modem will only send an update if the IP changes (i.e. if the modem is reset or is assigned a different IP). The value can be set from 0 - 255 minutes, and should be set to a value appropriate for your application.

Restrictions for Modem Name

• Must begin with a letter or number

- Can include a hyphen (-)
- Cannot contain spaces
- Must be no longer than 20 characters total

Click the Write icon to save the changes.

Click the **Reset** icon to restart the modem.

Click the **Disconnect** icon to terminate communications with the modem.

5.3 Raven XT-Rogers Indicator Lights

When your Raven XT-Rogers is connected to power and an antenna, there is a specific pattern to the lights to indicate its operation mode.



- **Network**—Indicates a successful connection to the cellular network with an IP address given and a channel acquired.
- **Signal**—Light shows the strength of the signal and may be nearly solid (strong signal) or flashing (weaker signal). A slow flash indicates a very weak signal.
- Activity—Lights will flash as data is transferred to and from the modem on the remote network.
- **Power**—Indicates the power adapter is connected and there is power getting to the Raven XT-Rogers.
- The **Reset button** (on the left side of the Raven XT) has two functions. If it is quickly depressed and released, the modem will simply power cycle the internal hardware. If, however, the reset is depressed and held for several seconds (count 10 slowly, and wait for the power light to go off after the light pattern stops), the ALEOS configuration settings will return to the factory defaults.

Light Patterns

The LEDs on the front of the modem will respond in different patterns to indicate modem states.

- Normal—Each LED, mentioned above, lit as applicable.
- Start up—The LEDs will cycle from left to right.
- **PassThru mode**—Network and Signal LEDs will blink in tandem. The Activity LED will blink when transmitting or receiving data.
- **SOS**—The Network LED blinks.
- **Configuration Reset**—The LEDs will cycle left to right and then right to left 4 times.
- Authentication Failure—The Network, Signal, and Activity LEDs blink every 2 seconds.
- **Data Retry**—The Network, Signal, and Activity LEDs blink every 3 seconds.

6. LoggerNet/PC400W Software Setup

The Device Map is configured from the "Setup" button on the LoggerNet/PC400W Toolbar. Configure the Device Map as described below.

- 1. Selet Add Root | IPPort.
- 2. Add a datalogger to the IPPort (Pakbus dataloggers, e.g. the CR1000, require a PakBusPort).
- 3. On the IPPort page, add the IP address or fully qualified domain name as setup in Section 5.2 and the Port number (the Raven template file configures the port to be 6785). Add four seconds of extra response time.
- 4. For PakBus dataloggers, leave the default settings on the PakBusPort page.
- 5. For PakBus dataloggers, set the PakBus address to match that of the datalogger (default address in the datalogger is 1). Make sure that "PakBus Port Always Open" is unchecked.

LoggerNet Device Map

For a Dynamic IP using Sierra Wireless's IP Manager (Section 5.2), enter the internet IP address as:

xxxx.yyyy:6785, where xxxx is the modem name, yyyy is the Domain name, and 6785 is the port number.

★ Setup Screen				
Eile View Network Tools Options He	þ			
Add Boot Add Delete Repare	Lindo Redo			EZ View
Network Map				
Sep Prot				
CR1000	Hardware Notes			
	Standard			
	Communications Enabled			
	Internet ID & datases	4355551212 edps2 eairlink corrs6785		
	Theniet IT Address	1000001212.00102.001111.001101.00		
	Advanced			
	Call-Back Enabled	Cache IP Address		
	TCP Listen Only			
	Extra Hesponse Time	U4 s		
	Delay Hangup	00 s 000 ms	*	
	IP Port Used for Call-Back	0		
	AirLink Device ID			
	No problems found with	n settings for the selected dev	vice	
Check Apply Cancel				
				Connected: localhost

Uncheck "Pakbus Port Always Open".

🖋 Setup				
File Edit Tools Options Help				
Add <u>Root</u> Add <u>D</u> elete Rename	Lindo Redo			
BigH IPPort PakBusPort CR1000	PakBusPort : PakBus Hardware PakBus Nodes	usPort		
	Standard Communications Enabled PakBus Port Always Opt	d en		
	Maximum Time On-Line	00 h 00 m 00 s 000 ms		
	Beacon Interval	00 h <mark>00</mark> m 00 s		
	Advanced			
	Extra Response Time	00 s	-	
	PakBus Address	3999		
	Delay Hangup	00 s 000 ms	•	
Check Apply Cancel	No problems found wi	th settings for the selecte	d device	
		Connect	ed: localhost	

Enter Pakbus address that has been set in the datalogger (default is 1).

🖋 Setup			
File Edit Tools Options Help			
Add Root Add Delete Rename	Lindo Redo		
PPort ABusPort	CR1000 : CR1000		
	Hardware Schedule Data	Files Clock Program	
	Standard Communications Enab Call-Back Enabled	led	
	PakBus Address Advanced	1	
	Maximum Packet Size	1000	
	Security Code	0	
	Delay Hangup	00 s 000 ms	
	Enable Automatic Hole	Collection	
Check Apply Cancel	No final storage tables are def Scheduled Data Collection is o	ined in the stations program disabled	<
	,	Connected: localhost	

In some cases where signal strength is low, you may have to decrease the packet size of the CR1000. A recommended value of 400 bytes should be sufficient.

7. Troubleshooting

If LoggerNet/PC400W software is unable to establish a connection with the modem:

7.1 Check the Modem Configuration

- a. Check the GPRS cellular account information, and verify there is GPRS coverage at the site. Dynamic IP accounts require a Dynamic Domain Name Server (DDNS) (Section 5).
- b. The modem has to be configured using AceManager as described in Section 5.
- c. Modem settings have to be changed, and the APN entered, using AceManager (Section 5). After the Raven XT template file has been loaded, you can verify settings in the Status, Misc, Serial, and GPRS/EDGE groups have been configured as shown below.

e Modem	Template	e Tools Help)			-		-				
Dy .	🔹 Refresh	👔 Refresh All	Oisconnect	/ Write	Reset	Load	Save	Copy	$\mathop{\times}\limits_{{\rm Clear}}$	내 Update PRL	Auto Refresh	n: Disabled
mplate "C:\	AirLink\rav	vengprs_11520	/0.xml" loaded						_			
GR	OUPS	MODEM DAT	ΓA								PRINTABL	E VIEW
	INFO	АТ	Name			٧	/alue					<u> </u>
		*NETIP	Network	< IP		1	166.213	3.213.1	76			
51	<u>AIUS</u>	*NETSTATE	Network	< State	_	•	Vetwork	: Ready				
COM	MON	*NETCHAN	Channe	el		1	142					
	USB	*NETRSSI	RSSI (dBm)		- F	83	_	_			
	Serial TCP	*NETOP	Curren	t Networ	rk Oper:	ator	Cingula	r, 3104	10			
	UDP	+ICCID	SIM ID		_		390141	042112	496991	177		
Dynai	mic IP	+CIMI	IMSI				310410	124969	917			=
PPP/Eth	iernet		Host M	ode	_		ppp					
	SMTP	, 	Host S	ignl Lev	el	[DCD: H	IGH DT	R: HIGH	H DSR: HIGH CTS: HIGH	RTS: HIGH	
F	Other riends	*NETERR	Networ	k Error F	Rate	- (2					
100	CINC		Networ	k Bytes	Sent	(2					
LOG	GING	, 	Networ	k Bytes	Revd		2					
TELEM	ETRY	·	Host S	erial Byt	tes Sení		390					
ADDR	LIST		Host S	erial Byt	tes Bov		560					
DGE/H	SDPA		Networ	t TD Day	rkate Se	ant IC						
			Networ		skots Ru							
			Heat If	Deckei	te Cont	[
		1	JHOSE IP	Packer	a benu	J*	*					

🖋 COM1 SOS - Sie	rra Wireless AceMan	ager		
File Modem Templat	e Tools Help			
Donnect Refresh	👔 😣 Refresh All Disconned	ct Write Reset Load Save (Copy Clear Update PRL	Auto Refresh: Disabled 🗸
Template "C:\AirLink\ra	avengprs_115200.xml" load	led		
GROUPS	MODEM DATA			PRINTABLE VIEW
INFO	AT	Name	Value	New Value
STATUS	*DATE	Date and Time	10/21/2008 10:17:11	
COMMON	OPRG	Enable Over-the-Air Programing	1	1-ON 💌
Misc	*NETPHONE	Phone Number	14357571662	
USB Serial		Force Static IP	0.0.0.0	
TCP UDP	*DPORT	Device Port	12345	6785
DNS Dynamic IP	*NETUID	Network User ID	ispda@cingulargprs.com	
PPP/Ethernet PassThru	*NETPW	Network Password	CINGULAR1	
SMTP Other	*NETALLOWZEROIP	Allow Last Byte of net IP = Zero	1	1
Friends	*HOSTPAP	Request PAP	0	0-NO
LOGGING	S53	Destination Address		
TELEMETRY	S53	Destination Port	0	0
ADDR LIST	S53	Default Dial Code	т	T-TCP
EDGE/HSDPA				

The Device Port gets changed from the default 12345 to 6785 when the template file is loaded into the modem (Section 5). The Device Port number gets entered with the IP address in LoggerNet (Section 6).

nnect Refresh	😨 Refresh All	S Disconnect	/ Write	! Reset	<i>⊯</i> Load	L Save	і Сору	× Clear	Upo	tate PRL	,	uto Refresh:	Disable	ed
mplate "C:\AirLink\ra	avengprs_11520	0.xml" loaded												
GROUPS	MODEM DAT	A									1	PRINTABLE	VIEW	
	AT	Name					Va	lue	N	ew Value				
STATUS	S23	Configure	Serial F	Port			11	5200,81	V1 1	15200,8N1				
	١Q	Serial Port	Flow C	ontrol			0		-	D-None	-			
COMMON Misc	S50	Data Forwa	arding 1	limeout	:		1		1					
USB Serial	S51	Data Forwa	arding (Characte	er		0		- 0)				
TCP UDP	E	DB9 Serial	DB9 Serial Echo						- г		-			
DNS Dynamic ID	E	USB Serial	Echo				1		- r		-			
PPP/Ethernet	E	Telnet Ech	0				1		— Г		-			
SMTP	v	AT Verbos	e Mode				1		- 1	1-Verbose	-			
Other Friends	8.D	DTR Mode					0		- [0	D-Ignore DTR	-			
LOGGING	S211	DTR Mode					1		1	1-Ignore DTR	-			
TELEMETRY	&S	Assert DSF	ι				1		- 1	1-In Data Mode	•			
	&C	Assert DCI	>				1		- 1	1-In Data Mode	•			
ADDR LIST	*CTSE	Enable CT	S to In	dicate N	etwork	Covera	ge 0		- [c	D-Disabled	-			
DGE/HSDPA	Q	Quiet Mod	e				0		- [0	D-OFF	-			
	x	Call Progre	ess Res	ult Mod	e		0		- [0	D-OFF	-			
	*NUMTOIP	Convert 12	2 diait I	lumber	to IP		0		_ [c)-Use as Name	-			

Connect to the modem with AceManager (Section 5.3). Select the "Serial" Group, and make sure the "AT Verbose Mode" is set to "Numeric" for use with the CR10(X), CR510, and CR23X dataloggers, or "Verbose" for other dataloggers (e.g. CR1000).

The "Raven XT Template 9600" template file sets the baud rate to 9600, which is the maximum baud rate for the CR10X and older dataloggers. For newer dataloggers, the baud rate can be changed to the highest baud rate supported by the datalogger (e.g. 115200 baud for the CR1000).

NOTE Baud rate changes require the modem to be reset before the change takes affect. Click the **Reset** icon in AceManager to the reset the modem and implement the change.

🗲 COM1 SOS - S	ierra Wireless	AceManag	er								
File Modern Temp Connect Refre	late Tools Help () h Refresh All	Disconnect	Vrite Reset	Load Save	Copy	× Clear	내 Update F	'nL	Auto Refre	sh: Disable	ed 🔽
GROUPS	MODEM DAT	ĨĂ							PRINTAB	le view	~
INFO	AT	Name				Value	•	New Value			
STATUS	*NETAPN	Set APN				INTE	RNET	I2GOLD.COM			
СОММОМ	+CGDCON	Define PI	OP context			1,IP,	INTERNET	1,IP,I2GOLD.COM	1		
Mise	+COPS	Set Carrie	er [operator] Se	election		0					
Seria TCF	+CGQREQ	Set Quali	ty of Service Pr	ofile							
	+CGQMIN	Minimum	Acceptable Qu	ality of Servic	e Profile						
Dynamic IF											
PassThru											
Othe											
	-										
TELEMETRY											
ADDR LIST	-										
EDGE/HSDP4	1										
											\sim

Verify the APN has been entered in the NETAPN and +CGDCONT fields as shown above (where VPN.COM is the APN).

- d. If an SC105 interface is used, its default baud rate of 9600 will have to be changed to match the baud rate of the modem (using CSI's DevConfig utility).
- e. Check the Network light. Network indicates a successful connection to the cellular network with an IP Address given and a channel acquired.
- f. Make sure the modem has sufficient power.
- g. Check the signal strength (make sure your antenna is properly connected and oriented). Signal strength should be in the -51 to -90 range (-51 is a strong signal, -90 is a weak signal).
- h. If you have a Static IP account, verify the Static IP Address. Preceding zeros in the IP address are not entered in LoggerNet/PC400W.
- i. If you have a Dynamic IP account, you will need to have a DDNS (dynamic domain name server) name that LoggerNet can reference to make the connection (Section 5).
- j. Connect with the modem through the serial port using AceManager. If the modem has been configured for "PPP" (see appendix B), then you may have to check the "Use SOS Mode" box.

From the "Status" group, make sure the "Network State" is "Network Ready", and note the "Network IP" address. This is the current IP address for the modem (a dynamic IP address may change when the modem is reset). Try connecting to this IP address using LoggerNet. If LoggerNet connects with the IP address, but not with the modem name.domain name, then there may be a problem with the Dynamic IP setup in the modem (Section 5).

7.2 Verify Connections at the Datalogger

Verify the modem is connected to 12 V and the power led is on (green).

Check the Network light on the modem. The Network light should be solid green, which indicates the modem is registered with the cellular network.

Make sure the antenna is properly connected and oriented. Signal strength should be the -60 to -80.

An SC932A or SC105 interface is required to connect the modem to a datalogger's CSI/O port. The default settings for SC105 (OS > 4) can be used with the Raven XT-Rogers when the modem is configured for 115200 baud (baud rate set by the template file). If the baud rate is changed in the modem, the baud rate in the SC105 will have to be changed to match that of the modem (settings can be changed using CSI's DevConfig utility).

Make sure the modem is connected to the "DCE Device" connector on the SC932A, or the "Modem" connector on the SC105.

A null modem cable is required to connect the modem to a datalogger's RS-232 port. No other interface is required.

7.3 LoggerNet/PC400W Device Map

Check your LoggerNet setup.

a. Make sure the port number at the end of the IP address matches the port number of the Raven (e.g. 6785, see Figure 7.3-1).

💊 Setup									X
File Edit Tools Optio	ons Help								
Kall → Add <u>R</u> oot <u>A</u> dd <u>I</u>	X S Delete Rename L	lodo Redo							
■ ²⁹ IPPort ■ ² PakBusPort ■ CR1000		IPPort : IPPort							
	S	itandard	d						
			-						
	1	Internet IP Address	435	5551212.edr	ns2.eairlink.co	om			
	Â	dvanced Call-Back Enabled		Cache IP Add	ress				
	[TCP Listen Only	04 -						
4 COULT COC Since	- Wireless Acelians								
COM1 SOS - Sierr	a Wireless AceMana	iger							×
File Modem Template	a Wireless AceMana Tools Help E Refresh All Disconnec	nger t Vite Reset Load	L. Save	🗈 🗙 Copy Clear	내고 Update PRL		Auto Refresh:	Disabled V	×
File Modem Template Connect Refresh Template "C:WirLinkVrav	a Wireless AceMana Tools Help Refresh All Disconnec engprs_115200.xml" load	t Write Reset Load	E Save	🗈 🗙 Copy Clear	나 <u>공</u>] Update PRL		Auto Refresh:	Disabled V	
COM1 SOS - Sierr File Modem Template Connect Refresh Template "C:VairLinkVrav GROUPS N	a Wireless AceMana Tools Help Effresh All Disconnec engprs_115200.xml" load	t Write Reset Load	L Save	≌ × Copy Clear	나희 Update PRL		Auto Refresh: PRINTABLE	Disabled VIEW	
COM1 SOS - Sierr File Modem Template Dy P Connect Refresh Template "C.VairLinkVrav GROUPS N INFO	a Wireless AceMana Tools Help Refresh All Disconnec engpro_115200.xml* load AODEM DATA	nger t Write Reset Load ed Name	L Save	Copy Clear	্দু Update PRL	New Value	Auto Refresh: PRINTABLE	Disabled VIEW	
COM1 SOS - Sierr File Modem Template Connect Refresh Template "C: VaitLink/traw GROUPS M INFO STATUS	a Wireless AceMana Tools Help Refresh All Disconnec engprs_115200.xm/*load MODEM DATA AT *DATE	eger Write Reset Load ed Name Date and Time	i Save	Copy Clear	ца Update PRL	New Value	Auto Refresh: PRINTABLE	Disabled VIEW	
COM1 SOS - Siern File Modem Template Connect Refresh Template "C. VaitLink/Vavv GROUPS M INFO STATUS COMMON	a Wireless AceMana Tools Help Refresh All Disconnec engprs_115200.xml" load KODEM DATA AT "DATE OPRG	eger Wite Reset Load ed Name Date and Time Enable Over-the-Air Pr	Save	Copy Clear Value 10/21/200 1	43 Update PRL 18 10:17:11	New Value	Auto Refresh: PRINTABLE	Disabled VIEW	
COM1 SOS - Sierr File Modem Template Connect Refresh Template "C:VaitLinkVav GROUPS M INFO STATUS COMMON Misc USB	a Wireless AceMana Tools Help Refresh All Disconnec engprs_115200.xml*load KODEM DATA AT *DATE OPRG *NETHONE	Rer t Write Reset Load ed Name Date and Time Enable Over-the-Air Pr Phone Number	Save		Update PRL	New Value	Auto Refresh: PRINTABLE	Disabled VIEW	
COM1 SOS - Sierr File Modem Template Connect Refresh Template "C-VaitLinkVrav GROUIS N GROUIS N INFO STATUS COMMON Misc Serial USB Serial TCP	a Wireless AceMana Tools Help Refesh All Disconnec engprs_115200.xml* load KODEM DATA AT *DATE OPRG *NETPHONE	Reer t Write Reset Load ed Name Date and Time Enable Over-the-Air Pr Phone Number Force Static IP	i Save	Value 10/21/200 11 14357571 0.0.0.0	Update PRL 8 10:17:11	New Value	Auto Refresh: PRINTABLE	Disabled	
COMI SOS - Sierr File Modem Template Connect Refresh Template "C-VaitLinkVrav GROUIS N INFO STATUS COMMON Misc USB Serial TCP UDP DNS	a Wireless AceMana Tools Help Refresh All Disconnec engprs_115200.xml* load KODEM DATA AT *DATE OPRG *NETPHONE DORT	Rer t Write Reset Load ed Name Date and Time Enable Over-the-Air Pr Phone Number Force Static IP Device Port Device Port	Save	Value 10/21/200 11 14357571 0.0.0.0 12345	4 <u>8</u> Update PRL	New Value	Auto Refresh	Disabled VIEW	
COM1 SOS - Sierr File Modem Template Connect - Refresh Template "C.VaiLink/rev GROUPS M INFO STATUS COMMON COMMON Serial TCP UDP Dynamic IP PPP/Ethernet	a Wireless AceMana Tools Help Refresh All Disconnec engprs_115200.xml" load KODEM DATA AT *DATE OPRG *NETPHONE *DPORT *NETPUID	ed Vite Reset Load Mame Date and Time Enable Over-the-Air Pr Phone Number Force Static IP Device Port Network User ID Network User ID	ograming	Value 10/21/200 1 14357571/ 0.0.0.0 12345 ispda@cinj	La	New Value	Auto Refresh	Disabled VIEW	
COM1 SOS - Sierr File Modem Template Connect - Refresh Template "C.VaiLinkVrav GROUPS M INFO STATUS COMMON Misc USB Serial TCP UDP DNS Dynamic IP PPP/Ethernet PassThru SMTP	a Wireless AceMana Tools Help Refresh All Disconnec engprs_115200.xmf" load KODEM DATA AT *DATE OPRG *NETPHONE *NETPHONE *NETUID *NETUID *NETPW *NETAL QWZERO ID	ed Vite Reset Load d Vame Date and Time Enable Over-the-Air Pr Phone Number Force Static IP Device Port Network User ID Network Password Allow Last Byte of net	ograming	Value 10/21/2000 1 14357571 0.0.0.0 12345 ispda@cinj CINGULAR 1	Land the second	New Value	Auto Refresh:	Disabled VIEW	

FIGURE 7.3-1. Device Port Configuration

- b. Try adding a few seconds to the extra response time on the IP Port in LoggerNet (you should not need more than 5 seconds).
- c. If you are trying to communicate to a PakBus datalogger:
 - i. Verify the PakBus address in the setup screen matches that of the datalogger.
 - ii. If you have multiple PakBus networks/ports setup in LoggerNet, uncheck the 'PakBus Port Always Open' options on all PakBus ports.

7.4 Using AceManager to Check Modem Communications with Datalogger

The modem's "Host Serial Bytes Sent" and "Host Serial Bytes Received" windows can indicate whether or not the modem is communicating with the datalogger.

Establish a connection with the modem through the cellular network using AceManager (click on the Modem menu item, Connect, UDP. Enter the IP address, and click OK). Go to the Status group and note the "Host Serial Bytes Sent" and "Host Serial Bytes Received" values (Figure 7.4-1). Try connecting with the datalogger using LoggerNet/PC400W. If a connection cannot be established, close LoggerNet and reconnect with AceManager and compare the current values with the previous values.

If the values are the same, the modem is not attempting to make a connection with the datalogger. Check that the Raven XT template file has been loaded.

If the "Host Serial Bytes Sent" increased, the modem attempted to connect to the datalogger, but the response from the datalogger did not make it back to the modem. Check the interface between the modem and the datalogger.

If both values incremented, the modem and the datalogger are communicating. Try adding some extra response time in LoggerNet.

NOTE Baud rate changes require the modem to be reset before the change takes affect. Click the Reset icon in AceManager to the reset the modem and implement the change.

🖋 COM1 SOS	5 - Sier	ra Wireless	AceManag	er										
File Modem	Template	e Tools Hel	Þ											
Dy Connect F	😰 Refresh	🛟 Refresh All	Oisconnect	/ Write	Reset	🗃 Load	📕 Save	Copy	imesClear	Update PRL	Auto Re	iresh:	Disable	d 🗸
Template "C:\A	irLink∖rav	vengprs_1152	00.xml" loaded	l										
GRC	OUPS	MODEM DA	TA								PRINT	BLE VI	sw	^
I	NFO	AT	Name			v	alue						^	
	THE	*NETIP	Network	k IP		1	66.213	.213.1	76					
<u></u>		*NETSTAT	E Network	k State		N	letwork	Ready						
СОМ	MON	*NETCHAN	Channe	el		1	42							
	USB	*NETRSSI	RSSI (d	dBm)		- [-	83							
5	Serial TCP	*NETOP	Current	t Netwo	k Operat	or	Cingula	, 3104	10				=	
	UDP	+ICCID	SIM ID			<u>ء</u>	90141	042112	496991	177				
Dynam	nic IP	+CIMI	IMSI			3	10410	124969	917					
PPP/Ethe Pase	ernet sThru		Host M	ode		F	PP							
	SMTP		Host Si	gnl Lev	el		CD: HI	GH DT	R: HIGH	DSR: HIGH CTS: HI	GH RTS: HIGH			
C Fri	other iends	*NETERR	Network	k Error f	Rate)							
LOGG	ING		Network	k Bytes	Sent)							
TELEME	TOX		Network	k Bytes	Rcvd)							
			Host Se	erial Byt	es Sent	3	90							
ADDR	LIST		Host Se	erial Byt	es Rovd	e	60							
EDGE/HS	DPA		Network	k IP Pa	kets Ser	t C)						◄ ,	~

FIGURE 7.4-1. AceManager status page showing communications with modem.

Appendix A. Wireless Ace Setup without Template File

Wireless Ace 3G is used to program settings in the Raven XT-Rogers modem to make the modem compatible with CSI dataloggers. Airlink template files to send the modems are available on the Campbell Scientific website (<u>http://www.campbellsci.ca/download</u>). The procedure for sending the template files is described in Section 5.

When the template files are not available, Wireless Ace 3G can be used to change the settings described below.

For a direct connection on a COM port use PPP.

Connect to	Modem				
UDP TCP	Port:	COM1		🔲 Use SOS Mode	
SMS PPP Ethernet	Password:	*****			
		ОК	Cance		

Make a note of the Device port (*DPORT). The default is 12345 and we use 6785 in our template. Any valid port can be used. This is the port number used in LoggerNet to get to the datalogger.

1	COM1 -	AirLink \	Wireless Ace v200	60404							
Fi	le Modem	Template	e Tools <u>H</u> elp								
C	Donnect	😰 Refresh	Refresh All Discon	ect Write Reset	Load Save	Сору	× Clear	내 Update PF	il i	Auto Refresh:	Disabled 💟
T	emplate "D:	\Digital Pho	ones\Airlink\CDMA\Ra	ven\ravengprs_9600.xi	ml'' loaded						
1	GR	OUPS	MODEM DATA							PRINT	ABLE VIEW
		INFO	AT	Name		Valu	e		New Value		
	ст	ATUS	*DATE	Date and Time		05/:	23/200	5 23:01:14			
			OPRG	Enable Over-the	Air Programin	g 1			-		-
Ш	COM	MON Misc	*NETPHONE	Phone Number					-		
Π		Serial TCP	*STATICIP	Force Static IP		0.0.	0.0				_
Π		UDP DNS	*DPORT	Device Port		123	45		6785		
Π	Dynai PPP/Ett	mic IP nemet	*NETUID	Network User ID		T					_
Π	Pa	SMTP	*NETPW	Network Passwor	d				[_
Π	Low	Other Power	*NETALLOWZEROI	Allow Last Byte o	f net IP = Zer	0 1					_
Π	F	riends	*STATUSCHK	Checking SMS St	atus (Second:	;) 0			[_
Π	LOG	GING	*HOSTPAP	Request PAP		0			[l.	-
Π	TELEM	ETRY	\$53	Destination Addr	ess				-		
Ш	ADDR	LIST	\$53	Destination Port		0			-		
		GPRS	\$53	Default Dial Cod	e	т					•
				,							

- S23 Configure Serial Port The baud rate needs to be configured to match a valid datalogger baud rate. For a CR10X: 9600,8N1 and for a CR1000: 115200,8N1.
- Q Serial Port Flow Control This should be set to None.
- V AT Verbose Mode Set this to Numeric.
- &D DTR Mode Set to Ignore DTR
- S211 DTR Mode Set to Ignore DTR

hect Refresh	Refresh All	Disconnect Write Reset Load Save C	🗈 🗙 Copy Clear	Update PRL	Auto Refresh:	Disable
plate "D:\Digital Pl	hones\Airlink\CE	DMA\Raven\ravengprs_9600.xml" loaded				
GROUPS	MODEM DAT	*A			PRINT	ABLE VI
INFO	AT	Name	Value	New Value		
STATUS	\$23	Configure Serial Port	115200,8N1	9600,8N1		
COMMON	١Q	Serial Port Flow Control	2	0-None	<u>.</u>	
Misc	S50	Data Forwarding Timeout	1	-		
<u>Senal</u> TCP	S51	Data Forwarding Character	0	[
UDP DNS	E	Command Echo	1	[•	
Dynamic IP PP/Ethernet	v	AT Verbose Mode	1	0-Numeric	V	
PassThru	8dD	DTR Mode	2	0-Ignore DTR	¥	
Other	\$211	DTR Mode	0	1-Ignore DTR	+	
Friends	8:S	Assert DSR	1	[-	
LOGGING	&/C	Assert DCD	1	[•	
TELEMETRY	*CTSE	Enable CTS to Indicate Network Coverage	0	[•	
	Q	Quiet Mode	0	[-	
	x	Call Progress Result Mode	0	[•	
GPRS	*NUMTOIP	Convert 12 digit Number to IP	0	[<u>I</u>	

- S0 TCP Auto Answer Set to On
- TCPT TCP Idle Timeout -- Set to a reasonable value like 2 min.

🞽 COM1 - AirLink Wir	reless Ace v20060404					
File Modern Template	Tools <u>H</u> elp					
Connect Refresh R	efresh All Disconnect Write Reset	Load ⊇	Save Copy Clear	나죠 Update PRL	Auto Refresh:	Disabled 💟
Template "D:\Digital Phone	s\Airlink\CDMA\Raven\ravengprs_9600.xr	ml" loader	d]
GROUPS MO	DEM DATA				PRINT	ABLE VIEW
INFO A	T Name	Value 1	New Value			
STATUS	0 TCP Auto Answer	0	1-0N	•		
s	7 TCP Connect Timeout	30	30			
Misc T	CPT TCP Idle Timeout	0	2			
Serial <u>TCP</u> T	CPS TCP Idle Timeout Secs	0	0-Minutes	•		
UDP DNS S	221 TCP Connect Response Delay	0	0			
Dynamic IP	60 Telnet Echo Mode	1	1-Local Echo	-		
PassThru *	ENQ Enable ENQ on TCP Connect	0	0-Disable	-		
SMTP Other			•			
Low Power Friends						
TELEMETRY						
TELEMETRY						
ADDR LIST						
GPRS						

Appendix B. Installation of SIM Card in the RavenXT-Rogers

The Subscriber Identity Module (SIM) in the Raven XT-Rogers is a smartcard securely storing the key identifying a mobile subscriber. Generally, you will only need to install the SIM once in the life of the modem.

Installing the SIM

To install the SIM, you will only need a small Phillips head screw driver.

Opening the Case

- 1. Unplug the modem power and all cables.
- 2. Using a small Phillips head screw driver, remove the two screws on the back of the modem, set the faceplate aside.



FIGURE B-1. Modem Faceplate

3. Remove the SIM from the card you obtained from Rogers, and gently press the SIM card to secure in place as shown in the figure below.





4. Replace the faceplate; the installation of the SIM is complete.

Appendix C. Configuring the Raven XT-Rogers for PPP

The Raven XT-Rogers template file configures the Raven XT-Rogers to function as a serial server. As a serial server, the modem has an IP address, and port number (6785) for the Raven XT-Rogers' RS232 port.

LoggerNet sends data via TCP/IP over the internet to the datalogger. The modem removes the data from the TCP packet and sends the data out the RS232 port to the datalogger. Returning data is put into a TCP packet by the modem and sent back to LoggerNet.

Settings in the Raven XT-Rogers and datalogger (CR800, CR1000, and CR3000) can be changed to configure the RS232 serial ports for Point-to-Point (PPP) protocol. When configured as PPP, the Raven XT-Rogers functions as a router, routing TCP/IP communications to the IP stack of the datalogger. PPP enables the datalogger to send/receive messages via email, HTTP, FTP to and from the datalogger, and allows concurrent communications between networked dataloggers and LoggerNet.

The default datalogger port number for PakBus/TCP communications is 6785. The datalogger will also respond to port 80 for HTTP, 23 for Telnet and 21 for FTP. These ports can be disabled in the dataloggers configuration.

NOTE After the RS232 port on the modem has been configured as PPP, use Wireless Ace 3G with a TCP or UDP connection to establish communications with the modem. It may also be possible to connect with the modem through its RS232 port using the "SOS" mode.

Raven XT-Rogers Settings for PPP Mode:

Download the current Raven XT-Rogers AceManager template file from <u>http://www.campbellsci.ca/download</u>. Load the template into AceManager and make the following changes in steps 1 and 2 before writing them to the Raven XT-Rogers modem.

Use AceManager to configure the following Misc setting:

• DPort = 3001 (Changed from 6785)

This setting change allows information to be passed from loggernet to the the Datalogger. If we were to leave the DPort setting at 6785 the Raven XT-Rogers would trap the information as its own and Loggernet will show an error of "Connection Refused" when you try to connect to the Datalogger. Ensure that the Loggernet port setting is left as 6785, so that the modem will function in PPP mode.

Use AceManager to configure the following UDP setting:

• MD = 02-PPP (Changed from 00 — Normal, AT command)

Modelli	rempiace	i tuuis meip	,										
🖳 🖕	👔 Refresh	👔 Refresh All	Oisconnect	Ø Write	! Reset	🗃 Load	L Save	Copy	× Clear	協 Update PRL	Auto Rel	resh: Disable	ed
mplate "C:\	AirLink\rav	/engprs_11520	00.xml" loaded										
GI	ROUPS	MODEM DAT	ГА								PRINTA	BLE VIEW	
	INFO	AT	Name				Value	New V	/alue				
ST	ATUS	MD	Startup Mo	de Defi	ault DB9	Serial	00	02-P	РР				
CON	AMON	582	UDP Auto	Answer			0	0-Dis	able	•			
cor	Misc	S83	UDP Idle T	imeout	:		0	0					
	Serial	HOR	UDP Auto	Answer	Respons	e	0	0-No	Respor	ise 💌			
	TCP UDP	*UDPLAST	UDP Conn	ect Last	:		0	0-Do	not cha	ange S53 💌			
Dyna	DNS mic IP	AIP	Allow Any 1	IP			0	0-All	ow only	S53 💌			
PPP/Et	hernet	*UALL	Allow All U	DP			0	0-No	effect	•			
Pa	SMTP	*DU	Dial UDP A	lways			0	0-Dis	able	•			
F	Other	*USD	UDP Serial	Delay			0	0					
LOG	GING												
TELEM	ETRY												
	LIST												

After the changes have been made, click the **Write** icon to save the changes in the modem.

Click the **Reset** icon to restart the modem. The other ways to reset the modem are by pressing the reset button on the front of the modem or removing the power from the modem.

Click the **Disconnect** icon to terminate communications with the modem.

Datalogger Settings:

Using the Device Configuration Utility, configure the following setting on the TCP/IP tab:

- Config Port Used = RS232
- IP Address = 0.0.0.0
- Modem Dial String = PPP
- Modem Dial Response = CONNECT
- User Name and Password are blank

Device Configuration	ı Utility Beta 1.8
File Language Help	
Device Type	Deployment
CD295 CH200 COM220 CH100 CR100 CR100 CR100 CR100 CR100 CR200 Series CR23X-FB CR23A-FB CR23A-F	Datalogger Ports Settings TCP/IP Net Services Advanced DNS Server 1: 0.0.0 0 Config/Port Used: R5232 DNS Server 2: 0.0.0 IP Address: 0.0.0 TCP/IP Info: IP Address: 0.0.0 User Name: Password: Modem Dial String: PPP Modem Dial Response: CONNECT
Cs150 M0465 NL100 Serial Port COM1 Baud Rate 115200 Disconnect	PPP Dial Specifies the dial string that would follow ATD (e.g., #777 for Redwing CDMA) or a list of AT commands seperated by ',' (e.g., ATV1;AT+CGATT=0;ATD*99***1#) that will be used to initialise and dial through a modern before a PPP connection is attempted. A blank string means that dialing is not necessary before a PPP connection is established. Apply Cancel Factory Defaults Read File Summary

Using the Device Configuration Utility, select the "Net Services" tab. The "PakBus/TCP Service Port" default is 6785. This is the "Port" number that will follow the "IP address" for LoggerNet to communicate with the datalogger.

Device Configuration	Utility Beta 1.8	
File Language Help		
Device Type	Deployment	
CD295	Datalogger Ports Settings TCP/IP Net Services Advanced	
COM220	HTTP Enabled PakBus/TCP Server PakBus/TCP Port	
CR10X CR10X-PB	FTP Enabled 6785	
CR10X-TD CR200 Series	FTP User Name: anonymous 6785	
CR23X CR23X-PB	FTP Password: * 6785	
CR23X-1D CR3000	▼ Telnet Enabled	
CR5000 CR510	✓ Ping (ICMP) Enabled	
CR510-PB	PakBus/TCP Service Port: 6785	
CR800 Series		
CR9000X CS150		
MD485		
Serial Port	Part Paud Pata Sattings	<u>^</u>
COM1	For Data Rate Settings	
	This setting governs the baud rate that the datalogger will use for a given port in order	to 💻
Baud Rate	support Pakeus or PPP communications. For some ports (COM1 through COM4), thi setting also controls whether the port will be enabled for Pakeus or PPP communication	s ons.
115200 💌		N
Disconnect	Apply Cancel Factory Defaults Read File Summary	
	1	

Using the Device Configuration Utility, fix the RS232 Baud Rate to "115200 Fixed" from the "Port Settings" tab.

Device Configuration	Utility Beta 1.8
File Language Help	
Device Type	Deployment
CD295 CH200 CH200 CR10X CR10X-PB CR200 Series CR23X-7D CR200 Series CR23X-7B CR23X-7B CR23X-7B CR23X-7B CR23X-7B CR23X-7B CR23X-7B CR23X-7B CR23X-7D CR2000 CR510-7D	Datalogger Ports Settings TCP/IP Net Services Advanced Select the Port R5-232 Image: Constraint of the selector of
Serial Port COM1 Baud Rate 11520 Disconnect	Port Baud Rate Settings This setting governs the baud rate that the datalogger will use for a given port in order to support PakBus or PPP communications. For some ports (COM1 through COM4), this setting also controls whether the port will be enabled for PakBus or PPP communications. Apply Cancel Factory Defaults Read File Summary

LoggerNet Settings:

Enter the IP address of the Raven XT-Rogers, and the PakBus/TCP Service Port number of the datalogger (e.g. 6785 as explained above).

🖋 Setup		
File Edit Tools Options Help		
Add <u>Root</u> Add <u>D</u> elete Rename	Undo Redo	
Egi IPPort G Childen CR1000_1	IPPort: IPPort Hardware Standard Internet IP Address 14357571661.internet.mycingular.com.6785 Advanced Call-Back Enabled	
Check Apply Cancel	CP Listen Only Extra Response Time O4 s Delay Hangup O0 s 000 ms Port Used for Call-Back O AirLink Device ID No problems found with settings for the selected device	
	Connected; localhost	

Example CR1000 Program

The following example sends an email message when an alarm condition is True. Both the CR1000 and Raven XT-Rogers modem must be configured as PPP as described above.

```
CR1000 Program Example to Send Email Message
'Main program variables
Public Batt, RefTemp, Temp
'declare Email parameter strings (as constants), Message String & Result Variable
Const ServerAddr="smtpauth.earthlink.net""207.69.189.201"
Const ToAddr="datalogger@hotmail.com"
Const FromAddr="datalogger@hotmail.com"
Const Subject="Email Message Test"
Const Attach=""
Const UserName="datalogger@earthlink.net"
Const Password="cr1000"
Const CRLF = CHR(13)+CHR(10)
Public Result as String * 100
Public AlarmTrigger As Boolean
Public Message As String * 250
Public EmailSuccess As Boolean
BeginProg
  Scan (1,Sec,3,0)
     Battery (Batt)
     PanelTemp (RefTemp,250)
     TCDiff (Temp,1,mV2_5C,1,TypeT,RefTemp,True,0,250,1.0,0)
  NextScan
SlowSequence
  Scan(1,sec,1,0)
     If AlarmTrigger = False Then
        If Temp > 28 THEN AlarmTrigger = True
        If AlarmTrigger Then
          Message = "Warning!" + CRLF + CRLF
          Message = Message + "This is a automatic email message from the datalogger station " + Status.StationName + "."
          Message = Message + "An alarm condition has been identified."
Message = Message + "An alarm condition has been identified."
Message = Message + "The temperature is " + Temp + " degrees C." + CRLF + CRLF + CRLF
Message = Message + "Datalogger time is " + Status.Timestamp
          EmailSuccess=EmailSend (ServerAddr, ToAddr, FromAddr, Subject, Message, Attach, UserName, Password, Result)
       EndIf
     EndIf
     If Temp < 28 then AlarmTrigger=False
  NextScan
EndProg
```