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Manual

C6400-Series Collector Installation and User Guide

Publication: 98-1095 Rev AA

Landis |Gyr⁺

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1 Introduction and Overview



The C6400-Series Collector is a RF mesh network device that serves a smaller number of endpoints in rural and deployment fringes.

Landis



Figure 1 - 1. C6400-Series Collector

The C6400 Series collector is a NEMA-4 sealed enclosure with a power supply, backup battery, system processor board and hosts one Gridstream IWR radio. The C6400 Series Collector can support IP addressability for external backhaul modems (C6400 variant) or the collector can be ordered with an integrated single backhaul modem for communication with public wireless carriers (C6420 or C6430 variants). The C6400 Series collectors receive data from Gridstream network routers and endpoints and sends the data to the host system via internet packets. These collectors mount on a wooden utility pole or a streetlight arm.

Three different C6400-Series Collector units are available:

- Collector C6400. No wireless backhaul modem.
- Collector C6420. Features embedded GSM/GPRS wireless backhaul modem.
- Collector C6430. Features embedded CDMA/EVDO wireless backhaul modem.

FCC Compliance Information

FCC Class B

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult Landis+Gyr or an experienced radio technician for help.



WARNING: Changes or modifications to this device not expressly approved by Landis+Gyr Technology, Inc. could void the user's authority to operate the equipment.

C6400-Series Collector FCC ID Label



Figure 1 - 2. FCC/Industry Canada ID Label

RF Exposure

In accordance with FCC requirements of human exposure to radio frequency fields, the radiating element shall be installed such that a minimum separation distance of 22 centimeters will be maintained.

De Facto EIRP Limit

The collector meets the required FCC specifications with any customer-selectable RF power setting of the radio, using the antennas indicated in this document. FCC testing was conducted using an antenna with a gain of 5.5 dBi. Antennas with higher gain at higher RF power settings may result in EIRP levels in excess of the FCC limit.



NOTE: If you increase the power from the factory settings, this can cause communication problems for other radios in the network.

Industry Canada

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

This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareillage numérique de la classe B répond à toutes les exigences de l'interférence canadienne causant des règlements d'équipement. L'opération est sujette aux deux conditions suivantes: (1) ce dispositif peut ne pas causer l'interférence nocive, et (2) ce dispositif doit accepter n'importe quelle interférence reçue, y compris l'interférence qui peut causer l'opération peu désirée.

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 permitted for successful communication.

This device has been designed to operate with the antennas listed below, and having a maximum gain of 5.5 dBi. Antennas not included in this list or having a gain greater than 5.5 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Approved Antennas: Landis+Gyr 01-1311: Antenna, Modem; 106119-000: Antenna, Whip





SIM Card Installation for the C6420 Collector

A subscriber identification module (SIM) is a smart card that securely stores the service-subscriber key (IMSI) used to identify a subscriber on mobile telephony devices (such as mobile phones, computers and C6400-Series Collectors).

Contact your local cellular carrier to obtain an Industrial Grade SIM card for each C6420 Collector to be installed.



NOTE: Industrial grade SIM cards that support a temperature range of at least -40 to 85C are required for C6400-Series Collector installations.



WARNING: Do not attempt to open a C6420 Collector and install a SIM card in the field. The C6420 Collector requires SIM card installation in a meter shop environment by qualified personnel.

ESD Precautions



CAUTION: These parts are static sensitive. Prior to handling, put on a Electrostatic Discharge (ESD) wrist strap and attach it to ground.

Electrostatic discharge (ESD) is the release of stored static electricity that can damage electrical circuitry. Static electricity is often stored in your body, and discharged when you come in contact with an object with a different potential. The ESD wrist strap safely channels this electricity from your body to a proper ground.

Use an ESD wrist strap whenever you open a C6400-Series Collector, particularly when you will be handling SIM cards. In order to work properly, the wrist strap must make good contact at both ends (with your skin at one end, and with the ground at the other).



WARNING: The wrist strap is intended for static control only. It will not reduce or increase your risk of receiving an electric shock from electrical equipment. Follow the same precautions you would use without a wrist strap.

Required Tools for SIM Card Installation and Activation

The following tools are required for SIM Card installation and activation.

- Industrial grade SIM card
- Torque Wrench
- Endpoint Testing Manager (ETM) version 5.5.7 or later software running on an external PC or Laptop Computer
- C6400-Series Collector radio antenna
- External power strip connected to a 120VAC source
- External AC Power cable (19-2276)

Installation, Replacement or Removal of a SIM Card

The following steps are required for successful installation, replacement or removal of a SIM Card.



WARNING: The C6420 Collector can be identified by a tie-wrap around the unit when it is shipped from the factory. Cut the tie wrap and discard it before opening the unit. If there is no tie wrap, do not open the unit.

Prior to Installation

1. Record the SIM Card ID number located on the front of the card.



Figure 2 - 1. Front and Back of a SIM Card

Installation Procedure

- 1. Open the C6400-Series Collector
 - A. Remove the 6 bolts, nuts and washers from the C6400-Series Collector enclosure.

NOTE: The enclosure bolts on C6420 Collector units are hand tightened and not torqued to the required setting when shipped from the manufacturer.

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Figure 2 - 2. Bolt Locations



WARNING: Care must be taken to not disturb any other components inside the enclosure. DO NOT UNPLUG ANY CONNECTIONS WITHIN THE ENCLOSURE. Disconnecting and reconnecting of components will cause serious communication issues. Do not allow the two sides of the enclosure to separate completely.

- **B.** Carefully open enclosure and lay flat on the work surface.
 - Ensure that the gasket remains on the PCB half of the enclosure.
 - Do not allow the two halves of the enclosure to separate completely, ensure that all connections between the two halves remain intact.
 - Do not unplug any components.
- C. Locate SIM Card slot.



Figure 2 - 3. SIM Card Location

- 2. Install the SIM Card
 - A. Locate the slot for the SIM card.
 - **B.** Align the SIM card with the marking on the slot. The gold contacts of the SIM card face down toward the contacts of the slot.



Figure 2 - 4. Align SIM Card to SIM Card Slot

C. Carefully slide SIM card in until fully inserted.



Figure 2 - 5. SIM Card Properly Inserted

- 3. Close the C6400-Series Collector
 - **A.** Make sure that the gasket is on the base side of the enclosure to aid in proper alignment of the top lid, see Figure 2 3.
 - **B.** Shut lid enclosure onto base enclosure.
- NOTE: Ground cable and battery cable must be fully within the inside of the enclosure while it is closed.
 - C. Replace bolts, washers and nuts, see Figure 2 6. To ensure a water tight seal, torque each bolt to 25 +/- 2 IN. LBS. Alternating from side to side and from top to bottom in the following sequence, 1, 4, 3, 6, 2, 5, see Figure 2 6. Make a second pass alternating from side to side and from top to bottom, in the same sequence, torquing each bolt to 45 +/- 5 IN. LBS.

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Figure 2 - 6. Replace Bolts, Washers and Nuts and Tighten

Backhaul Configuration

Modem Setup for C6420 and C6430 Collectors

Modem Setup Overview

This Procedure requires the use of an external Gridstream RF IWR radio and Endpoint Testing Manager (ETM) version 5.5.7 or later, running on an external PC or laptop computer.

- Attached both antennas to the C6400-Series Collector.
- Attach antenna to the IWR.

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- External IWR should be powered ON when the C6400-Series Collector is powered up to allow time for radios to synchronize.
- C6400-Series Collector must be within the cellular network providers service area for the activation to work correctly.
- Account must be provisioned within the carrier's cellular network in advance of activation.

NOTE: C6400-Series Collectors are shipped with the default Network ID setting of 670. The external IWR radio used to communicate with the C6400-Series Collector must also be set at 670.

Connect to the C6400-Series Collectors using ETM

For all modem models begin communication with the C6400-Series Collectors with the following steps.

1. Using ETM on an external PC, connect to an external IWR radio. When ETM program is started, it will require users to log in using a Command Center account.

NOTE: For more information on using ETM, please see Landis+Gyr publication 98-1055: *Gridstream 2-Way Endpoint Testing Manager User Guide*.

2. Once logged in, the ETM application connects to the previously connected serial port automatically. If it is not connecting, click on the **Connection Tab** and then choose the available serial port from the drop-down menu. Choose the COM port from the drop-down menu and then click on **Connect**. Verify **Enable Field Mode** in Application Settings is selected.

	G® Gridstream 2-Way Endpoint Test	ting Manager Version 5.5.1.0					
File	Security					Module ID:	
Con	nection Head End Radio Devi	ice Test Firmware Downl	oad Module	Reporting	Command Scheduler	Universal Event Log	Groups
ġ	Connection Settings	onnect Use COM + at 9600 +			Collector Settings		
	Application Settings						
	🔲 Display Scrolling Status	AMR Password (Utility)	Default	*	Import Security Key		
	Enable Test Reports	Polling Interval (Secs)	: 5	*			
	Enable Field Mode	Log Trace Level	Error	~	Passwords		

Figure 2 - 7. Connect to Head End

- 3. After clicking the Connect button, the display will automatically revert to the **Device Test** tab.
- 4. Verify the Current Mode in the Mode Settings window of this tab is set to Field Mode.
- 5. Select the Head End Radio tab and click Get WAN Nodes List. The WAN Nodes Information report will open.

Col	lector				
Cor	nection Head End Ra	adio Device Test Firmware Download Moo	dule Reporting	Command Scheduler	Universal Event Log Groups
-	Head End Radio Settings				
	Collector / Integrated WAN Ra	adio			
	Radio:	Unknown Series III	Encryption:	Disabled	Headend: Disabled -
	Firmware Version:	251006-422-P	Routing:	Disabled 👻	Operational: Enabled -
	LPP Address:	FE.80.70.3C.EE.00 [80.70.3C.EE]	Network ID:	670(29E HEX)	Baud Rate: 9600 -
	Туре:	Serial Radio	Time Keeper:	Disabled ×	
	Connection Successful			Reb	oot Modify
	Commands				
	Get WAN Nodes L	List Clear WAN Nodes List Test Device			



The WAN Nodes list will open, see Figure 2 - 9.

6. Select the radio of target C6400-Series Collector and push **Test Module** button located at the top of the screen.

1	🛚 WAN Nodes	s Information in	r 88 56 47.45	10 42	37.068	E C O [80	.70.3C.EE]							
	🛟 Refresh 🛛 🗎	Copy Moule ID	🔅 Test Module	Reboo	ot									
I	Address (Lat/Lo	in/Color/LAN)		RSSI	Tick %	Dack %	Can Route	Two Way	Last Data	Last Ack	Batt Back	Distance (miles)	Node R	Time of Last Transactic
	88° 56' 47.451" 88° 56' 47.451"	5 139° 20' 10.199" 5 135° 11' 59.330"	E C 0[80730123]	-91 -93	20 36	80 57	False False	True True	True True	False False	False False	0	RTR RTR	6/20/2011 11:34:05 Alv 6/20/2011 11:55:50 Alv
	88° 56' 47.451"	5 149° 35' 58.044"	E C 0[8073530E]	-99	86	61	False	True	True	True	True	0	COL	6/20/2011 12:23:51 PM
I														
	<													>

Figure 2 - 9. WAN Nodes Information

NOTE: When the radio of the C6400-Series Collector is successfully contacted, the Collector tab will become available. If the procedure times out, press the Start Test button on the Device Test tab.

C6420 Modem Setup

- 1. (Optional Step) Attach C6400-Series Collector radio antenna.
- NOTE: If C6400-Series Collector is within close proximity to the IWR radio, an antenna will not be needed.
 - 2. Attach an external power strip to 120VAC source set the switch on the power strip to the **OFF** position.
 - **3.** Attach the external AC Power cable (19-2276) to the 7 pin Male AC socket of the C6400-Series Collector enclosure and to the power strip.

GSM Modem Setup

This Procedure requires the use of an external Gridstream RF IWR radio and Endpoint Testing Manager (ETM) version 5.5.7 or later, running on an external PC or laptop computer. The external

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IWR should be powered ON when the C6400-Series Collector is powered up to allow time for radios to synchronize.

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NOTE: C6400-Series Collectors are shipped with the default Network ID setting of 670. The external IWR radio used to communicate with the C6400-Series Collector must also be set at 670.

- 1. Turn the power strip switch to **ON**.
- 2. Note the LAN ID of the C6400-Series Collector.
- **3.** Using ETM on an external PC, connect to an external IWR radio. When ETM program is started, it will require users to log in using a Command Center account.

NOTE: For more information on using ETM, please see Landis+Gyr publication 98-1055: Gridstream 2-Way Endpoint Testing Manager User Guide. **(i)**

4. Once logged in, the ETM application connects to the previously connected serial port automatically. If it is not connecting, click on the **Connection Tab** and then choose the available serial port from the drop-down menu. Choose the COM port from the drop-down menu and then click on **Connect**. Verify **Enable Field Mode** in application settings is selected.

NOTE: Before connecting confirm that you are in Field Mode. Figure 2 - 10.

5. Choose the COM port from the drop-down menu and then click on Connect. Figure 2 - 10.

L+G® Gridstream 2-Way Endpoint Testin	g Manager Version 5.5.1.0	
File Security		Module ID:
Connection Head End Radio Device	Test Firmware Download Module Re	eporting Command Scheduler Universal Event Log Groups
Settings	nnect Use 2011 - at 9600 -	Collector Settings
Application Settings		
Display Scrolling Status	AMR Password (Utility) : Default	Import Security
Enable Test Reports	Polling Interval (Secs) : 5	V Key
🕑 Enable Field Mode	Log Trace Level : Error	Setup AMR Passwords
	Current Encryption Key : Default	▼
	Timeout Period (Secs) 120	▼
		Save Settings

Figure 2 - 10. Connect to Head End

- 6. After clicking the Connect button, the display will automatically revert to the **Device Test** tab.
- 7. Verify the Current Mode in the Mode Settings window of this tab is set to Field Mode.
- 8. Select the Head End Radio tab and click Get WAN Nodes List. The WAN Nodes Information report will open.

Colle	ector				
Con	nection Head End Ra	adio Device Test Firmware Download Mo	dule Reporting	Command Scheduler	Universal Event Log Groups
- H	lead End Radio Settings				
1	Collector / Integrated WAN R	adio			
	Radio:	Unknown Series III	Encryption:	Disabled	Headend: Disabled -
	Firmware Version:	251006-422-P	Routing:	Disabled 👻	Operational: Enabled
	LPP Address:	FE.80.70.3C.EE.00 [80.70.3C.EE]	Network ID:	670(29E HEX)	Baud Rate: 9600 -
	Туре:	Serial Radio	Time Keeper:	Disabled -	
	Connection Successful				Boot Modify
	Commande				
			_		
	Get WAN Nodes I	List Gear WAN Nodes List Test Device			

Figure 2 - 11. Get WAN Nodes List

The WAN Nodes list will open.

9. Select the radio of target C6400-Series Collector and push **Test Module** button located at the top of the screen.

	WAN No	des Info	ormatic	101	88 56 47.45	10 42	37.068	E C O [80	.70.3C.EE]								
	🛟 Refresh	🗐 Co	py Mo <mark>u</mark> le	ID	🔅 Test Module	Rebo	ot										
	Address (La	it/Lon/Col	or/LAN)			K SSI	Tick %	Dack %	Can Route	Two Way	Last Data	Last Ack	Batt Back	Distance (miles)	Node R	Time of Last	Transactic
	88° 56' 47.4 88° 56' 47.4	51" 5 139 51" 5 139	9° 20' 10.1 5° 11' 59.3	.99" I 330" I	E C 0[80730123]	-91 -93	20 36	80 57	False False	True True	True True	False False	False False	0	RTR RTR	6/20/2011 11 6/20/2011 11	:34:05 A№ :55:50 A№
	88° 56' 47.4	51" S 149	9° 35' 58.0)44" (E C 0[8073530E]	-99	86	61	False	True	True	True	True	0	COL	6/20/2011 12	:23:51 PM
1	<																>
1																	

Figure 2 - 12. WAN Nodes Information

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NOTE: When the radio of the C6400-Series Collector is successfully contacted, the Collector tab will become available.

🕲 L+G® Gridstream 2-Way Endpoint Testing Manager Version 5.4.1.0
File Security Module ID: 807334F1
Connection Head End Radio Device Test Firmware Download Module Reporting Command Scheduler Universal Event Log Groups Collector
Name: Collector 4F,93.86.20.8E.DF Version: 4.2.3.3 Update Collector 5/W Reboot Collector Identification Basic Configuration Client Routing Events/Alerts Statistics
MAC Address: 00-00-00-00-00 Network ID: 670 IP Address: 127.0.0.1 Door State: Door Closed Port1 -: COM4@115200 : ConnectedTo 4F.93.86.20.8E.C4 [80.73.34.F1] (251271-05.56) Port2 -: <port found="" of=""> Port3 -: <port found="" of=""> Port4 -: <port found="" of=""> Application Restarts: 12 Running Time: 17 hours, 56 minutes, 33 seconds Battery voltage 14.008 Battery stats</port></port></port>
Modem Settings Modem Type: MultiTechEDGE Revision: REVISION 01.100 Manufacturer: CINTERION ICC ID: 89014104243389158169 Model: MC751 IMSI: 310410338915816 Serial Number: 012054000000706 Status: RASCS_OpenPort, S_OK Provider: ATT Settings
Save All Restore
Activity Log Insert Comment 10:25:51.288 Meter Module [80.73.34:F1] was discovered. 10:26:6288 Meter Module [80.73.34:F1] was discovered. 10:26:14.485 Meter Module [80.73.34:F1] was discovered. 10:26:14.485 Meter Module [80.73.34:F1] was discovered. 10:26:24.485 Meter Module [80.73.34:F1] was discovered. 11:13:22:39 Meter Module [80.73.34:F1] was discovered. 11:13:22:39 Meter Module [80.73.34:F1] was discovered. 11:13:23:103 Meter [80.73.34:F1] was discovered. 11:13:23:103
🕢 Connected to Authentication Server 🔹 Security Mode:AESECB MAT certificate is valid for 0 Days 23 Hours 4 Minutes and 12 Seconds 🧾

Figure 2 - 13. Collector Tab

10. On the Collector tab, the following Modem Settings will be populated, see Figure 2 - 13:

Confirm the presence of a SIM Card by looking at the ICC ID and IMSI entries. Confirm the entries match the account. These entries should not say **Check SIM**.

- A. Modem Type: Multi TechEDGE
- B. Manufacturer: Modem Manufacturer
- C. Model: Modem model number
- D. Serial Number: Modem serial number
- E. Provider: Selected carrier

(i)

- F. Revision: Modem revision.
- **G. ICC ID**: SIM Card ICC ID
- H. IMSI: SIM Card IMSI
- I. Status: RASCS_OpenPort, S_OK. This message confirms that the modem is currently disabled.

NOTE: If any fields say Check SIM, an error has occurred in the installation of the SIM card. Contact Landis+Gyr Customer Support at 1-888-390-5733.

11. Select the Settings.... button, see Figure 2 - 13. The Modem Configuration window will open.

Modem Cont	iguration 📃 🗆 🔀
APN:	(apri)
User ID:	
Persword	
	Enable cellular modern
S	end Cancel

Figure 2 - 14. Modem Configuration Window

12. Modem Configuration. This procedure requires cellular service from the carrier in question.

- A. Enter APN information obtained from the carrier and is specific to each customer.
- B. Enter a User ID and Password.
- **C.** Check the **Enable cellular modem** check-box.
- D. Select Send.
- 13. After selecting Send, select Yes to reboot the C6400-Series Collector.

Wait approximately 3-5 minutes to allow the C6400-Series Collector to reboot. Once this time has elapsed, select **Fetch All**, see Figure 2 - 13.

14. The status change to **RASCS_Connected**, **S_OK** confirms that the unit is successfully connected to the cellular network.

Security					Module ID: 8073	34F1
nnection Head End R lector	adio Device Te	est Firmware Download	Module Reportin	g Command Scheduler	Universal Event Log G	iroups
Name: Collector 4F.93.B	5.20.8E.DF				_	
Version: 4.2.3.3	Update Collecto	S/W Reboot Collector			F	etch All
dentification Basic Configurat	ion Client Routing E	vents/Alerts Statistics			S	end All
Port 2 • : <pre>cport not for Port 3 • : <pre>cport not for Port 4 • : <pre>cport not for Application Statistics Application Restarts:13 Pathema Values 14:00</pre></pre></pre>	and> and> Running Time: 1	minute, 11 seconds				
- Modem Settings	Baccery Stats	J				
Modem Type: MultiTechE Manufacturer: CINTERIO Model: MC751 Serial Number: 012054000 Provider: ATT	:DGE N 1000706	Revision: REVISION 01.10 ICC ID: 8901410424338 IMSI: 3104103389158 Status: RASCS_Connect	00 9159169 16 ted, S_DK		Settin	gs]
Provider: AII					Settin	gs

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CAUTION: If the value noted for Battery Voltage states Error, contact Landis+Gyr Technical Support at 1-888-390-5733. This condition indicates that the battery pack became disconnected or other communication issues have occurred. As a result, battery stats will display erroneous values.

C6430 Verizon CDMA Modem Setup

- 1. Complete steps 1-6 in section See "Connect to the C6400-Series Collectors using ETM"
- After connecting to the C6400-Series Collector, please confirm the Serial Number field matches the ESN on the account to be activated. Also, ensure the Provider indicates Verizon. With Verizon it is necessary to dial an activation code to the network. This will signal NAM information to be sent over the air. This can be done by pressing the Activate button.

Security		Module ID: 00725326
nnection Head End R liector	adio Device Test Firmware Download Module Reporting	Command Scheduler Universal Event Log Groups
Name: Collector DI JF5.0	CLEDUF	
Version: 4.2.5.0	Update Collector S/W Reboot Collector	Fetch All
Identification Basic Configurat	an Client Routing Events/Werts Statistics	Send All
MAC Address: 00-00-00-00	00-00 Natawark ID: 32	
IP Address: 127.0.0.1	Door State: Door Opened	
Port 2 - : cport not fee Port 3 - : cport not fee Port 4 - : cport not fee Application Restarts: 16	ndo ndo ndo Running Timer 8 minutos, 32 seconds	
Battery Voltage 13.52	Battery Rats	
Modern Settings		
Moden Type: MultiTechi Narafartuawi SIEBBA W	VD0 Revision: P2811301,52296 [JUL 15 2009 15:51:31] IDELESS INF 300 The M/A	
Model: MC5728V	L V 1.0 (0) IMSI: N/A	
Serial Marsher: COSCC /E	FRASCS_OpenPort, S_OK	
Provider: Venat	Activate 04: 4049914976:4049651147	Settings
	Save Al	Restore
	Activity Log Insert Con	wort
4 15:552 Integrated WAN Rad 4 19:950 Integrated WAN Rad 4 29:900 Integrated WAN Rad 4 40:909 Integrated WAN Rad 4 51:354 Meter Module (80:73	o uccessfully connected. uccessfully connected and Encogloon settings are Verified puccessfully connected and Encogloon settings are Verified puccessfully connected and Encogloon settings are Verified 3.54 was discovered.	

Figure 2 - 16. Initiate Verizon Service

- **3.** Once the activation process has been initiated, wait at least 5 minutes for the over the air programming of the NAM to occur. Once completed, press the **Settings** button Figure 2 16.
- 4. The Modem Configuration information box will open. These settings are for reference only and will not be editable. Check the **Enable Internet data connection for the cellular modem** check-box and select **Send**.

🖶 Modem Configuration				
NAI: 6787139029@VZW3G.	СОМ			
Home Address:	0.0.0.0			
Primary Home Agent:	255.255.255.255			
Secondary Home Agent:	255.255.255.255			
Home Agent Shared Secret Key:	SET			
Home Agent SPI:	300			
AAA Shared Secret Key:	SET			
AAA SHILL OPL	2			
Enable Internet data connection for cellular modem				
Send	Lancel			

Figure 2 - 17. Modem Configuration Settings

5. Select Yes from the pop-up dialog box.

Ô L+G® Gridstream 2-Way Endpoint Testing Manager Version 5.4.1.0
File Security Module ID: 80735326
Connection Head End Radio Device Test Firmware Download Module Reporting Command Scheduler Universal Event Log Groups
Collector
Name: Collector 06-F8-08-C1-FD-DF
Version: 4.2.5.0 Redate Collector SNM Deboot Collector
Identification Basic Configuration Clent Routing Events/Alerts Statistics
MAC Address: 00-00-00-00-00 Network ID: 32
IP Address: 127.0.0.1 Door State: Door Opened
Pot 1 + ; COM4@115200 ; ConnectedTo 06.F8.08.C1.FD.C4 (80.73.53.261 (251271-06.54)
Port 2 +: <port found="" not=""></port>
Port 3 • c (sport not found)
Pot 4 Pakent 0K7
Application and the cellular modem will require a reboot of the Collector. This would make the Collector unavailable for approximately 3 minutes. Are you sure this is what you application and the one of the collector unavailable for approximately 3 minutes.
Modern Se
Modem Typer Hamiltonic to the formation of the formation
Manufacturer: SIERRA WIRELESS, INC. ICC Dr. N/A
Model: MU5/28V HEV I.U (U) IMDI: N/A

Figure 2 - 18. Enable Modem

Wait approximately 3-5 minutes for the C6400-Series Collector to reboot. Once this time has elapsed, attempt to Fetch All again, Figure 2 - 16. The status will change to RASCS_Connected, S_OK when the unit is successfully connected to the cellular network.

a according						Madda The MURRISON
onnection ollector	Head End Rad	io Device Tes	t Firmware Downloa	ad Module Reporting	Command Scheduler	Universal Event Log Group
Name:	5	Update Collector 5	/w Reboxt Collector			Petch Al
Identification	Basic Configuration	Client Routing Ew	nts/Alerts Statistics			Send A
Pert 2 • Port 2 • Port 4 • Application Sate Nodew Sett Modem Typ	cport not found cport not found cport not found Statistics Restarts: 17 y votage 13.324 ingi set Multi Techi VD	Running Time: 31 Bettery stats	neands Rotean P2811301.522	206 (JUL, 15 2009 15;51:31)	1	
Menufactur Mod	er: SIERRA WIRE et: MC5728V REV er: 0x50C41ECF er: Voizon	LESS, INC. / 1.0 (0)	ICC ID: N/A IME: N/A Status: RASCS_Conne	outed. \$_OK		Disable
Senal Nuniti Provid					and the second	
Provid			Save AL.		Restore	
Senai huno Provid			Save AL.	Activity Log Insert Co	Restore	

Figure 2 - 19. Connected to Cellular Network

C6430 Sprint CDMA Modem Setup

- 1. Complete steps 1-6 in section See "Connect to the C6400-Series Collectors using ETM"
- **2.** After connecting to the C6400-Series Collector, please confirm the **Serial Number** field matches the ESN on the account to be activated. Click the **Settings** button.

+ GD Grider	tream 7-Way End	point Testing Ma	nager Version 5.4.1.0				E 15
e Security	_						Module 10: 007334E7
onnection ollector	Head End Rad	dio Device Ter	t Firmware Downl	oad Module R	eporting Comm	and Scheduler Univ	versal Event Log Groups
Name: Version:	Phates Coloring (http: 4.2.3.3	Update Collector 1	(W Reboxt Collect	tor			Tetch All
Identification	Basic Configuration	Client Routing Ev	ents(Alerts Statistics				Send All
HAC Addres	SI 00-30-64-04-FI	8-05	Network ID: 620				
IP Address	127.0.0.1		Door State: Door Close	-4			
	Tarrison a		the states which the	Constant and the second	0.000		
Pot1 -	COM4@11520	D ConnectedTo F	E 80.73 34.E7.00 [80.7]	1.34.E7] (251271-0	15.56}		
Pat 2 ·	(port not found)	de :					
Pot 3 .	cpert not form	də 🛛					
Fox4 +	cpert net four	de					
Acceleration	n Statistics						
Applicatio	n Restarts: 15	Running Time: 44	seconds:				
Batte	ery Voltage 13.662	Battery Stats					
Hodem Sa	chings						
Moders T)	yper HultiTechEV	00	Revisioni P2811301.6	0653 (JUL 15 2009	15:51:31]		
Manufacto	UN: SIERRA WIR	ELESS_INC.	TOC ID: N/A				
Pas	KORE MES/28V HE	A 170 (n)	INDI: N/A				
Serier Num	der: Societ		SCHUR HASES_COM	nectes. >_UA			Contrar 1
	and a separate						- one der
			Save AL		Restore	1	
			Automation and	Activity Log	Insert Connent	e	
40.33.078 Sete	control WAR Bodie -	contracted by contract and		meaning boy	(sourcestance)		
40.32.195 Inte	igrated WAN Radio	successfully connect	ed and Encryption settings	are Verified			
42:10:251 Met 42:10:992 Met	ter Module (88.73.34 ter (80.73.34 Fil) sure	FI] was discovered. estfully contacted					
The state of the state	ter Monkele Ski 73 34	£11 was docevered.					

Figure 2 - 20. Initiate Sprint Service

3. The Activation Settings information box will open displaying the **Modem Configuration** settings, Figure 2 - 21. Enter the Mobile IP settings obtained from the cellular service provider. Check the **Enable Internet data connection for the cellular modem** check-box and select **Send**.

🖶 Modem Configuration	
NAI:	
Home Address:	0.0.0.0
Primary Home Agent:	0.0.0.0
Secondary Home Agent:	0.0.0.0
Home Agent Shared Secret Key:	SET
Home Agent SPI:	1234
AAA Shared Secret Key:	SET
AAA Server SPI:	1234
📃 Enable Internet data connecti	on for cellular modem
Send	Cancel

Figure 2 - 21. Modem Configuration Settings

Wait approximately 3-5 minutes for the C6400-Series Collector to reboot. Once this time has elapsed, attempt to Fetch All again, Figure 2 - 16. The status will change to RASCS_Connected, S_OK when the unit is successfully connected to the cellular network.

The second se						0.0000
and and a second					Mi	schule ID; IIII/334E7
nnection Head End R liector	adio Device Test Fi	rmware Download	Module Repo	rting Command	Scheduler Universal E	Event Log Groups
Name: PLEAS Coloring	A-107294875					
Version: 4.2.3.3	Update Collector S/W	Reboot Collector				Fetch All
Identification Basic Configural	tion Client Routing Events(A	lerts Statistics				Send Al
MAC Addressi 00-30-64-04	-EB-D5 Neb	kork 80: 670				
IP Address: 127.0.0.1	Der	r State: Door Closed				
Pat 4 • 1 sport not for Application Statistics Application Statistics Battery Voltage 13.60	Running Time: 44 secon 22 Battery State	ufa				
Hoden Sitting: Noden Type: HulhiTech Menufacturer: SIERIEA V Hodie: MCS728V Seriel Number: 0x60C430 Browder: Sprint	EVDO Re JIRELESS, INC. 1 REV 1.0 (0) JGD 1	visioni P2011301.60653 CC ID: N/A JMSI: N/A Ratus RASCS_Connect) (JUL 15 2009 15:5 164. 5_0K	91:31]		Settings
		Save AL		Restore		
			a contract of some line of the	Contraction of the second s		

Figure 2 - 22. Connected to Cellular Network

Ethernet Setup for C6400 Collectors

The utility determines the best configuration to connect the collector to the network.

3 C6400-Series Collector Installation



Pre-Installation Overview

Proper planning and thorough preparation are critical to successful C6400-Series Collector installation. This chapter outlines basic requirements for the pre-installation phase of the C6400-Series Collector deployment process.

Safety Overview

Prior to starting the installation process, you must develop and launch an installer safety training plan for initial, refresher, and ongoing safety training. Ensure that installers receive appropriate initial and refresher training to meet their specific safety-related responsibilities. You must provide safety training when:

- 1. an existing installer assumes new duties for which they have not previously received training.
- 2. new processes and methodologies representing new risks are introduced into the installation environment.
- 3. previously unidentified risks are reported.

The installation supervisory team assumes responsibility for ensuring that installers are properly trained, authorized, and continually qualified to perform their work. The team must also take responsibility for the safety of their installers and to assure safe work methodologies. Installers must understand that their supervisor's responsibility does not relieve them from their individual responsibility to perform the work safely and to follow all safety rules and procedures applicable to their work.

Pre-Installation Checklist

Be prepared before you go on site. The following list includes most pre-install items.

Item	Description
Site Survey	The utility has surveyed the area to determine optimal locations for C6400-Series Collector installation. Landis+Gyr offers this professional service as a contract option.

Table 1. Pre-Install Checklist

Item	Description
Obtain Necessary Permits	When the C6400-Series Collector is to be installed on utility or municipal property such as utility poles, there is a general agreement to install on these poles. There may be a requirement for the utility or municipality to approve individual sites. It is the installer's responsibility to ensure that approval has been given for each installation.
Network Installation Timeline	The Network Installation Plan specifies and formalizes the entire C6400-Series Collector installation plan. Perform all surveys in advance to ensure ample time for make-ready work as well as addressing any unforeseen installation issues. All C6400-Series Collectors will be installed, quality-checked, and online prior to any endpoint installation in a scheduled route.
Tools and Equipment	The latter part of this chapter has detailed tool and equipment information.
Bucket Truck	Procure all necessary barricade and traffic permits for the bucket truck as required, unless covered by prior permits.

Table 1. Pre-Install Checklist

Getting Organized

C6400-Series Collector Installation Tool List

- Gas or hydraulic-powered drill, 3/4 inch augur bit
- Two adjustable-end wrenches
- Squeeze-on crimpers and crimps
- Standard socket wrench set
- C6400-Series Collector and applicable install kit
- C6400-Series Collector power cable with standard 120VAC outlet
- Survey sheet
- Personal Protection Equipment
- Voltmeter
- Cell phone or 2-way communication device
- Phillips head screw driver
- Laptop computer with serial port or USB to serial adapter
- IWR Radio Kit (IWR, Power Supply, Antenna, Serial Cable)

Additional Tools Required for Metal Pole Installations

- Steel banding tool
- Tin snips
- Hammer

Additional Tools Required for Building and Structure Installs

- Steel banding tool
- Hammer drill
- Bits

Installation Material and Third Party Supplies

The installation process consists of using predetermined route information identifying C6400-Series Collectors that need to be installed and methods for recording data to document the installation.

From the Cross-Dock, obtain C6400-Series Collector and installation kits to install.

Additional Materials that may be needed:

- Steel banding material
- Mastic/vinyl tape
- Crimp-on connectors



NOTE: **28-1299: Bracket, Mounting, Wood Pole**, is not part of a mounting kit and must be ordered separately.

Antenna Mounting

The C6400-Series Collector requires two antennas to communicate with the endpoints and to relay information from the endpoint to the host application:

- 1. One modem antenna
- 2. One whip antenna

The LAN antenna mount on the bottom of the C6400-Series Collector. The WAN communications antenna mounts on top of the enclosure or on the antenna bracket.



CAUTION: Use only Landis+Gyr-approved antennas.

For All Installations

C6400-Series Collector Installation Sheet

The utility provides a C6400-Series Collector Installation Sheet for every C6400-Series Collector to be installed. The sheet contains:

- Street address
- Type of mounting (wood pole, streetlight pole, building, etc.)
- Access method (bucket truck or installer climb).

Power Requirements

Power requirements are listed in Product Specifications. Verify that the power source is 120V-240VAC single phase.

Power Cable Preparation

You can use the following AC power cable options with any Landis+Gyr mounting kits. Cable part numbers are:

- 19-2207. Cable Assy, Power Cable, 10ft
- 19-2286. Cable Assy, Power Cable, 20 ft
- 19-2280. Cable Assy, Street Light, 6 ft
- **19-2281**. Cable Assy, Street Light, 18 ft

Depending on the utility requirements, physically connecting to the secondary may have additional requirements.

Adding Drip Loops to Cables

For any cables in an assembly, allow some slack to rest below metal parts. The slack is called a "drip loop." With a drip loop, water from rain and condensation drips from the cable without damaging associated mechanical equipment



Figure 3 - 1. Cable with a drip loop

See "Cable Installation" on page 65, for additional power cable installation information.

Kit Part Numbers

Different kinds of installs may require different mounting and install kits. The following table contains a list of part numbers by installation type. This document details each kit in the appropriate install description.

Kit Number	Description
45-1211	Collector C6400: Mounting Kit, Street Light Arm, 18 ft. Cable
45-1212	Collector C6400: Mounting Kit, Utility Pole, 20 ft. Cable
45-1213	Collector C6400: Mounting Kit, Street Light Arm, 6 ft. Cable
45-1214	Collector C6400: Mounting Kit, Utility Pole, 6 ft. Cable
45-1140	Collector C6420/C6430: Mounting Kit, Street Light Arm, 18 ft. Cable
45-1180	Collector C6420/C6430: Mounting kit, Street Light Arm, 6ft. Cable
45-1141	Collector C6420/C6430: Mounting Kit, Utility Pole, 20 ft. Cable
45-1367	Collector C6420/C6430: Mounting kit, Utility Pole, 10ft Cable

Table 2. Mounting Kits

For information about installation types not listed here, contact Landis+Gyr Customer Operations via solutionsupport.na@landisgyr.com.

C6400-Series Collector Assembly

Unless otherwise noted, all kits in this manual are specifically for the C6400-Series Collector

Part Number	Name
26-1330	C6400-Series Collector w/CDMA Modem - Sprint
26-1331	C6400-Series Collector w/CDMA Modem - Verizon
26-1398	C6400-Series Collector, w/Edge Modem
26-1399	C6400-Series Collector without Modem

Optional Parts

Landis+Gyr can accommodate specialized needs for remote antenna installation.

Utility Pole Mount Installation

The utility or municipality determines the final guidelines of where to install the C6400-Series Collector. Know and follow the utility or municipality guidelines before installing the C6400-Series Collector and antennas.

Utility Pole Mounting Kit

In addition to the C6400-Series Collector assembly kit, you need a mounting kit.

Part Number	Name	Qty	45-1141	45-1367	45-1212	45-1214
01-1311	Antenna, Modem	1	✓	\checkmark		
106119-000	Antenna-Whip	1	\checkmark	\checkmark	\checkmark	\checkmark
19-1332	Cable Assy, Modem Antenna	1	\checkmark	\checkmark		
19-2270	Cable Assy, Ethernet, External, 18 ft.	1			\checkmark	\checkmark
19-2286	Cable Assy, Power Cable, 20 ft.	1	\checkmark		\checkmark	
19-2207	Cable Assy, Power Cable, 10 ft.	1		\checkmark		\checkmark
22-0421	WASHER,1/4 FLAT,1/16 THK, SS	8	\checkmark	\checkmark	\checkmark	\checkmark
22-0422	WASHER,1/4 SPLIT LCK,1/ 16 THK,SS	8	\checkmark	\checkmark	\checkmark	\checkmark
22-1118	Bolt, Hex Head, 1/4-20 x 4.0 inch, SS	4	\checkmark	\checkmark	\checkmark	\checkmark
28-1367	Bracket, Wood Pole Lid	1	\checkmark	\checkmark	\checkmark	\checkmark
28-1368	Bracket, Wood Pole Arm	1	\checkmark	\checkmark	\checkmark	\checkmark
30-0055	Cable Tie, 5.6 inch Length, UV, Nylon, Black	2	\checkmark	\checkmark	\checkmark	\checkmark
HRDW-00724	SCREW, 1/4-20 x 1/2 PPH SS	4	\checkmark	\checkmark	\checkmark	\checkmark
101983-025	Nut, Serrated hex Flange Lock Nut, 1/4-20 UNC, SS	4	\checkmark	\checkmark	\checkmark	\checkmark

Table 4. Utility Pole Mounting Kit

Utility Pole Installation Procedure

1. Affix the Wood Pole Arm (PN 28-1368) to the wood pole using three mounting bolts (two lag bolts and one D/A bolt) with washer and nut or steel bands. (Hardware parts are not included in kit.)



Figure 3 - 2. Bracket, Wood Pole Arm

NOTE: When mounting the bracket, align the bracket so that the C6400-Series Collector does not exceed 5° off perpendicular to the ground.

- 2. Attach the C6400-Series Collector to the bracket. Use the four (4) carriage bolts, washers, lock washers and nuts included in the kit. See Figure 3 3
- **3.** Torque bolts to 25 + 3.0 in. lb.

 (\mathbf{i})



Figure 3 - 3. Attach C6400-Series Collector to the Bracket

4. Kits 45-1141 and 45-1367 Only.

Attach the Modem Cable Assembly directly to the C6400-Series Collector and bracket lid.

- A. Remove hardware from N-bulkhead connector of modem cable.
- **B.** Secure the connector to the bracket by applying 100 + 10 in. lb. torque to hex nut.
- C. Attach modem antenna to the N-Bulkhead connector.
- **D.** Secure modem cable to bracket lid with the cable tie provided in the kit.



Figure 3 - 4. Modem Cable Assembly Attachment

5. Attach the bracket lid to the bracket arm using washers, lock washers and screws provided with the kit. See Figure 3 - 5. Torque screws to 45 +/- 5.0 in. lbs.



Figure 3 - 5. Attach Lid to Base

6. Attach the **power cable assembly**, secure power cable to bracket arm with cable tie provided in the kit. Figure 3 - 6.



Figure 3 - 6. Attach Power Cable, Secure with Cable Tie

7. Kits 45-1212 and 45-1214 Only.

Attach the **ethernet cable assembly**, secure ethernet cable to bracket arm with the cable tie provided in the kit.



Figure 3 - 7. Attach Ethernet Cable, Secure with Cable Tie

8. Attach the whip antenna to the bottom of the C6400-Series Collector.



Figure 3 - 8. Attach Antenna

Streetlight Arm Horizontal Mount Installation

The utility or municipality determines the final guidelines of where to install the C6400-Series Collector. Know and follow the utility or municipality guidelines before installing the C6400-Series Collector and antennas.

C6400-Series Collector Streetlight Arm Mounting Kit

In addition to your chosen C6400-Series Collector assembly kit, you need a mounting kit.

Part Number	Name	Quantity	45-1140	45-1180	45-1211	45-1213
01-1311	Antenna, Modem	1	\checkmark	\checkmark		
106119-000	Antenna-Whip	1	\checkmark	\checkmark	\checkmark	\checkmark
19-1332	Cable Assy, Modem Antenna	1	\checkmark	\checkmark		
19-2270	Cable Assy, Ethernet, External, 18 ft.	1			\checkmark	\checkmark
19-2281	Cable Assy, Street Light, 18 ft.	1	\checkmark		\checkmark	
19-2280	Cable Assy, Street Light, 6ft.			\checkmark		\checkmark
22-0421	WASHER,1/4 FLAT,1/16 THK, SS	4	~	\checkmark	\checkmark	\checkmark
22-0422	WASHER,1/4 SPLIT LCK,1/ 16 THK,SS	4	\checkmark	\checkmark	\checkmark	\checkmark
22-0452	WASHER,FLT,3/8IDx.81ODx1/16,SS	6	\checkmark	\checkmark	\checkmark	\checkmark
22-0453	WASHER,3/8 SPLIT LOCK, S S	6	\checkmark	\checkmark	\checkmark	\checkmark
22-0628	NUT,3/8-16,HEX,SS	4	\checkmark	\checkmark	\checkmark	\checkmark
22-1117	Bolt, Hex Head, 3/8-16x1.0 inch,	2	\checkmark	\checkmark	\checkmark	\checkmark
22-1118	Bolt, Hex Head, 1/4-20x4.0 inch, SS	4	\checkmark	\checkmark	\checkmark	\checkmark
22-1135	Spacer, 1/4, 1/2OD x 1-3/4L, Stainless Steel	4	\checkmark	\checkmark	\checkmark	\checkmark
22-1472	SEMS,6- 32x5/16inch,INT,PNH,PHH,SS	2	\checkmark	\checkmark	\checkmark	\checkmark
28-1299	(Optional) Bracket, Mounting, Wood Pole. Not part of kit, order separately.	0	✓	\checkmark	~	✓
28-1317	Bracket, Streetlight Enclosure	1	\checkmark	\checkmark	\checkmark	\checkmark
28-1318	Bracket, Streetlight, Pole Mount	1	\checkmark	\checkmark	\checkmark	\checkmark
28-1319	V-Bolt, 3/8, Streetlight	2	\checkmark	\checkmark	\checkmark	\checkmark

Table 5. Mounting Kit, Streetlight Arm

Table 5. Mounting Kit, Streetlight Arm

Part Number	Name	Quantity	45-1140	45-1180	45-1211	45-1213
30-0055	Cable Tie, 5.6 Inch Length, UV, Nylon, Black	1	\checkmark	\checkmark		

Streetlight Arm Installation Procedure

1. Attach the C6400-Series Collector to the streetlight enclosure using the bolts, spacers, washers and lock washers included in the kit. Figure 3 - 9

Torque to 45 +/- 5.0 in. lb.



Figure 3 - 9. Attach to Streetlight Enclosure

2. Insert two screws into the front of the bracket and torque to 8 +/- 2.0 in. lbs. Figure 3 - 9

3. Attach streetlight bracket to streetlight arm or optional wood pole mounting bracket using V-bolts, washers, lock washers and nuts provided in the kit. Figure 3 - 10.

Torque to 45 +/- 5.0 in. lb.

4. Attach streetlight enclosure containing C6400-Series Collector to the streetlight bracket using hex head bolts, washers and lock washers provided in the kit. Figure 3 - 10.

Torque to 140 +/- 10.0 in. lb.

- 5. *Kits 45-1140 and 45-1180 Only*. Attach the Modem Cable Assembly directly to the C6400-Series Collector and the bracket lid, as shown in Figure 3 10.
 - A. Remove hardware from N-bulkhead connector of modem cable.
 - **B.** Secure the connector to the bracket by applying 100 +/- 10 in. lb. torque to hex nut.
 - C. Attach modem antenna to the N-Bulkhead connector.
 - **D.** Secure modem cable to bracket with cable tie provided in the kit.





Figure 3 - 10. Mount to Streetlight Arm of Optional Wood Pole Mounting Bracket

- 6. *Kits 45-1211 and 45-1213 Only.* Attach the **ethernet cable assembly**. See Figure 3 11.
- 7. Attach power cable assembly. See Figure 3 11.



Figure 3 - 11. Attach Ethernet and Power Cables

8. Attach the whip antenna to the bottom of the C6400-Series Collector.

4 Setting Up and Managing in Command Center

Command Center Setup

The C6400-Series Collector acts as the gateway between Command Center and the endpoints in the Gridstream network. The C6400-Series Collector provides the interface for sending commands to endpoints and getting readings from endpoints. Prior to receiving readings from endpoints, C6400-Series Collectors must be established in Command Center.

Successful completion of this chapter will enable you to:

- Establish C6400-Series Collector communication
- Enable C6400-Series Collector Auto-registration
- View existing C6400-Series Collectors in the system
- Manage C6400-Series Collectors

C6400-Series Collector Communication

The C6400-Series Collector receives data from routers and endpoints to provide to the host system via TCP/IP. The communication between the Gridstream C6400-Series Collector and Command Center works similar to the way an e-mail enabled cell-phone operates. This connection can be provided by our GPRS and CDMA cards.

Collector Auto-registration

Collectors will attempt to establish a communication link with Command Center when installed. If the collector is able to do so it will appear in the Manage Collectors screen in the Discovered status.

Manage Collectors								
New								
Drag a column header here	to group by that column.							
Collector Name	Status	Туре	Has Endpoints	Firmware	Substation	Comm. Type	Location - Level 1	Location 2
	Y Y	Y	Y	Y	7	7	T	7
<u>956 TOP</u>	Normal	RF(C7400)	Yes	4.1.5.0		LAN		
GAP Collector I	Normal	RF(C6400)	Yes	4.2.2.0		LAN		
<u>916 TOP</u>		RE(C7400)	Yes	4.1.4.0		LAN		
GAP Collector II	Discovered	RF(C6.00)	Yes	4.2.1.11		LAN		

Figure 4 - 1. Discovered Collector

Landis

Following is the procedure for completing the registration process:

- 1. From Command Center home, select **Setup > Collectors**. The Manage Collectors window will open.
- 2. Click the link for the desired C6400-Series Collector.
- 3. Click the General Settings tab.

Collector Information					
GAP Collector II , RF(C640	0)			Normal (May 25 01:35 PM/May 25 09:00 AM)	
Comm Type: LAN				<u>1 Endpoints</u> Firmware: 4.2.1.11	
General Settings Manag	e Statistics History				
General Settings					
RF Collector Name *	GAP Collector II	Status *	Normal	~	
RF Collector ID *	0030640985D8	Time Zone	UTC-5 New York	~	
Longitude *	-84.23449528	Latitude *	34.56779472		
Registration ID *	1	Zipcode	30022		
Radio Serial Numbers	0000807334F7				
Directions					
Collector Radios					
0000807334F7					
Communication Settin	gs				
Comm Type	LAN	IP Address	10.1.152.223		
Notes					
			Save Cancel		
Click here to produce use	er .ini file.				

Figure 4 - 2. Collector General Settings

- **4.** Enter the following fields:
 - **A. RF Collector Name**. Enter the C6400-Series Collector Name. This name must be unique to the organization.
 - **B.** Status. Select Normal from the drop-down menu.
 - C. Enter the Latitude/Longitude for the C6400-Series Collector.
 - **D. Registration ID**. Enter the Registration ID for this collect. The RegistrationID is utility defined, if more than 255 values are required, the utility may repeat numbers, however it is recommended that C6400-Series Collectors in close proximity of each other not use the same ID.
 - **E. ZIP Code**. Enter the ZIP Code for this C6400-Series Collector location. This will be used in gathering weather related data for the meters communicating through this C6400-Series Collector.
- 5. Click Save to save C6400-Series Collector settings.

Configure NTP Server IP Address/NTP Poll Interval

- 6. Select the Manage tab.
- 7. From the Command List drop-down menu, choose Modify Collector Settings.
 - A. Choose NTP Server and move to the selected column by selecting the ">" symbol.
 - **B.** Enter the utility NTP server IP address in x.x.x.x format.

- C. Choose NTP Poll Interval and move to Selected column by selecting the ">" symbol.
- **D.** Enter NTP Poll Interval = 8

Collector Information

GAP Collector II , RF(C6400) Comm Type: LAN		Normal (May 25 01:35 PM/May 25 09:00 AM) <u>1 Endpoints</u> Firmware: 4.2.1.11
General Settings Manage Statistics History		
	Select a Command Modify Collector Settings Select as many collector key val Available Application Starts Broadcast Fragment Delay CC Bytes Received CC Failed Receive Calls CC Failed Receive Time CC Failed Send Time	es as desired. Selected NTP Poll Interval NTP Server
	General Configuration Settings	
	NTP Poll Interval 8	[Remove]
	NTP Server	[Remove]
	Send Recently Issued Comr Only commands that return interesting data are shown	nands n. Ordered so most recent appear first.

Figure 4 - 3. Collector Manage Tab

8. Click Send.

Collector Time Sync Request

- 9. From the Manage tab
 - A. From the Command List, select Collector NTP Time Sync.
 - B. Click Send

Collector Information			
GAP Collector I , RF(C6400)		Normal (May 25 01:45 PM/May 25	5 09:41 AM)
Comm Type: LAN		Birmware: 4.2.2.0	
General Settings Manage Statistics History			
	Select a Command	Collector NTP Time Sync	
		Send	
		Recently Issued Commands	
	Only commands that return inter	esting data are snown. Ordered so most recent appear fil	rst.
Command	User	Sent	Received
Get Collector Settings	katpallin	05/24/2011 11:40:10 AM	05/24/2011 11:40:11 AM
Modify Collector Settings	katpallin	05/23/2011 05:31:43 PM	05/23/2011 05:31:45 PM
Collector Ping Command	SYSTEM	05/23/2011 05:30:55 PM	05/23/2011 05:30:56 PM
Collector Ping Command	SYSTEM	05/23/2011 05:30:52 PM	05/23/2011 05:30:55 PM

Figure 4 - 4. Collector NTP Time Sync

Collector Time Sync Verification

10. From the Manage tab

- A. From the Command List, select Get Collector Settings
- **B.** All field will be displayed in the **Selected** column.
- C. Click Send



Figure 4 - 5. Collector Command Response

- D. The Collector Command Response window will open.
- **E.** Review the General Application Statistics
 - Confirm the current collector time is correct and that the time change was under 10 seconds.
 - If the collector time is not correct, issue the Collector NTP Time Sync command again.

Time Keeper Flag/CRC/Registration ID

- **11.** From the Manage tab:
 - A. From the Command List, select Modify Collector Settings
 - B. Select isTimeKeeper and move to the Selected column by selecting the ">" symbol.
 - Set the value to **True**
 - C. Select CRCAdder and move to the Selected column by selecting the ">" symbol.
 - Enter the Network ID for the utility
 - **D.** Select the **RegistrationID** and move to the Selected column by selecting the ">" symbol.

Set the value to a unique ID assigned to this Collector by the utility (valid range 1 - 255)

NOTE: The RegistrationID is utility defined, if more than 255 values are required, the utility may repeat numbers, however it is recommended that Collectors in close proximity of each other not use the same ID.

 (\mathbf{i})

Select a Command	Modify Collect	or Settings	*	
Select	as many collect	tor key values	s as desired.	
	Availabl	e 11	Selected	
Alert Priority Thresh	old	>>	CRC Adder	
Broadcast Fragmen CC Bytes Received	t Delay	>	Registration ID	
CC Bytes Sent CC Failed Receive C	Calls	<		
CC Failed Receive T CC Failed Send Tim	ïme e 💌	<<		
General Configuration	Settings	_		
CRC Adder		470		[Remove]
Is TimeKeeper		true 💌		[Remove]
Registration ID		1 🛰		[Remove]
	_			
		ena		

Figure 4 - 6. Modify C6400-Series Collector Settings

12. Click Send.

The C6400-Series Collector configuration is complete.

C6400-Series Collector General Settings Tab

Collector Information				
GAP Collector II , RF(C6400)			Normal (May 25 01:55 PM/May 25 09:00 AM)
Comm Type: LAN				<u>1 Endpoints</u> Firmware: 4.2.1.11
General Settings Manage	Statistics History			
General Settings				
RF Collector Name *	GAP Collector II	Status *	Normal	~
RF Collector ID *	0030640985D8	Time Zone	UTC-5 New York	~
Longitude *	-84.23449528	Latitude *	34.56779472	
Registration ID *	1	Zipcode	30022	
Radio Serial Numbers	0000807334F7			
Directions				
Collector Radios	L			
0000807334F7				
Communication Setting	JS			
Comm Type	LAN	IP Address	10.1.152.223	
Notes				
			Save Cancel	
Click here to produce use	r .ini file.			

Figure 4 - 7. General Settings Tab

General Settings

• **RF Collector Name**. The name must be unique among all active Collectors.

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NOTE: Collector names may not contain any spaces.

- Status. Indicates the current status of the collector: Normal, Discovered, Inactive.
- **RF Collector ID**. Represents the MAC address of the C6400-Series Collector. This field is automatically populated on C6400-Series Collectors discovered in Command Center.
- Time Zone. Enter the time zone for the location of the C6400-Series Collector
- **Longitude**. Enter the longitude of the C6400-Series Collector location. Used for viewing the C6400-Series Collector in the system map.
- Latitude. Enter the latitude of the C6400-Series Collector location. Used for viewing the C6400-Series Collector in the system map.
- **Organization Location**. Select the location from the drop down list box. (Will only be visible if organization locations have been established for the utility.)
- **ZIP Code**. Enter the ZIP Code for the C6400-Series Collector location. This ZIP Code is used to collect weather related data.
- **Collector Radios**. The C6400-Series Collector radio ID will be automatically populated upon completion of the auto registration process.
- **Directions.** (Optional) Enter directions to the C6400-Series Collector location.

Communication Settings

• **Comm Type.** The comm type will be automatically populated upon C6400-Series Collector discovery in Command Center.

Notes

• Notes. Enter any notes concerning the C6400-Series Collector in the Notes window.

Click the Save button to save all data to the Central Server database.

Collector Manage Tab

This screen allows the user to manage commands specifically related to Collectors.

1. Click Setup > Manage Collectors.

The Manage Collectors screen will open.

- 2. Click the name of the C6400-Series Collector to display the Collector Information screen.
- 3. Click the Manage tab if it is not already displayed.

Collector Information				3
GAP Collector II , RF(C6400)		Normal (May 25 01:55 PM/I	1ay 25 09:00 AM)	
Comm Type: LAN		<u>1 Endpoints</u> Firmware: 4.2.1.11		
General Settings Manage Statistics History				
	Your command '	'Get Collector Settings" has been issued.		
	Select a Command	Ding W		
	Select a Command	ring 🔹		
		Send		
		Recently Issued Commands		
	Only commands that return inte	eresting data are shown. Ordered so most recent app	ear first.	
Command	User	Sent	Received	~
Get Collector Settings	LGSupport	05/25/2011 10:04:09 AM	05/25/2011 10:04:12 AM	
Get Collector Settings	katpallin	05/24/2011 12:06:15 PM	05/24/2011 12:06:16 PM	
Modify Collector Settings	katpallin	05/24/2011 12:06:01 PM	05/24/2011 12:06:03 PM	
Get Collector Settings	katpallin	05/24/2011 12:05:18 PM	05/24/2011 12:05:20 PM	
Modify Collector Settings	katpallin	05/24/2011 12:04:24 PM	05/24/2011 12:04:25 PM	=
Get Collector Settings	katpallin	05/24/2011 12:03:19 PM	05/24/2011 12:03:21 PM	
Modify Collector Settings	katpallin	05/24/2011 09:56:53 AM	05/24/2011 09:56:54 AM	
Get Collector Settings	katpallin	05/24/2011 09:56:36 AM	05/24/2011 09:56:37 AM	
Modify Collector Settings	katpallin	05/24/2011 09:56:11 AM	05/24/2011 09:56:13 AM	
Get Collector Settings	katpallin	05/24/2011 09:55:35 AM	05/24/2011 09:55:36 AM	
Collector Ping Command	katpallin	05/24/2011 09:51:46 AM	05/24/2011 09:51:47 AM	
Reboot Collector System	katpallin	05/24/2011 09:40:26 AM	05/24/2011 09:40:27 AM	
Collector Echo	katpallin	05/24/2011 09:39:16 AM	05/24/2011 09:39:16 AM	
Collector Test URL	katpallin	05/24/2011 09:38:56 AM	05/24/2011 09:38:57 AM	
Collector Test URL	katpallin	05/24/2011 09:38:17 AM	05/24/2011 09:38:39 AM	~

Figure 4 - 8. Manage Collectors Tab

4. Select from among the following commands.

Collector Commands

Ping

The Ping command may be issued from the manage tab. It returns a response window populated with the C6400-Series Collector firmware version. The response will appear in new browser window for immediate viewing, or the response can be viewed at a future time from the C6400-Series Collector statistics tab.

Get Collector Registration Info

This Command may be issued to a C6400-Series Collector that has auto-registered with Command Center. This command would be issued to a C6400-Series Collector in Discovered status. Initiating this command would automatically populate the C6400-Series Collector Name, C6400-Series Collector ID, latitude, longitude, and radio serial number.

Update Collector Firmware

Allows the user to select from a drop-down list of available firmware to send to the C6400-Series Collector.

Read Radio Memory

This command reads a specified number of bytes from an arbitrary memory address in the target radio. This command should be used by advanced Command Center users only.

Get Collector Settings

This command allows the user to select from a list of C6400-Series Collector settings, and will return the current settings for the selected values.

• See publication **98-9108: RF** Command Center User Guide for descriptions of all collector settings.

Modify Collector Settings

The Modify Collector Settings command will allow the user to select the desired settings from a drop-down list, and allow a configuration change to be sent to the C6400-Series Collector.

Echo Message

This command functions much like a PING command, however, the purpose of the command is to be able to send varying sized packets to test the link between Command Center and the endpoint. The PING is a very small command, it will often times succeed, where a larger command may not.

• The C6400-Series Collector will respond to this message by sending it back to the sender immediately.

Clear Collector Queues

This command will cause the C6400-Series Collector to purge both of the collector queues. This may be recommended in the event of an extended provider outage.

Collector NTP Time Sync

This command causes the C6400-Series Collector to initiate a time synchronization with the NTP server.

Reset Collector Port

This command closes and re-opens the connection to the given port. In some cases this can recover a connection with a radio that has become unresponsive.

Reboot Collector System

The Reboot Collector system command will cause the Collector processor to reboot. This is a full reboot of the operation system, and thus will take 2 or 3 minutes following issue of the command before communication with the Collector is re-established.

Collector Test CC URL

This command allows the user to specify a Command Center location for the collector to test its connection. The form of the location should be in the form of an IP address or domain name preceded by http://.

Collector Test NTP Server

This command allows the user to specify the remote server that could be used as the C6400-Series Collector's NTP server. This command will test the location and provide the results of

that test once complete. The format of the location may be either IP address or a domain name.

Statistics Tab

The Collector Statistics tab displays a "mini dashboard" for the C6400-Series Collector. This mini dashboard will provide notification of collector events and the status of collector processes in a timely basis without user interaction.



Figure 4 - 9. Statistics Tab

- **Status**. The Status section will display the number of endpoints that are in each of the different statuses. Clicking on any of the links in the Status section will open the Endpoint by Status window.
- **Events/Alerts**. The Events/Alerts section summarizes several different endpoint-related errors that could cause a problem with obtaining proper billing data.
- **Statistics**. The Statistics section will summarize the following data:
 - Last Command Request. This will list the time the last command was sent to the C6400-Series Collector.
 - Last Data Sent. This will list the date and time the last data was sent from the C6400-Series Collector.
 - **Max. layer**. The Max layer indicates the highest layer in this C6400-Series Collector's pocket.
 - Avg. layer. The Average layer indicates the average layer in this C6400-Series Collector's pocket.
 - Transceiver Firmware. Indicates the firmware version of the transceiver.
 - Last Network Layer Refresh. This will list the date and time the last network layer refresh was sent to the C6400-Series Collector.
- **Layer**. The Layer section will indicate the number of endpoints on each layer within this C6400-Series Collector's pocket. Clicking the link in the Layer section will open the Endpoint Information screen displaying a list of the endpoints on the given layer.
- The Collector Readings Analysis for the last 7 days provides a graphical view of the billable readings currently available and those readings pending from the endpoints on the Collector.
- **File Name**. The file name indicates the name of a command sent to the Collector. Selecting the link of any of these files will open the response file.

History Tab

The Collector History tab will display the most recent events and errors that the C6400-Series Collector has logged. By default, the last fifty events and errors are displayed.

Collector Information	
GAP Collector II , RF(C6400) Comm Type: LAN	Normal (May 25 02:24 PM/May 25 10:04 AM) <u>1 Endpoints</u> Firmware: 4.2.1.11
General Settings Manage Statistics History	
Events and Errors	
Category	Received
Rf No CommandCenter Comm	5/24/2011 11:15 PM
RF Collector Time Adjustment	5/24/2011 9:39 PM
RF Collector Time Adjustment	5/24/2011 5:39 PM
Rf Tranceiver Reset	5/24/2011 12:04 PM
Rf Tranceiver Reset	5/24/2011 12:04 PM
Rf Tranceiver Reset	5/24/2011 12:04 PM
Rf Tranceiver Reset	5/24/2011 12:04 PM
Rf Tranceiver Reset	5/24/2011 12:04 PM
Rf Tranceiver Reset	5/24/2011 12:04 PM
RF CommandCenter Comm Established	5/24/2011 12:04 PM
Rf No CommandCenter Comm	5/24/2011 12:04 PM
Francis	
Category	Received
RFEventDecodeError	5/25/2011 11:10 AM
RFEventProcessingError	5/23/2011 5:30 PM
RFEventProcessingError	5/23/2011 5:27 PM

Figure 4 - 10. History Tab

- The list can be filtered by selecting the radio button for 50, 100 or all to view the events and errors for the desired time frame.
- Click any of the event or error links to view further details.

🖉 Event Details - Windows Internet Explorer provided by Landis+Gyr 🔳 🗖 🗙					
Event Details					
U ViewE	ventOrErrorPage				
Collector	/ GAP Collector II				
	5/24/2011 9:39:02 PM				
	Event				
Details	Collector generated event type RfTimeAdjustment (-20344 seconds)				
Descriptio	n RF Collector Time Adjustment				
	Close				
	8	~			

Figure 4 - 11. Event Details window

5 Using Endpoint Testing Manager



Access to Endpoint Test Manager

With the release of Command Center 5.0, ETM users must be authenticated into Command Center prior to accessing the ETM application and communicating with devices in the network. The designated Security Administrator for the utility is responsible for configuring the connection to the Command Center server, and providing log in credentials (including user names and passwords) for those who will require access to the software.



NOTE: For complete instructions on using Endpoint Testing Manager, please refer to publication **98-1055, Gridstream 2-Way Endpoint Testing Manager User Guide**

Connecting to a C6400-Series Collector

See "Connect to the C6400-Series Collectors using ETM" on page 31.

Collector Tab

Functionality has been added to Endpoint Testing Manager that supports advanced configuration tools for C6400-Series Collector setup via a tab labeled **Collector**. This tab only appears when ETM is connected to a C6400-Series Collector. Use the **Connection** tab to connect to a C6400-Series Collector.

Sub-tabs on the Collector tab support radio:

- 1. Identification
- 2. Basic Configuration
- 3. Client Routing
- 4. Events/Alerts
- **5.** Statistics

Field	Description
Name	Identifies the device and lists the hexadecimal descriptor.
Version	C6400-Series Collector software version

Field	Description	
Update Collector S/W <button></button>	Accesses the Select Collector Update file dialog and permits navigating to and selecting the intended software update for the currently-connected collector.	
Reboot Collector <button></button>	Restarts the C6400-Series Collector main board.	
Fetch all <button></button>	Updates and refreshes all displayed C6400-Series Collector data	
Send All <button></button>	Uploads all currently displayed parameters into the connected endpoint.	
Save All <button></button>	Saves all C6400-Series Collector information on the tab, independent of sub-tab display, including collector MAC Address, the radios associated with the C6400-Series Collector, etc. This information is saved as a "Settings" file into a location designated by the user on a standard Save As dialog.	
Restore <button></button>	After storing all C6400-Series Collector settings to a file, collector settings can be restored automatically. This action may be needed after performing maintenance on the C6400-Series Collector. After clicking the Restore button, ETM verifies the current C6400-Series Collector radios against the ones in the saved file. If the radios are different, then ETM displays a warning dialog. Saved information includes the original C6400-Series Collector's unique identity on the RF mesh (the WAN address) and its unique identity on the Internet (the static IP address). These two identities must be unique. In the warning dialog, ETM asks the user whether the C6400-Series Collector is a replacement for the old collector. If the response is No, then ETM does not change these two identities as it copies the data out of the saved file. You can use saved data for one C6400-Series Collector to match up all other C6400-Series Collector without creating conflicts with these two identities.	

Collector Tab - Identification sub-tab

Identification Basic Configura	tion Client Routing	Events/Alerts St	tatistics	Send All
MAC Address: 00-00-00-0)-00-00	Network ID:	670	
IP Address: 127.0.0.1		Door State:		
Port 1 + : COM4@11	i200 : Connected	o FE.80.73.53.0	IE.00 [80.73.53.0E] {251271-06.54}	
Port 2 - : <port f<="" not="" td=""><th>und></th><td></td><td></td><td></td></port>	und>			
Port 3 👻 : Kport not f	und>			
Port 4 👻 : <port f<="" not="" td=""><th>und></th><td></td><td></td><td></td></port>	und>			
Application Statistics				
Application Restarts: 18	Running Time:	3 minutes, 38 se	conds	
Modem Settings				
Modem Type: MultiTecl	EVDO	Revision: P	P2811301,58003 [JUL 15 2009 15:51:31]	
Manufacturer: SIERRA	VIRELESS, INC.	ICC ID: N	N/A	
Model: MC5728V	REV 1.0 (5)	IMSI: N	A/A	
Serial Number: 0X60C41	E7	Status: F	RASCS_OpenPort, S_OK	
Provider: Verizon	Activate	NAM: 0	0000005959:0000005959 Er	able

Figure 5 - 1. Collector Tab - Identification sub-tab

Identification sub-tab				
MAC Address	A Media Access Control Address is a unique identifier assigned to the connected C6400-Series Collector by the manufacturer for identification. It may also be known as a hardware address or physical address.			
IP Address	Displays the IP Address (unique Internet identity) of the connected C6400-Series Collector.			
Network ID	Displays the Network ID of the C6400-Series Collector.			
Door State	A sensor in the collector door recognizes the door as open or closed. If no cable connects the sensor to the main board, this condition is identified.			
Port1 - Port 4	The down-arrow provides a reboot option for the C6400-Series Collector radio associated with the numbered port.			
Application Statistics	3			
Application Restarts	The C6400-Series Collector tracks the number of times that it has started. This includes both reboot operations, power events that exceed the life of the battery, application upgrades, or commands from a remote host to restart. This value *is* written to compact flash, so the count grows over time.			
Running Time	The C6400-Series Collector tracks how much time has passed since it was started. This is tracked independently from the time-of-day clock. So, for example, if the C6400-Series Collector receives a command to bump its clock forward by one hour, the "up time" computation will not change.			
Modem Settings				
Modem Type	The type of modem inserted specific to a particular modem manufacturer. At this time this is either None, MultiTechEDGE (GSM), or MultiTechEVDO (CDMA).			
Revision	The software revision of the modem.			
Manufacturer	The manufacturer of the modem or modem chipset.			
ICC ID	The serial number of the SIM card if one is inserted.			
Model	The model number of the modem.			
IMSI	For a GSM modem, the International Mobile Subscriber Identity, which uniquely associates the modem account with the network.			

Identification sub-tab		
Serial Number	The electronic serial number of the modem. For GSM this is IMEI. For CDMA this is either ESN or MEID.	
Status	The status of the modem's data connection plus the result of the dial attempt to the network.	
Provider	An attempt to determine which carrier the modem is associated with. If "Unknown" we are unable to determine this.	
Activate <button></button>	Used to activate a Verizon CDMA modem only.	
NAM	If the data connection is not active we may attempt to read the data from a CDMA modem's NAM. This is useful for debug.	
Settings <button></button>	Access modem specific settings to activate the data connection on the network.	

Collector Tab - Basic Configuration sub-tab

Identification Basic Config	uration Client Routing Events/Alerts Statistics	Send All
Time Keeper:	No V	
Auto-registration ID	Decal radios are routers: No	
	HEX Format Italitude/Longitude Format	
Default Geocode:	00.00.00.00.00	
Security Level:	0 V Local radio encryption enabled	
NTP Server:	Test Connection	
NTP Poll Interval:	4 hours Report time changes larger than 10 seconds	
Windows Software Upda	te Service	
WSUS Address:	Everyday 💙 @ 12 AM 💙 (GMT)	
WSUS Group:		
Internet Settings		
 Dynamic IP (DHCP) 	O Static IP: 0.0.0.0 Subnet Mask: 0.0.0.0 Dflt Gateway: 0.0.0.0	
	DNS Address(es): Primary: Secondary:	

Figure 5 - 2. Collector Tab - Basic Configuration sub-tab

Basic Configuration sub-tab				
Time Keeper	 ETM always allows you to turn off the Time Keeper bit, but it only allows you to turn it on in specific cases: 1) The C6400-Series Collector is already designated as a Time Keeper. 2) A "Restore All" file has the Time Keeper bit set, and ETM detects that it is talking to the same C6400-Series Collector (ETM knows this by comparing the ID numbers of the radios in the C6400-Series Collector against the ID numbers stored). This case allows a user to read and save the configuration information from an existing C6400-Series Collector, swap compact flash cards in the C6400-Series Collector, and then restore the configuration to the new card. 			
Auto Registration	Also called Auto-registration, this user specified parameter identifies the C6400- Series Collector so that data traffic is properly routed when endpoints register in the network.			
Local Radios are routers	Indicates whether this neighbor can pass packets along the mesh network if that packet is not directly destined for it. For example, if radio A attempts to send a packet to radio C. Radio A cannot communicate directly with radio C. If radio A can communicate directly with radio B, and radio B is a router, then radio A can send the packet to radio B. Radio B forwards the packet to radio C. Most radios on the network are routers.			

Basic Configuration sub-tab			
HEX - Lat/Long Format	Select the HEX radio button to display all radio WAN addresses in their encoded 6- byte hexadecimal format. Selecting the Latitude/Longitude radio button will display the radio's WAN address in degrees-minutes-seconds format.		
Default Geocode	Geographic coordinates for the connected C6400-Series Collector.		
Security Level	Levels 0 and 1 are selectable for the connected C6400-Series Collector. Level 0 indicates OPEN (non-secured) and Level 1 is for AESECB. Levels 2 (AES Counter mode) and 3 (ECC) are exclusively administered by Command Center.		
Local radio encryption enabled	This check box sets, disables, or identifies connected radio encryption status.		
NTP Server	Network Time Protocol. A server that can provide the C6400-Series Collector with correct time for the C6400-Series Collector. This can be entered as a physical IP address or a DNS name.		
Test Connection <button></button>	Clicking this button verifies the NTP Server link.		
NTP Poll Interval <#> hours	Typically set for eight hours, this parameter tells the C6400-Series Collector how often to check network time.		
Report Time Changes	Use this data field to set the amount of time change in the C6400-Series Collector that will trigger an alert action.		
Windows Software U	pdate Service		
WSUS Address	This URL points to the L+G update server and provides a path for the C6400-Series Collector to receive compatible operation system updates. An incorrect URL can corrupt C6400-Series Collector main board configuration.		
WSUS Group	WSUS enables targeting updates to specific groups of C6400-Series Collector, ensuring that they receive the right updates at the most convenient times on a regular basis.		
Internet Settings			
Dynamic IP (DHCP)	Internet Protocol - refers to the IP address of the connected C6400-Series Collector, and specifies routing for data communications.		
Static IP	An IP address that is hard coded into the collector.		
Subnet Mask	The process of subnetting is the division of a network into groups that have the identical common component of their IP address designated as their routing prefix. The subnet mask is the network address plus the bits reserved for identifying the subnetwork.		
Default Gateway	The node on the network that the network software uses when an IP address does not match any other routes in the routing table; provides an entry point and an exit point in a network.		
DNS Address(es)	Domain Name System. This allows the collector to look up an IP address by name rather than needing to know the exact numerical address.		
Primary	A more frequently used DNS Address.		
Secondary	An alternative DNS Address used in the event the primary DNS is unreachable.		

Collector Tab - Client Routing sub-tab

Identification Basic Configuration	Client Routing	Events/Alerts	Statistics	Send All
TCP Listening Ports: V Port 29029 V Port 29030 V Port 29031 V Port 29032 V Port 29033				
Collector-initiated:				

Figure 5 - 3. Collector Tab - Client Routing sub-tab: Port 29029

Mapped Message Types are listed when a TCP Listening port is highlighted, along with check boxes for these types. Check boxes can individually selected for each port according to configuration preferences.

Identification	Basic Configuration	Client Routing	Events/Alerts
TCP Listeni	ing Ports:	apped LAN I	Ds:
Port 2	9029		Mapped Msg Types: Connected Client(s):
✓ Port 2: ✓ Port 2: ✓ Port 2: ✓ Port 2: ✓ Collector-ir ✓ Comman	9031 9032 9033 (1) itiated: d Center		DCW Query 10.1.152.150:3401 Status Query General Query Control DCW Response Status Response General Response Information RTU Device Data Events
	L	Add	*** Commands Only ***

Figure 5 - 4. Collector Tab - Client Routing sub-tab: Port 29033

TCP Listening Port 29029 Client Routing displays the Connected Client for the current session of Endpoint Testing Manager. Regarding messages, this port, as indicated below the Mapped Msg Types window, is for Commands Only.

Identification Basic Configuration	Client Routing Events	/Alerts Statistics			Send All
TCP Listening Ports: V Port 29029 V Port 29030 V Port 29031 V Port 29032 V Port 29033	Mapped LAN IDs:	Mapped Msq Types: DCW Query Status Query General Query Control	Connected Client(s):	-	
Collector-initiated; V Command Center		DCW Response Status Response General Response Information V RTU Device Data Events			
	Add				

Figure 5 - 5. Collector Tab - Client Routing sub-tab: Command Center

When the Collector-initiated port is highlighted, the Command Center Address List appears, displaying both the Send and Poll Paths, parameters for Push Data Interval and Maximum Messages per Push, and the Collector to Command Center Queue Status.

Client Routing sub-tab		
TCP Listening Ports	Identifies, and allows the user to select access to, the TCP ports for each radio that the collector is connected to.	
Collector-initiated	These are connections the collector attempts to initiate. For example, in Command Center applications the collector is programmed with the list of addresses of Command Center instances it needs to contact.	

Collector Tab - Events/Alerts sub-tab

Identification Basic C	onfigural	tion Cli	ent Routing	Events/Alerts	Statistics	Send All
	<u>Disable</u>	<u>Event</u>	Alert			
Radio Connect:		۲				
Radio Disconnect:		۲				
Network Connect:		۲				
Network Disconnect:		۲				
Clock Change:		۲				
Power Fail:		۲				
Power Restore:		۲				
Low Battery	۲					
Door Tamper:	۲					
Software Watchdog:		۲				
Crypto token received	۲					
Debug Messages:	۲					

Figure 5 - 6. Collector Tab - Events/Alerts sub-tab

The three choices available to the user (Disable/Event/Alert) on this screen designate the step that the C6400-Series Collector takes whenever one of these actions occurs at the collector. It is up to the user to set this configuration, according to local practice.

Selections for occurrences on this screen impact the Client Routing screen. Events map to priority, Alerts map to push. Disable directs the collector to ignore a so-designated occurrence.

Events/Alerts sub-tab:				
Specific radio and network occurrences may require programmed action. This will vary according to local practice. Some incidents will require no action, while others will be logged as they occur. Certain events necessitate special notification. For the events listed below, ETM can be configured for varied response. "Disable" designates no response to the event, while "Event" and "Alert" choices send messages to the host. "Event" carries a different "command byte" than "Alert" so that the host can differentiate between the two. An "Alert" will be sent with a different priority. Neither "Event" or "Alert" actions log locally. A list of events where actions may be programmed to occur appears below.				
Radio Connect	Radio Disconnect			
Network Connect	Network Disconnect			
Clock Change	Power Fail			
Power Restore	Low Battery			
Door Tamper	Software Watchdog			
Crypto Token Received	Debug messages			

Statistics sub-tab

Identification	Basic Co	onfigura	tion Cli	ient Routing	Events/Alerts	Statistics	Send All
		Disable	Event	Alert			
Radio	Connect:	0	(0)	0			
Radio Dis	connect:		(0)				
Network	Connect:		()				
Network Dis	connect:		۲				
Clock	Channe		۲				
D	ower Fail						
Bouro	Doctorou		0				
Power	Delter						
LOV	w Battery:						
Dool	r Tamper:	۲					
Software W	Vatchdog:		۲				
Crypto token	received:	۲					
Debug M	lessages:	۲					

Flaure 5 - 7. Statistics sub-tai	Fiaure	5 -	7.	Statistics	sub-tab
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Statistics sub-tab		
Current Time	Allows a user to insert comments into the Activity Log. These time- stamped comments will also list in the Log file.	
Application Running Time	The amount of time the collector application has been running.	
Boot Count	The number of times the collector application has started.	
Time Changes	A list of the most recent adjustments to the collector's system clock.	
Message Counters	The number of messages the collector has received and processed.	
Radio Messages Received	The number of messages the collector has received via its local Gridstream radio.	
Tool Messages Received	The number of messages the collector has received from a tool.	
CC Messages Received	The number of messages the collector has received from Command Center.	
Last Dropped Message	If the collector needs to drop a message due to a full Gridstream radio queue, it is noted here.	

A Specifications



Specifications

Element	Description			
Electrical/Power Supply				
Supply Voltage	96 - 277 _{Vrms}			
Power Consumption	9W typical - batteries not charging 18W typical - batteries charging			
Gridstream Radio, General				
Frequency Range	902 - 928 MHz			
Channels	240 or 85 (depending on mode)			
Modulation	FSK/GFSK			
Baud Rates	9.6, 19.2, 38.4 kbps (100kHz channels), 9.6, 19.2, 38.4, 50, 115.2 kbps (300kHz channels)			
Frequency Deviation	4.95 to 57.6 kHz (depending on baud rate)			
On-Channel Transmit Time	< 400 msec			
Frequency Stability	± 10 ppm (over temperature and 10 years aging)			
Antenna Type	External, omni-directional, vertically polarized			
Antenna Gain	5.5 dBi max			
Gridstream Radio, Transmitter				
Output Power (conducted)	28 dBm min/29 dBm typ / 30 dBm max			
Conducted Harmonics	<-70dBc (second harmonic), <-80dBc (all others)			
20dB Bandwidth	25 kHz (at 9.6 kbps), 245 kHz (at 115.2 kbps)			
Gridstream Radio, Receiver				
Sensitivity (10% PER):	-112 dBm (9.6 kbps), -103 dBm (115.2 kbps) typical			
Adjacent Channel Rejection:	35 dB typical			
Alternate Channel Rejection:	50 dB typical			
Out-of-Band Blocking (±10MHz)	5 dB typical			
Input IP3:	-4 dBm min, -1 dBm typical			

Table 1. C6400-Series Collector

Table 1.	C6400-Series	Collector
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Max RF Input Power (no damage)	15 dBm			
RSSI Accuracy:	±6 dB			
Backhaul Modem				
	GSM/GPRS/EDGE			
Frequency Bands:	850/900/1800/1900 MHz			
Standards:	E-GPRS class 12, GPRS class 12			
Data Rate:	Packet data up to 240 kbps (modulation & coding scheme, MCS 1-9, mobile station class B)			
	EV-DO			
Frequency Bands:	800/1900 MHz			
Standards:	EV-DO Rev A/CDMA2000 1xRTT			
Data Rate:	Peak Downlink up to 3.1 mbps/Peak Uplink up to 1.8 mbps			
Interface				
Туре:	Gigabit Ethernet (IEEE 802.3-2008)			
	Mechanical			
Dimensions (excludes antennas:	5.04" H x 11.82" W x 9.30" D			
Antennas	Two (2), one on top and one on the bottom.			
Weight	9.6 Lbs.			
Standards Compliance	FCC Part 15, Class B			
Operating Temperature	-40°C to 60°C			
Storage Temperature	-40°C to 85°C			
Humidity	0 to 95% relative humidity, non-condensing			
Color	White			
Enclosure Material/Type	Aluminum/NEMA-4			
Battery Backup Time	8 hrs, typical			
Backup Battery	LiFePO4 cells in a 4s4p arrangement, 13.2V, 9200mAhrs nominal			
Mounting Options	Utility poles and streetlights			

C6400-Series Collector Dimensions



Figure A - 1. C6400- Series Collector Dimensions

B Cable Installation



Power Connection and Termination



Figure B - 1. Improper Power Termination



WARNING: If using the 19-2207 or 19-2286 cables, the end of the cable opposite the connector (the unterminated end) must be installed in a junction box, other suitable enclosure, or drip loops at both ends of the cable should be provided.

Leaving the end of the cable exposed may allow water to migrate into the cable and into the C6400-Series Collector.

See below for power cable installation procedures and details.

Junction/Disconnect Box Installation

When existing 19-2207 or 19-2286 cables are used, they must be terminated inside a junction or disconnect box. The inner wires cannot be exposed until after the cable enters the enclosure. Once inside the box, connect the power leads to wires going to the mains per local practice. Connections to the mains must use UV-stable wiring. As long as the wire is UV-stable and rated for outdoor use, the wire model and manufacturer may be selected by the programs. Part number 18-1058 wire is acceptable and recommended.

In published examples, collector cables are shown going through conduit. Conduit is not required for C6400-Series Collectors, but the entrance to the junction box should be through a clamp at the bottom of the junction box. Junction boxes do not have a part number and are available through local vendors. As always, electrical connections need to meet the requirements of the local utility and local ordinances.

The following diagram shows an installation using a junction box with a C6400-Series Collector.



Figure B - 2. Suggested Power Termination

If the 19-2207 or 19-2286 cables are used, then the cable can go directly to the mains, provided drip loops are made at the point of contact with the mains and at the C6400-Series Collector. The drip loop at the point of attachment to the mains should rise above the level of the point of attachment.

Direct Cable Installation to Main



Figure B - 3. Direct Cable Installation to Main

Ethernet Cable Installation



Figure B - 4. Ethernet Cable Installation to Communication Cabinet