



# User Guide

## **Clear-Com Gateway** X1/X4 User Guide

Part Number: 399G140 Rev A  
Date: 3/17/15

## Document Reference

Clear-Com X1/X4 Gateway User Guide

Part Number: 399G140

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Clear-Com Offices are located in California, USA; Cambridge, UK; Dubai, UAE; Montreal, Canada; and Beijing, China. Specific addresses and contact information can be found on Clear-Com's corporate website:

[www.clearcom.com](http://www.clearcom.com)

Clear-Com Contacts

Americas and Asia-Pacific Headquarters

California, United States

Tel: +1.510.337.6600

Email: [CustomerServicesUS@clearcom.com](mailto:CustomerServicesUS@clearcom.com)

Europe, Middle East, and Africa Headquarters

Cambridge, United Kingdom

Tel: +44 1223 815000

Email: [SalesSupportEMEA@clearcom.com](mailto:SalesSupportEMEA@clearcom.com)

Canada Office

Quebec, Canada

Tel: +1 (450) 653-9669

China Office

Beijing Representative Office

Beijing, P.R.China

Tel: +8610 65811360 / 65815577

## Important Safety instructions

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do **not** use this apparatus near water.
- Clean only with dry cloth.
- Do **not** block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do **not** install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do **not** defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-cord supply or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- **Warning:** To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.

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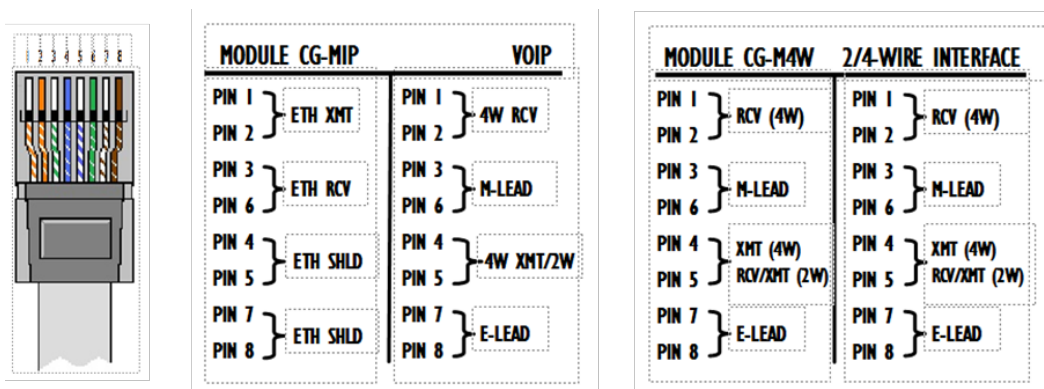
## Introduction

Clear-Com® Gateway is an interoperability platform for linking and bridging communication systems to deliver advanced radio interfacing and IP connectivity on a single platform.

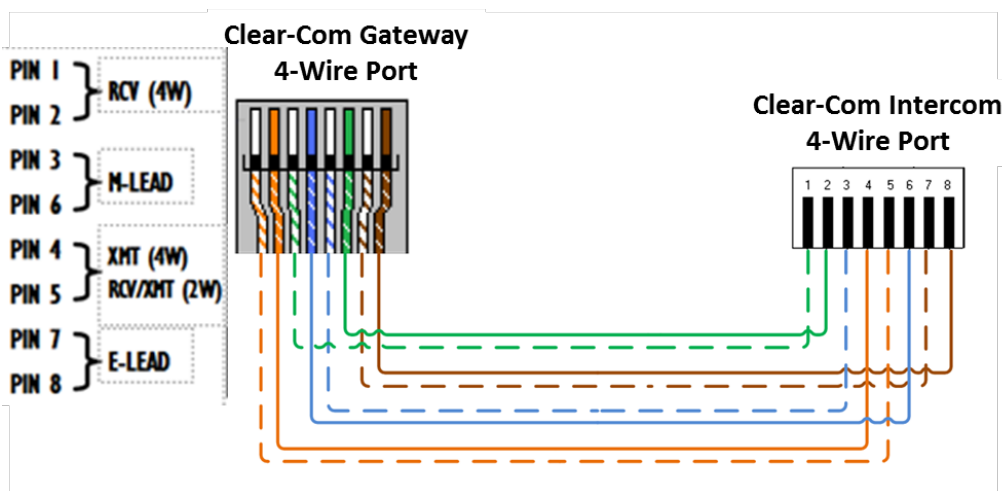
The Clear-Com Gateway platform consists of the compact CG-X1 and CG-X4 devices for connecting 2-way radios, intercoms, telephones and IP networks. The CG-X1 is the 2-port option for remote sites and single-channel bridging. The CG-X4 carries a higher port density of 8 ports in a small form factor.

## Gateway Port Pin Outs

On top of each Gateway, there are labels with pin out information for each port installed in the gateway.



Connecting to Clear-Com Eclipse Matrix 4- Wire ports



# 1 Getting Started

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## 1.1 Unpacking

### What is in the Box

- **Software CD:** This CD includes the User Manual and Clear-Com Gateway Software
- **AC Power Supply Adapter:** 120/240 VAC, 12 VDC 1.5 Amp regulated (Note: on units powered from a DC source, this item will not be included)
- **Power Cord:** (Note: on unit's power from a DC source, this item will not be included)
- **USB Cable:** for configuring gateway

### Software & System Requirements

Microsoft® Windows® XP, Vista®, Windows® 7, Windows® 8 \*

NET framework version 3.5

One available USB 2.0 Port

One standard USB A to USB cable (included)

*\* If you are using Windows 8 OS you will need to bypass the Microsoft Driver signature enforcement, or you can use Windows 7 OS. The link below provides third party instructions on how to perform the driver enforcement bypass for Windows 8.*

<http://sixcolumns.com/how-to-disable-and-bypass-driver-signature-enforcement-in-windows-8/>

## 1.2 Installing the Clear-com Gateway Software

**Note:** Install this software before plugging in Clear-Com Gateway.

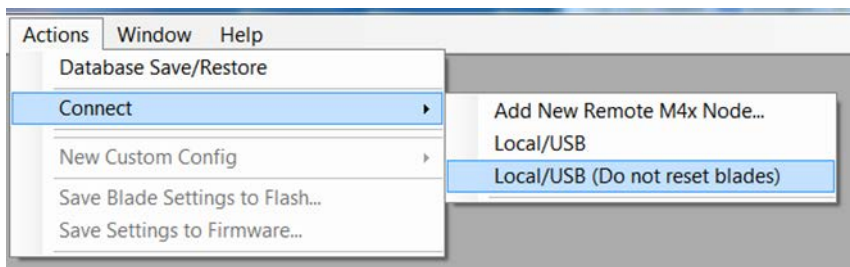
1. **Uninstall any older versions of Clear-Com Gateway Software before installing a new version.**
2. Install the software by inserting the CD into the computer's CD Drive.
3. We recommend selecting "Easy Install" when prompted.
4. Follow the on-screen prompts to complete the installation.
- 5.

## 1.3 Power Up the Clear-Com Gateway

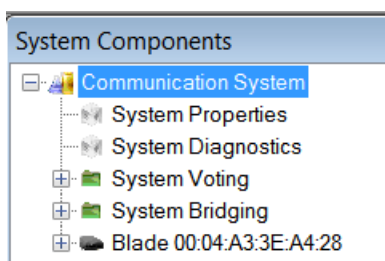
1. Connect the Power Cable into the AC Power Adapter.
2. Connect the AC Power Adapter to your AC power source. (The AC Power Adapter can be connected to a 100 to 240 VAC, 50-60 Hz, 0.5A source).
3. Connect the DC plug from the AC Power Adapter into the DC jack on the rear of the Gateway
4. Upon power up Green and Red Port LEDs will flash and green LED will display above ports to indicate power.

## 1.4 Starting the Clear-Com Gateway Software

- Verify the Gateway is powered on.
- Connect the USB Cable to the Gateway as well as to the computer.
- Located on the Computer Desktop, select "CC Gateway" shortcut.
- Clear-Com Gateway Screen will open.
- Select "Actions" menu in the upper left area of the screen.
- Select "Connect"
- Select "Local/USB"

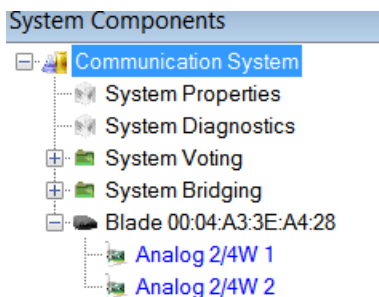


You are now connected to the Gateway, on the right-hand side of the screen, a new box will appear.

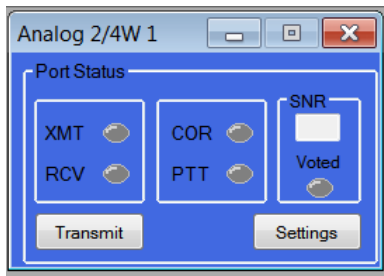


## 1.5 Configuring the Clear-Com Gateway Analog 4-Wire Module

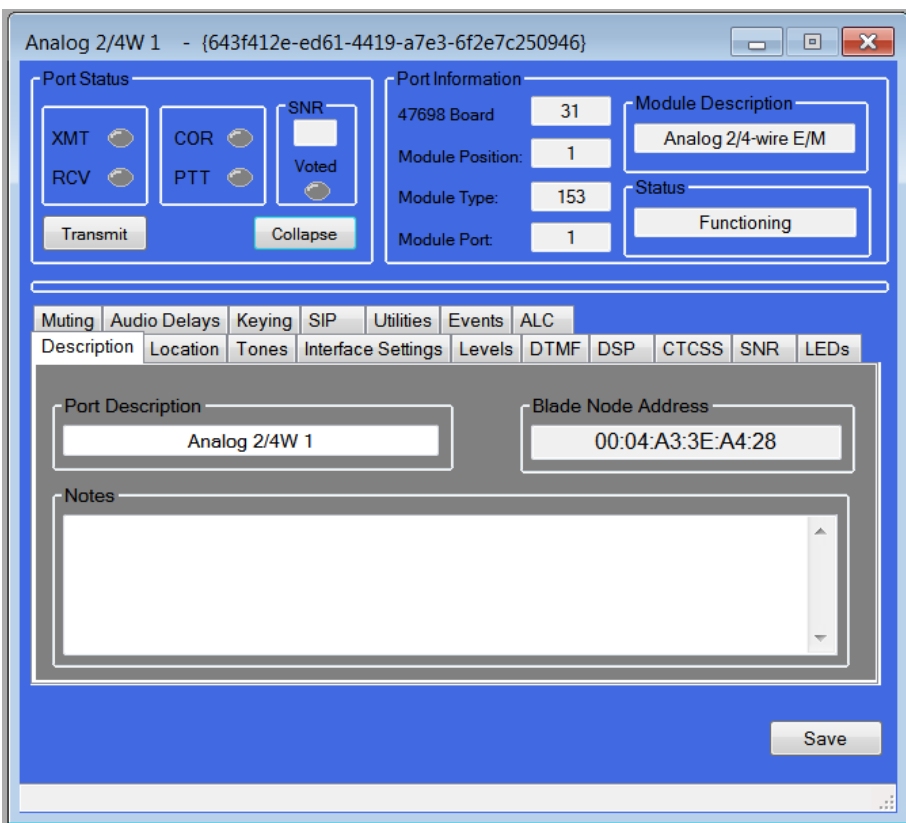
Click on the "+" just to the left of the Gateway, All ports populated will show a generic name until the user changes it.



Click on the port that you want to analyze or configure. The Port Status, along with the Transmit and Settings control buttons appear.

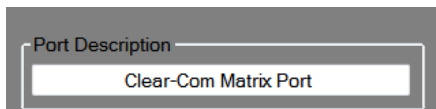


Press the Setting button in order to expand the settings screen. To open configuration Menu



### Description Tab

Rename port by writing over the Port Description

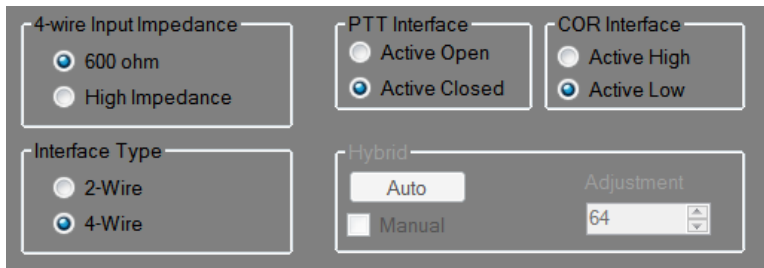


**Caution: Do not change Blade Node Address**

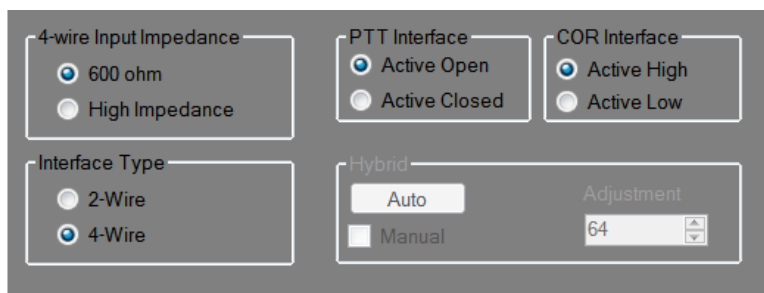


## Interface Settings

If connecting to a Clear-Com 4-wire port or creating, an E&M COR bridge use default.



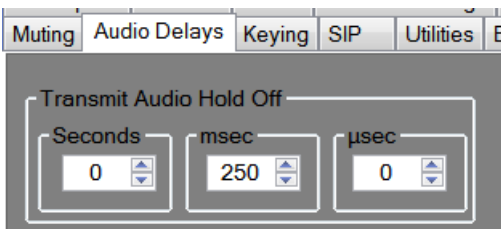
For radio connection that does not have active COR, select, the Active Open, Active High



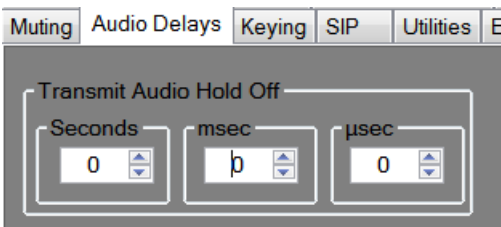
**Note:** This setting is for radios that do not have active COR

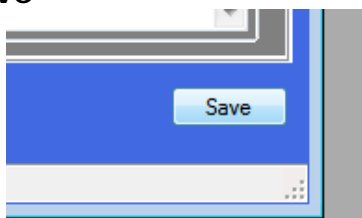
## Audio Delays Tab

Use Default (250 msec) when connecting to a Radio



Set Transmit delay to zero when connecting to a Clear-Com 4-wire port

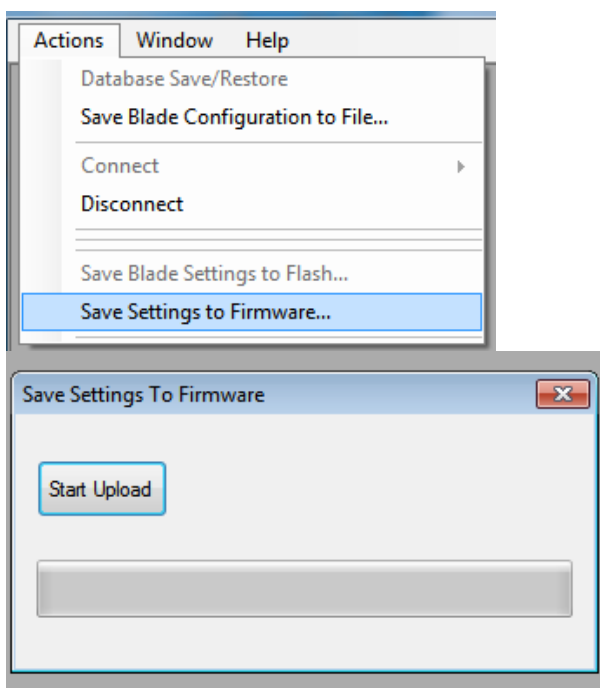


**Save**

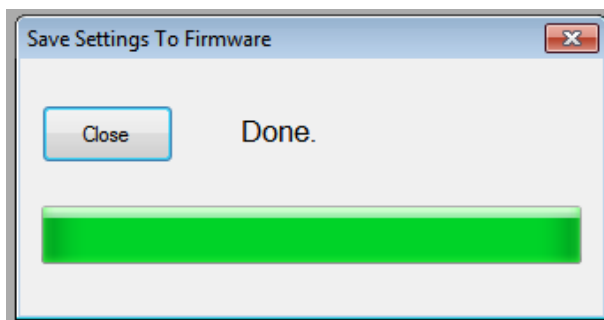
*Repeat above process for all 2/4 wire ports*

## 1.6 Saving your Configuration

When all changes have been made, click "Actions" menu and then "Save Settings to Firmware". This will save the settings to the Clear-Com Gateway.



Press the Start Upload button to save settings to the Gateway

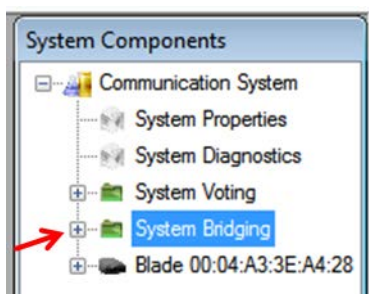


After saving settings to firmware "Power cycle the Gateway by unplugging the unit and plugging it back in".

## 2 Configuring an E&M Radio Bridge

An E & M conference bridge utilizes E-Lead or COR input received on a bridge port to activate an audio bridge or path routing the inbound audio to the output of all other ports of the bridge and asserting an M-Lead (or PTT closure) on those output ports. When the E-Lead goes away on the input port, the audio bridging will cease and the M-Lead (PTT closure) will deactivate.

Click "System Bridging" on the right side of the screen.

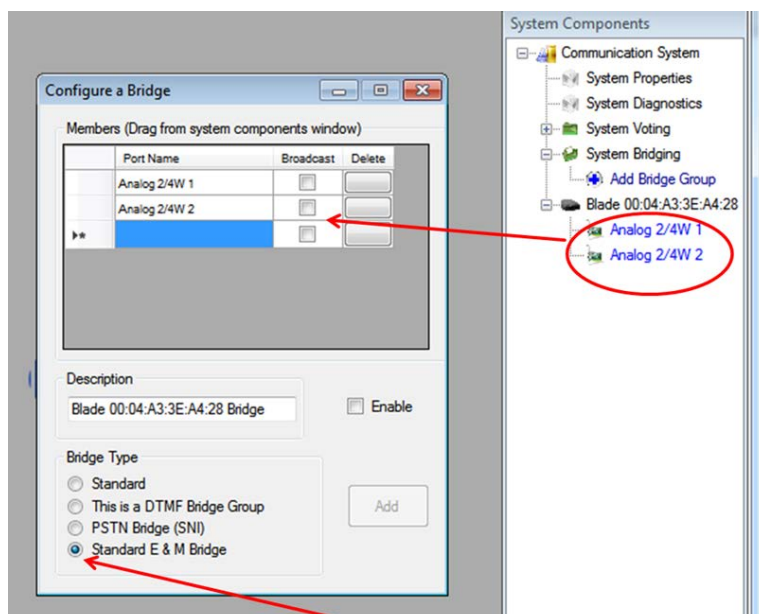


Click on + To Add A Bridge Group

Change description - *This is only opportunity to make this change after you save you will not be make changes.*

### Configure a Bridge

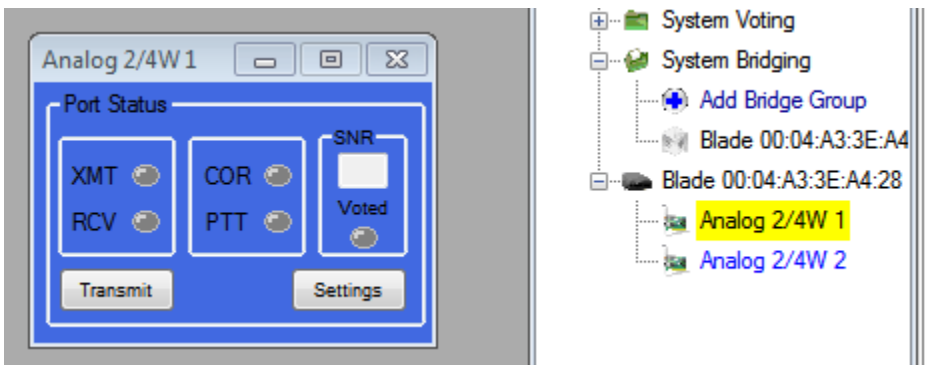
To set up a bridge simply drag the Gateway ports on the right of the screen into Members Window in the Bridge Configuration pop up box.



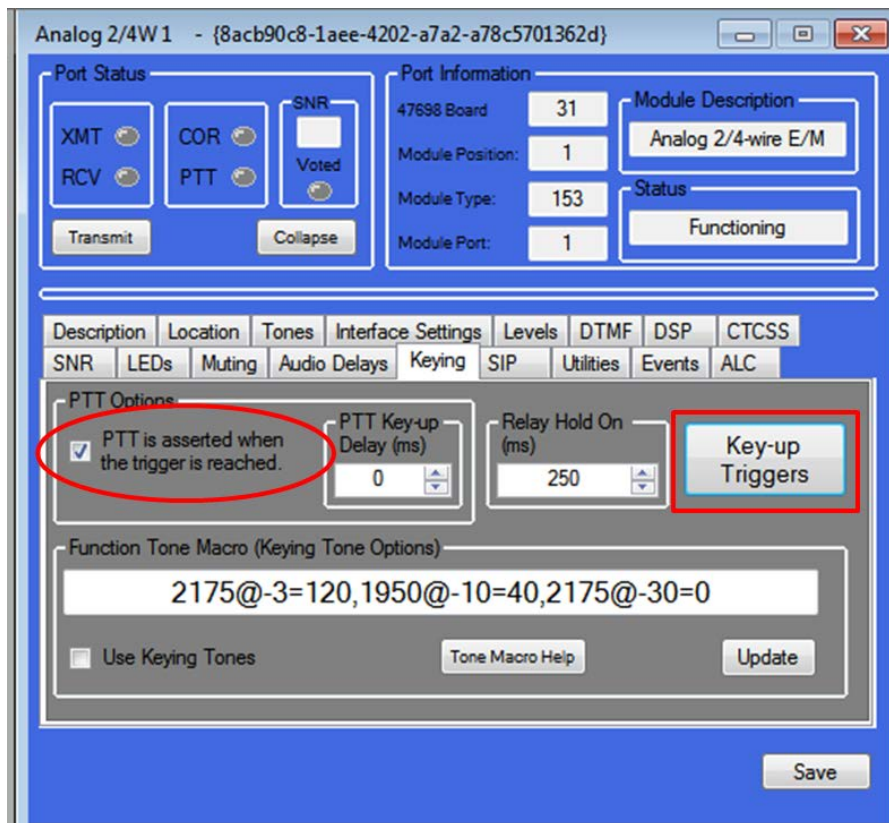
After dragging the desired ports in to the "Configure a Bridge" box, check "Standard E&M Bridge".

When done, select the "Enable" and "Add" buttons. After selecting "Add" follow the prompts save and then close the bridge box from the desk top.

Next bring out the port settings tabs for each of the ports in your bridge group by clicking on their icon at the right of the screen.



Clicking once on each port in your bridge group will bring the port settings tabs out to the desk top as shown below. Expand a port settings tab by clicking on "Settings" and then select the "Keying" tab



After selecting the “Keying Tab”, Check the box for “PTT is asserted when the trigger is reached”

**Caution!** DO NOT make any changes to the “Key-up Triggers” menu. Any changes made will cause the bridge to not key or function properly.


When done with this port, make your keying selections Save, close window and configure the other ports in the bridge.

### 3 VoIP/RoIP Module Configuration

The Clear-Com Gateway IP Module access and programming, is done through a HTML browser Interface.

The Clear-Com Gateway VoIP interface **default IP address is (10.1.1.253)**

You need to set your PC to a Static IP address so you can access the Gateway HTML interface.

Static IP Address	
Address	<input type="text" value="10.1.1.253"/> 
Mask	<input type="text" value="255.255.255.0"/>
Default Router	<input type="text" value="0.0.0.0"/>
DNS Primary	<input type="text" value="0.0.0.0"/>
DNS Secondary	<input type="text" value="0.0.0.0"/>
DNS Tertiary	<input type="text" value="0.0.0.0"/>

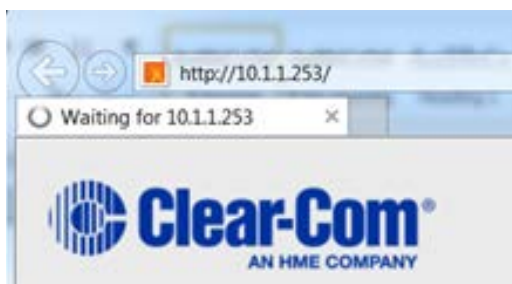
#### 3.1 Gateway Connections

Connect Ethernet Cable from PC to Port 1 on X-1 Gateway, or Port 7 on X-4 Gateway.



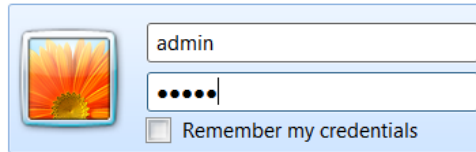
#### 3.2 Logging into VoIP/RoIP Interface

Type default IP address is 10.1.1.253 into your browser address bar.



Default Password is admin, admin

Enter admin (lower case) in each field, select OK



Upon Login you will land on to the System Information tab



## VoIP/RoIP Gateway Configuration

System Information		
<b>System Information</b>	<b>Network</b>	
◦ Status	<b>Address</b>	10.1.1.253
<b>Network Setup</b>	<b>Gateway</b>	0.0.0.0
◦ Network	<b>DNS Primary</b>	0.0.0.0
<b>SIP Setup</b>	<b>DNS Secondary</b>	0.0.0.0
◦ SIP Accounts	<b>DNS Tertiary</b>	0.0.0.0
◦ SIP Codecs	<b>System</b>	
◦ SIP Directory	<b>CPU Utilization</b>	33%
◦ Advanced	<b>Memory Available</b>	1037556
◦ Interface		

### 3.3 Configuring the Gateway Network

Select the Network Tap on the left hand side and enter your desired IP address, and network settings, then save using button in lower right hand corner.



## VoIP/RoIP Gateway Configuration

Network Configuration		
<b>System Information</b>	<b>General</b>	
◦ Status	<b>Host</b>	CCGateway
<b>Network Setup</b>	<b>Domain</b>	
◦ Network	<b>Connection Type</b>	<input type="radio"/> Dynamic IP <input checked="" type="radio"/> Static IP <input type="radio"/> PPPoE
<b>SIP Setup</b>	<b>Static IP Address</b>	
◦ SIP Accounts	<b>Address</b>	10.1.1.253
◦ SIP Codecs	<b>Mask</b>	255.255.255.0
◦ SIP Directory	<b>Default Router</b>	0.0.0.0
◦ Advanced	<b>DNS Primary</b>	0.0.0.0
◦ Interface	<b>DNS Secondary</b>	0.0.0.0
<b>RTP Sessions</b>	<b>DNS Tertiary</b>	0.0.0.0
◦ RTP Sessions	<b>Additional Settings</b>	
<b>Blade Link Setup</b>	<b>MTU Size (advanced)</b>	1500
◦ Gateway Link Setup	<b>VLAN</b>	
◦ Gateway Link Status	<b>VLAN</b>	<input type="checkbox"/> Enabled
◦ Gateway Link Config	<b>ID</b>	4 (value: 0 to 4094)
◦ PSTN Setup	<b>User Priority</b>	0 - Best Effort (default: 0)
<b>System</b>		
◦ Local Analog Port		
◦ Administration		
◦ Date/Time		
◦ Backup/Restore		
◦ Upgrade Firmware		
◦ Logout		

Save Changes

After saving you will be prompted to apply you changes, press "Apply Now"

**Network Configuration**

**Your settings have been saved, but must be applied to take effect!**  
 Applying your changes will result in a temporary loss of internet connectivity and telephone service. You may continue to make other changes and apply all of them together at a later point.

Apply Now

**RoIP Gateway Configuration**


**System restart**  
Please Wait....

**VoIP module is being restarted**

After system restart, enter new IP address and log back in using your browser.

### 3.4 Setting Up a SIP Account

Set up SIP account information from you SIP server or service provider.



**VoIP/RoIP Gateway Configuration**

**SIP Account**

<b>System Information</b>	
* Status	
<b>Network Setup</b>	<b>SIP Account Management</b>
* Network	Select Existing Account <span style="float: right;">Account 1 ▾</span>
<b>SIP Setup</b>	<b>SIP Account Configuration</b>
* SIP Accounts	Account Active <input checked="" type="checkbox"/> Enable
* SIP Codecs	Description <input type="text" value="IFB 1"/>
* SIP Directory	Username/Number <input type="text" value="ClearComGateway"/>
* Advanced	Display Name <input type="text" value="IFB1"/>
* Interface	SIP Domain/IP Address <input type="text" value="opensips.org"/>
<b>RTP Sessions</b>	
* RTP Sessions	

Select account from pull down menu. Check Enable and enter the name for this account in the description field.

Enter username or number, the display name, and the SIP domain or IP address of your SIP account.

#### Associate Gateway Analog Ports

To associate a 4-wire port on the Gateway with a SIP account, enter the following settings.



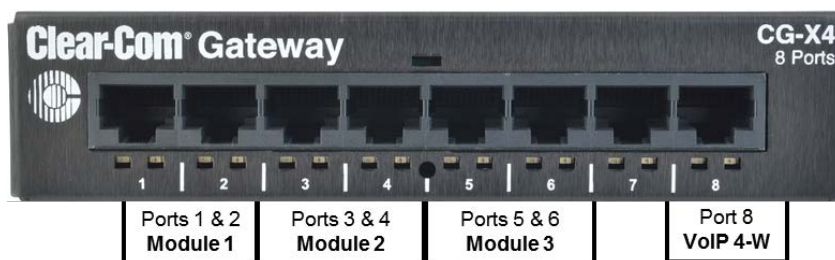
### X1 Gateway

Check the use VoIP module analog port, enter 1 for module number and 2 for gateway module port, check auto answer and translate DTMF, then save using button in lower right hand corner.

Associated Analog Port Settings	
<b>Use VoIP Module Analog Port?</b>	<input checked="" type="checkbox"/> (last port on gateway)
<b>Gateway Module Number</b>	<input type="text" value="1"/> Module Number (1 - 4)
<b>Gateway Module Port</b>	<input type="text" value="2"/> Module Port Number (1 - 2)
<b>Auto Answer Calls</b>	<input checked="" type="checkbox"/>
<b>Translate DTMF</b>	<input checked="" type="checkbox"/> (OOB DTMF is converted to analog DTMF)
<input type="button" value="Save Changes"/>	

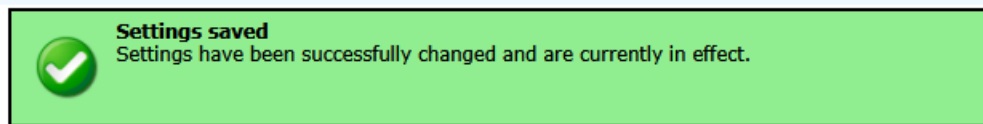
### X4 Gateway

On the X4 gateway you can choose any 4-wire port and assign it to a SIP account, first enter module number,



Associated Analog Port Settings	
<b>Use VoIP Module Analog Port?</b>	<input type="checkbox"/> (last port on gateway)
<b>Gateway Module Number</b>	<input type="text" value="2"/> Module Number (1 - 4)
<b>Gateway Module Port</b>	<input type="text" value="2"/> Module Port Number (1 - 2)
<b>Auto Answer Calls</b>	<input checked="" type="checkbox"/>
<b>Translate DTMF</b>	<input checked="" type="checkbox"/> (OOB DTMF is converted to analog DTMF)

After entering the Gateway module number, enter module on port you would like to associate with SIP account, check auto answer, and translate DTMF.



### 3.5 Setting SIP Codecs

Select the SIP Codecs tab to select Codec desired and add to preferred list, the Codec at the top will be the primary Codec used.

The screenshot shows the Clear-Com VoIP/RoIP Gateway Configuration interface. At the top, the Clear-Com logo and the title "VoIP/RoIP Gateway Configuration" are displayed. Below the title is a "Status" bar. The main configuration area is divided into several sections: "System Information", "Network Setup", "SIP Setup", "RTP Sessions", "Blade Link Setup", and "System". The "SIP Setup" section is expanded, showing "SIP Codecs" as the selected option. The "RTP Configuration" section shows "Port Range" set to 23456 to 23556. The "Codec Selection" section contains a warning message: "The G.729 codec may require a license arrangement between you (the user) and an intellectual property rights holder (IPR). It is your responsibility to determine whether any licenses or fees are due to an IPR holder." Below this, there are two columns: "Available" and "Preferred". The "Available" column lists various codecs, with "G.729" selected. The "Preferred" column lists "G.711 uLaw", "DVI4 Narrowband", and "G.729". Between the columns are "Add >>" and "<< Remove" buttons. To the right of the "Preferred" column are "Move Up" and "Move Down" buttons. At the bottom right of the configuration area is a "Save Changes" button. A green notification banner at the bottom of the screenshot reads: "Settings saved Settings have been successfully changed and are currently in effect."

Connect your 4-wire source, connect Ethernet port to network, and test your SIP connection by dialing the SIP account number or address.

## 4 Specifications

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### Audio

#### 4-Wire Ports

**Input/Output Levels:** -16 to 7 dBm @ 600 Ohms, adjustable in 0.1dB steps

**Frequency Response:** 5 to 3400 Hz; +/-1 dB ref. to 1 KHz

**Isolation:** >60 dB

**Idle Noise:** <20 dbrnC0

**Input Impedance:** 600 Ohms or 100 Ohms, software selectable each port

**Output Impedance:** 600 Ohms, true differential

Hybrid Return Loss: 25 dB minimum

### Port Signaling

#### M-Lead Relay

**Optical:** Coupled MOS

**Maximum Contact Voltage:** 60 VDC, 20 VAC

**Maximum Current:** 50 mA

#### E-Lead Input

**Active High Input:** Open circuit or >+1.8 VDC

**Active Low Input:** Ground, negative voltage or <+0.32 VDC

**Clear-Com Signaling:** Eclipse and HelixNet

### IP Ports

**Format:** Supports 10Base-T and 100Base-T

**Networking Stack:** TCP/IPv4

**Protocols:** SIP, SDP, RTP, IPV67 and STUN (Simple Traversal of UDP through Network Address Translation)

**Codecs:** G.711 (fully compatible), G.726 (16/24/33/40 kbps), G.722, DVI4 (narrow/HD/Ultra HD), Linear PCM

**SIP Accounts:** 8 per module

### Mechanical/Electrical/Environmental

**LAN:** RJ45 (port 2 on CG-X1, port 7 on CG-X4)

**PC Configuration:** USB Port Type B

**4-Wire:** RJ45

#### Power Supply

Switchable plug-in adapter with locking connector and IEC cord

**Input Voltage:** 85 – 264VAC; 100 – 240VAC; nominal

**Output Voltage:** 12V; 1.67A

**MTBF (min.):** 200,000 hours demonstrated

#### Temperature

**Operating:** 32°F - +122°F (0°C - +50°C)

**Storage:** -40°F - +176°F (-40°C - +80°C)

**Humidity:** 0 – 95%, non-condensing

**Dimensions**

**CG-X1:** 5.4in W x 1.4in H x 6.4in D (137.2mm x 35.6mm x 162.6mm)

**CG-X4:** 5.7in W x 1.4in H x 13in D (144.8mm x 35.6mm x 330.2mm)

**Weight**

**CG-X1:** 3.5lbs (1.59kg)

**CG-X4:** 4.75 lbs (2.15kg)

**NOTICE ABOUT SPECIFICATIONS**

While Clear-Com makes every attempt to maintain the accuracy of the information contained in its product manuals, the information is subject to change without notice. Performance specifications included in this manual are design-center specifications and are included for customer guidance and to facilitate system installation. Actual operating performance may vary.

## 5 Compliance

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### FCC notice

This device complies with Part 15 of the FCC rules. 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.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communication. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by Clear-Com, LLC, an HM Electronics, Inc. company could void the user's authority to operate this equipment.

### Industry Canada Compliance Statement

This Class [A] digital device complies with Canadian ICES-003.  
Avis de conformité à la réglementation d'Industrie Canada  
Cet appareil numérique de la class[\*] est conforme à la norme NMB-003 du Canada.

#### **Warning:**

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. The FIM-222S complies with the following specifications:

UL 60065-7  
CAN/CSA-C22.2 No.60065-3  
IEC 60065-7

## Waste Electrical And Electronic Equipment (WEEE)

The European Union (EU) WEEE Directive (2002/96/EC) places an obligation on producers (manufacturers, distributors and/or retailers) to take-back electronic products at the end of their useful life. The WEEE Directive covers most Clear-Com products being sold into the EU as of August 13, 2005. Manufacturers, distributors and retailers are obliged to finance the costs of recovery from municipal collection points, reuse, and recycling of specified percentages per the WEEE requirements.

### Instructions for Disposal of WEEE by Users in the European Union

The symbol shown below is on the product or on its packaging which indicates that this product was put on the market after August 13, 2005 and must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of the user's waste equipment by handing it over to a designated collection point for the recycling of WEEE. The separate collection and recycling of waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local authority, your household waste disposal service or the seller from whom you purchased the product.



Figure 7-1: WEEE Symbol