©entri Series
HE1U-XX12-MU

High-Efficiency Low Profile 12V Power Supply

- *Internet ready*
- *Front panel display*
- *Remote monitoring of voltage, current, temperature, and external alarm*
- *Remote control of power supply ON/OFF and alarm output via web interface*
- *Configuration alarms, email notification, and SNMP traps*

Model	HE1U-2012-MU	HE1U-5012-MU	HE1U-12012-MU
Output Amperage	20 Amps	50 Amps	100 Amps
Output Voltage	13.8 VDC		
Input Voltage Range	90 – 264 VAC auto-ranging		
Product Dimensions	19 x 14 x 1.75 in, 19" Rack Mount 1U Height		
Shipping Dimensions	21 x 15 x 8 in		
Shipping Weight	11 lbs		

*NOTE: Specifications are subject to change without notice.

Table of Contents

Section 1 | Important Safety Instructions

THESE INSTRUCTIONS ARE INTENDED FOR USE BY A TECHNICIAN FAMILIAR WITH ELECTRONIC PRODUCTS.

WARNING: There are no user serviceable parts inside. Service must be referred to a qualified factory technician or factory trained technician. DO NOT operate the unit in a hot, enclosed environment or compartment. Be sure adequate ventilation for cooling is provided since heat buildup will shorten component life.

NOTE: The individual user should take care to determine prior to use or installation whether this device is suitable, adequate, and safe for the use intended. Since individual applications are subject to numerous variations, DuraComm makes no representation or warranty as to the merchantability, suitability, or fitness of these units for any specific application.

Section 2 | Product Overview

The HE1U-XX12-MU is an internet-ready high-efficiency AC to DC power supply in a 1U chassis. The unit comes with power factor correction, and four layers of protection against overload, over voltage, over temperature, and short circuit.

The internal Remote Monitoring and Control Unit (RMCU) provides the ability to remotely monitor the AC voltage, power supply voltage, power supply current, and internal temperature, as well as the ability to remotely control the power supply ON/OFF state and battery connection all via the internet using any standard web browser. A mobile-friendly version of the status page is also included.

Users that have access to the network can view the status of the power supply, control outputs, and the alarm conditions, as well as download a CSV file of logged states. Administrative users can access the setup screens and change the control settings by logging into the RMCU via the browser. Alarm conditions are configurable and can include over and under thresholds. Alarm notifications can be configured by an administrator to send email and SNMP traps. Setups are saved in non-volatile RAM, and a battery backed up real-time clock is provided to timestamp information logged to the internal SD card. Logging rate can be set by the user.

See www.duracomm.com for more information.

Section 3 | Installation and Operation

The outputs are NOT referenced to the chassis. However, the Alarm IN and the Alarm OUT are referenced to the negative output, so 'G' on the alarm connections will be negative 12 volts if the unit is installed in a positive ground system. As an option, the Alarm IN and the Alarm OUT can be configured to be fully opto-isolated.

DO NOT block any of the cooling vents on the sides and/or cooling fan. Always allow adequate ventilation by not installing the unit inside tightly closed spaces.

Conductor Pretreatment

All kinds of copper conductors can be clamped without treatment. DO NOT solder tin stranded conductors. The solder yields and fractures under high pressure. The result is increased contact resistance and excessive temperature rise. Additionally, corrosion has been observed due to the fluxes. Notch fractures at the transition from the rigid tinned part to the flexible conductors are also possible. Ferrules can be used as a protection when wiring stranded conductors. Copper ferrules prevent the current transfer from being influenced by dissimilar metals and remove the risk of corrosion. Always use the correct tool to crimp the ferrule.

Recommended Copper Wire Size for Current Capacity

(Insulated Wire, Single Conductor in free air)

Current Level in Amperes	Wire Size Requirements According to MIL-W-5088B	
	Up to 5 feet	Up to 10 feet
<7 AMPERES	20 AWG	18 AWG
14 AMPERES	18 AWG	16 AWG
20 AMPERES	16 AWG	14 AWG
30 AMPERES	14 AWG	12 AWG
40 AMPERES	12 AWG	10 AWG
50 AMPERES	10 AWG	8 AWG
70 AMPERES	8 AWG	6 AWG
100 AMPERES	6 AWG	4 AWG

Front Panel Control

The screen will auto-scroll through the status sensors of the power supply.

- Pressing the 🏠 button at any time will exit the current menu and display the hardware and firmware version of the remote monitoring unit, then return to scrolling.
- Pressing the ▶| button will manually scroll through the sensors and the digital inputs and outputs of the device.
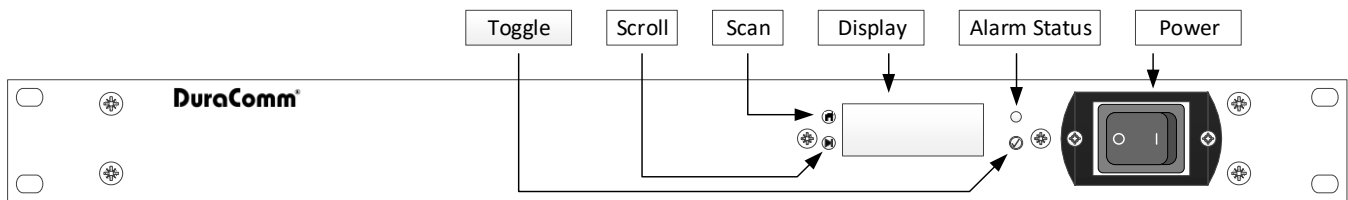- The ☑ will toggle the currently selected output ON and OFF.

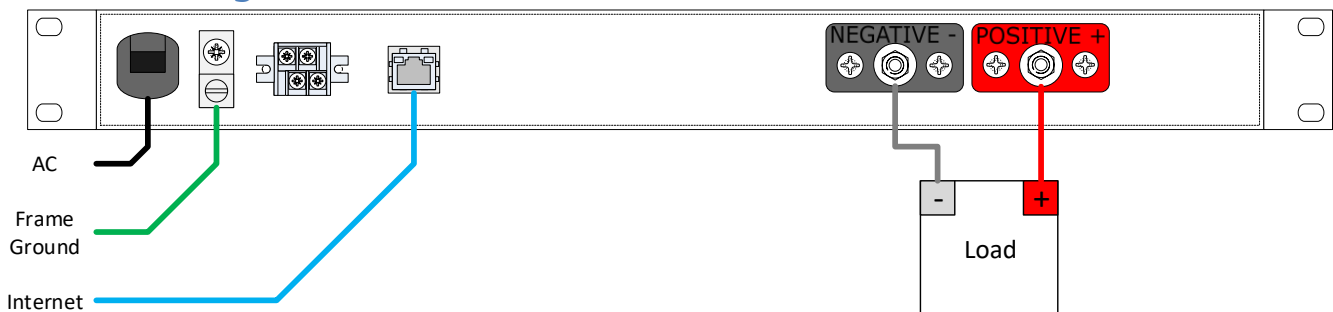Figure 1. Front panel layout.

Rear Panel Wiring

Figure 2: Rear panel connections of a HE1U-XX12-MU unit.
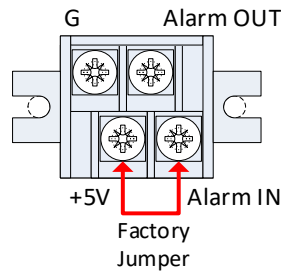
4

Rear Connectors

G   Alarm OUT

+5V   Alarm IN

Factory
Jumper

Figure 3. Alarm wiring shown with factory jumper to silence alarm condition.

Between +5V and Alarm IN	Output Status
Switch Closed	Alarm Closed
Switch Open	Alarm Open

Between G and Alarm OUT	Output Status
Alarm ON/LOW	Shorted
Alarm OFF/HIGH	Open

The Alarm OUT is an open drain MOSFET referenced to G. The Alarm OUT can sink a maximum current of 500 mA at a maximum voltage of +60 VDC. The Alarm IN, also referenced to G, is a LED in series with a 220 Ohm resistor internally, and can withstand 50 mA max. A factory jumper is installed from +5 to Alarm IN to silence the alarm. The jumper can be replaced with external wirings to a switch or a relay.

Connecting to the DuraComm Unit VIA the Internet

Prerequisites
System administrators must decide whether the DuraComm internet-ready unit will operate on the network with DHCP or a fixed IP address. The factory-set unit will have these static addresses: **IP address: 192.168.100.220, gateway address: 192.168.100.1, netmask: 255.255.255.0, and DNS address: 192.168.100.1**.

If you configure it to use DHCP, the DuraComm internet-ready unit will request an available IP address on your network. You will need to determine what address it has been given.

If DHCP is not used, system administrators must also choose an unused IP address, and other network settings to use in the Network Setup screen. System administrators will also need to choose an email service and address to use for notifications if needed. These will be used in the Email Setup Screen.

Determining the IP Address of the Unit
Power up the DuraComm unit then connects the it to the network with an Ethernet cable.

Using DHCP
You will need to get the IP address in one of two ways. You can get the IP address from the DHCP server's client list, or you can use a PC on the same network to scan for the new IP address by using a software tool such as Angry IP Scanner. In Angry IP Scanner, you should add the MAC address "Fetcher" under "Tools > Fetchers". The DuraComm MAC addresses all start with a base address of **70-B3-D5-6B-3.** Write down the IP address of the unit then proceed to the section in this manual named "**Open a Web Connection to the Unit**".

Using Static IP and Network Configuration

If your network is not set up for DHCP, you will need to manually configure the settings to match the network it will be used on. Before you can do that, you will need to configure a computer to talk to the DuraComm internet-ready unit at the default configuration settings shown above. We will use Windows 7 as an example. Other operating systems will vary, but the overall concept is the same.

1. Disconnect your PC from all networks.
2. Connect it directly to with an Ethernet cable (You may need to use an Ethernet crossover cable if the PC does not automatically detect this configuration).
3. Open the control panel on your PC and select "View Network Status and Tasks"
4. Click on "Change Adapter Settings" on the left side of the screen.
5. Right click on "Local Area Connection" and click on "Properties"
6. Click on "Internet Protocol Version 4 (TCP/IPv4)" to highlight it, then click the "Properties" button.
7. Before you make any changes, **record the existing settings**, so that you can change them back when you are finished setting up the unit.
8. Enable "Use The Following IP Address"
9. Now enter 192.168.100.221 for the IP address.
10. Enter 255.255.255.0 Subnet mask
11. Click OK to save the network configuration.
12. Jump to the section in this owner's guide named **"Open a Web Connection to the Unit"** to log in and enter the final network settings for the unit.

Open a Web Connection to the Unit

1. Connect the RJ-45 connector on the back of the DuraComm unit to your network.
2. Use your favorite device and browser (Chrome, Firefox, Internet Explorer, etc.), and enter the IP address of the power supply on your network into the URL box on the browser (see the screenshot below). If you are unable to connect to the device with the browser, you will need to use a terminal with a USB connection to access the device and configure the IP address. If the unit responds with the "Status" screen, you can skip to the 'User Login' Section. You may want to refer to the 'User Setup' section now or later to change user account information or, if necessary, perform a factory reset.

Figure 4. Enter IP address to connect to the unit.

Section 4 | Remote Monitoring and Control Setup

User Setup
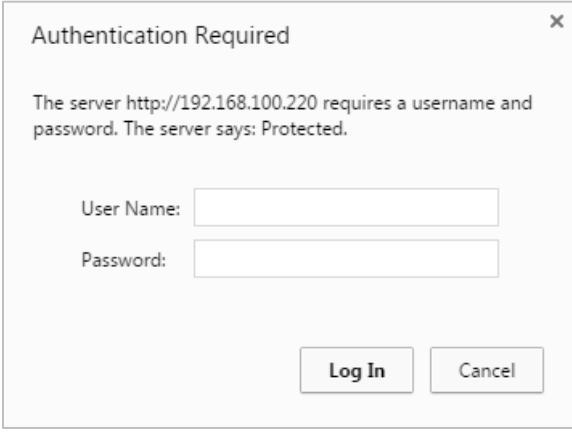

Figure 5. User setup page.

Password changes and hard resets are performed by using this page. Care should be taken when changing any of these settings.

NOTE: To hard reset your device back to factory settings, perform a factory reset here, or press the red button on the on-board "remote control unit PCB and hold it for more than 30 seconds (you will need to remove the cover on the DuraComm unit, and connect power to the battery terminals). Re-connect to the unit through your web browser by entering the factory supplied IP address and HTTP port (see Network Setup).

All setup requires an administrative user to log into the DuraComm internet ready unit. Click the 'Login' button in the top menu, and you should see the following User Login screen.

Note: These screenshots are taken from a DuraComm internet-ready MU series and show typical setup information for all model numbers in the series (except for the model number).

User Login

Figure 6. User login pop-up window prompting user name and password.

Enter the username and password. The "Admin" and "Control" are the only two users pre-configured in a DuraComm internet-ready unit. Factory default username and password are as follows:

"Admin" users have full user control of the device.

     Username: admin
     Password: admin

"Control" users have limited control capability (access all screens except the User Setup screen).

     Username: control
     Password: control

Network Setup

Figure 7. Network setup page.

A network administrator for your company must choose the settings for this page. The default HTTP port is **80**. If a different HTTP port is used, it will need to be added to the URL to access the DuraComm unit. For example: if the port is changed to **8080** then the address would be changed to http://192.168.0.253:8080

NOTE: You must reboot the device for changes in these settings to take effect.

SNMP Traps

This section is simplified and meant for network administrators who already understand SNMP traps and how to configure capable equipment into their system. For those who want to understand the benefits of using SNMP traps, you can search for training material online under "SNMP Traps", "MIB Browsers", and "SNMP Monitoring".

The MIB file for the DuraComm unit can be downloaded after you connect to it with your browser. Go to the Device Setup page and log in to the unit. Halfway down the page there is a link to the MIB file. Right-click on the link and click "Save Link As" to download the file.

After download, import the MIB file into your MIB browser or Monitoring software to configure it for use with the DuraComm unit.

When the MIB file has been loaded, complete the "SNMP Setup" section on the "Network Setup" page of the DuraComm unit to configure it for use with your monitoring solution.

The DuraComm internet-ready unit will send traps for all configured alarm conditions including bootup, temperature, analog alarms, and digital alarms.

Digital Outputs can also be controlled by SNMP and configured for alarms on the DuraComm unit.

Email Setup

Status	Device Setup	Sensor Setup	Alarm Setup
User Setup	Network Setup	E-Mail Setup	Logout (control)

Email setup

E-mail server:	
Server port:	25
Server username:	
Server password:	
E-mail to:	to@someplace.com
E-mail from:	me@myplace.com
Minimum interval:	5 Minutes

Device won't attempt to send e-mails faster than this, any alarms that happen will be queued and sent when this duration has expired.

Periodic interval:	Never ▼
Periodic start:	Enabled ▼
	00:00
Send e-mail on bootup?	No ▼
Send test e-mail now?	No ▼

Leave hostname blank or set port to 0 to disable e-mails.

Leave the username/password blank if your e-mail server doesn't require it.

Submit Values Cancel Changes

Figure 8. Email setup page.

Enter the required email setup parameters given to you by your System Administrator. You can also send a test email from this screen.

Sending Text Messages

In order to send a text, you need to send an email to the appropriate email address of your cell phone carrier. Simply enter your phone number with no spaces, parenthesis, or hyphens followed by your carrier address. For example, 8165551234@vtext.com would send a text message to the Verizon user at phone number (816) 555-1234. Here are the most common carrier addresses.

- **Alltel:** *phonenumber*@message.alltel.com
- **AT&T:** *phonenumber*@txt.att.net
- **T-Mobile:** *phonenumber*@tmomail.net
- **Virgin Mobile:** *phonenumber*@vmobl.com
- **Sprint:** *phonenumber*@messaging.sprintpcs.com
- **Verizon:** *phonenumber*@vtext.com
- **Nextel:** *phonenumber*@messaging.nextel.com
- **US Cellular:** *phonenumber*@mms.uscc.net
- **Cricket Wireless:** *phonenumber*@sms.mycricket.com

The body of the email or alert will be sent to your phone as a text message. Note: Text limits and fees vary by provider and plan.

Device Setup

Figure 9. Device setup page.

A custom site name can be entered here, and the model, serial number, hardware and firmware version are shown here.

The DuraComm internet-ready unit will log all measurements and alarms to an SD card that is plugged in on-board. Users can set the logging rate, as well as clear the card, or append new measurements. The CSV log file can be downloaded here, or in the Status page. If the SD card fills up, the oldest sample is discarded when a new one is stored. The unit's custom device name is stored with the logged data, so that the source of the card can be identified after it is removed from the previous device.

The log file will be automatically renamed and a new one started when the file size reaches 5MB. Download all log files before deleting them!

The ability to log readings when an alarm occurs is included. To turn off periodic logging, enter 0 as the logging rate. You can set up logging to occur only on alarms, periodically, both or none.

The SNMP MIB File can be downloaded from this page.

Configuration for all date and time settings. Date and time are battery backed up on the card, and the values are saved in the logged samples. The real-time-clock can synchronize its time to the network through an NTP server, or it can be set manually if a network is not available.

The NIST NTP servers can be used by entering **time.nist.gov** or **pool.ntp.org,** or another NTP server address into the **NTP Server box.**

You can set the number of significant digits after the decimal for the Analog Voltage readouts on the Status page, as well as set the temperature units.

Sensor Setup

Figure 10. Sensor setup page.

The admin user can set custom names for each input or output. Factory set names will be supplied, but they can be re-written to be more descriptive or to manage larger systems. Alarm colors can be set here to represent the proper logical state for your system. Digital inputs can also be set here to send notification emails to the email address configured in the Email Setup screen. If any of the name fields on the left are left blank, the channel will be hidden on the status screen. Inputs and outputs of the DuraComm internet-ready unit are wired as shown on the Sensor Setup screen.

The user can enter text to change the user meaning of the digital output states, and there are 3 color options for the buttons. "Active" means that the digital output MOSFET is conducting. Digital Outputs can also be configured to output a pulse with a selectable duration.

Digital Outputs and Logging can be configured to turn on and off according to a schedule. 16 schedules can be set for outputs, and one for logging.

Alarm Setup

Figure 11. Analog, Temperature, AC, and Digital alarm setup.

In a DuraComm internet-ready unit, the analog alarms can be set by selecting the drop-down menu next to the "Analogs" label. As shown in the figure, the "Amps Power Supply" is currently selected.

In general, the Digital Output 1 is an alarm output, and the Digital Output 2 controls the power supply ON/OFF state. The user must be logged in as the admin or control user to adjust the digital outputs. The digital outputs can be controlled by the buttons on the status page, mobile page, or via SNMP on the unit. Optionally, they can be automatically controlled by connecting them to an alarm on the "Alarms" screen.

The Alarm Setup page is where thresholds are set to define alarm conditions for the analog channels. You can choose to set an email notification when the alarm conditions are met.

The "Log All Alarms" setting in the "Global Settings" on this page is the same as the "Log Alarms" setting on the Device Setup page.

Default Analog Alarm Settings

Measurement	Units	Under Alarm	Under Alarm Recv.	Over Alarm	Over Alarm Recv.
Ac Line Voltage	Volts	100	107	140	135
Temperature	Fahrenheit	40	45	150	145
Amps Power Supply	Amps	-1000	0	1000	0
Amps Battery	Amps	-1000	0	1000	0
Volts Power Supply	Volts	8.0	13.0	15.5	14.8
Volts Battery	Volts	11.5	12.5	15.5	14.8

Remote Monitoring and Control Status Page

Figure 12. (a) Status Page Screen. (b) Simplified Mobile Version.

This screen shows the status of all analog and digital inputs. A user can also download the Log file from this page. AC Voltage is approximate.

A simplified version of the status page is available for mobile devices. Just use the same IP address and add '/m'. For example, 192.168.100.220/m

Note: These screenshots are taken from a DuraComm internet-ready MU series and are shown typical setup information for the numbers in the series (except for the model number).

Section 5 | Specifications

	Models	HE1U-2012-MU	HE1U-5012-MU	HE1U-12012-MU
Output	DC Voltage		13.8 VDC	
	Maximum Output Current	20 Amps	50 Amps	100 Amps
	Maximum Power, continuous	330 Watts	750 Watts	1500 Watts
	Maximum Ripple and Noise	150 mV p-p	150 mV p-p	150 mV p-p
	Voltage Tolerance	± 1.0 %	± 1.0 %	± 1.0 %
	Line Regulation	± 0.3 %	± 0.5 %	± 0.5 %
	Load Regulation	± 0.5 %	± 0.5 %	± 0.5 %
	Rise Time following ON	50 msec	50 msec	60 msec
	Hold Up Time, Typical	16 msec	16 msec	10 msec
Input	Input Voltage	90 – 264 VAC auto-ranging		
	Input Frequency Range	47 – 63 Hz		
	Typical Efficiency	88 %	89 %	89 %
	Typical AC Current	3.5A / 115VAC 1.8A / 230VAC	8.2A / 115VAC 3.9A / 230VAC	14A / 115VAC 8A / 230VAC
	Max Inrush Current, single cycle	35A / 115VAC 70A / 230VAC	25A / 115VAC 40A / 230VAC	35A / 230VAC
Protection	Short Circuit Protection	Constant Current Limiting		
	Overload, % rated output power	105 – 135 %	105 – 125 %	105 – 115 %
	Over Voltage	18.8 – 21.8 V	17.0 – 20.5 V	15.75 – 18.75 V
	Over Temperature	>195 F (90 C) auto output shutdown		
Temp.	Working Temperature Range	-22 to 158 F (-30 to 70 C)		
	Storage Temperature	-40 to 185 F (-40 to 85 C)		
Safety	Withstand Voltage	I/P-O/P: 3 KVAC I/P-FG: 2 KVAC O/P-FG: 0.5 KVAC	I/P-O/P: 3 KVAC I/P-FG: 2 KVAC O/P-FG: 0.5 KVAC	I/P-O/P: 3 KVAC I/P-FG: 2 KVAC O/P-FG: 1.5 KVAC
RMCU	Hardware Version	2.0		
	Network Connector	RJ-45 (10/100 Ethernet) with activity LEDs		
	Backup Battery	CR2032		
	Memory Card	4GB Micro SD		
	AC Voltage Measurement Range	0 – 300 VAC RMS		
	DC Voltage Measurement Range	0 – 100 VDC		
	DC Current Measurement Range	0 – 100 Amps		
	Digital Alarm Input	Normally Closed Contacts (5V to Alarm IN)		
	Alarm Output	Open drain, 60 VDC max, 500 mA sink max		
	Alarm Response Time	250 msec		
	Alarm Notifications	Email and/or SNMP		
	Logging Rate	1 minute – 1 hour @ 1-minute resolution		
	Log Download Format	Comma Separated Values (CSV) File		
	SNMP MIB File	Download from Device Setup Page		
	5V Supply Maximum Current	300 mA		

Section 6 | Warranty

DuraComm warrants to the initial end user, each power supply manufactured by DuraComm to be free from defects in material and workmanship when in normal use and service for a period of three years from the date of purchase from an authorized DuraComm dealer.

Should a product manufactured by DuraComm fail or malfunction due to manufacturing defect, or faulty component, DuraComm, at its option, will repair or replace the faulty product or parts thereof, which, after examination by DuraComm, prove to be defective or not operational according to specifications in effect at the time of sale to the initial end user. The product that is replaced or repaired under the provisions of this warranty will be warranted for the remainder of the original warranty period, only, and will not extend into a new three-year warranty period.

The limited warranty does not extend to any DuraComm product which has been subject to misuse, accidental damage, neglect, incorrect wiring not associated with the manufacturer, improper charging voltages, or any product which has had the serial number removed, altered, defaced, or changed in any way.

DuraComm reserves the right to change, alter, or improve the specifications of its products at any time, and by so doing, incurs no obligation to install or retrofit any such changes or improvements in or on products manufactured prior to inclusion of such changes.

DuraComm requires any product needing in or out of warranty service to be returned to DuraComm. All requests for warranty service must be accompanied by proof of purchase, such as a bill of sale with purchase date identified. DuraComm is not responsible for any expenses or payments incurred for the removal of the product from its place of use, transportation or shipping expenses to the place of repair, or return expenses of a repaired or replacement product to its place of use.

The implied warranties that the law imposes on the sale of this product are expressly LIMITED, in duration, to the three (3) year time period specified herein. DuraComm will not be liable for damages, consequential or otherwise, resulting from the use and operation of this product, or from the breach of this LIMITED WARRANTY.

Some states do not allow limitations on the duration of the implied warranty or exclusions or limitations of incidental or consequential damages, so said limitations or exclusions may not apply to you. This warranty gives you specific legal rights which vary from state to state.

This warranty is given in lieu of all other warranties, whether expressed, implied, or by law. All other warranties, including WITHOUT LIMITATION, warranties of merchantability and fitness or suitability for a particular purpose, are specifically excluded. DuraComm reserves the right to change or modify its warranty and service programs without prior notice.

Section 7 | Contact Us

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