DuraComm® POWER SUPPLIES
A Benny Lee Company

PRODUCT USER GUIDE

RM-DC-RMCU1

Rack Mounted DC-Powered

Remote Monitoring and Control Unit REV 2.0 Owners Guide

(These instructions are intended for use by a technician familiar with electronic products)

- Rack Mount Remote Monitoring and Control Unit (2U)
- Web Ready / Web GUI / Mobile Status Page
- 6 Isolated Voltage inputs with adjustable high and low alarm thresholds. (CH 1 set to measure current)
- 4 Digital Outputs(Open-Drain MOSFET)
- 4 Digital Inputs
- Configure emails for alarms with external email accoun
- SNMP Traps for Boot-up and Alarms
- SNMP Control of Digital Outputs
- Remote reboot
- 2 User Levels with different permissions
- Manual or NTP Time Setting
- Temp Sensor Input (Uses LM35)
- AC Voltage Monitor Input, 300 VAC
- Monitoring Samples can be Logged and Downloaded
- Battery backed up Real Time Clock to Timestamp Logge New Live Information
- Wide Input DC Supply Range, 9 to 60 VDC
- Accessory Kit Supplied
- 3 year warranty

DuraComm®
SITE©ENTRI

DESCRIPTION

The new RM-DC-RMCU1 Rack Mount DC-Powered Remote Monitoring and Control Unit, provides the ability to remotely monitor AC Line voltage up to 300 VAC, up to 6 DC Voltages and 1 temperature, monitor the status of up to 4 external alarms, as well as the ability to remotely control the state of 4 digital open-drain MOSFET outputs, all via the internet using any standard web browser. The Channel 1 DC voltage input is configured at the factory to measure current using the included 100 Amp/50mV shunt. Additional channels can be configured at the factory for current measurement. A mobile friendly version of the status page is also included. Alarms and email notifications can be configured for the 6 analog voltage channels (high and low voltage), and email notifications can be configured for the Alarm inputs. A high-temperature alarm threshold can be configured to send an email notification, as well as control one of the digital outputs internally. The RM-DC-RMCU1 also sends SNMP Traps for alarm conditions. The RM-DC-RMCU1 can also be set to log measurements to a 2 GB internal micro SD card, and the measurements are time-stamped with a real-time clock.

Guest users will see the status page that displays the AC Voltage, measured values and alarm condition of all active voltage channels, temperature value and alarm condition, as well as alarm input status, and control status.

Admin and Control Users will be able to configure all of the input and output settings, and set the state of the digital outputs. Admin and Control users can set device settings for logging, time, and Site Name.

Admin users have exclusive control of network configuration, including manual time setting or NTP, soft reboot of the RM-DC-RMCU1, factory reset of the entire configuration, and Control or Admin user passwords.

The RM-DC-RMCU1 comes with the DuraComm three-year warranty.

TABLE OF CONTENTS

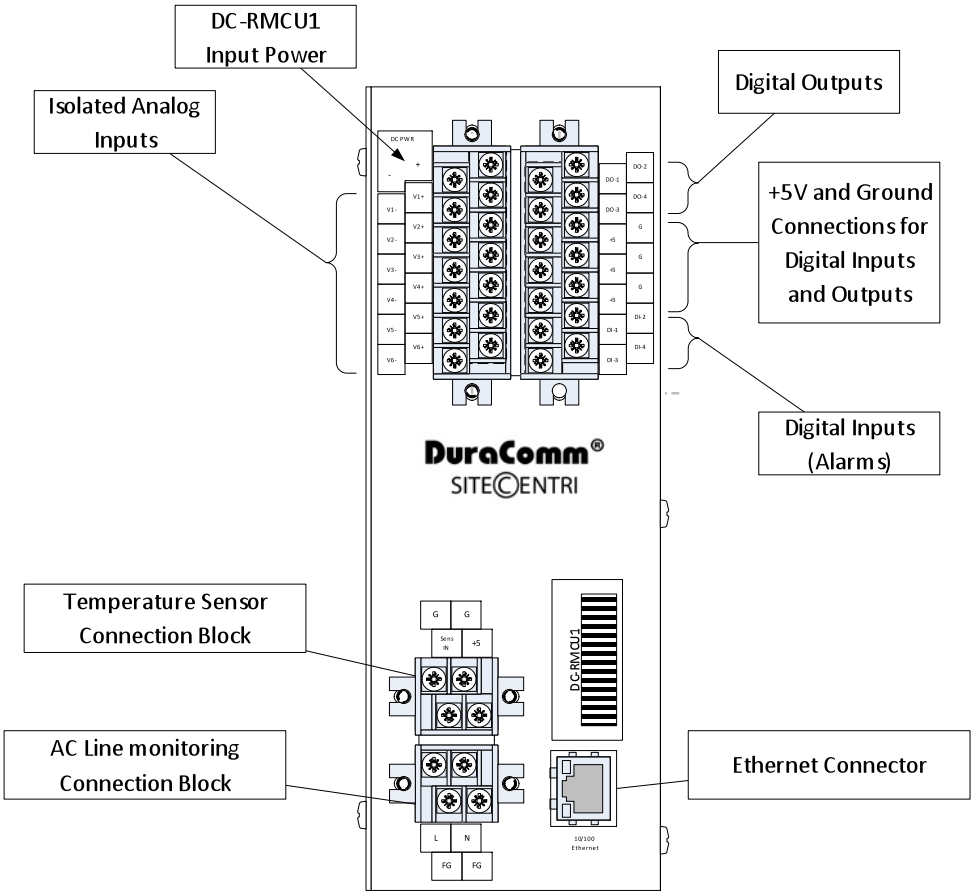
SPECIFICATIONS

DC Input Power	9 to 60 VDC @ 500 mA max
Internal +5VDC supply current (Source for external Logic)	300 mA Max
Working Temperature Range	-4 F to +140 F (-20 C to +60 C)
Voltage Input Channels (6 channels) – Max Voltage	(Internally Isolated) +/-2 V with jumper, +/-100 V without jumper
Digital Alarm Input Channel Thresholds (4 channels)	LED with 220 Ohm Series Resistor, 50 mA Max (per channel)
Digital Output (4 Channels)	Open Collector, 60 VDC Max, 500 mA sink Max (per channel)
Network Connector	RJ-45 (10/100 Ethernet) with activity LEDs
Terminal Connector	(factory diagnostics only)
Backup Battery (for Real Time Clock)	CR2032
Memory Card	2GB min Micro SD
Voltage Measurement Range	0 VDC to 100 VDC
Current Measurement Range	0 Amps to 100 Amps
Alarm Response Time	250ms
Alarm Notifications	Email and/or SNMP
Logging Rate	1 minute resolution, 1 minute to 1 hour
Log Download Format	.Comma Separated Values (CSV) File
Storage Temperature	-40 F to +185 F (-40 C to +85 C)
Dimensions	8”H x 3.2”W x 5”D
Weight	1.7 lbs.

ACCESSORY KIT (INCLUDED)

Ethernet Cable	3 feet
Current Measurement Shunt	100 Amp / 50 mV
Temperature Sensor	LM35
Rubber Feet	4
Wall Mounting Bracket	2 brackets and 4 sheet metal screws

INSTALLATION



Input Power

The RM-DC-RMCU1 DC PWR connections on the power strip. Please be sure to connect the positive terminal to the positive(+) supply lead, and the negative terminal to the negative(-) supply lead. The supply voltage may be 9 VDC to 60 VDC.

NOTE: The RM-DC-RMCU1 is "ON" as soon as power is applied.

10/100 Ethernet

Connect the RJ-45 on the RM-DC-RMCU1 to your network with an Ethernet patch cable. A short 3 foot cable is provided with the RM-DC-RMCU1.

NOTE: The USB connector is for factory diagnostics only.

DCRMU BOARD LAYOUT AND CONFIGURATION

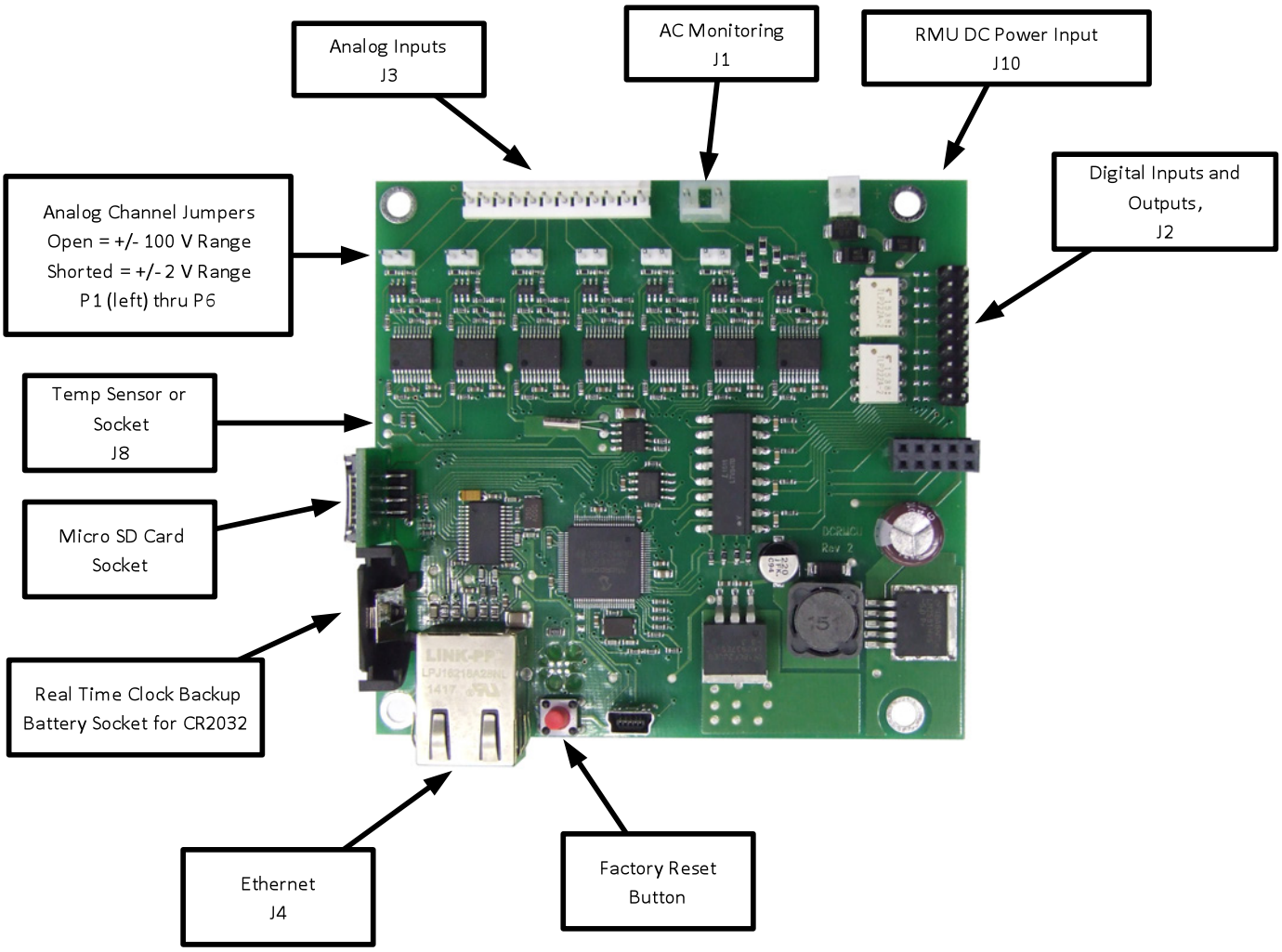


Figure 1: PCB Layout

The RM-DC-RMCU1 comes with a jumper installed on P1 to configure analog channel 1 for +/- 2 V to measure current shunt voltage.

See the Sensor Setup Section for sensor wiring and configuration.

Figures 2 and 3 Show connector wiring for the RM-DC-RMCU1 inputs for troubleshooting purposes.

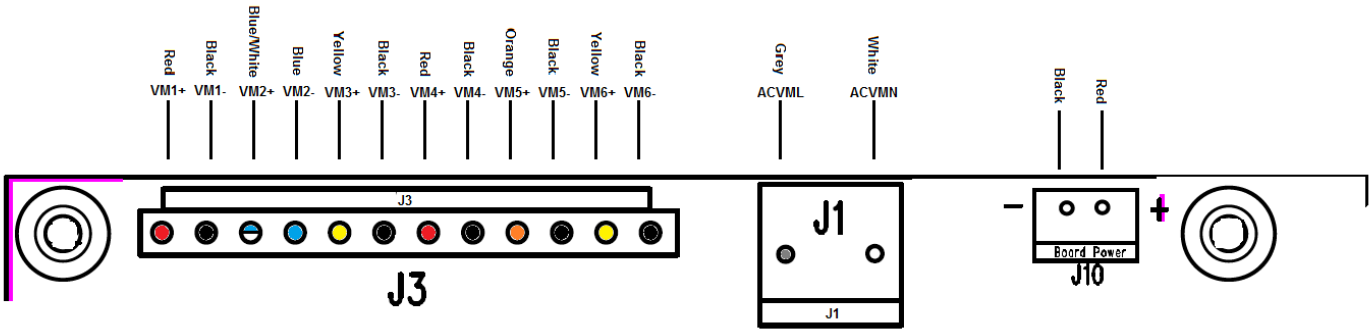


Figure 2: J1 and J3 Wiring

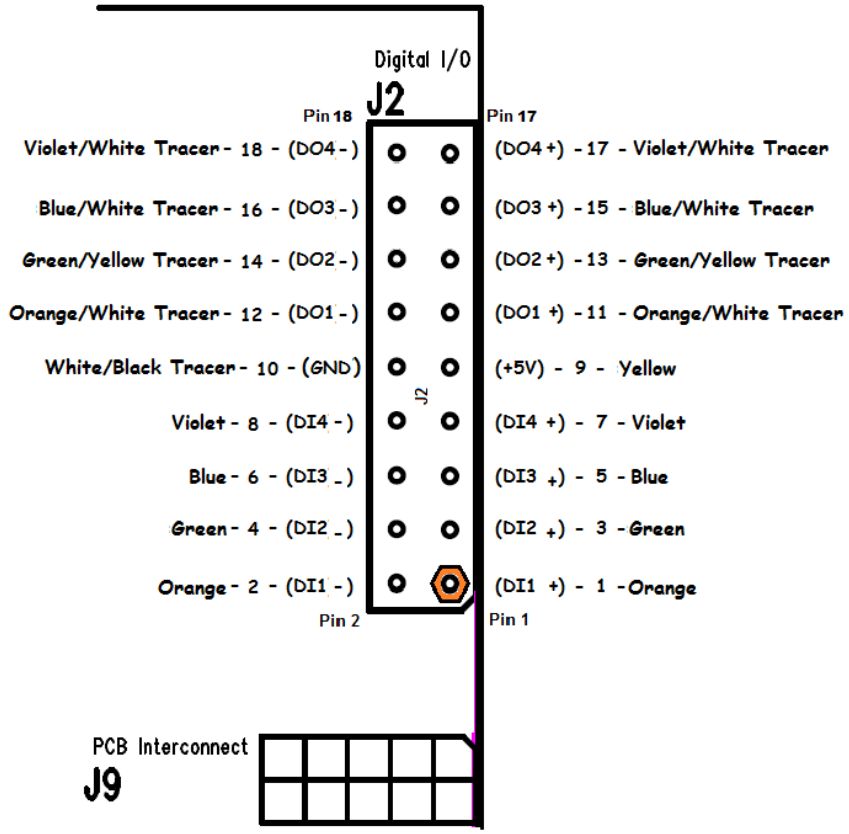


Figure 3: J2 Wiring

CONNECTING TO THE RM-DC-RMCU1 VIA THE INTERNET

Prerequisites

System administrators must decide whether the RM-DC-RMCU1 will operate on the network with DHCP or a fixed IP address. The factory-set RM-DC-RMCU1 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 RM-DC-RMCU1 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 RM-DC-RMCU1

Power up the RM-DC-RMCU1 then connect the RM-DC-RMCU1 to the network with an Ethernet cable. A 3 foot cable is provided.

Using DHCP

The RM-DC-RMCU1 will attempt to connect to the network via DHCP when it is first connected, or when you perform a factory reset.

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 RM-DC-RMCU1, then proceed to the section in this manual named "**Open a Web Connection to the RM-DC-RMCU1**".

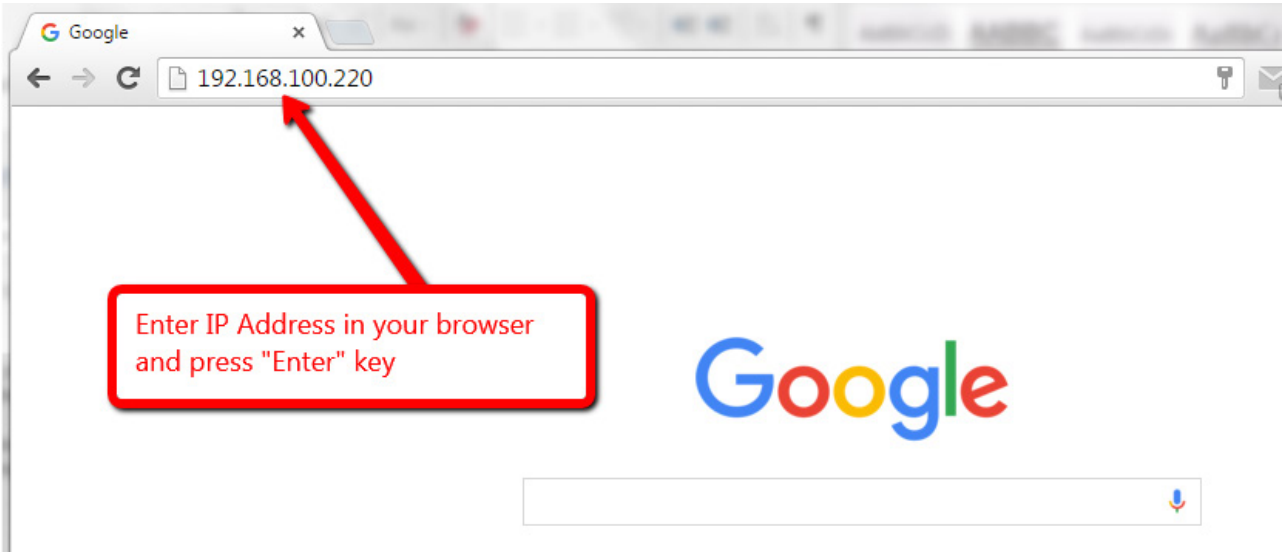
Using Static RM-DC-RMCU1 IP and Network Configuration

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 RM-DC-RMCU1 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 the RM-DC-RMCU1 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 RM-DC-RMCU1.
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 owners guide named **"Open a Web Connection to the RM-DC-RMCU1"** to log in and enter the final network settings for the RM-DC-RMCU1.

OPEN A WEB CONNECTION TO THE RM-DC-RMCU1

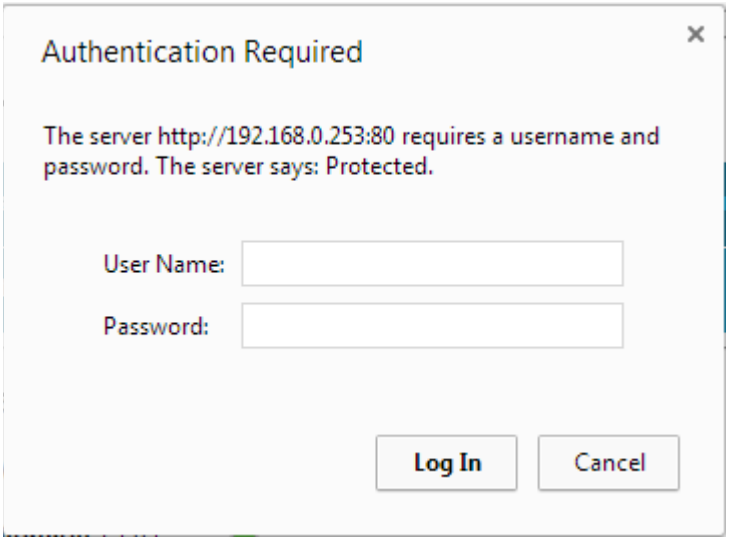
Use your favorite device and browser (Chrome, Firefox, internet Explorer, etc.), and enter the IP address of the power supply on your network into the URL box on the browser (see the screenshot below). The RM-DC-RMCU1 should respond with the “Status” screen.



REMOTE MONITORING AND CONTROL SETUP

Click “Network Setup” in the menu at the top of the screen. All setup requires an administrative user to log into the RM-DC-RMCU1. See default passwords below.

User Login



Enter the user name and password. Factory default username and password are as follows:

Admin Users have full control of the device.

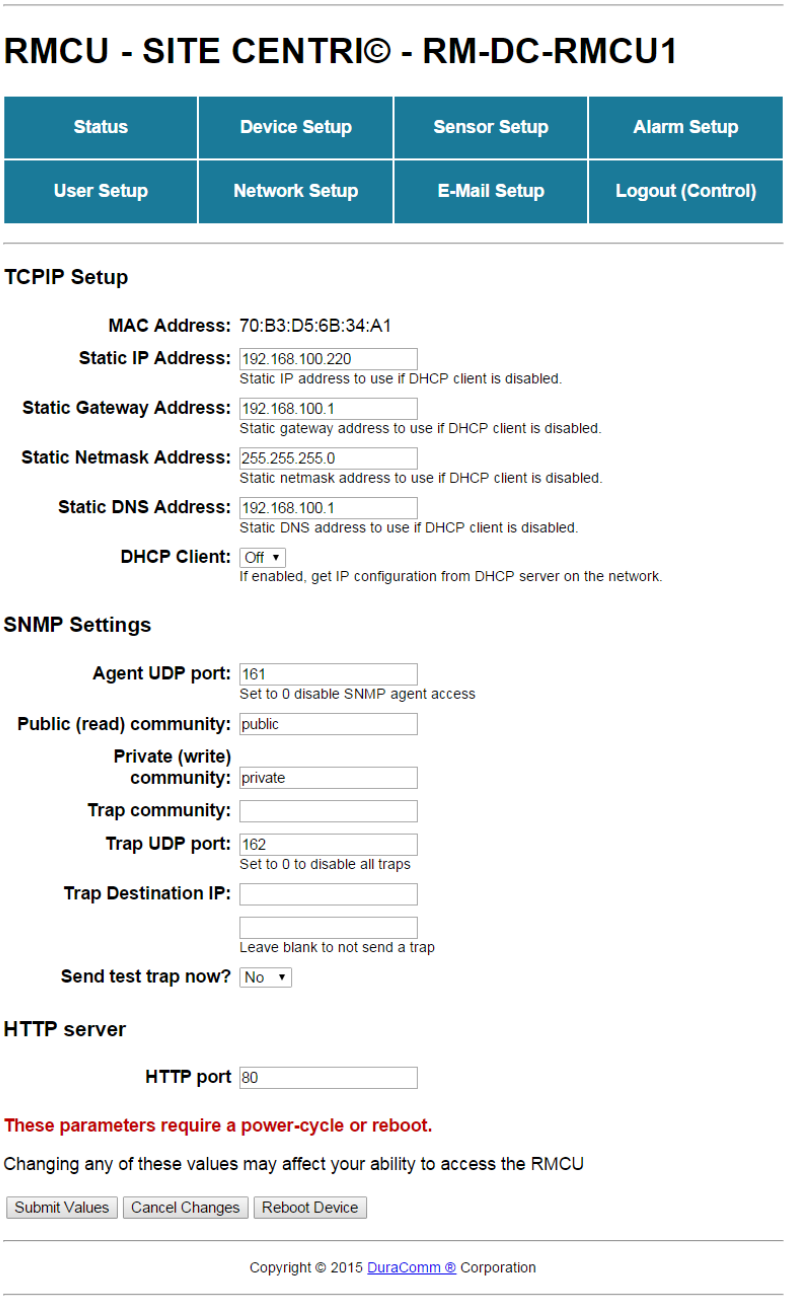
Username: admin (cannot be changed)
Password: admin

Control users have limited control capability.

Username: control (cannot be changed)
Password: control

These two users are the only ones available in the DC-RMCU. “Control” users can access all screens except the User Setup screen.

NETWORK SETUP



RMCU - SITE CENTRI© - RM-DC-RMCU1

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

TCPIP Setup

MAC Address: 70:B3:D5:6B:34:A1
Static IP Address: 192.168.100.220
Static IP address to use if DHCP client is disabled.
Static Gateway Address: 192.168.100.1
Static gateway address to use if DHCP client is disabled.
Static Netmask Address: 255.255.255.0
Static netmask address to use if DHCP client is disabled.
Static DNS Address: 192.168.100.1
Static DNS address to use if DHCP client is disabled.
DHCP Client: Off
If enabled, get IP configuration from DHCP server on the network.

SNMP Settings

Agent UDP port: 161
Set to 0 disable SNMP agent access
Public (read) community: public
Private (write) community: private
Trap community:
Trap UDP port: 162
Set to 0 to disable all traps
Trap Destination IP:
Leave blank to not send a trap
Send test trap now? No

HTTP server

HTTP port 80

These parameters require a power-cycle or reboot.

Changing any of these values may affect your ability to access the RMCU

Submit Values | Cancel Changes | Reboot Device

Copyright © 2015 DuraComm ® Corporation

Network Setup Notes

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 RMCU. 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 SETUP

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”.

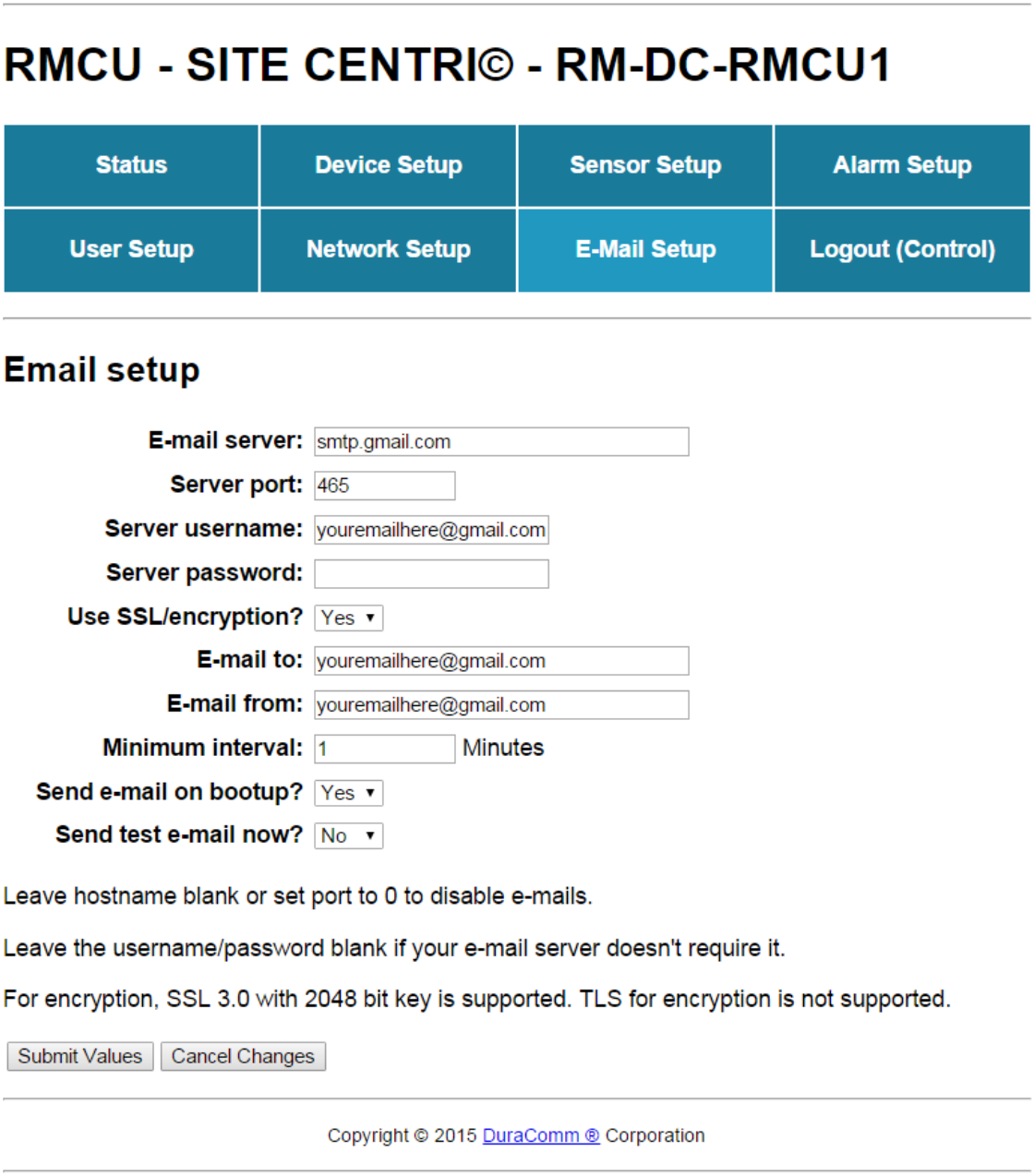
The MIB file for the RM-DC-RMCU1 can be downloaded from the RM-DC-RMCU1 after you connect to it with your browser. Go to the Device Setup page and log in to the RM-DC-RMCU1. Halfway down the page there is a link to the MIB file. Right click on the link and click “Save Link As” to download the file.

After download, import the MIB file into your MIB browser or Monitoring software to configure it for use with the RM-DC-RMCU1.

When the MIB file has been loaded, complete the “SNMP Setup” section on the “Network Setup” page of the RM-DC-RMCU1 to configure it for use with your monitoring solution.

The RM-DC-RMCU1 will send traps for all configured alarm conditions including bootup, temperature, analog alarms, and digital alarms.

EMAIL SETUP



Email Setup Notes

Enter the required email setup parameters given to you by your System Administrator. You can also send a test email from this screen. The example shows how to set up a Gmail account connection. **Note: the Gmail account needs to be set 2-step authorization "Off".** Log in to the Gmail account, go to account settings, go to the "Signing In" section, and verify that 2-step authorization is "Off".

DEVICE SETUP

RMCU - SITE CENTRI© - RM-DC-RMCU1

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

Device Setup

Device Info

Site Name: RM-DC-RMCU1
Model: RMCU
Serial Number: 5281
Version: HW: 2.0, FW: 2.2

Logging

Logging rate: 0 Minutes
Log start date: NEVER
Last log date: NEVER
Clear Log? No
Append Now? No
Logging status: Never used
Download log: RMCU.CSV
Right click to save

SNMP MIB File Download

Download MIB File: SNMP MIB File - Right click to save

Date and time settings

Current system time: Mon, 28 Dec 2015 13:02:24
NTP Server:
Leave blank to disable NTP
NTP sync now? No
NTP status: Disabled
Time Zone: -6 Hours
Manually set time? No
Date (MM/DD/YY): 12/28/15
Time (HH:MM:SS): 13:02:20

Miscellaneous

Signficant digits: 1
Temperature units: Fahrenheit

Submit Values Cancel Changes

Device Info

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

Logging

TheRM-DC-RMCU1will log all measurements and alarms to an SD card that is plugged into theRM-DC-RMCU1board. Users can set the rate here, as well as clear the card, or append new measurements. The CSV log file can be downloaded here, as well as the Status page. You can also examine the log file using a terminal connection through the USB port. If the SD card fills up, the oldest sample is discarded when a new one is stored. TheRM-DC-RMCU1custom device name is stored with the logged data, so that the source of the card can be identified after it removed from the RMCU.

A RM-DC-RMCU1 connected to a battery backup power system can monitor and log information about AC mains power outages, as well as all the other measurements for as long as the battery backup lasts.

When a log file reaches 5 MB, it is renamed, and a new one is started. **Download all log files before clearing the log**.

Date and Time Settings

Configuration for all date and time settings. Date and time is battery backed up on the card, and the values are saved in the logged samples. The real-time-clock can synchronize it's 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.**

Miscellaneous Settings

The number of significant digits for the analog channels can be configured here. Note: Best resolution is about 1 in 1000.

Temperature can be configured to read in Fahrenheit or Celsius.

.

SENSOR SETUP

RMCU - SITE CENTRI© - RM-DC-RMCU1

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

Sensor Setup

	Analog Inputs	Alarm color
#1	DC Current #1	
#2	DC Voltage #1	
#3	DC Voltage #2	
#4	DC Voltage #3	
#5	DC Voltage #4	
#6	DC Voltage #5	

	Digital Inputs	Open color	Email
#1	DI #1		Never email
#2	DI #2		Never email
#3	DI #3		Never email
#4	DI #4		Never email

	Digital Outputs	Inactive	Active	Pulse
#1	DO #1	Yellow/Left OFF/HIGH	Green/Right ON/LOW	No
#2	DO #2	Yellow/Left OFF/HIGH	Green/Right ON/LOW	No
#3	DO #3	Yellow/Left OFF/HIGH	Green/Right ON/LOW	No
#4	DO #4	Yellow/Left OFF/HIGH	Green/Right ON/LOW	No

Submit Values | Cancel Changes

Sensor Setup Notes

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.

Digital Outputs can be user-configured to match your circuit. “Active” refers to the output MOSFET being “ON” or conducting. You may also configure each output to provide a positive or negative 500uS pulse. Button colors and orientation are also selectable.

Analog alarms are set up in the “Alarm Setup” screen. See the “Alarm Setup” section for more information.

SENSOR CALIBRATION

RMCU - SITE CENTRI© - RM-DC-RMCU1

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

Calibration

DC Current #1 ▾

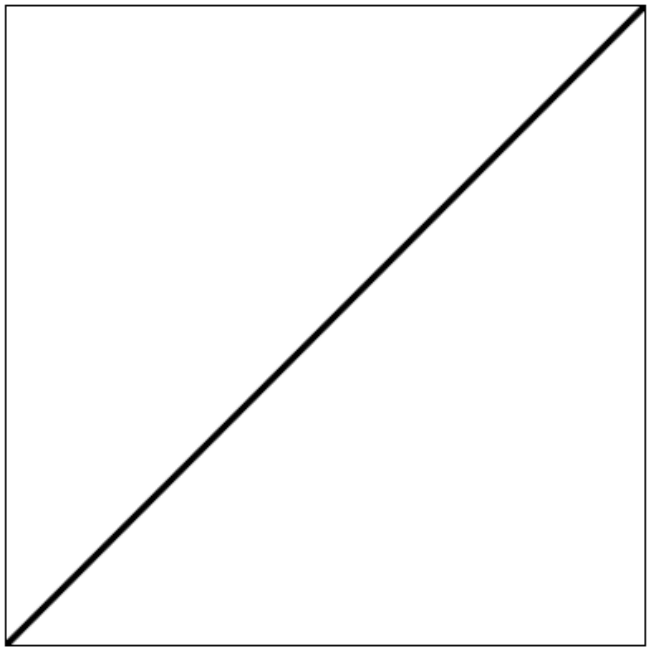
0.05 VDC

MAX Range:
+/- 100 VDC
without
jumper

Or

+/- 2 VDC
with jumper

0 VDC



0	Amps	100
Bottom	Units	Top

Jumpered: Yes ▾

Submit Values | Cancel Changes

Sensor Calibration Notes

Sensor calibrations is provided to convert the native voltage measurements of the RM-DC-RMCU1 into other units for linear transducers. For example, the current transducer provided with the RM-DC-RMCU1 will have 50mv across it when 100 Amps is flowing through it. The conversion factor is entered on this page.

Channels that only measure voltage do not need a conversion factor, and the entries can be left at 0. When a physical jumper is placed on channel 1, it is changed from a +/-100 Volt max range to a +/-2V max range to gain resolution for smaller voltages. The “Jumpered” drop-down must be set to “Yes” for a channel with a jumper so that it is scaled properly. Since a current shunt is designed for a typical voltage drop of 50mv at full scale, Channel 1 is configured with a physical jumper, the “Jumpered” dropdown is set to “Yes”, and calibration factors are entered. Since 0 v will be equal to 0 Amps, we don’t need to change the lower left calibration factors. We change the vertical maximum to 0.05 VDC (50mv) and the horizontal maximum to 100. We then type “Amps” as the user units.

By defining 2 points on the linear graph, we can calibrate any linear transducer, within the voltage measurement range of the RM-DC-RMCU1. This will allow you to use a broad range of existing transducers to measure many different things like pressure, temperature, force, etc. Even 4-20ma transducers can be used by measuring the voltage across a resistor placed in series with the transducer. These transducers require that both the lower-left and upper right calibration points be configured on the graph.

ANALOG AND DIGITAL WIRING

AC Line Voltage Measurement

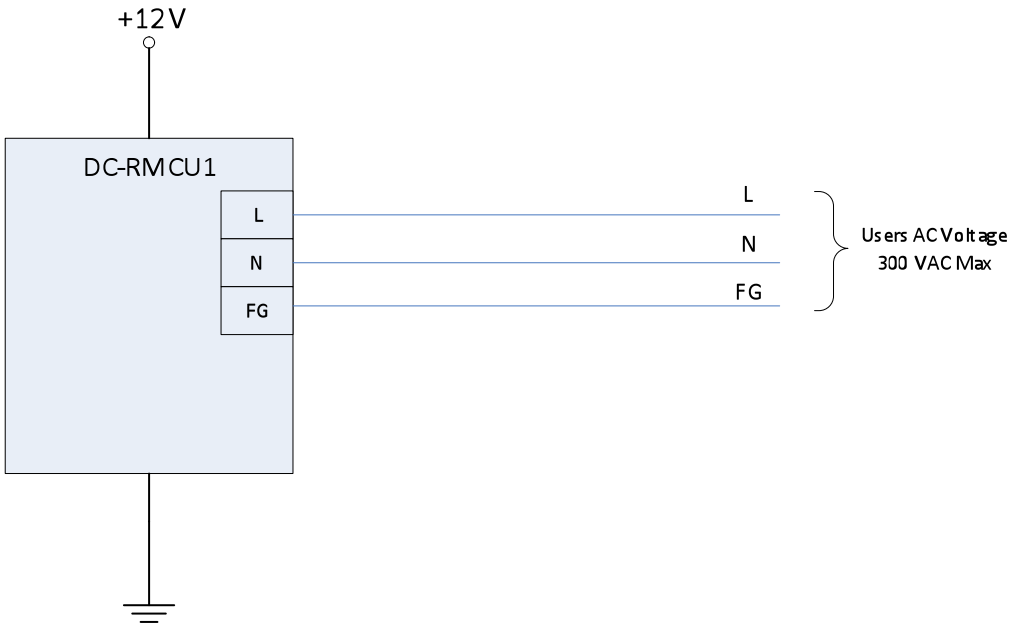


Figure 4

Analog Channels: DC Voltage Measurement

- Inatall a jumper on the channel if you want 2 VDC Max Range. Otherwise it is +/- 100 V Max Range
- Each Analog input is isolated from ground

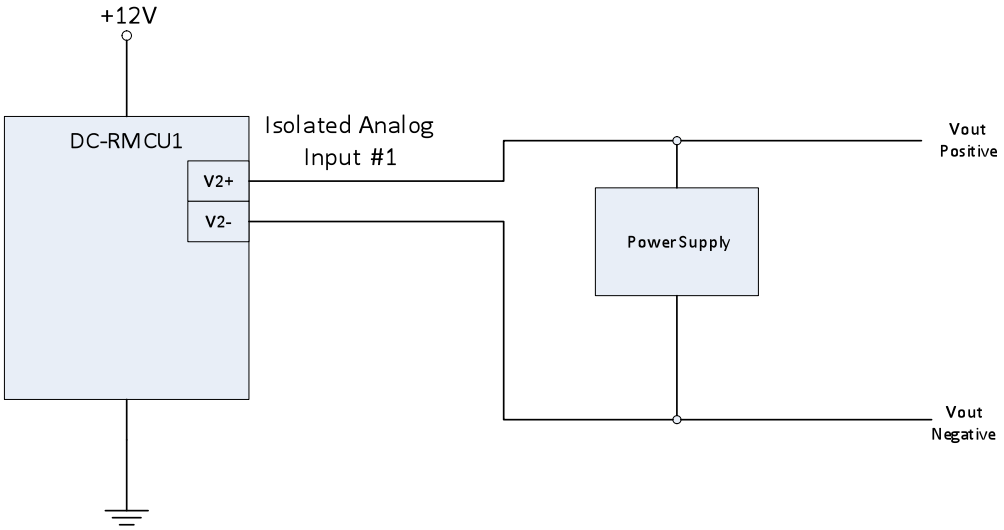
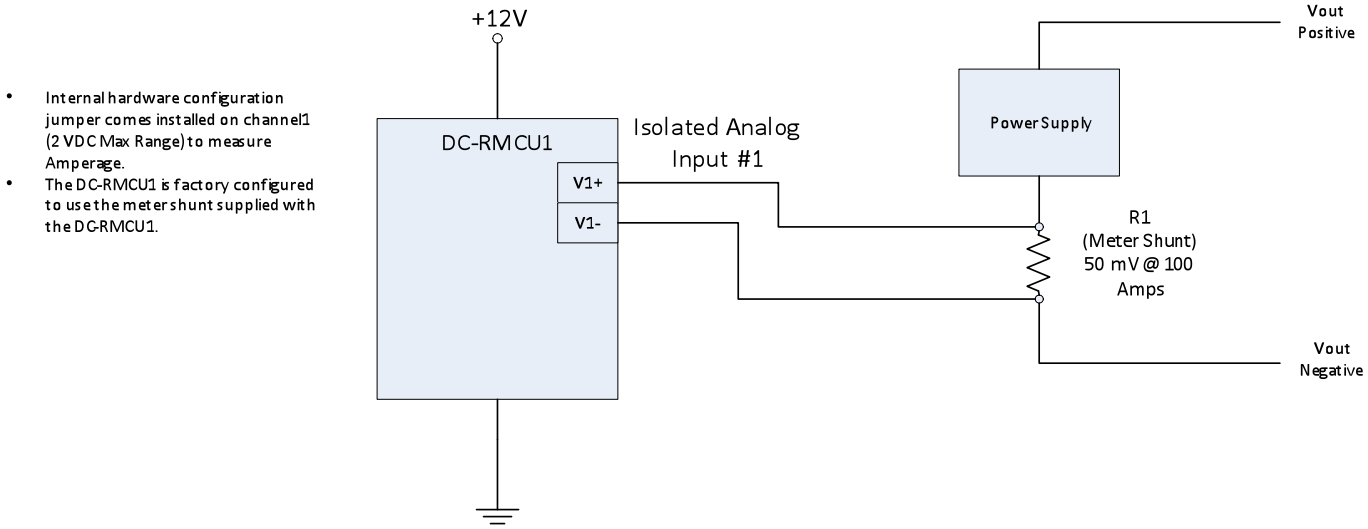


Figure 5

Analog Channels: DC Amperage Measurement

The RM-DC-RMCU1 comes pre-configured from the factory to measure amperage on channel 1. A jumper is installed on the board in the channel 1 circuit to configure it to measure +/-2 V max instead of +/- 100 V max to measure the low voltage associated with the meter shunt. RM-DC-RMCU1 Channel 1 is calibrated to use the 100 Amp / 50mV shunt supplied with the RM-DC-RMCU1.



To measure lower amperage ranges, please contact DuraComm technical support.

Figure 6

Temperature Measurement

Connect the LM35 Temperature sensor to the RM-DC-RMCU1 Temperature connector as shown.

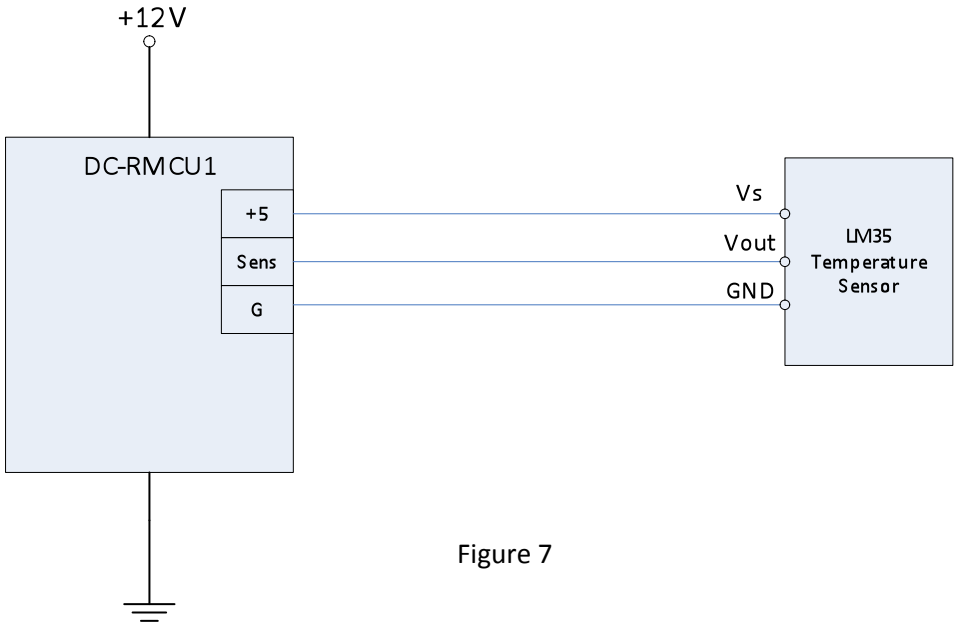


Figure 7

Sensor Setup – Digital Inputs (Alarms)

- NOTE: Digital ground is the same as the DC-RMCU1 Ground

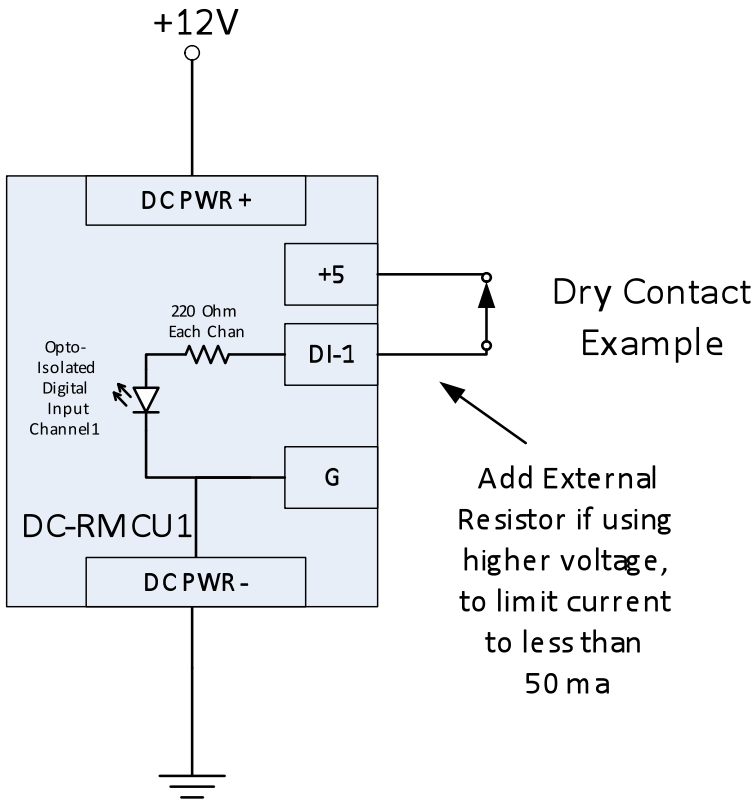


Figure 8

Sensor Setup – Digital Open-Drain Outputs

Digital output names have a unique configuration feature. To reverse the displayed logic of the digital output, just add a "+" character to the end of the name for that channel. Here are a couple of examples.

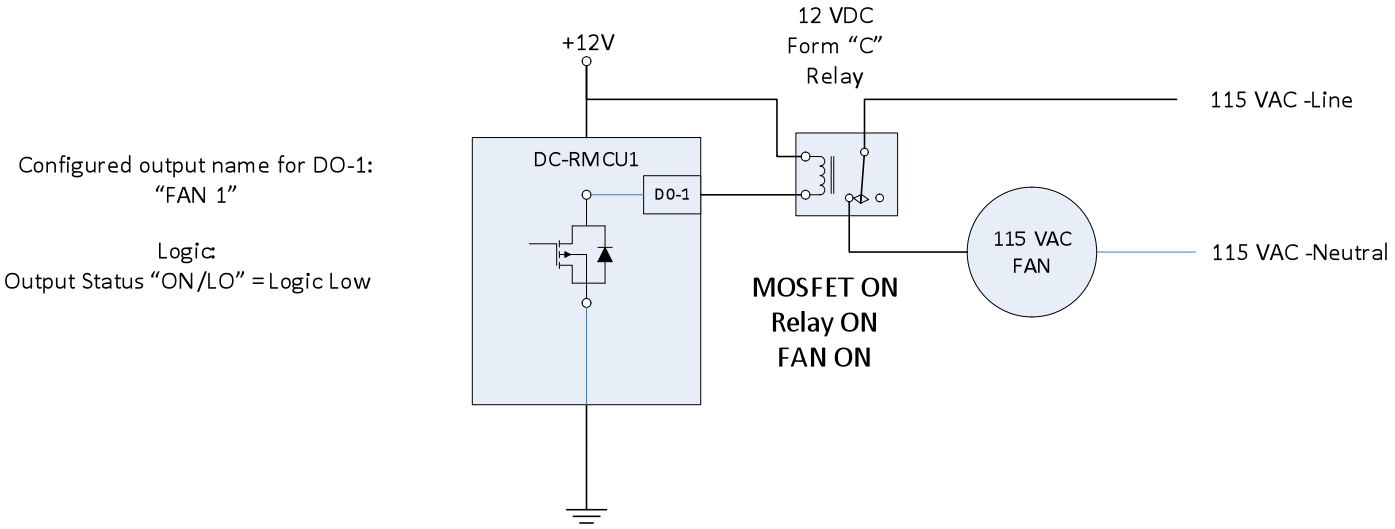


Figure 9: Normal Digital Output Configuration

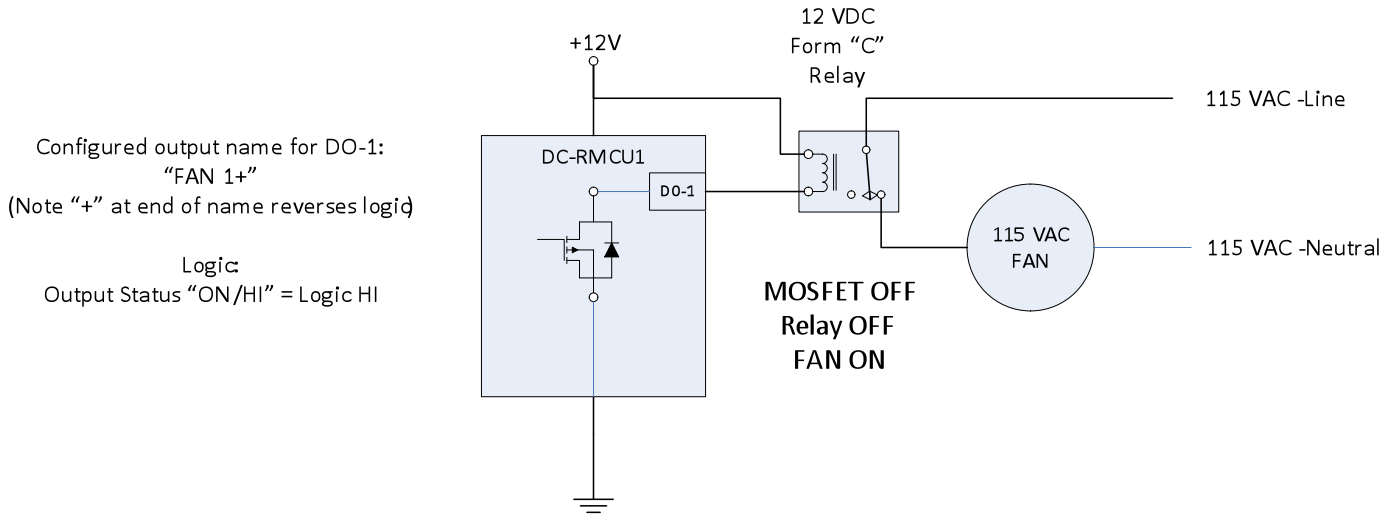


Figure 10: Reversed Logic Digital Output Configuration

ALARM SETUP

RMCU - SITE CENTRI© - RM-DC-RMCU1

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

Alarm Setup

Analogs — DC Current #1

Under alarm

Threshold: < -1000 Amps
Recovery: > 0 Amps
Send e-mail: No
Alarm contacts: #1 #2 #3 #4

Over alarm

Threshold: > 1000 Amps
Recover: < 0
Send e-mail: No
Alarm contacts: #1 #2 #3 #4

Temperature

Under alarm

Threshold: < 40 F
Recovery: > 45 F
Send e-mail: No
Alarm contacts: #1 #2 #3 #4

Over alarm

Threshold: > 300 F
Recovery: < 280 F
Send e-mail: No
Alarm contacts: #1 #2 #3 #4

Line AC

Under alarm

Threshold: < 100 Volts
Recovery: > 107 Volts
Send e-mail: No
Alarm contacts: #1 #2 #3 #4

Over alarm

Threshold: > 140 Volts
Recovery: < 135 Volts
Send e-mail: No
Alarm contacts: #1 #2 #3 #4

Submit Values | Cancel Changes

Alarm Setup Notes

To set up analog alarms, first you must select the alarm channel to set. This is accomplished by selecting the custom name of the channel in the dropdown box next to the “Analogs” label. For example, we are looking at the settings for the “Ammeter #1” channel in the screen above. “Ammeter #1” is the name given to this channel in the Sensor Setup screen.

Temperature measurement is set for maximum range of the sensor, not the temperature range of the DC-RMCU.

This screen 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, and you can assign the alarm to one of four alarm contacts

Factory Default Alarm Settings

MEASUREMENT	UNITS	OVER ALARM	OVER ALARM RECOVER	UNDER ALARM	UNDER ALARM RECOVER
AC Line Voltage	Volts	140	135	100	107
Temperature	Fahrenheit	300	280	40	45
Ammeter #1	Amps	105	100	-10	-1
Voltmeter #1	Volts	100	95	-10	-1
Voltmeter #2	Volts	100	95	-10	-1
Voltmeter #3	Volts	100	95	-10	-1
Voltmeter #4	Volts	100	95	-10	-1
Voltmeter #5	Volts	100	95	-10	-1

USER SETUP

RMCU - SITE CENTRI© - RM-DC-RMCU1

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

Change Password

Select user: Control ▾

New password:

Confirm password:

Change

Maximum password length is 32 characters.
Passwords are case sensitive. Please record your password.
Loss of Administrator password will require a complete system reset.

Miscellaneous

Calibration access: Admin User ▾

Submit Values | Cancel Changes

Factory Reset

This will restore ALL settings to original factory default values, including the password.
Remote communications may be lost.
On-site reconfiguration may be required.
Some settings require a power-cylce/reboot to take effect

Type the current Administrator password here to confirm

Password: Restore

Network Reset

Pressing and holding down the button on the unit for over 20 seconds will reset all the network settings and passwords to factory default. The button is located on the PCB.

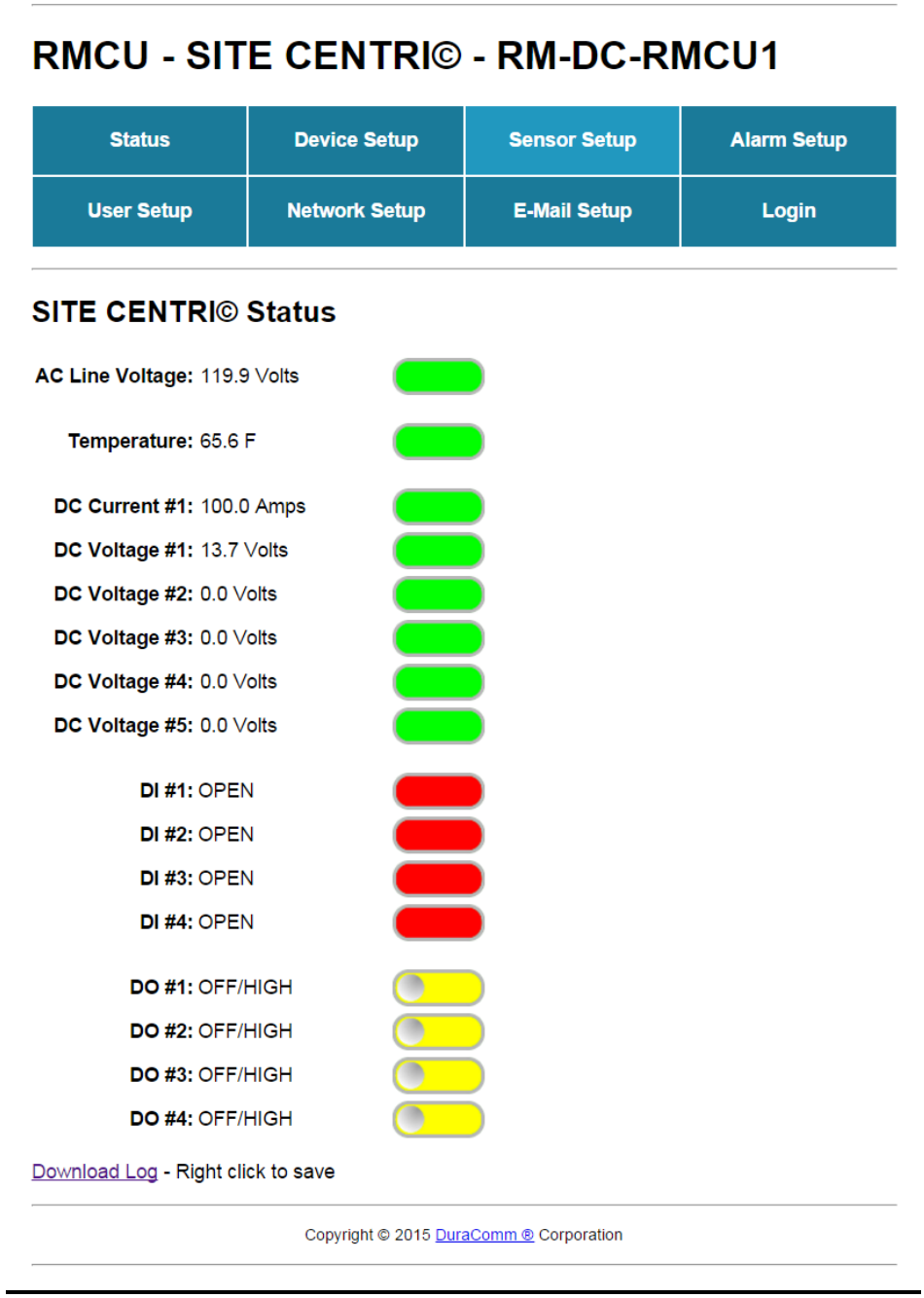
User Setup Notes

Password changes and RM-DC-RMCU1 hard resets are perform by using this page. Care should be taken when changing any of these settings.

Admin users of the RM-DC-RMCU1 with Revision 2.2 Firmware have access to a new calibration page. This page allows the user to calibrate a relationship between voltage measured and user units, such as Amperage. See the calibration page for more detail. The Admin user can also allow the Control user to perform this function by selecting Control User in the Calibration Access Dropdown list, and clicking Submit Values.

NOTE: To hard reset your device back to factory settings, press the red button on theRM-DC-RMCU1PCB and hold it for more than 20 seconds. You will need to re-connect to theRM-DC-RMCU1through your web browser by entering the factory supplied IP address and HTTP port (see Network Setup). Using the factory reset here or using the red button to reset will change the network settings back to the factory reset/default values shown in this manual on the network configuration page, even if your unit was custom set at the factory to a user IP address. If your unit was set to a custom IP address, it will be labeled underneath the product label on the side of the RM-DC-RMCU1.

REMOTE MONITORING AND CONTROL STATUS PAGE



Status screen

This screen shows the status of all analog and digital inputs, as well as digital outputs. A user can also download the Log file from this page. AC Voltage is approximate. This example shows the factory settings. The temperature will show abnormally high readings if no LM35 temperature sensor is connected, because the input will float high.

Mobile Status Screen

The following examples show a configured RM-DC-RMCU1 that is reading various voltages and currents. Any unused channels (configured with a blank name) are hidden in the desktop browser view, and grayed out in the mobile browser view.

RMCU - RM-DC-RMCU1 Line Voltage: 119.912 VAC Temperature: 65.6 F		
DC Current #1 100.0 Amps	DC Voltage #1 13.7 Volts	DC Voltage #2 0.0 Volts
DC Voltage #3 0.0 Volts	DC Voltage #4 0.0 Volts	DC Voltage #5 0.0 Volts
DI #1 OPEN	DI #2 OPEN	
DI #3 OPEN	DI #4 OPEN	
DO #1 OFF/HIGH	DO #2 OFF/HIGH	
DO #3 OFF/HIGH	DO #4 OFF/HIGH	

RMCU MAINTENANCE

Battery

The battery on theRM-DC-RMCU1is used to back up the real time clock for logging purposes. Logged in users can see the current system time on the Device Setup page under Date and Time settings.

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
<7 AMPERES	20 AWG Up to 5 feet 18 AWG Up to 10 feet
14 AMPERES	18 AWG Up to 5 feet 16 AWG Up to 10 feet
20 AMPERES	16 AWG Up to 5 feet 14 AWG Up to 10 feet
30 AMPERES	14 AWG Up to 5 feet 12 AWG Up to 10 feet
40 AMPERES	12 AWG Up to 5 feet 10 AWG Up to 10 feet
50 AMPERES	10 AWG Up to 5 feet 8 AWG Up to 10 feet
70 AMPERES	8 AWG Up to 5 feet 6 AWG Up to 10 feet
100 AMPERES	6 AWG Up to 5 feet 4 AWG Up to 10 feet

.

LIMITED 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 manufacture, 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 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 which 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.

DuraComm® Corporation

6655 Troost Avenue
Kansas City, MO 64131
Phone (816) 472-5544 Fax (816) 472-0959
www.duracomm.com