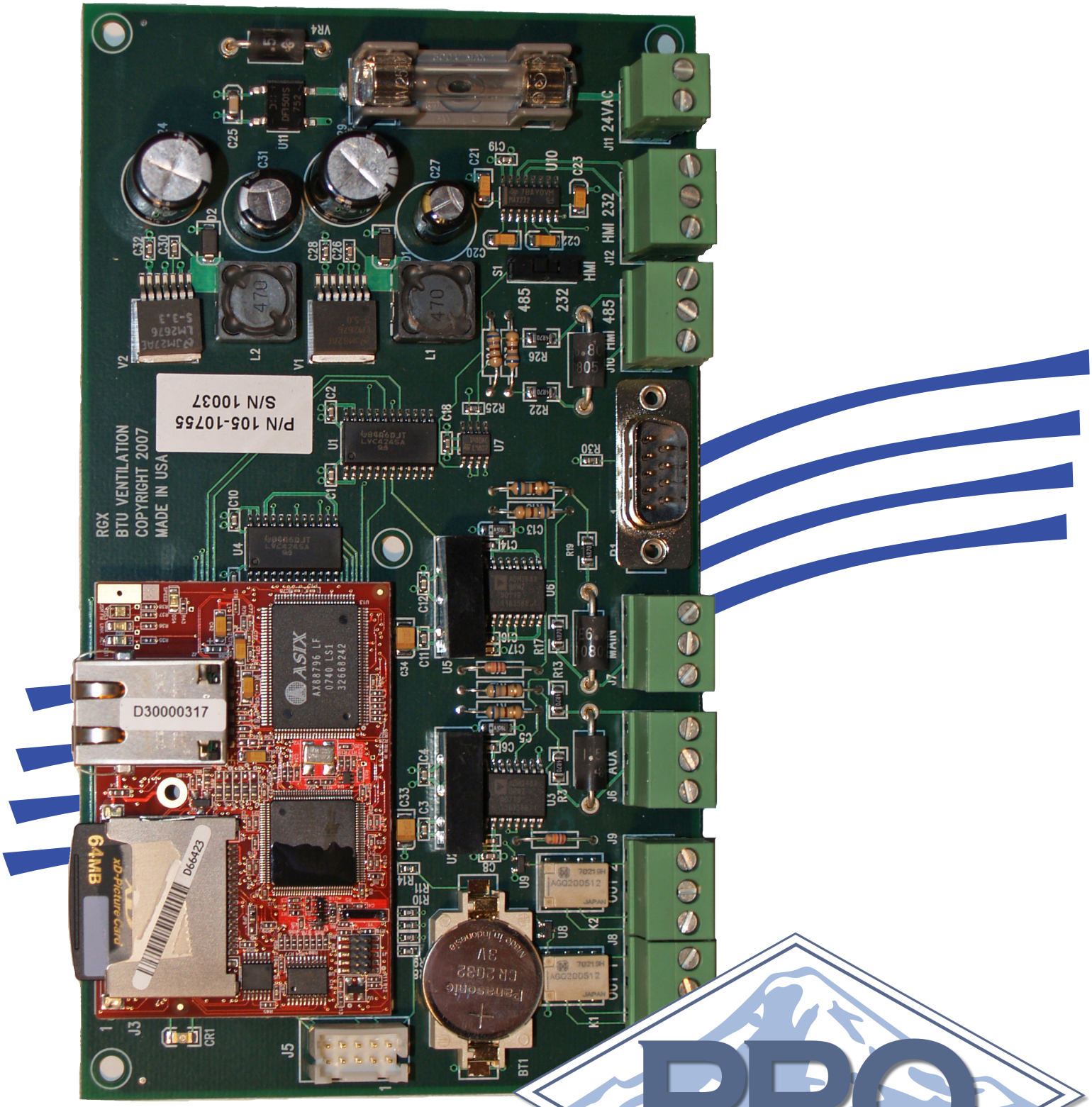
RGX MANUAL

Pro Refrigeration, Inc



PRO
REFRIGERATION INC

Table of Contents

1 Preface

This manual is intended to be used in conjunction with Pro Refrigeration's RGX Communication Card.

This manual will guide you through the process of installing, programing and configuring your RGX communication card.

Note: Check the following URL for the latest version of this manual and other Pro Refrigeration, Inc product documentation. http://www.prochiller.com/support

RGX Summary

The RGX Communication Card was created to be a communication hub for the CR110 refrigeration card and the ER110 evaporator Controller. The RGX Card can communicate with up to 10 devices through an RS-485 communications bus.

The data obtained from these devices is made available through a web-interface served from the RGX's embedded web server.

Offered By:

Pro Refrigeration, Inc.

Pro Refrigeration is located in Auburn WA. Auburn is located 30 miles from Seattle, WA in the shadow of Mt. Rainier.

Physical Address:
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Auburn, WA 98001

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Customer Service

Please feel free to contact customer service with any questions pertaining to this or any other Pro Refrigeration, Inc product.

Customer Support Hours:
Monday-Friday
7am-5pm (Pacific Standard Time)

Telephone: 253-735-9466
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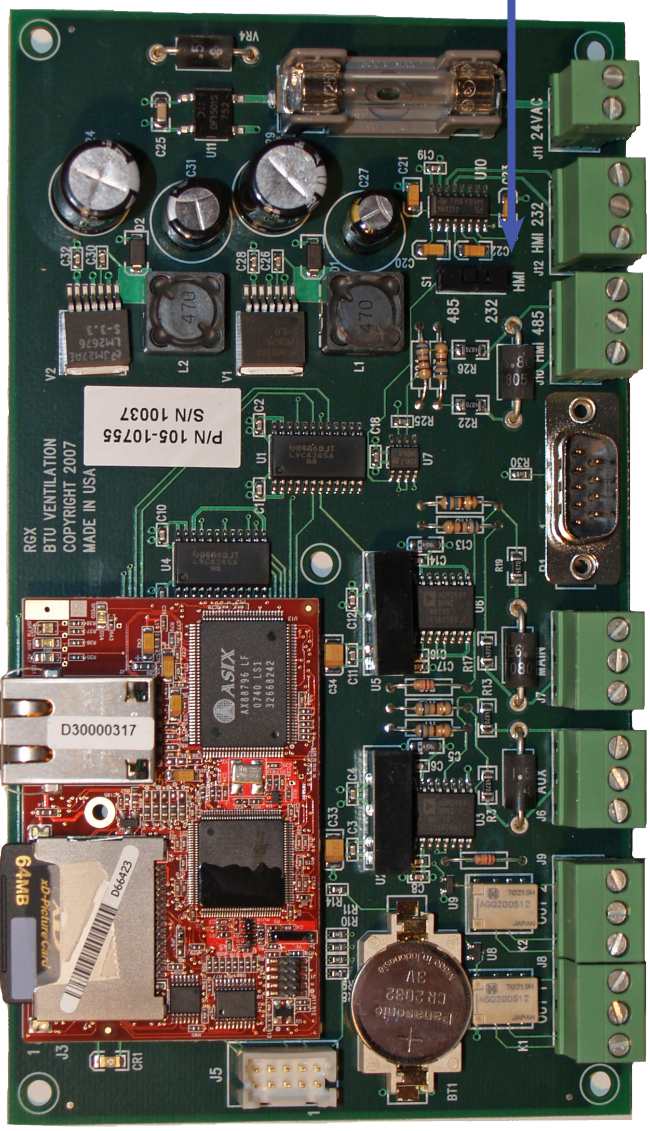
RGX CARD OVERVIEW



S1: This switch selects which MODBUS port you are using (J10 RS-485 or J12 RS-232). You must use one or the other and run wires to the associated port.

J11: Connect to 24V AC or DC Power Source.

J12: (optional) Connect for MODBUS RS-232 or BCS Client or Server. Must be set on J12 Site Config Page

J10: (optional) Connect for MODBUS RS-485 or BCS Client or Server. Must be set on J10 Site Config Page

Note: J10 and J12 may not be connected simultaneously. To switch between J10 or J12 move switch S1 to either 485 for J10 or 232 for J12.

P1 (MODEM): Connect to PLC (RS-232) 9-PIN connection on the Maple HMI.

J7: Connect to COM 2 on the G55 Interface. Also can be used as a MODBUS slave port (Baud rate adjustable, default 9600kps).

J6: Connect to a CR110 controller card. Connect red (+) and black (-) cables to J13 and the shield (C) to J7 on the CR110. If you are using multiple CR110 Cards make connections as previously stated into the first card only as the communication wires are daisy chained between CR110 cards.

Ethernet: The ethernet port on the RGX allows you to connect the RGX communications gateway to your existing computer network giving you the ability to access and modify your system data. The default IP address of the RGX card is 192.168.1.50.

RGX QUICK START GUIDE

The quick start guide is designed to be used in conjunction with an RGX Communications Card that was factory installed on a Pro Refrigeration, Inc Chiller System. As such, this guide assumes that all programming and non-network related wiring is complete. If you have purchased the RGX Communications Gateway to add to an existing Chiller System please refer to sections 3 and 4 for installing and programming your RGX Communications Card.

STEP 1

Using a laptop, connect a cross-over Ethernet cable from the network port on the laptop to the network port on the RGX Card. The IP address on the laptop must be changed. To change the IP address open Control Panel on your laptop. Right click on Local Area Connection and select Properties. When the Local Area Connection Properties dialog box opens scroll down, select Internet Protocol (TCP/IP) and click Properties. On the Internet Protocol (TCP/IP) Properties dialog box change the IP address to 192.168.1.1 as shown in Fig 1-1. Once the correct information has been entered click OK for settings to take effect.

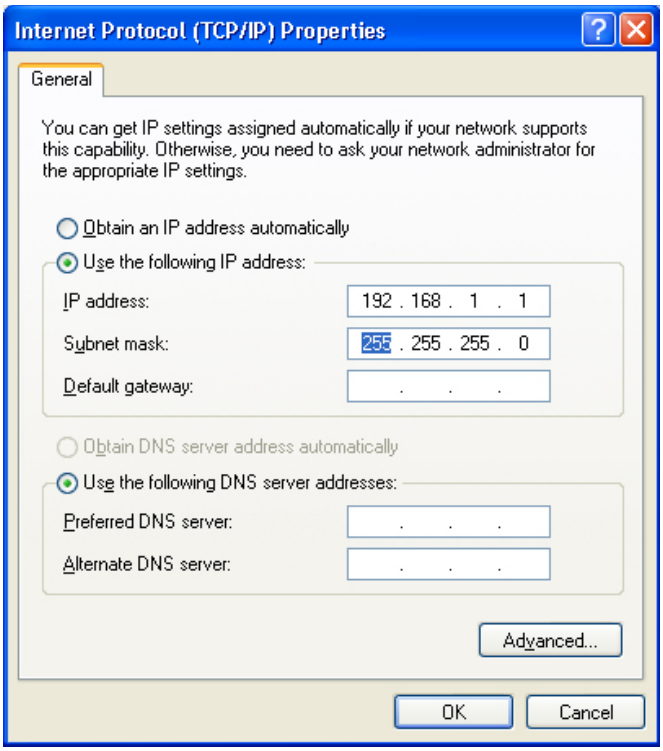


Fig 1-1 TCP/IP Properties

STEP 2

Once you have successfully changed the IP address of the laptop's network card, open an internet browser and enter into the URL bar the IP address of the RGX Card (by default this IP is 192.168.1.50). Once prompted for User Name and Password enter the following:

User Name: user1
Password: pass1

Once logged in you should see information pertaining to your site (e.g. number of compressors, set point, etc.). If you do not see any information see section 4 for information pertaining to uploading an INF file. Click on Configure Site to enter site specific settings.

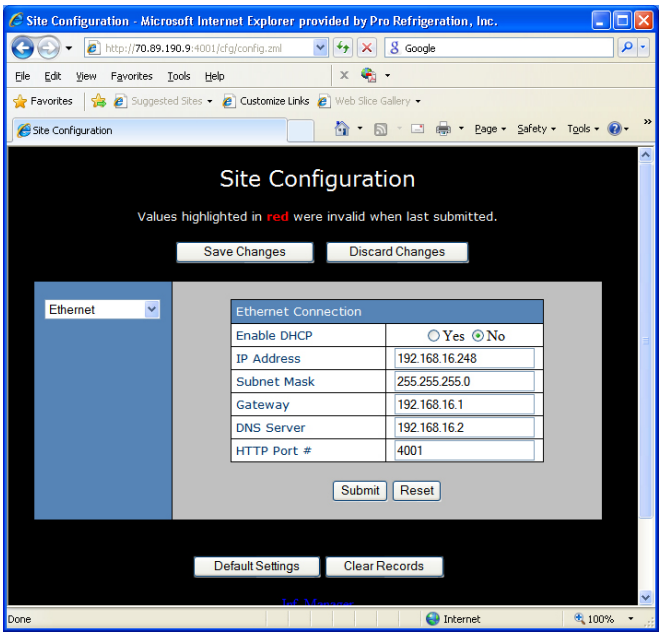


Fig 1-2 Site Configuration

On the Site Configuration page, with "Ethernet" selected in the left hand drop down, change the IP address to an available IP address on your network. Also update the "Subnet Mask", "Gateway", and "DNS Server" with your network's information. Change the "HTTP Port #" to an available port. We recommend 4001 for single RGX deployments. Make note of your setting for both the IP Address and the HTTP Port # as you will need this data when setting up port forwarding. Once you have finished entering the corresponding data, click the "Submit" button, and then click the "Save Changes" button.

Select "Site Info" from the left hand drop down. Change the "Name" to any site name of your choosing and the "UDP Port #" to the same setting used for HTTP Port # on the previous page as shown in Fig 1-3. Once you have finished entering the corresponding data, click the "Submit" button, and then click the "Save Changes" button. After completing all the changes, you will need to cycle power to the RGX for these changes to take effect. To do this you can turn off and then on the Controller switch.

STEP 3

After completing Step 2 you are ready to connect the RGX Card to your network. Attach a network cable to the network port (RJ45 Jack) located on the RGX Card. After attaching the network/ethernet cable you should be able to access the RGX Card from any computer on the same network. To do this open an internet browser such as Internet Explorer and enter in the URL bar the IP Address of the RGX followed by a colon and the HTTP Port # as assigned in Step 2. (Ex: http://192.168.1.50:4001)

STEP 4

Finally, in order to allow computers outside of your network to view your RGX's web page, you will need to setup port forwarding on your router for the HTTP Port # used in Step 2 and 3 to the IP address you assigned in Step 2. The final result should be that any requests sent to the router's external IP address for the port specified will be forwarding to the same port on the internal IP address of the RGX card. Thus giving the ability to access the RGX's web-interface remotely by entering into your internet browser the external IP address of your router followed by a colon and the HTTP Port # assigned in Step 2 (ex: http://EXTERNALIP:4001).

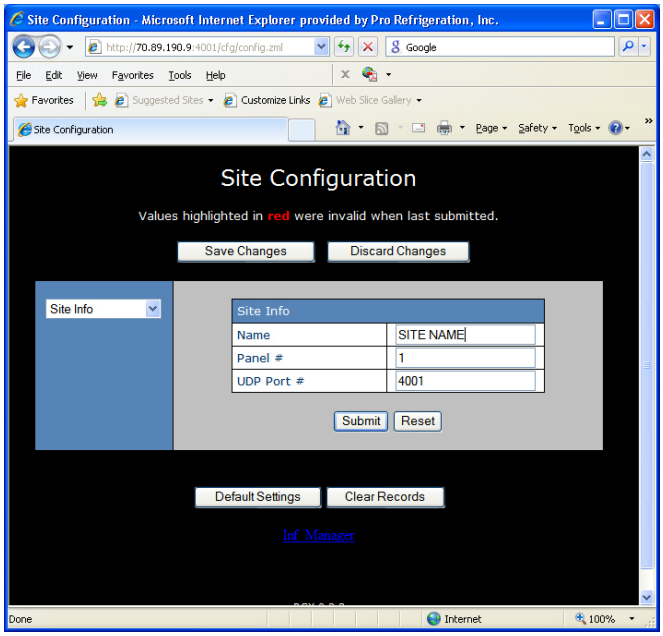
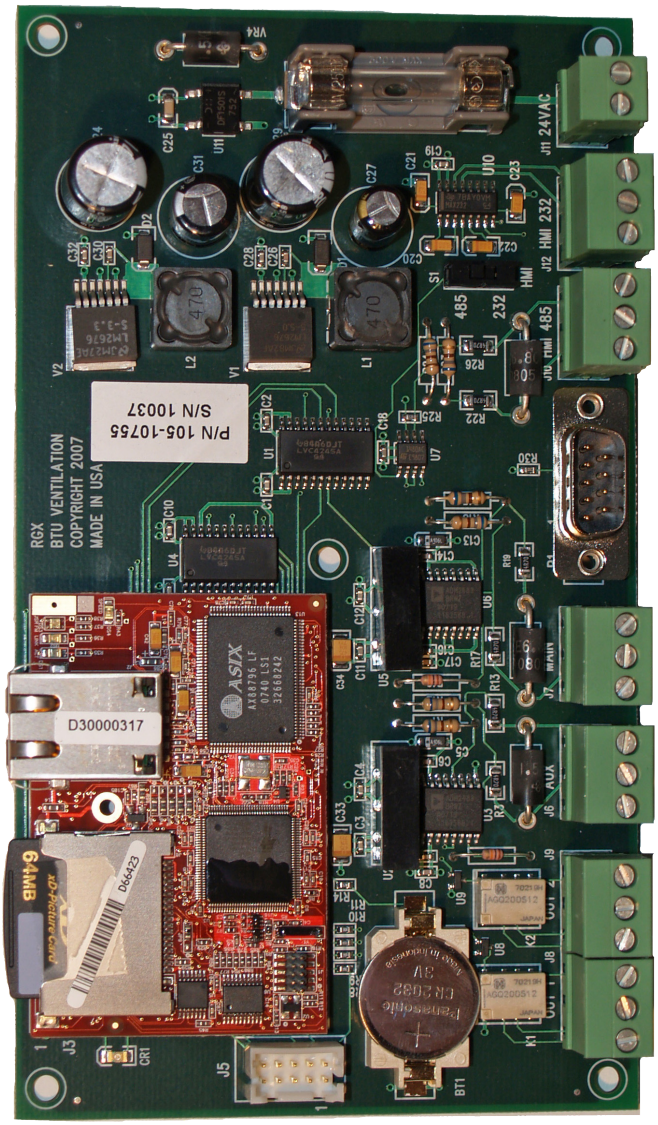


Fig 1-3

WIRING WITH G55/TCP TOUCHSCREEN INTERFACE

The depiction below shows the connections that need to be made to allow communication between the RGX, CR110 and G55 Interface. On terminals where "optional" is indicated the connection is not required for communication with the CR110 Controller Card and the G55 Interface.



J11: Connect to 24V AC or DC Power Source.

J12: (optional) Connect for MODBUS RS-232 communication.

J10: (optional) Connect for MODBUS RS-485 communication.

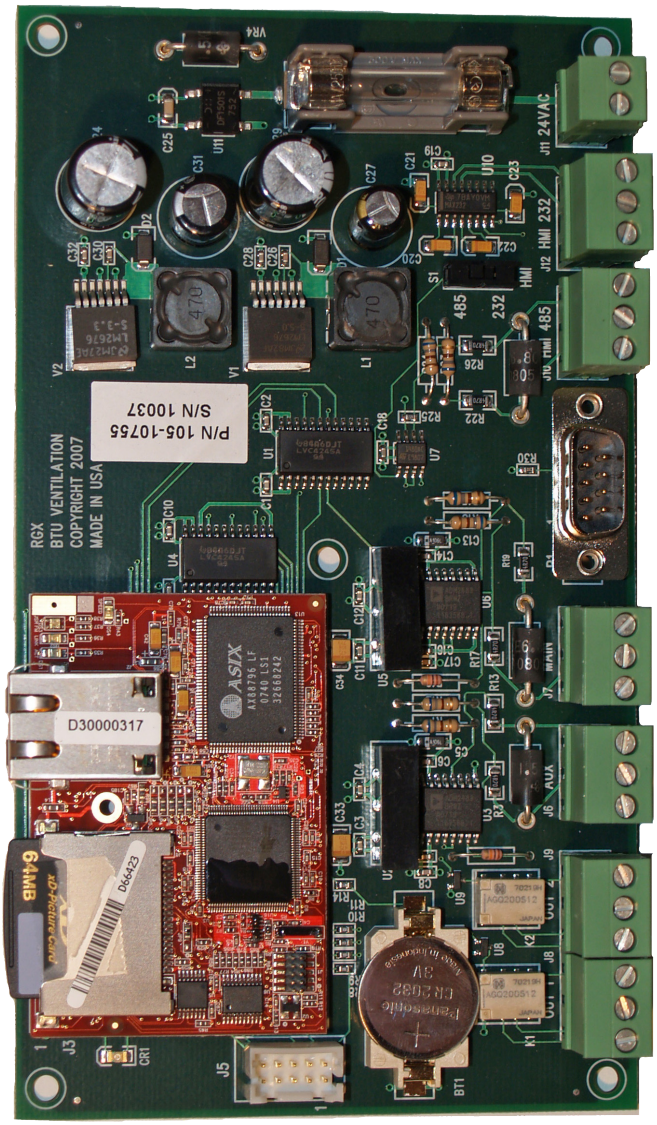
Note: J10 and J12 may not be connected simultaneously. To switch between J10 or J12 move switch S1 to either 485 for J10 or 232 for J12.

J7: Connect to COM 2 on the G55 Interface. Also can be used as a MODBUS slave port (Baud rate adjustable, default 9600kps).

J6: Connect to a CR110 controller card. Connect red (+) and black (-) cables to J13 and the shield (C) to J7 on the CR110. If you are using multiple CR110 Cards make connections as previously stated into the first card only as the communication wires are daisy chained between CR110 cards.

WIRING WITH MAPLE HMI

The depiction below shows the connections that need to be made to allow communication between the RGX, CR110 and Maple HMI. On terminals where "optional" is indicated the connection is not required for communication with the CR110 controller card and the Maple HMI.



J11: Connect to 24V AC or DC Power Source.

J12: (optional) Connect for MODBUS RS-232 server

J10: (optional) Connect for MODBUS RS-485 server.

Note: J10 and J12 may not be connected simultaneously. To switch between J10 or J12 move switch S1 to either 485 for J10 or 232 for J12.

P1 (MODEM): Connect to PLC (RS-232) 9-PIN connection on the Maple HMI.

J6: Connect to a CR110 controller card. Connect red (+) and black (-) cables to J13 and the shield (C) to J7 on the CR110. If you are using multiple CR110 Cards make connections as previously stated into the first card only as the communication wires are daisy chained between CR110 cards.

Programing

Required Hardware

The following items are required for programing the RGX Communications Card:

- **Rabbit Programming Cable**
  zworld part number: 20-101-0542
  available from www.zworld.com.
  This cable is used in the programing of the RGX Rabbit Processor.

- **USB to Serial Converter**
  zworld part number: 20-151-0178
  available from www.zworld.com.
  This cable is only necessary if the laptop being used to program does not have a serial port.

Installing Rabbit Utilities

To obtain the Rabbit Field Utility go to: www.prochiller.com/support

Once you have downloaded the Rabbit Utility zip file, extract it to a directory on your computer. Remember its location as you will need to run the rfu.exe file each time you program an RGX card.

If you are using a USB to serial converter make sure to install the supplied software and drivers.

Programing the RGX Card

The Rabbit Field Utility is used for loading updates as well as the initial programing of the RGX Card.

To program the RGX connect the Rabbit Programming Cable to an available serial port (RS-232) on your laptop. If your laptop does not have a serial port you must use a USB to serial converter.

Plug the 10 pin black "PROG." jack on the other end of the Rabbit Programming Cable into the Rabbit program jack on the bottom left corner of the red Rabbit card. The red stripe on the right side of the cable should be facing the J5 jack on the RGX card (as seen in Fig 3-1). Once the Programming cable has been connected, turn the power back on the RGX card.

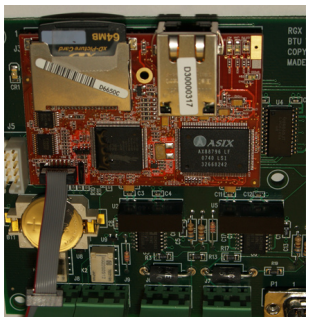


Fig 3-1 Rabbit Card

Note: The RGX must be powered off prior to connecting the Programing Cable.

Open the Rabbit Field Utility and select Communications from the Setup menu. If you are using the USB to serial converter check the "Use USB to Serial Converter" box and make sure that the "Enable Processor Verification" box is unchecked (as seen in Fig 3-2).

Verify that the selected COM port is the COM port that is being used to program. To do this right click on My Computer, and select Properties. In the System Properties dialog box select the Hardware tab, and click on Device Manager. Once the Device Manager window opens expand the Ports (COM & LPT) section. To the right of the device that your cable is connected to you will see parentheses and a COM number (e.g. USB Serial Port (COM6).

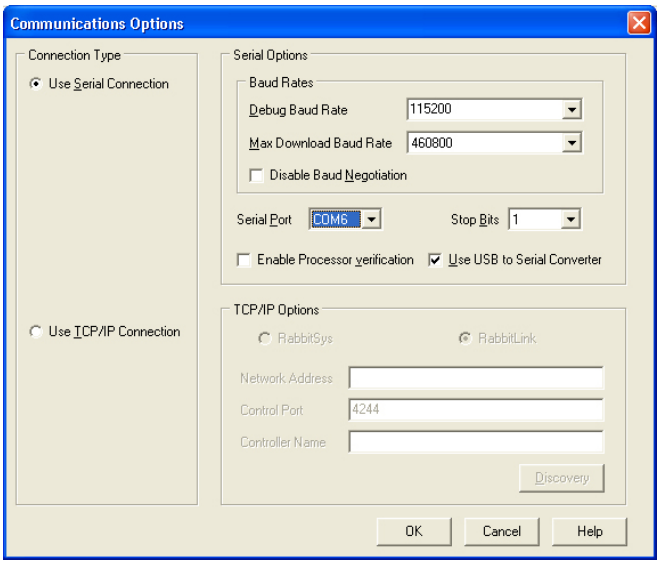


Fig 3-2 Communication Options

Click the OK button when you have made the previously mentioned changes.

Next select the File Locations option from the Setup drop down menu. Browse to and select the file for each of the requested files. These files are located in the directory to which you extracted the Rabbit Field Utility zip file. Please see Fig 3-3 for an example. After selecting each file click the OK button.

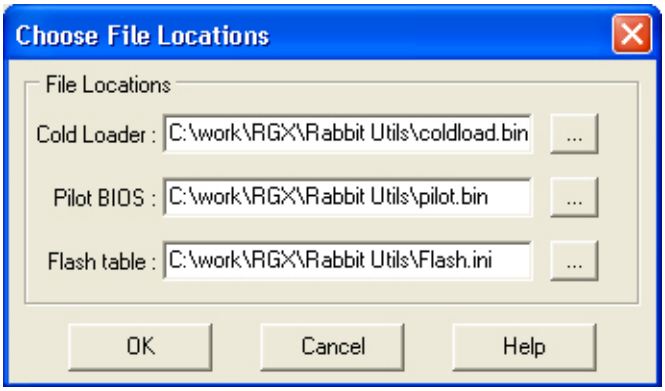


Fig 3-3 File Locations

You are now ready to select the bin file you wish to load. Please check to verify that the version you are loading is the most current. You can find and download the current version at www.prochiller.com/support. Updates to the RGX may require additional configuration as noted.

To download the bin file select the Load Flash Image option from the File drop down menu. Select the desired bin file from the Open dialog box and click Open. (As seen in Fig 3-4)

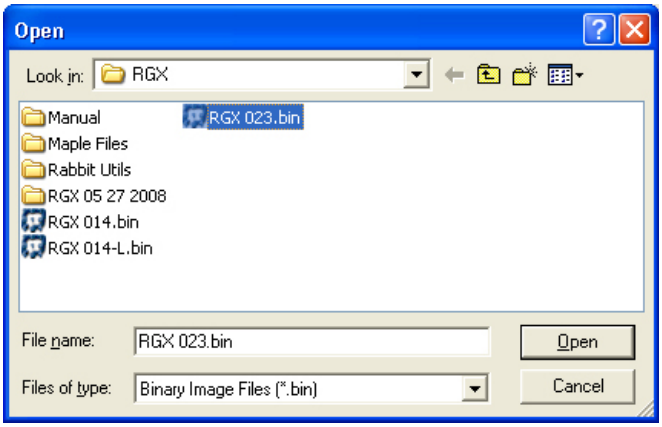


Fig 3-4 Open Binary File

Once you have selected the desired bin file and clicked Open the program will start to load the bin file to the

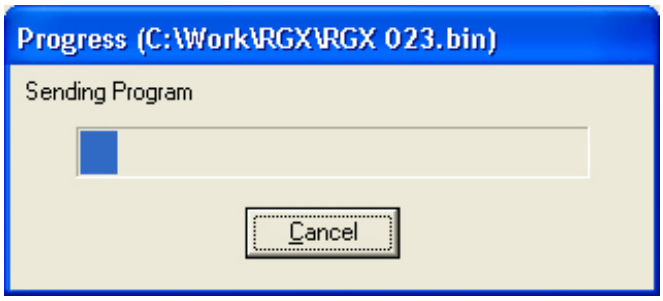


Fig 3-5 Progress Bar

Once the program is finished loading the bin file to the RGX card the progress window will go away and your RGX card will be successfully programed.

Uploading the INF file

Now that your RGX is programed you will need to upload a configuration file (INF file) specific to the number of circuits your RGX Card will be monitoring. (For more information on the INF Configuration File please refer to the INF File Overview section in this manual.) In order to do this you must first connect a cross-over ethernet cable from the network port on the laptop to the network port on the RGX. The IP address on the laptop must be changed. To change the IP address, open Control Panel on your laptop. Right click on Local Area Connection and select Properties. When the Local Area Connection Properties dialog box opens, scroll down and select Internet Protocol (TCP/IP), then click Properties. On the Internet Protocol (TCP/IP) Properties dialog box change the IP address to 192.168.1.1 (as seen in Fig 3-6). Once the correct information has been entered click OK for settings to take effect.

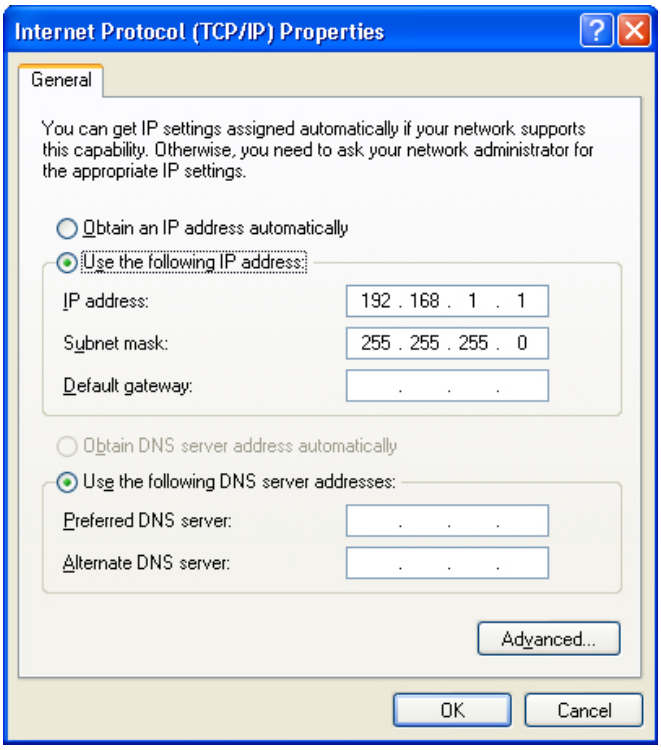


Fig 3-6 Network Properties

You will now be able to access the RGX web interface. Open an internet browser and enter http://192.168.1.50 into the URL bar. Once prompted for User Name and Password enter the following:

User Name: user1
Password: pass1

Once logged in you should see the message "No Cards Defined." Click on the Configure Site button. This will take you to the "Site Configuration" page. (For more information about this page please see the Site Configuration section in this manual.) Click on INF Manager. On the Config File Upload page click Browse to select the INF configuration file you wish to load and click the Upload button. If the file is successfully loaded you will see the message "Last Config File Upload Error: NONE." (As seen in Fig 3-7.)

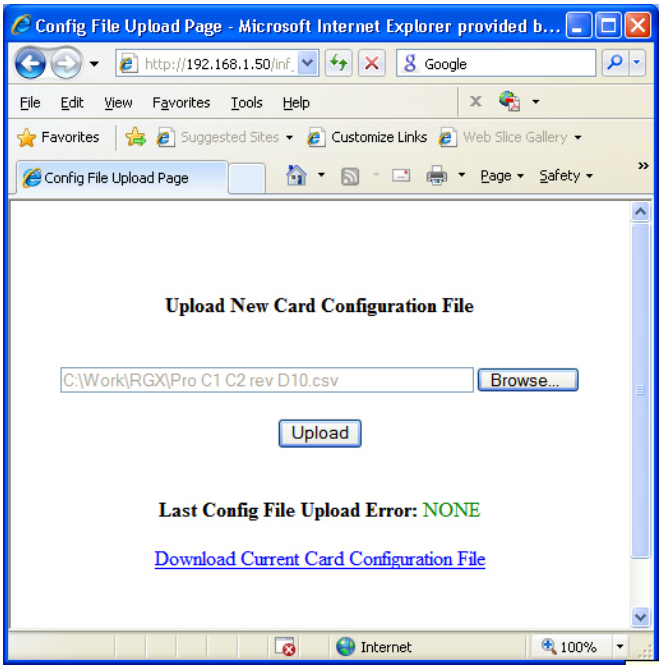


Fig 3-7 Upload INF File

RGX Overview

Web Interface Overview

This section contains a summary of each page within the RGX Communication Card's embedded web server. Details will be given on each setting to give a better understanding of how it can be effectively used in your specific deployment.

Default Information

By default the RGX has three users setup with full access. Below are the default users login information.

User Name	Password
user1	pass1
user2	pass2
user3	pass3

The default IP address is 192.168.1.50.

If at anytime you wish to reset the card to its factory default values simply install a jumper on J5 as shown and cycle power to the RGX card.

Main Page

After logging into the web interface for the RGX Communications Card you will land on the main page (as seen in Fig 5-1). This page contains, from top to bottom, the following:

- **Site Name** - (This can be modified by selecting "Site Info" from the drop down menu on the Site Configuration page.)
- **Time & Date** - (This can be modified by selecting "Clock" from the drop down menu on the Site Configuration page.)
- **Chiller Specific Data** - (As defined in the INF configuration file.) By clicking on the link under the name column for a compressor or an electronic expansion valve you are sent to a Details Page that gives specific performance information. Please see Details Page for further information.
- **Configure Site Button** - Clicking this button will direct you to the Site Configuration page.

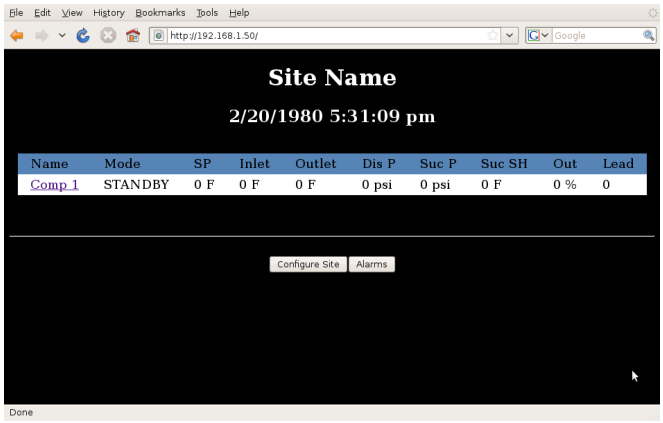


Fig 5-1 Main Page

Site Configuration Page

This page contains settings related to network, communications, reports and web site configuration. To cycle through the setting categories click the drop down menu on the left side of the screen; by default, ethernet is selected. After making changes to a categories settings click the Submit button. You are then able to change categories and make additional changes. When you are finished making changes click the Save Changes button for the changes to take effect. Below are details on each category in the order they appear in the drop down menu:

Ethernet: This category contains information specific to the network that the RGX Card is being deployed on (as seen in Fig 5-2). The settings are from top to bottom:

- **Enable DHCP** - The RGX can be configured as a Dynamic Host Configuration Protocol (DHCP) client. A DHCP client automatically retrieves an IP address from a DHCP server. This setting should be set to "No" since a static IP address is needed in order to access the web interface with ease.

• **IP Address:** The default value is 192.168.1.50. This should modified to an available IP address on your network.

• **Subnet Mask** - The default value is 255.255.255.0. Enter your network's subnet mask.

• **Gateway** - The default value is 192.168.1.1. Enter the IP address for your network's default gateway. This is typically the LAN IP address of your router.

• **DNS Server** - The default value is 192.168.1.1. Enter the IP address of your DNS Server. This can often be supplied by your Internet Service Provider.

Note: The DNS Server is only used for sending reports through email or SMS

• **HTTP Port #** - The default value is 80. This is the port number used to access the Web-based utility. If port 80 is already in use within your network, enter an available port number.

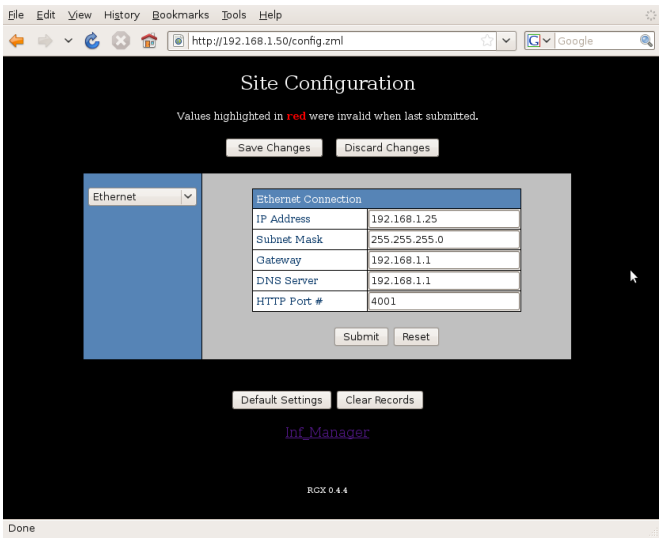


Fig 5-2: Ethernet

Users: This category allows you to create users with varying degrees of access to the Web-based utility (as seen in Fig 5-3). The settings are from left to right:

• **User Name** - This column allows you to define three user names. The default values are user1, user2, and user3.

• **Password** - This column allows you to set the password for the three user names in the previous column. The default values are pass1, pass2, and pass3.

• **View** - This column sets the security for the Main page. By setting this field to N you disable the user's access to all of the Web-base utility. The default value is Y.

• **Control** - This column sets the security for the Details page. By setting this field to N you disable the user's access to change performance based settings such as set point. The default value is Y.

• **Configure** - This column sets the security for the Site Configuration page. By setting this field to N you disable the user's access to change any RGX specific settings. The default value is Y.

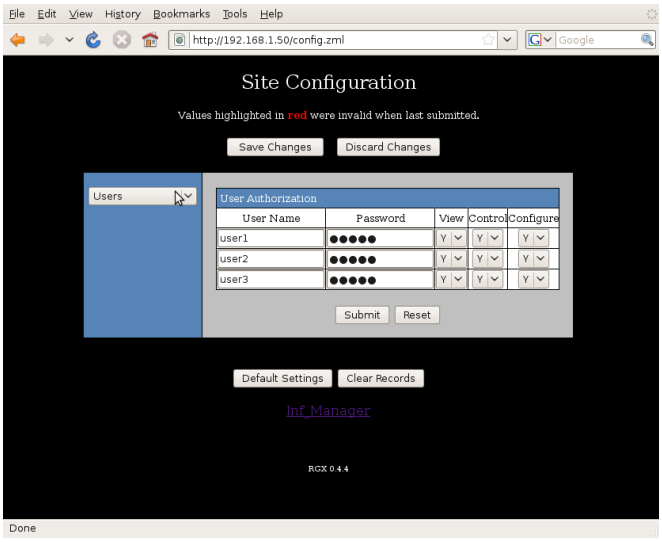


Fig 5-3: Users

Site Info: This category allows you to change some site specific information (as seen in Fig 5-4). The settings are from top to bottom:

• **Name** - The default value is "Site Name". This is the site name displayed on the top of the Main page.

• **Panel #** - The default value is 1. This setting is used for UDP communications. This may need to be modified if the RGX is sharing the network with other devices and 1 is already in use. In those cases a slave address that is not in use should be chosen.

• **UDP Port #** - The default value is 4001. This setting is used for remote access through programs such as Xmax and Xbase. Typically this should be set to the same value as the HTTP Port # under the Ethernet category.

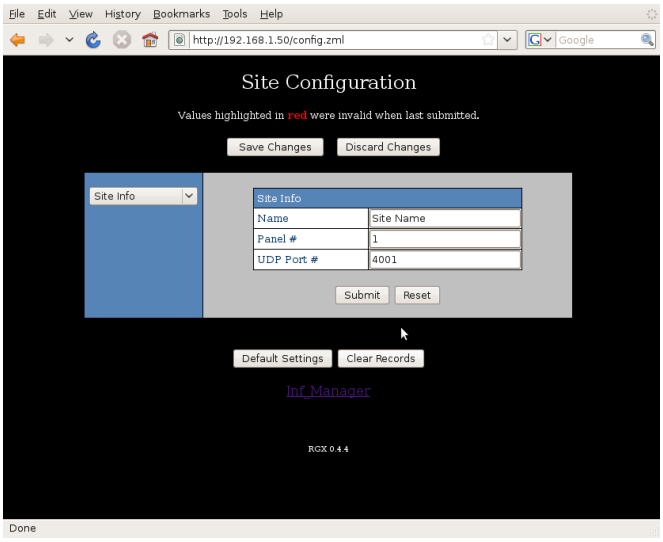


Fig 5-4: Site Info

Clock: This category allows you to change the RGX card's time & date stamp (as seen in Fig 5-5). The settings are from top to bottom:

• **Date** - This field allows for the entry of a date in the format mm/dd/yyyy.

• **Time** - This field allows you to enter the current time in the format hh:mm. When setting the clock user a 24 hour format. The Clock will be displayed in 12 hour format.

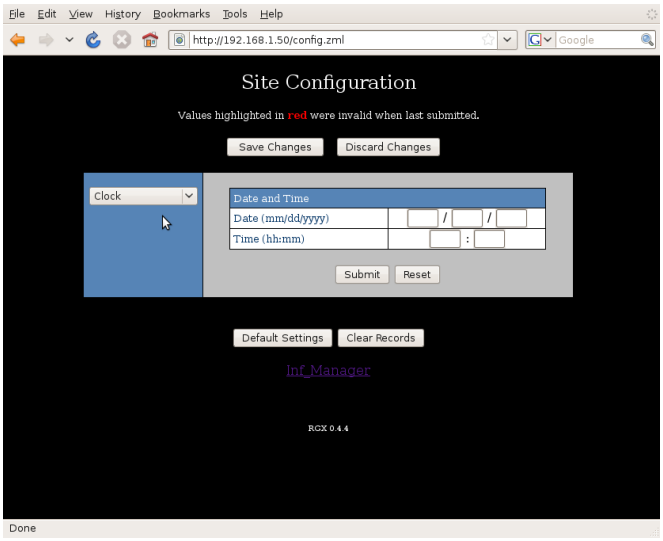


Fig 5-5: Clock

Records: This category is strictly to set the time interval at which records will be taken (as seen in Fig 5-6):

• **Record Rate** - This setting is for the time in minutes at which historical records will be taken.

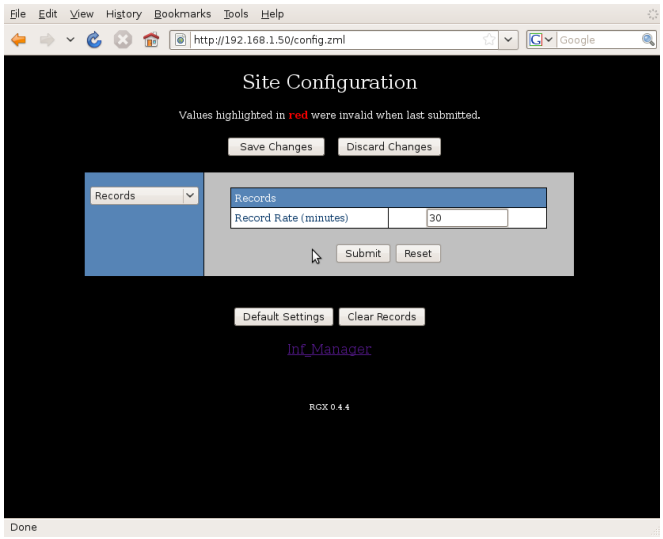


Fig 5-6: Records

Email: This category can be used to configure the RGX for email and text messaging (as seen in Fig 5-7):

• **SMTP Server** - Enter the address for your SMTP Server. If your network does not have its own mail server this can often be provided by your internet service provider. An SMTP Server enables the RGX Card to send email reports and alerts.

• **Panels Email Address** - This setting is for an email address that you would like the reports and alert emails to come from.

• **Email Address 1-4** - These fields can be used to define up to four email addresses that you would like the reports and alerts sent to.

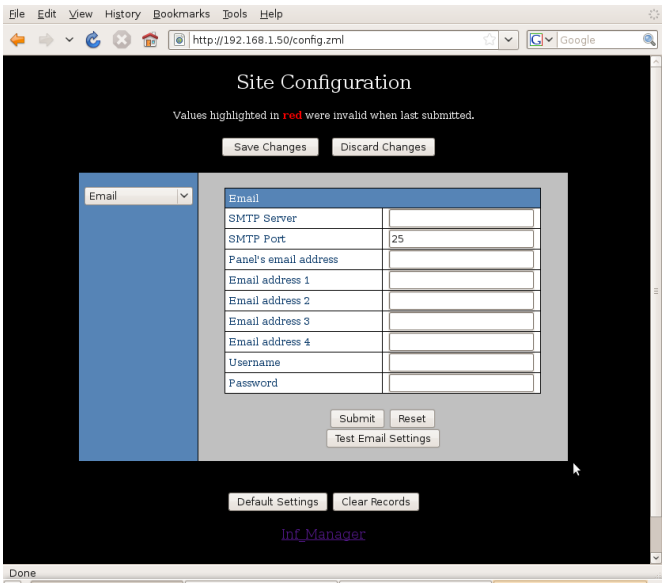


Fig 5-7: Email

Communications: This category enables you to define the RGX Card's communications (as seen in Fig 5-8):

• **MODBUS Server ID** - The default value is 1. This value assigns the cards MODBUS network ID as where the RGX card will be acting as a slave device.

• **Card Poll Rate (seconds)** - The default value is 3 seconds. This value sets the rate at which the connected devices are polled for data.

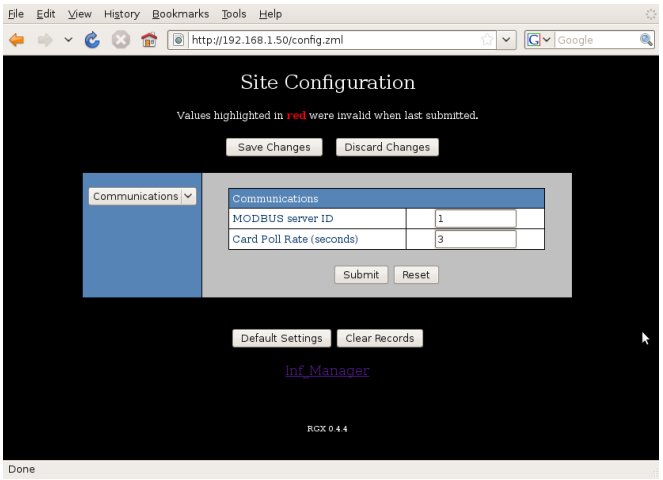


Fig 5-8: Communications

J6-P1 Port Page(s)

Pages J6 Port, J7 Port, J10/12 Port, and P1 Port displays data necessary for correctly addressing and communicating with the devices connected to these ports. (as seen in Fig 5-9)

• **Function** - This drop down menu gives you the ability to specify what type of devices is connected. Below are the options and their meanings:

BCS CLIENT: This setting is used with the CR110 Card.

MODBUS CLIENT: This setting is used with ModBus Slave devices.

BCS SERVER: This setting is used with the G55 or TCP Touchscreen interface.

MODBUS SERVER: This setting is used with ModBus Master devices.

• **Baud Rate** - This field allows you to set the buad rate for the connected device(s). The default value is 9600.

• **Inter-byte Timeout (msec)** - This field allows you to set the timeout in milliseconds between bytes from the device.

• **First Byte Timeout (msec)** - This field allows you to set the timeout in milliseconds between the request from the RGX and when the first byte is received

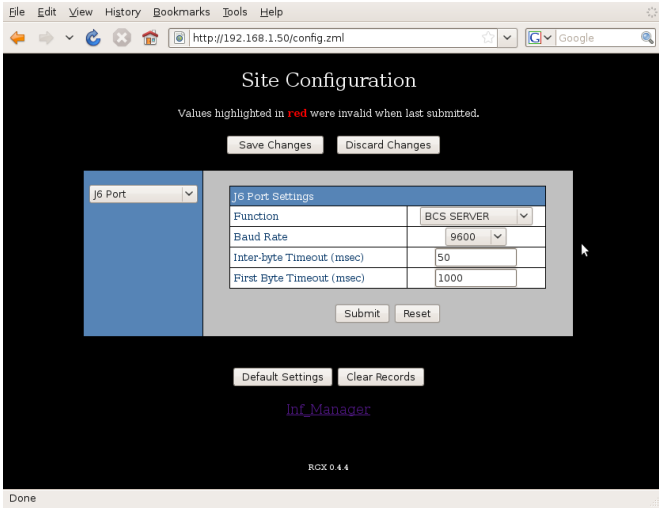


Fig 5-9: J6-P1 Port Page(s)

Details Page

The Details page displays the current operating values of your chiller system (as seen in Fig 5-10). This page can be customized by adjusting the values of your INF Configuration File (Please see INF File Overview section for further information).

• **Circuit Information** - Below the site name and date is a table that list the circuit's current operating values.

• **Home Button** - The Home button takes you to the Home page.

• **Modify Values Button** - The Modify Values button takes you to the Modify page. The Modify pages allows you to adjust the operating parameters of the circuit.

• **Retrieve Records Button** - This button retrieves records from 12am of the date specified in the Start date field to 12am of the date specified in the End date field. The records will be downloaded to a CSV formatted file. There are two types of records that are contained in the downloaded records file: historical records and the activity log. Historical Records are time triggered and the time interval by which they are taken can be specified on the Records section of the Site Configuration Page (default is 30 minutes). The activity log is an instantaneous record that is event triggered. You can modify the events that trigger activity log records in the INF file.

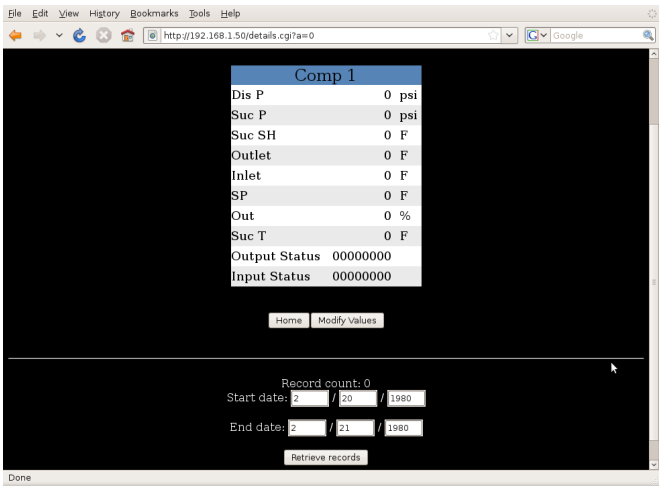


Fig 5-10: Details Page

Modify Values Page

The Modify Values page allows you to adjust the selected circuits operating parameters (as seen in Fig 5-11). This page can be customized by adjusting the values of the INF configuration file (Please see INF File Overview section for further information).

• **Circuit Parameters** - Below the site name and date is a table that lists the current circuits parameters. Next to the each parameter is an input box that allows you to change the value of that parameter. Once you have changed the value desired click the Update button to save the parameter.

• **Reset Card Button** - The Reset Card button can be used to clear CR110 alarms associated with the current circuit.

• **Home Button** - The Home button takes you to the Main page.

• **Details Button** - The Details button takes you to back to the Details page.

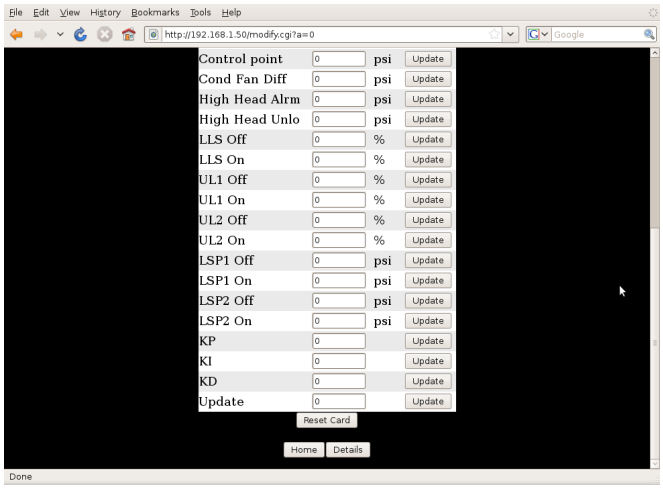


Fig 5-11: Modify Values Page

INF File Overview

The INF file is the configuration file that allows you to specify which devices you would like to monitor. It also controls the layout of the Main, Details and Modify Values pages. The INF Configuration File should be configured by Pro Refrigeration, Inc. personnel only. It's very complex and all values have to be set appropriately for the RGX Card to function. Below is a basic overview of what the INF file consists of. Each file will start with a [RGX_INF_XX] followed by the [CARD_DEF_X] tags and end with the [CARD_X] tags.

[RGX_INF_XX] ← The RGX will check the value of XX to verify that it is the current version.

[CARD_DEF_X] ← Card_Def_1 thru Card_Def_5 is factory defined and should not be modified outside of its original version unless instructed by Pro Refrigeration, Inc.

Below we look at the [CARD_X] tag and what the values preceding it represents. The first four rows below the [CARD_X] tag are row ordered, and the proceeding rows are column ordered.

[CARD_X] ← Card_X is what the RGX looks at for the start of the Xth devise. There can be up to 10 cards defined. The cards should be defined in the order you wish them to be displayed on the Main page.

1 XX COMP XX ← First value in this row is the type of card as define in the CARD_DEF's above. The value 1 indicates this is a CR110 card.

Second Value is the address assigned to the card. For example a common address for the first card of a CR110 system would be 01.

Third Value is the name you would like displayed on the Main page of the RGX's web interface.

0 1 3 4 7 8 9 10 11 12 13 14 15

The row above specifies the modes that will trigger a record you can use as much or little as desired. Listed below are the modes each number represents.

MODE VALUES:

0 = STANDBY	8 = DP SENSOR AL
1 = REFRIG	9 = SP SENSOR AL
2 = DEFROST	10 = LOW SUC AL
3 = PUMP DN	11 = EXTERNAL AL
4 = SHORT CYCLE	12 = SUPER HEAT AL
5 = SHUTDOWN	13 = TEMP SENSOR AL
6 = COIL DRY	14 = FAN FAIL AL
7 = HIGH HEAD AL	15 = AUX ALARM

0 1 3 4 7 8 9 10 11 12 13 14 15

The row above specifies the modes that will trigger an email or text message you can use as much or little as desired. This row utilizes the aforementioned mode number schema.

13 1 2 3 7 32 ← This row determines what values will be used for the records and in what order they will appear from left to right.

The next values are column ordered. We have included a header below to show what each column is used for. These column headers are not included in the actual INF file.

VALUES column correlates with the rest of the columns. Please refer to values list on the next page for what value each number represents.

MAIN-MODIFY columns represent the display order of each page on the web interface. The example below shows value 13 (MODE) as the first value displayed on the Main page.

MODBUS column assigns a MODBUS address for each value (Card 1 starts at 1, Card 2 at 1001 and Card 3 at 2001).

MODE column is used to identify which VALUE is the MODE.

BINARY column is used to signify which VALUES are input/output values by assigning a 1 to the desired VALUE. These values will then be displayed in binary where 1 represents on and 0 off.

AVG column is used to assign what VALUES can or cannot be averaged. 1 signifies that the VALUE can be averaged and 0 that it cannot.

VALUES	MAIN	DETAILS	MODIFY	MODBUSS	MODE	BINARY	AVG
1	2	1	0	1	0	0	1
2	3	2	0	2	0	0	1
3	4	3	0	3	0	0	1
4	0	0	0	4	0	0	1
5	0	0	0	5	0	0	1
6	0	0	0	6	0	0	1
7	7	5	0	7	0	0	1
8	0	0	8	8	0	0	1
9	0	0	9	9	0	0	1
10	0	0	5	10	0	0	1
11	0	0	6	11	0	0	1
12	0	0	7	12	0	0	1
13	1	0	0	13	1	0	0
14	0	8	0	14	0	1	1
15	0	0	0	15	0	1	1
16	6	6	0	16	0	0	1

CR110 VALUES:

1	Dis P
2	Suc P
3	Suc SH
4	Outlet
5	Inlet
6	SP
7	Out
8	Low Suc A
9	Low Suc T
10	Sheat Lo
11	Sheat Hi
12	Sheat Time
13	Mode
14	Output Status
15	Input Status
16	Lead
17	Main
18	Backup
19	Comp_off
20	Comp _on
21	Short_cycle
22	Control point
23	Cond Fan Diff
24	Defrost_off
25	Override
26	Max Def
27	Temp Terminate
28	Coil Dry
29	Room Offset
30	Last Defrost
31	Lead Run Time
32	Suc T
33	Process
34	Amps
35	Software Ver
36	Evap Sh

ER110 VALUES:

1	Suc A
2	Suc A Temp
3	Suc B
4	Suc B Temp
5	Spare
6	Spare
7	SH SP
8	Spare
9	SH A
10	Spare
11	SH B
12	Valve A
13	Valve B
14	Spare
15	Spare
16	Mode

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