



TECHNICAL Practice

TELECOM SOLUTIONS FOR THE 21ST CENTURY

RC-4

**Network Enabled
Relay Controller**

February 7, 2012

Control Relay Contacts Across a Local Area Network



The **RC-4** Network Enabled Relay Controller provides networked control of four remote relays via a web interface. The same interface can be used to check the status of four contact closures at the remote location.

Relays can be toggled on or off, or user-programmed timed closures can be activated. Two levels of user access permit selected users to have full operational and programming rights while others have operational control but not programming capability.

Features

- Terminal strip connections for normally open, normally closed, and common for all four relays
- Relays can be toggled or timed closures of from 1 - 99 seconds can be activated
- Terminal strip connections for all four sensor inputs
- Ready-to-use webpage control interface
- Encrypted login
- Two levels of access based on login:
 - Administrator (full access)
 - Guest (programmable limits)
- Relay names and input names can be customized on webpage
- Firmware remotely updateable

Applications

Remote Control of:

- Secure building entry
- Heating/cooling equipment
- Pumps and fans
- Security system
- Gates
- Lighting
- Emergency tones

Specifications

Power: 120VAC/12VDC 500ma UL listed adapter provided
Dimensions: 133mm x 89mm x 44mm (5.25" x 3.5" x 1.75")
Shipping Weight: .9 kg (2 lbs)
Environmental: 0 C to 32 C (32 F to 90 F) with 5% to 95% non-condensing humidity
Relay Contact Ratings: 5A @ 30VDC/250VAC
Connections: (1) 12 position screw terminal block, (1) 6 position elevated screw terminal block
LAN Interface: (1) RJ45 10Base-T
Minimum Requirements: Windows XP and up, Java-script enabled internet browser

Phone...715.386.8861

www.vikingelectronics.com

IF YOU HAVE A PROBLEM WITH A VIKING PRODUCT, PLEASE CONTACT: VIKING TECHNICAL SUPPORT AT (715) 386-8666

Our Technical Support Department is available for assistance Monday 8am - 4pm and Tuesday through Friday 8am - 5pm central time. So that we can give you better service, before you call please:

1. Know the model number, the serial number and what software version you have (see serial label).
2. Have your Technical Practice in front of you.
3. It is best if you are on site.

RETURNING PRODUCT FOR REPAIR

The following procedure is for equipment that needs repair:

1. Customer must contact Viking's Technical Support Department at 715-386-8666 to obtain a Return Authorization (RA) number. The customer MUST have a complete description of the problem, with all pertinent information regarding the defect, such as options set, conditions, symptoms, methods to duplicate problem, frequency of failure, etc.
2. Packing: Return equipment in original box or in proper packing so that damage will not occur while in transit. Static sensitive equipment such as a circuit board should be in an anti-static bag, sandwiched between foam and individually boxed. All equipment should be wrapped to avoid packing material lodging in or sticking to the equipment. Include ALL parts of the equipment. C.O.D. or freight collect shipments cannot be accepted. Ship cartons prepaid to: **Viking Electronics, 1531 Industrial Street, Hudson, WI 54016**
3. Return shipping address: Be sure to include your return shipping address inside the box. We cannot ship to a PO Box.
4. RA number on carton: In large printing, write the R.A. number on the outside of each carton being returned.

RETURNING PRODUCT FOR EXCHANGE

The following procedure is for equipment that has failed out-of-box (within 10 days of purchase):

1. Customer must contact Viking's Technical Support at 715-386-8666 to determine possible causes for the problem. The customer MUST be able to step through recommended tests for diagnosis.
2. If the Technical Support Product Specialist determines that the equipment is defective based on the customer's input and troubleshooting, a Return Authorization (R.A.) number will be issued. This number is valid for fourteen (14) calendar days from the date of issue.
3. After obtaining the R.A. number, return the approved equipment to your distributor, referencing the R.A. number. Your distributor will then replace the product over the counter at no charge. The distributor will then return the product to Viking using the same R.A. number.
4. **The distributor will NOT exchange this product without first obtaining the R.A. number from you. If you haven't followed the steps listed in 1, 2 and 3, be aware that you will have to pay a restocking charge.**

LIMITED WARRANTY

Viking warrants its products to be free from defects in the workmanship or materials, under normal use and service, for a period of one year from the date of purchase from any authorized Viking distributor or 18 months from the date manufactured, whichever is greater. If at any time during the warranty period, the product is deemed defective or malfunctions, return the product to Viking Electronics, Inc., 1531 Industrial Street, Hudson, WI., 54016. Customer must contact Viking's Technical Support Department at 715-386-8666 to obtain a Return Authorization (R.A.) number.

This warranty does not cover any damage to the product due to lightning, over voltage, under voltage, accident, misuse, abuse, negligence or any damage caused by use of the product by the purchaser or others. This warranty does not cover non-EWP products that have been exposed to wet or corrosive environments.

NO OTHER WARRANTIES. VIKING MAKES NO WARRANTIES RELATING TO ITS PRODUCTS OTHER THAN AS DESCRIBED ABOVE AND DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTIES OR MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

EXCLUSION OF CONSEQUENTIAL DAMAGES. VIKING SHALL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE TO PURCHASER, OR ANY OTHER PARTY, FOR CONSEQUENTIAL, INCIDENTAL, SPECIAL OR EXEMPLARY DAMAGES ARISING OUT OF OR RELATED TO THE SALE OR USE OF THE PRODUCT SOLD HEREUNDER.

EXCLUSIVE REMEDY AND LIMITATION OF LIABILITY. WHETHER IN AN ACTION BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR ANY OTHER LEGAL THEORY, ANY LIABILITY OF VIKING SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE PRODUCT, OR AT VIKING'S OPTION, REFUND OF THE PURCHASE PRICE AS THE EXCLUSIVE REMEDY AND ANY LIABILITY OF VIKING SHALL BE SO LIMITED.

IT IS EXPRESSLY UNDERSTOOD AND AGREED THAT EACH AND EVERY PROVISION OF THIS AGREEMENT WHICH PROVIDES FOR DISCLAIMER OF WARRANTIES, EXCLUSION OF CONSEQUENTIAL DAMAGES, AND EXCLUSIVE REMEDY AND LIMITATION OF LIABILITY, ARE SEVERABLE FROM ANY OTHER PROVISION AND EACH PROVISION IS A SEPARABLE AND INDEPENDENT ELEMENT OF RISK ALLOCATION AND IS INTENDED TO BE ENFORCED AS SUCH.

FCC REQUIREMENTS

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. Inside the front panel of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive REN's on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of the REN's should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total REN's, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

The plug used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this RC-4 does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

If the RC-4 causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance

notice in order for you to make the necessary modifications to maintain uninterrupted service.

If trouble is experienced with the RC-4, for repair or warranty information, please contact:

Viking Electronics, Inc., 1531 Industrial Street, Hudson, WI 54016 (715) 386-8666

If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

Connection to Party Line Service is subject to State Tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

WHEN PROGRAMMING EMERGENCY NUMBERS AND (OR) MAKING TEST CALLS TO EMERGENCY NUMBERS:

Remain on the line and briefly explain to the dispatcher the reason for the call. Perform such activities in the off-peak hours, such as early morning or late evenings.

It is recommended that the customer install an AC surge arrester in the AC outlet to which this device is connected. This is to avoid damaging the equipment caused by local lightning strikes and other electrical surges.

PART 15 LIMITATIONS

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

Definitions

Client: A computer or device that makes use of a server. As an example, the client might request a particular file from the server.

DHCP: Dynamic Host Configuration Protocol. In this procedure the network server or router takes note of a client's MAC address and assigns an IP address to allow the client to communicate with other devices on the network.

Host: A computer or device connected to a network.

Host Name: A host name is a label assigned to a device connected to a computer network that is used to identify the device in various forms of network communication.

Hosts File: A file stored in a computer that lists host names and their corresponding IP addresses with the purpose of mapping addresses to hosts or vice versa.

IP Address: This is the address that uniquely identifies a host on a network.

LAN: Local Area Network. A LAN is a network connecting computers and other devices within an office or building.

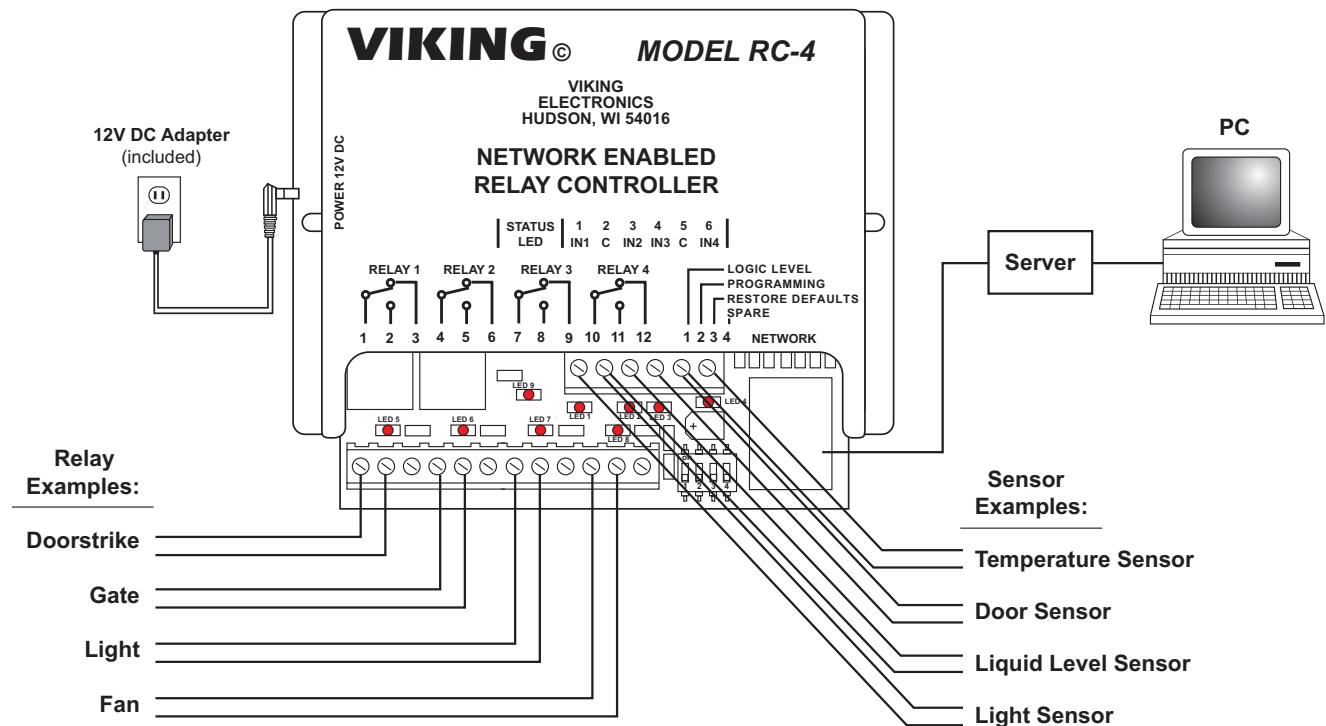
Lease: The amount of time a DHCP server reserves an address it has assigned. If the address isn't used by the host for a period of time, the lease can expire and the address can be assigned to another host.

MAC Address: MAC stands for Media Access Control. A MAC address, also called a hardware address or physical address, is a unique address assigned to a device at the factory. It resides in the device's memory and is used by routers to send network traffic to the correct IP address. You can find the MAC address of your **RC-4** printed on a white label on the top surface of one of the relays.

Server: A computer or device that fulfills requests from a client. This could involve the server sending a particular file requested by the client.

Installation

A. Installing the RC-4



Hook up the **RC-4** as shown above. The relay outputs can be connected to devices that are controlled by contact closures, such as doorstrikes or gates. Both normally open and normally closed terminals are provided. The sensor terminals are to be connected to devices that indicate their state by either opening or closing a contact. Examples would include a maximum or minimum temperature sensor or a door sensor. When all the relay and sensor connections have been made, use a network cable to connect the network jack on the **RC-4** to a network jack on your LAN. Plug in power to the **RC-4**.

When **RC-4** is powered up, it sends a request to the network server to assign it an IP address. If there are addresses available, the server assigns one and relays this information to the **RC-4**. From this point on, this address is used by the **RC-4** to communicate with the rest of the network.

B. Setting Up the RC-4 on the Network

The **RC-4** is controlled by a webpage that is accessed using a web browser. To connect to the page, it is necessary to know either the IP address of the **RC-4**, which is the address that was assigned by the network server when the **RC-4** powered up, or to know the host name of the **RC-4**. Once you are able to connect to the **RC-4**, it can be operated using the dynamic IP address assigned by the server or it can be programmed to use a static IP address.

1. Unit Name (Host Name)

When the **RC-4** is accessed using a browser, it is acting as a host. Most networks allow the user to address the host using the host name, which is a sort of nickname that can be used instead of typing in the full four-byte IP address of the host. The default host name of the **RC-4** is "myviking". Type <http://myviking> into the address bar of the browser and hit enter or click on the arrow. If the Viking **RC-4** access page comes up, proceed to 4. Authentication.

If entering the host name produces a "cannot display the webpage" message, the network server was unable to translate the host name into an IP address. From this point, there are two ways to proceed. Both require finding out what IP address the network server assigned to the **RC-4**.

2. Dynamic IP Address

When the **RC-4** is connected to a network server and powered up, it receives an IP address from the network server. This address can be determined by using the Microchip Ethernet Discoverer, which reads and displays it. The utility can be downloaded from Viking's website:

<http://www.vikingelectronics.com>

Under Quick Links at the middle right of the home page, find Software Downloads and click on it. You can read the information and then scroll down to the bottom of the page and click on "I Accept". Find "Microchip Ethernet Discoverer" in the list of selections, click on it and proceed with the download.

Once the discoverer has been downloaded, double-click on the icon to activate it. In the display that comes up, look for the line that has the host name "myviking". Just to the left of this entry is the IP address that has been associated with the **RC-4**. Type this into the browser's address bar and click to bring up the **RC-4** webpage. Note that from this point on the page can be accessed by clicking on this address in the browser history instead of manually entering it every time, as long as browser history is not cleared. Another way of setting up the first connection is to just double-click on the line in the discoverer display where the **RC-4** is shown. While this also connects to the webpage, it does not store the page in browser history, so it should be stored in favorites for future fast access.

If you have tried the steps above and are still not connected, see the last section, **Troubleshooting**.

3. Static IP Address

To set the **RC-4** up for operation with a static IP address, first arrange with your network administrator for an address on the server to be configured as a static IP address. Once this is done, use the default host name "rc4host" or the dynamic IP address obtained on powerup to connect to the **RC-4** (see sections 1 and/or 2 above). On the main page, find Network Configuration near the bottom and click on it. Find the Enable DHCP checkbox near the bottom and uncheck it. The text boxes below are no longer greyed out. In the IP Address box, enter the static IP address you want to use. The Gateway, Subnet Mask, Primary and Secondary DNS server boxes can be left unchanged. After making this change, it will likely be necessary to clear the host-name cache in order to connect with the new IP address. This can be done by entering "nbtstat -R" in the Windows command prompt window.

4. Authentication

The **RC-4** is securely accessed using standard authentication procedures. There are two levels of access, each requiring the entry of a user name and password. The Guest level allows operation of the relays but not programming of their default closure times or changes to username and password or network configuration. The Administrator level allows both relay operation and programming (see Programming sections A and B). The default usernames and passwords are listed below.

Guest username	guest	Admin username	admin
Guest password	password	Admin password	viking

There is one guest username and password available, and one admin username and password. It is recommended that these be changed to unique values for better security. If you forget your username and password, see C. DIP Switch Programming, Switch 3 to return to the original factory settings and reprogram the usernames and passwords.

C. DIP Switch Programming

Switch 1 – Logic Level

This dipswitch lets you set the logic level for the contact closure inputs. In the default OFF position, the logic level is 15V with a 7V trip point, which is best for long, relatively noisy runs. The higher trip point makes the input more immune to noise. Closing the switch sets a 5V logic level with a 2.5V trip point. This is the preferred level for a short run to another device with a similar logic level.

Switch 2 – Programming

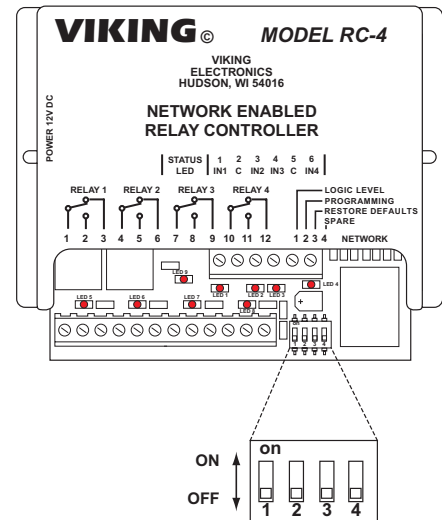
Dipswitch 2 allows programming on the Set Defaults and Network Configuration pages. It works in conjunction with the user's authentication level. If the user is logged in as a Guest, no programming is possible. The programming pages can be accessed, and the programmable values are visible in their textboxes, but they are greyed out and can't be changed. It's when the user is logged in as an Administrator that Dipswitch 2 makes a difference. If Dipswitch 2 is OFF, programming is permitted. If Dipswitch 2 is ON, programming is blocked, even when the user is logged in as an Administrator. This hardware switch provides an additional level of security against hacking. To take advantage of this feature, turn Dipswitch 2 ON when programming is completed to lock the settings. If security is less of a concern, Dipswitch 2 could be left OFF and remote programming will always be permitted if the user is an Administrator.

Switch 3 – Restore Defaults

Dipswitch 3 allows a complete return to factory defaults, including all network addresses, username and password, and programmed time values. To return to defaults, the **RC-4** must be powered down. With the unit powered down, turn on Dipswitch 3. Power up the **RC-4**. After four to eight seconds, the Status LED starts flashing. Turn Dipswitch 3 back off. After a second or two the status LED returns to steady on, and the return to defaults procedure is complete.

Switch 4 – (not used)

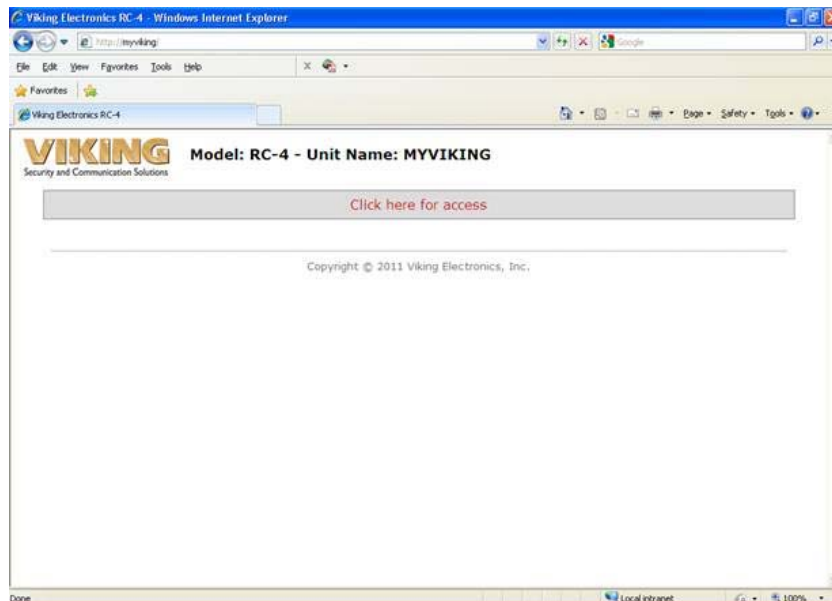
Switch	Position	Description
1	OFF	Logic Level 15V with a 7V trip point
1	ON	Logic Level 5V with a 2.5V trip point
2	OFF	Programming access is enabled
2	ON	Programming access is blocked
3	OFF	Normal operation
3	ON	Restore factory programming defaults
4	--	(not used)



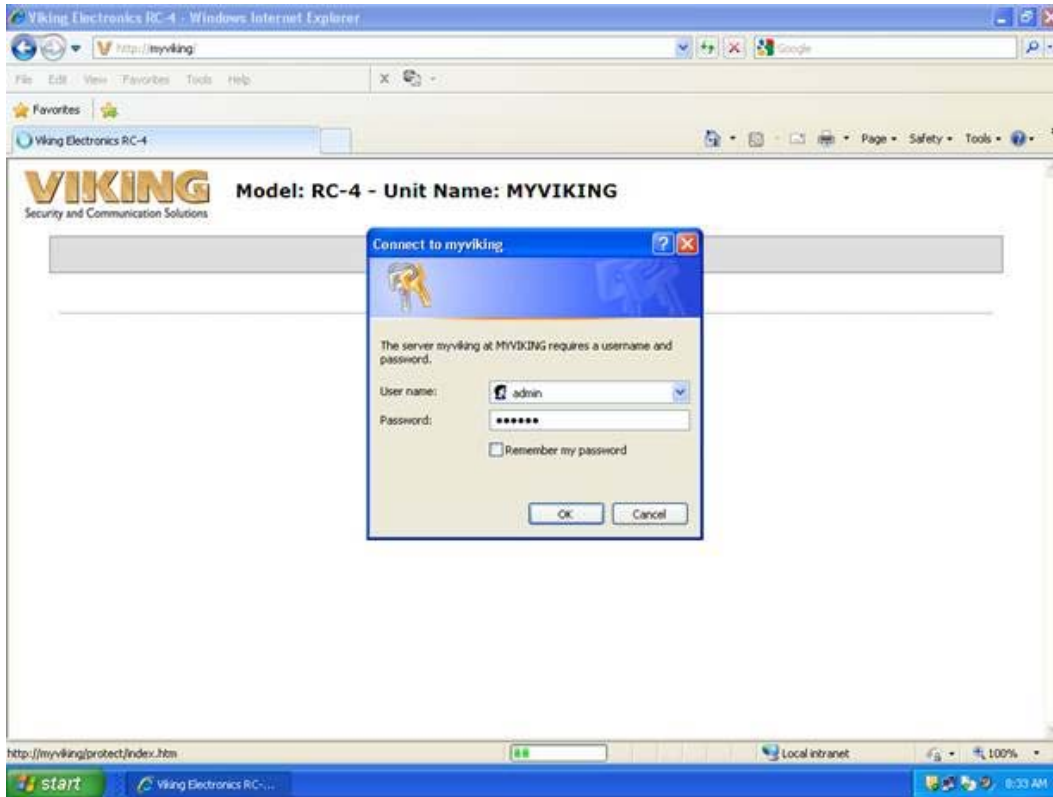
Note: The default setting for all dipswitches is OFF.

Operation

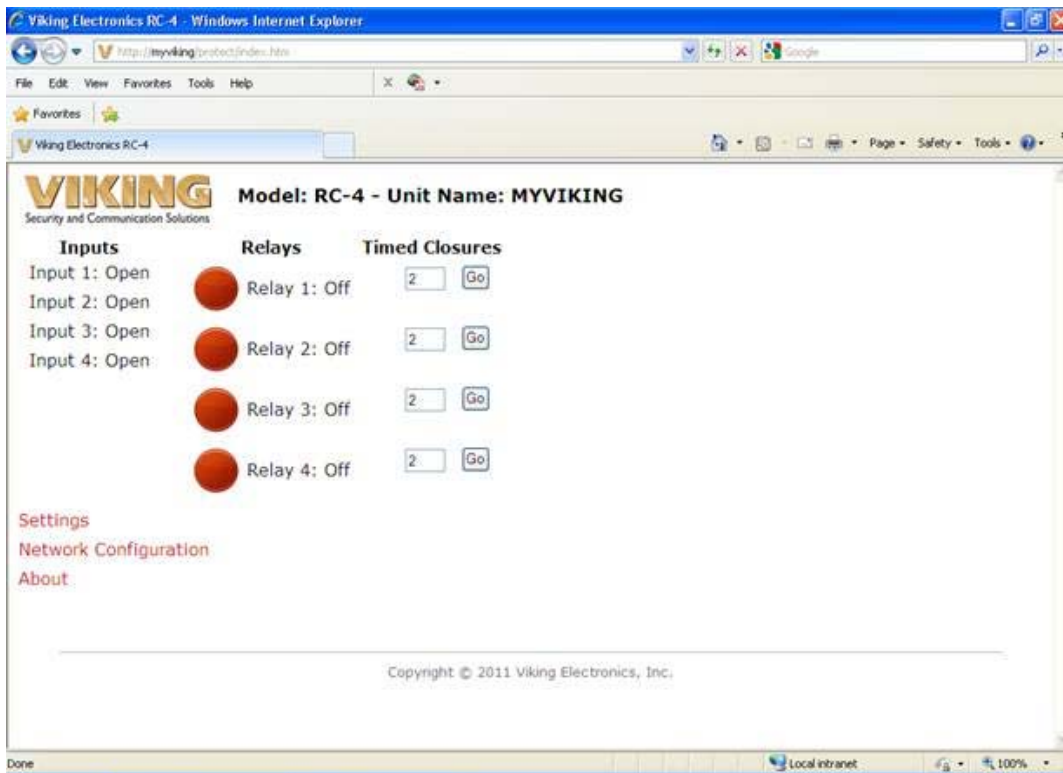
Connect to the webpage as described in **Installation** section **B. Setting Up the RC-4 on the Network** on page 4. The **RC-4** access page appears.



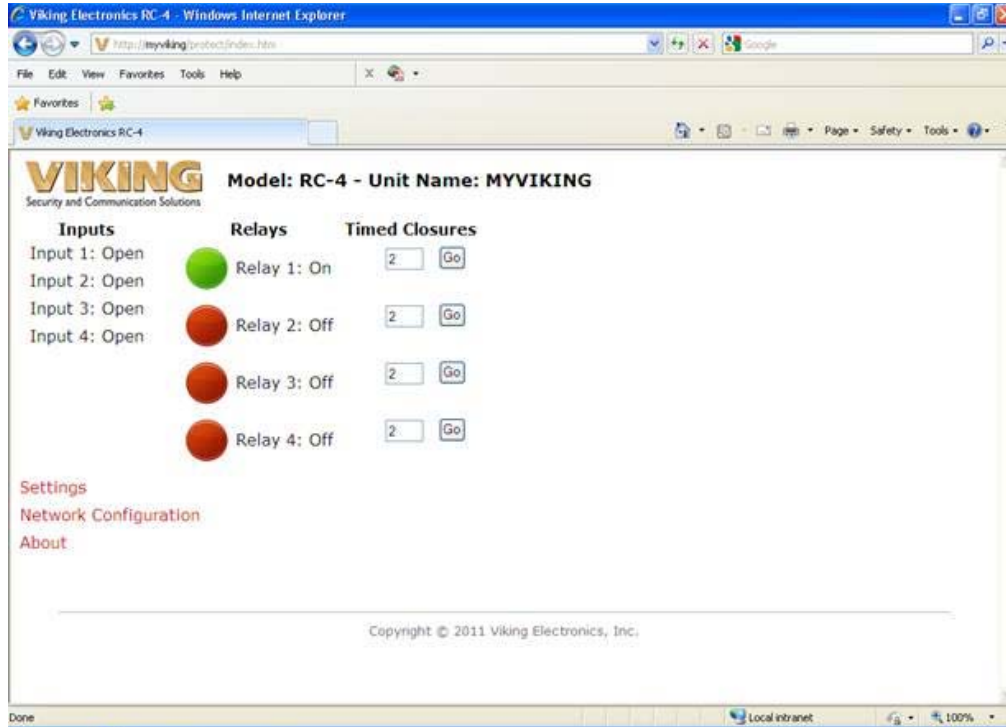
Near the top of the page, locate and click on “Click here for access”. The browser’s authentication dialog appears.



For User Name, enter “admin”, and for Password, enter “viking”. The main page appears. Note that all four remote switches are shown Open and the relays are all Off.



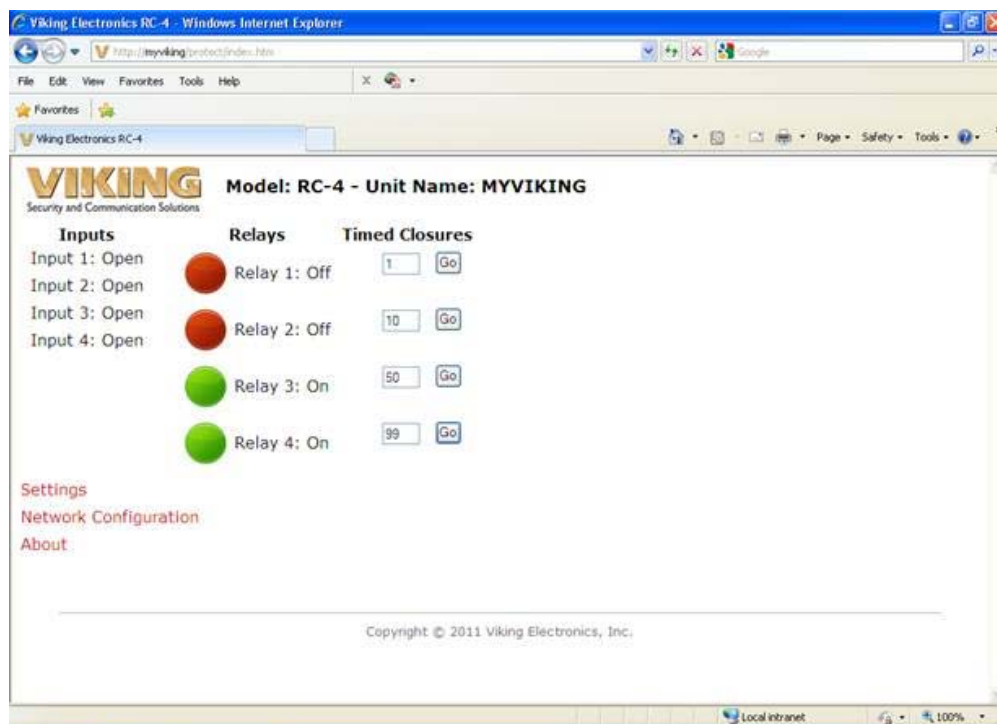
The relays may be toggled On or Off, or they may be programmed to provide a timed closure of from 1 to 99 seconds. Relay 1 is red, which indicates that it is Off. Click on the image of the red circle next to "Relay 1". The circle changes from red to green, and relay 1 is turned on.



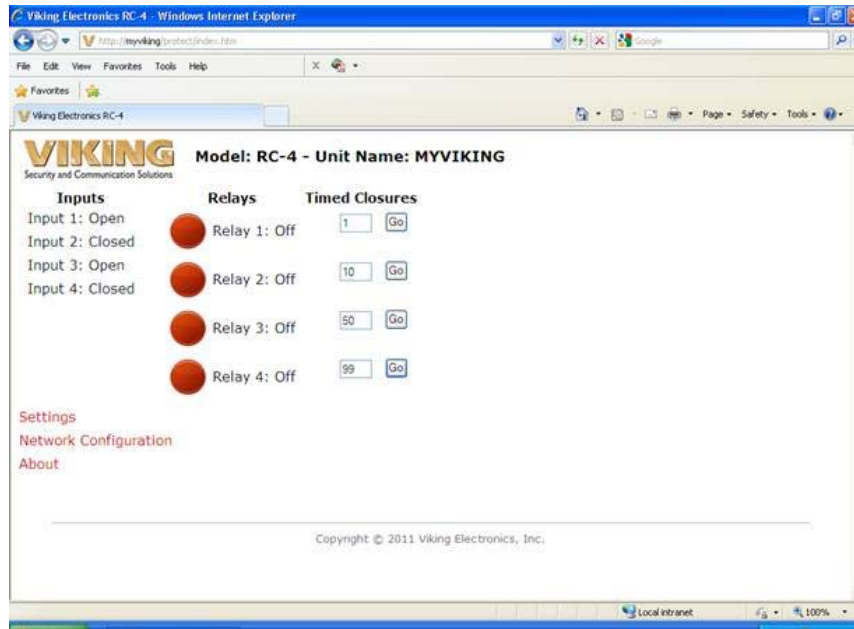
To toggle Relay 1 back off, click on the green circle, it changes to red, and Relay 1 turns off.

To activate a timed closure, click on the "Go" button next to the relay. The closure is activated for the number of seconds shown in the box.

In the picture below, all four relays have had timed closures activated. Relays 1 and 2 had short closures and have already returned to the Off state. Relays 3 and 4 had longer times programmed and are still in the On position. When their times are up, they will return to the Off position.



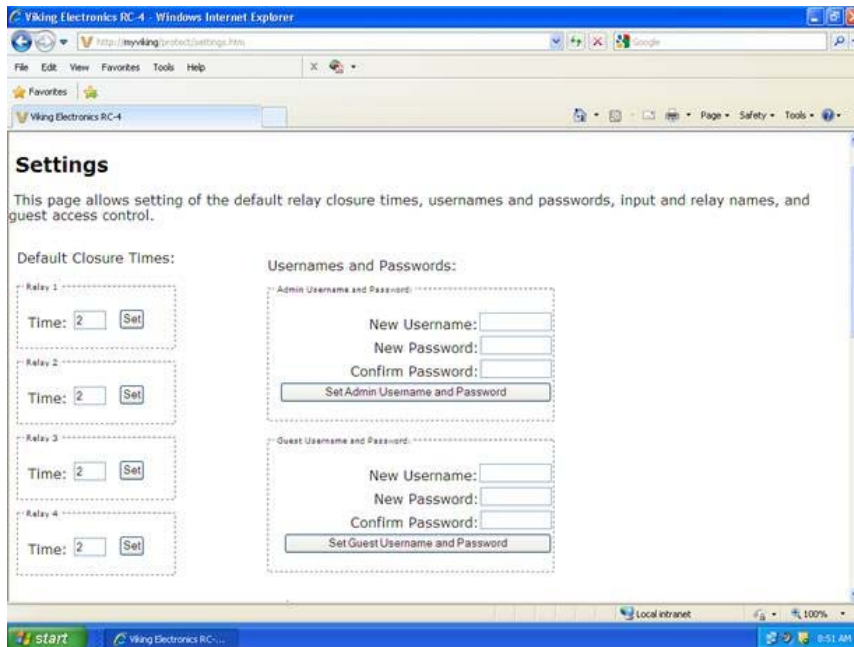
The **RC-4** also provides a status indication for the four inputs on the terminal block. In the pictures, inputs 1 and 3 are shown as Open and inputs 2 and 4 are shown as Closed. This indication is constantly refreshed so that the status indication is always current.



Programming

A. Settings Page

From the main page, click on “Settings”. The settings page appears.



1. Setting Default Closure Times

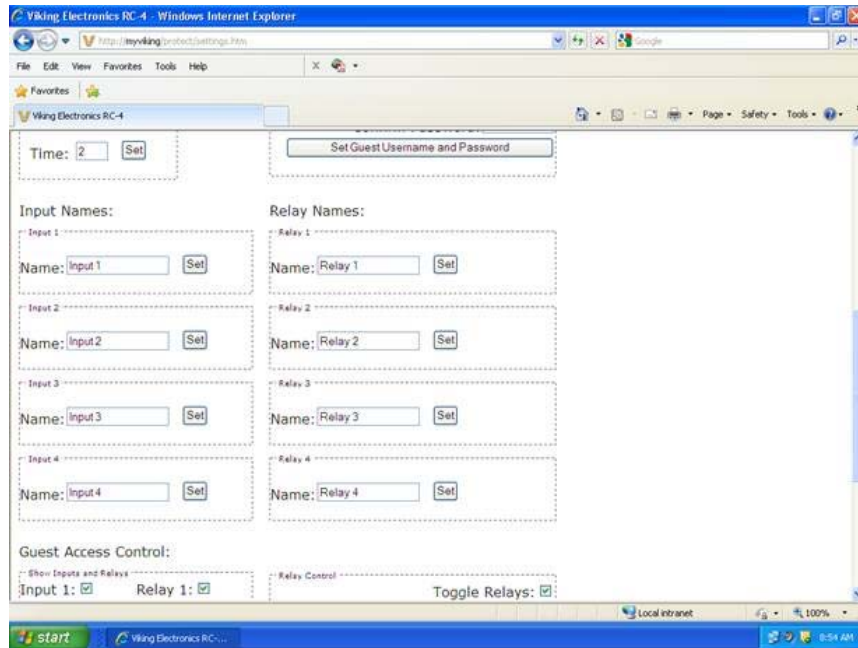
On the left side of the page are the default relay closure times. The time shown in the box next to a relay is the time that relay remains activated when the “Go” button is clicked. Note that these times can be overridden by entering another value in the box and clicking on “Go”. The next time the Main Page is activated, however, the default time value will appear again in the box. It is this time value that is being set on the Set Defaults page. To change a time value, enter the new time and click “Set” for that button. The **RC-4** accepts whole integer values from 1 - 99, corresponding to closure time in seconds.

2. Changing Username and Password

To change username and password, enter the new values and click on “Set Admin Username and Password” or “Set Guest Username and Password”. Permitted characters are upper and lowercase alphabet (case sensitive), numbers and the underscore character. 1 - 10 characters are permitted. When you click on the button, the **RC-4** stores the change and offers a link to the Main Page. If the Administrator username and password were changed, the browser’s username/password dialog comes up again to allow re-authentication with the new values.

3. Customizing Input Names and Relay Names

In the middle of the settings page are textboxes for changing the Input Names and Relay Names. Just enter new names and click on the “Set” button. There is room for up to 16 characters, with permitted characters including upper and lowercase alphabet, numbers, spaces, and the underscore character.

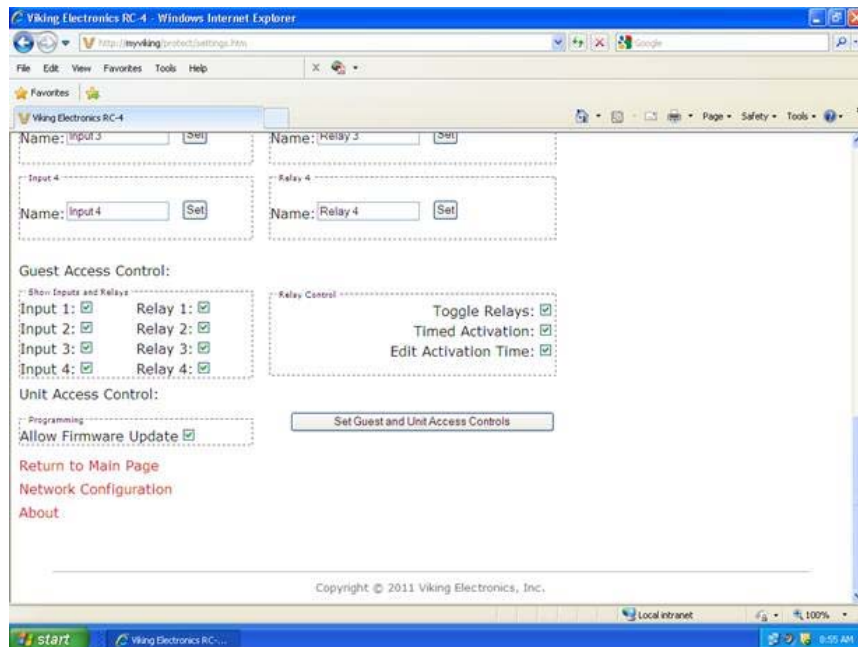


4. Guest Access Control

Near the bottom of the Settings page is a series of checkboxes to allow precise control of which functions are allowed or which icons are displayed when the user is logged in as a Guest. These limitations apply only to the Guest login; users logged in as Administrator retain full privileges and functionality.

The Show Inputs and Relays group lets you select which inputs or relays appear on the main page. If an input or relay is checked, it appears on the main page, and if not, it is hidden and does not appear.

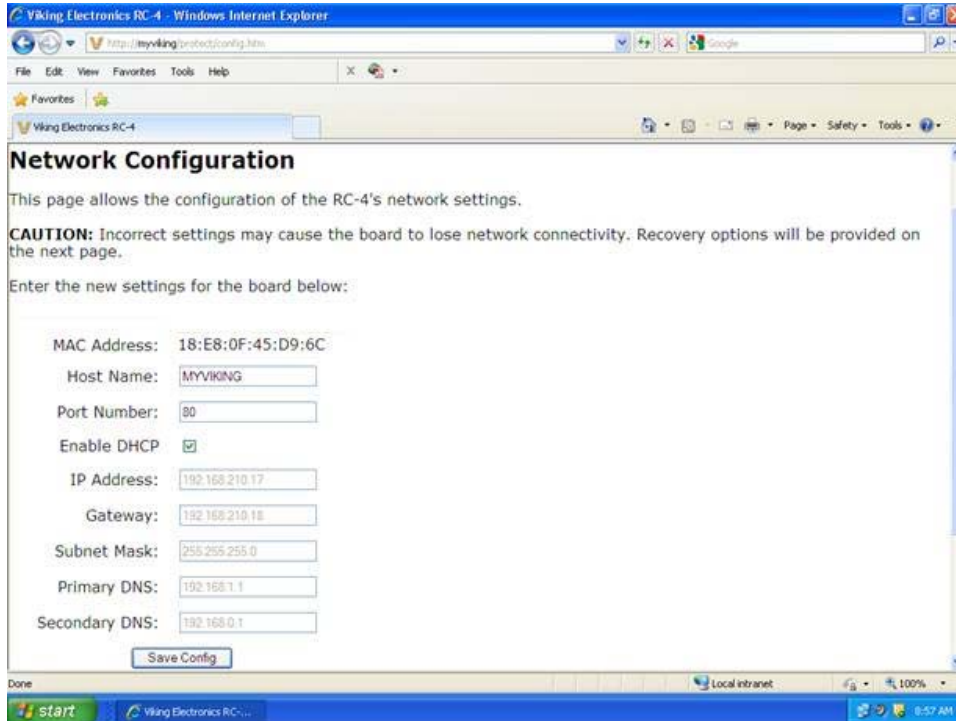
The Relay Control group allows selective control of relay functions when the user is logged in as a Guest. A function is allowed if checked and blocked if not.



5. Firmware Updates

At the bottom of the Settings page is a checkbox for allowing firmware updates for **RC-4** firmware downloaded from Viking’s website. By default, firmware updates are allowed, but the box can be unchecked to prevent changes to the firmware as an additional security precaution.

B. Network Configuration Button



From the main page, click on “Network Configuration”. The Network Configuration page appears.

The following items are displayed:

MAC Address: This is for display only, since the MAC address cannot be changed.

Host Name (Unit Name): The current host name appears in this box. The default host name, MYVIKING, can be changed to provide a more user-specific name or to distinguish between multiple **RC-4**'s installed on the same network. The host name can be 1-15 characters long, must begin with a letter, is not case-sensitive and can include the underscore character.

Port Number: This should be left set to 80.

Enable DHCP: With the Enable DHCP box checked, all of the addresses below and the subnet mask are greyed out because they have already been fixed by the DHCP server. Unchecking the DHCP box disables DHCP and makes it possible to set the addresses manually in order to use a static IP address. These changes should only be made by a qualified network administrator.

IP Address

Gateway

Subnet Mask

Primary DNS

Secondary DNS

To save network configuration changes, click on “Save Config”. The Reboot page appears, and the **RC-4** makes the changes, reboots, and displays the host name. Reconnection instructions are offered in the event the configuration changes resulted in a loss of connection.

Troubleshooting

Here are some suggestions if you are unable to connect with the **RC-4** webpage.

Check that the **RC-4** has power (Status LED should be lit).

Check that the network cable is OK.

Power up the **RC-4** and connect it to the network.

Run the Microchip TCPIP Discoverer.

Does the **RC-4** show up on the display?

NO Return the unit to defaults (Installation C. DIP switch programming, Switch 3)

Try the Microchip TCPIP Discoverer again

Does the **RC-4** show up on the display?

NO Call Tech Support (see below).

YES

Find the line the **RC-4** is on and double-click on it.

Do you connect with the **RC-4** webpage?

NO Call Tech Support (see below).

YES

At this point, you can connect to the website by manually typing in the IP address shown in the Microchip TCPIP Discoverer window and connecting in the future by clicking on the address in the browser history, or by saving the website as a browser favorite. Do you want to do this?

YES Done

NO

The other way to access the **RC-4** page is to type in the host name in the address window. Try each of these items, and then try connecting using the **RC-4** host name.

Clear the browser cache

From the command prompt in Windows, enter "nbtstat -R" to clear the hostname cache

Edit the hosts file of your PC to include the RC-4 hostname

In Windows XP, Vista, and 32-bit Windows 7, the path to the hosts file is

C:/Windows/System32/drivers/etc/hosts

and in 64-bit Windows 7 it is

C:/Windows/Syswow64/drivers/etc/hosts

Follow the directions in the file for adding a host, entering the IP address of the **RC-4** in place of the sample IP address and "myviking" in place of the sample host name "localhost".

If you have not done so already, try returning the unit to defaults (Installation C. DIP switch programming, Switch 3).

If none of these suggestions help, it will be necessary to call tech support.

TO CALL TECH SUPPORT: Call 715-386-8666 M-F 8:00 AM to 5:00 PM CST

Product Support Line...715.386.8666

Fax Back Line...715.386.4345

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