

Appendix IP

Integrated IP Interface Option

Revision: 4 January 2006, software version 1.55

1.1 Appendix Organization

This appendix describes the additional functions provided by the RC3000's integrated IP interface option and is provided as a supplement to the baseline RC3000 manual. The corresponding paragraphs in the baseline RC3000 manual are referred to when data specific to the Integrated IP Interface option is described.

1.2 Software Configuration

The Integrated IP interface option provides the ability to control the RC3000 via the internet. This feature is designated as one of the remote control options of the RC3000:

Remote Control Option Designation	Monitor and Control Software Enabled (via serial port)	ANTENNA SAFETY INTERLOCK option	IP INTERFACE Enabled
N			
O		YES	
P	YES	YES	
R	YES		
I			YES
J		YES	YES

The software containing the IP interface feature would therefore be designated as either RC3K-ab-xy**I** or RC3K-ab-xy**J**.

1.3 IP Interface Overview

The IP Interface Option provides internet accessible control of the RC3000 through a web browser. This option is mechanized by an additional card placed inside the RC3000. The card provides an Ethernet interface at the back of the controller and communicates with the rest of the RC3000 via an internal serial port.

The main program running on the IP interface card provides a HTTP server that serves a web page containing a Java Applet. The Java Applet simulates the RC3000 front panel and communicates with the IP interface card via UDP to provide near realtime control of the RC3000. Another web page available allows for the programming of the IP interface address. The IP address may also be programmed via a RC3000 configuration screen.

2.0 Installation

2.1 Equipment Mounting

The IP Interface card is mounted internally to connectors J10 and J14 on the RC3000's analog board. Reference sheet 10 of the RC3KAN5 Analog Board schematics in the RC3000 user's manual.

2.2 Electrical Connections

When equipped with the IP Interface Option, a RJ-45 Ethernet connector is provided on backpanel connector J14. This connector follows standard RJ-45 pin definitions for Ethernet.

2.2.11 Remote Control

In order for the RC3000's digital board to communicate with the IP Interface card, the X1 through X5 positions of the J12 jumper on the analog board must be set to the -232 position. Also the J12 jumper must be set to the "RABBIT" position. If this option is purchased at time of manufacturing, the J12 jumpers will be placed in these positions.

NOTE: the IP Interface Option precludes the remote control of the RC3000 via the serial remote control port. The above jumper settings will disconnect the serial input from J11 to the RC3000's digital board. No connection should be made at J11 though as the output pin on J11 will reflect digital board to IP interface board communications.

3.0 DETAILED OPERATION

IP ADDRESSING

According to the configuration of the network the RC3000 is attached to, the IP address of the RC3000 may be programmed by changing the:

- IP Address
- Net Mask
- Gateway Address
- DNS Address
- HTTP Port
- UDP Port

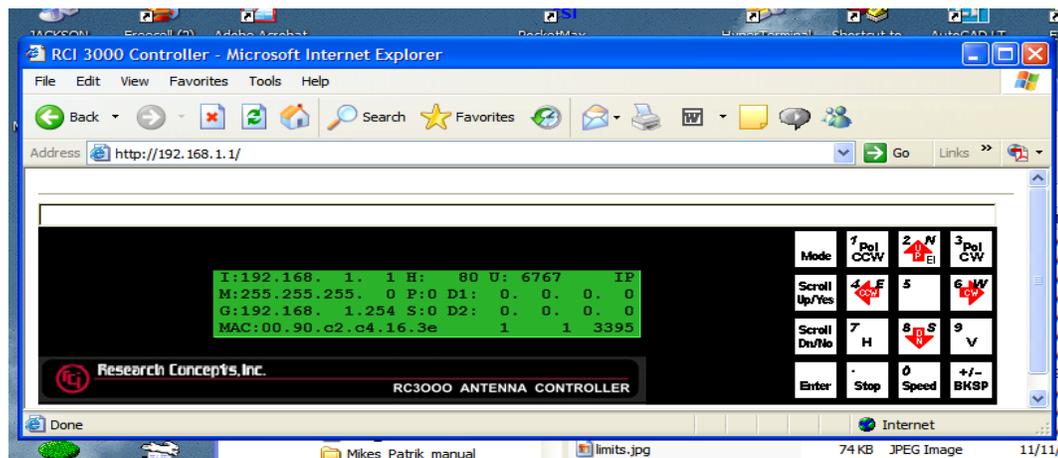
The RC3000 may also be programmed to automatically obtain an IP address from a DHCP server and/or obtain a DNS address from a DHCP server.

At power up, the IP interface board asks for addressing information from the RC3000 digital board. The IP addressing may be programmed either from the IP CONFIGURATION screen detailed in 3.3.1.3.15 of this appendix or from the configuration web page described in this section.

RC3000 FRONT PANEL WEBPAGE

When a web browser is pointed at the programmed IP address of the RC3000, a web page and applet are loaded at the browser. The applet connects back to the RC3000 via the defined UDP port (socket).

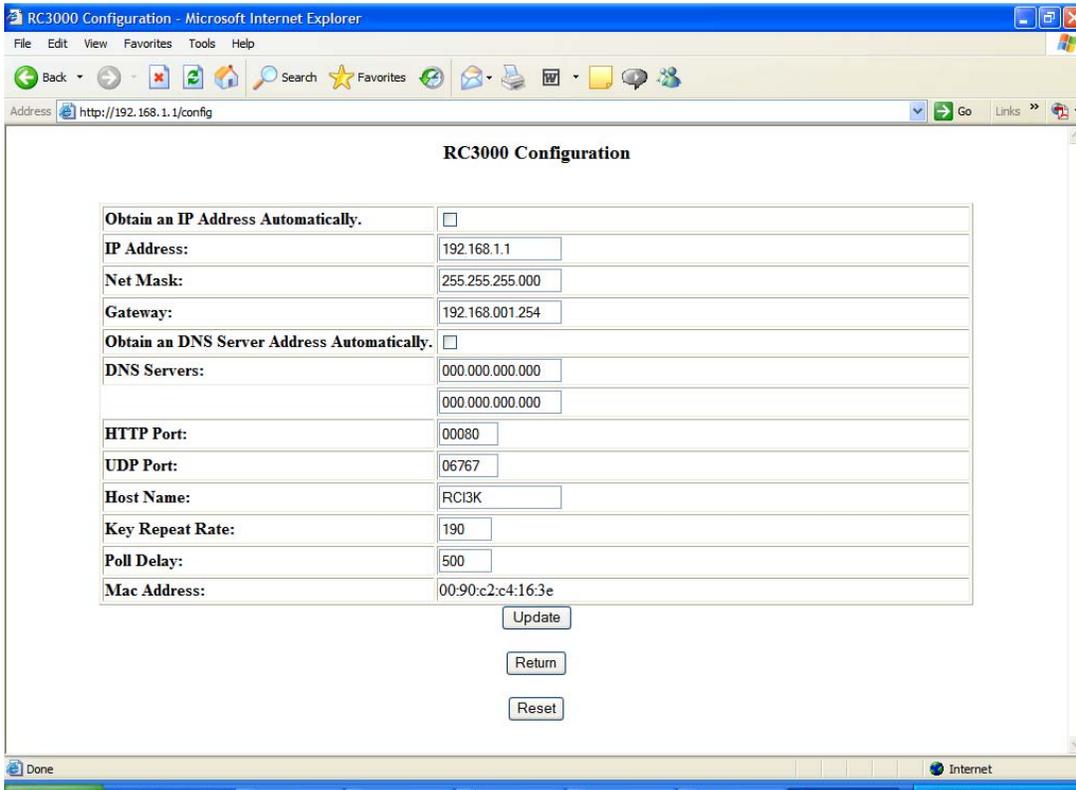
Once connected, a representation of the RC3000 front panel is displayed.



This screen mechanizes remote front panel control of the RC3000. Pressing keys on the screen performs the same action as if the keys were pressed on the front panel of the RC3000. The current content of the RC3000's display is periodically reflected to the display area of this screen.

IP CONFIGURATION WEBPAGE

When a web browser is pointed at "programmed_ip_address"/config, the following screen is loaded:



3.3.1.3.15 IP Programming Items

The IP Programming configuration screen allows the user to set the desired values for addressing from the RC3000 front panel.

NOTE: the IP interface card only requests this data from the digital board after it has gone through its power up routine. Therefore, to change the interface board's addressing, the RC3000 must be powered off and back on to get any updated addressing to the interface board.

The example screen below shows the default values stored in the RC3000.

```
I:192.168. 1. 1 H: 80 U: 6767 IP
M:255.255.255. 0 P:0 D1: 0. 0. 0. 0
G:192.168. 1.254 S:0 D2: 0. 0. 0. 0
IP ADDRS #1 <0-255>
```

As the user scrolls through each field a prompt describing the data item will appear on the bottom line of the display.

I: IP Address #1-4 <0-255>

M: Net Mask #1-4 <0-255>

G: Gateway #1-4 <0-255>

D1: DNS1 #1-4 <0-255>

D2: DNS2 #1-4 <0-255>

H: HTTP Port <0-65535>

U: UDP Port <0-65535>

P: DHCP IP <0-DISABLE 1-AUTO>

S: DHCP DNS <0-DISABLE 1-AUTO>

3.3.2.12 IP Maintenance

When the IP Interface Option is present, the MAINTENANCE screen (3.3.2 in user's manual) includes a selection for an IP Interface maintenance mode.

```

1-VOLTS    2-DRIVE    3-TIME    4-SIG MAINT
5-LIMITS   6-GPS COM  7-FG COM  8-MOVETO
9-FG CAL   0-SHAKE                    .-CI RECORD
^-IP                               Z1-GTRv1.55

```

Pressing the Scroll/Up key (^) from the MAINTENANCE menu moves the RC3000 into the IP maintenance mode screen. The main purpose of this screen is to reflect the current addressing from the IP Interface card. At RC3000 power up, the display values are all set to zero as shown below.

```

I:  0.  0.  0.  0 H:   0 U:   0      IP
M:  0.  0.  0.  0 P:0 D1:  0.  0.  0.  0
G:  0.  0.  0.  0 S:0 D2:  0.  0.  0.  0
MAC:00.00.00.00.00          0    0    0

```

Shortly after power up, the IP Interface card should send its current addressing to the RC3000.

```

I:192.168.  1.  1 H:   80 U: 6767      IP
M:255.255.255.  0 P:0 D1:  0.  0.  0.  0
G:192.168.  1.254 S:0 D2:  0.  0.  0.  0
MAC:00.90.c2.c4.16.3e      1    1    37

```

The user may use this screen to confirm that the IP Interface card has been correctly programmed.

When changes are made to the IP addressing via the configuration webpage, those changes will be reflected to this screen and the locally (within the RC3000 digital board) stored addressing values will be updated.

In the lower right corner of the display, three additional "sign of life" values are displayed:

- the leftmost value shows the number of requests for addressing from the IP interface board since power up. Within 10 seconds of power up, this value should be 1 to indicate that the interface board has requested programming information from the digital board.
- the middle value shows the number of times since power up that the interface board has reflected its addressing to the digital board. This value should also change to 1 shortly after power up. This number will also increment every time the interface board reflects changed addressing due to programming via the configuration webpage.
- the rightmost value shows the number of reflect_display requests from the interface board since power up. For normal operation, this value should increment every few seconds indicating the interface board is getting display information for updating the front panel webpage.