

APPENDIX OpenAMIP – External Modem

Last Revised: 25 March 2019

This appendix describes the additional functions provided by the RC4000's external modem option as implemented via the OpenAMIP protocol.

1 Introduction

1.1 Manual Organization

This appendix is provided as a supplement to the baseline RC4000 manual. The corresponding paragraphs in the baseline RC4000 manual are referred to when data specific to the external modem option is described.

1.2 RC4000 Features

This option provides the ability to automatically connect to the network via an external modem.

1.3 Software Overview

RC4000 software configuration is presented in the form RC4K-ab-vwxyz where ab-vwxyz represents: (Mount manufacturer/Model) **ab** (Navigation Sensor Option) **v** (Tracking Option) **w** (Remote Option) **x** (Internal Receiver Option) **y** (External Receiver Option) **z**

Software that has support for the external modem software will have a O (OpenAMIP) or a W (Newtec) in the External Receiver Option position.

2 Hardware

2.1 Boardset Devices

2.1.2 Electrical Interfaces

2.1.2.4 Options Board

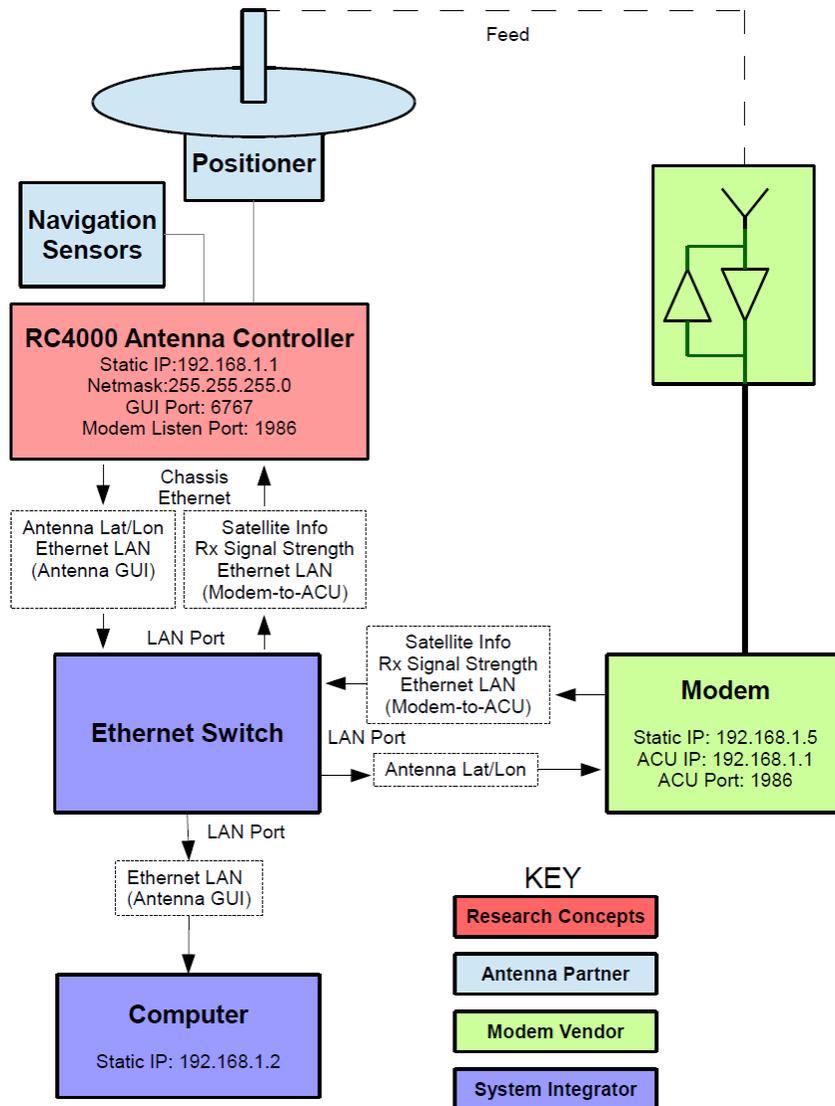
2.1.2.4.2 J14 – IP Reset

As stated in the baseline RC4000 manual, when an IP reset is performed, the IP address will be reset to 192.168.1.1. If the IP settings were changed to work with the modem, please ensure to set the values back to the appropriate settings.

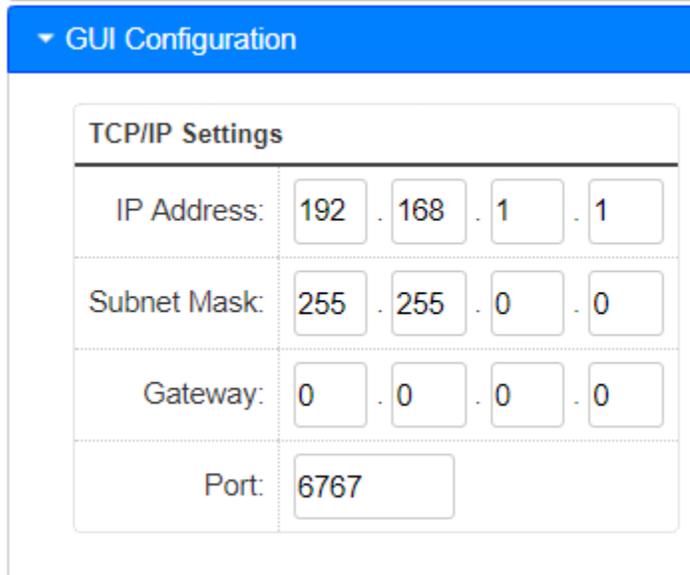
2.2 External Equipment

2.2.9 Chassis Modem Connections

The RC4000 can also be installed in a variety of chassis configurations that would include external ports. The modem will interface via a standard Ethernet cable to the Ethernet port on the chassis of the controller. Consult your enclosure specific appendix (Appendix C) for guidance on which port will be used for Ethernet. For reference, the following image shows a diagram for how the modem would connect to the Ethernet port on the RC4000 controller in a chassis.



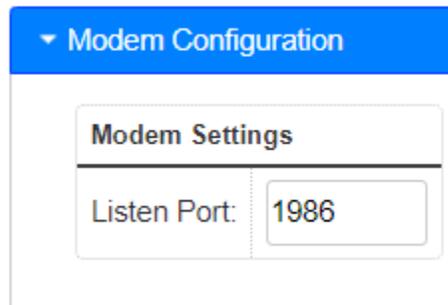
When configuring the IP address of the ACU and modem, it is important that they are both placed at an IP address that is within the subnet mask range of the ACU. The default TCP/IP settings for the ACU are shown in the image below.



The image shows a screenshot of a web-based configuration interface. At the top, there is a blue header with a dropdown arrow and the text "GUI Configuration". Below this header is a white box titled "TCP/IP Settings". Inside this box, there are four rows of configuration fields:

TCP/IP Settings							
IP Address:	192	.	168	.	1	.	1
Subnet Mask:	255	.	255	.	0	.	0
Gateway:	0	.	0	.	0	.	0
Port:	6767						

On controllers that have the OpenAMIP software option, there will be an additional dropdown to allow the user to configure the modem listen port. The default modem listen port is shown in the image below.



The image shows a screenshot of a web-based configuration interface. At the top, there is a blue header with a dropdown arrow and the text "Modem Configuration". Below this header is a white box titled "Modem Settings". Inside this box, there is one row of configuration fields:

Modem Settings	
Listen Port:	1986

The modem will then need to be configured to talk to the ACU at the ACU IP address and modem listen port. There should be no need to change either the GUI port or the Modem Listen Port. However, if these ports are already in use in a system, the installer should take care to ensure that they are not using the same port.

3 Software

3.2 Operating Group

3.2.1 Manual Mode

In the baseline RC4000 manual it lists SS1, SS2, and RF as possible signal strength options that can be displayed. Software that has the modem option will have REM signal strength, indicating a signal strength being provided via Ethernet. The signal strength will be 0 when the controller is communicating with the modem, but is not receiving any signal from the satellite. If the controller is not communicating with the modem the signal strength will display ****. When the controller is communicating with the modem and the modem is on the satellite the signal strength will be displayed as an integer greater than 0. The signal strength will correspond to the receive power being reported by the modem.

3.2.2 Menu Mode

3.2.2.3 Locate

Note: When the modem enters the network after satellite acquisition, the controller momentarily may lose communication with the modem and display a signal strength of **. This is normal operation and is expected.**

In addition to the LOCATE functions described in the RC4000 baseline manual, software with the external modem option will have an initial step in the locate process.

When using the external modem software, the modem will tell the controller what satellite to locate. When this occurs you will see the following screen.

```

LOCATE
REMOTE: WAITING FOR SATELLITE...

<MODE>EXIT

```

The modem will then provide the correct satellite for the current location of the antenna. Please note that this may change based on data from the modem, but the modem will always provide the correct satellite. Once the satellite information has been provided the following screen will appear.

```

POS:      38°56N  94°44W  180.0   LOCATE
SAT:115.0W      115.0W      AZ: 30.1
                                     EL: 40.2
<1>SELECT NEW SAT      READY TO LOCATE

```

Note that if the external modem is the only locate source on your controller, the SELECT NEW SAT option should not be used. In this case the satellite from the modem should always be used.

3.2.2.3.1 Satellite Selection

On antennas that have only the modem as a locate source, this option should not be used.

3.2.2.3.2 LOCATE Automatic Movement

Note: When the modem enters the network after satellite acquisition, the controller will momentarily lose communication with the modem and display a signal strength of **. This is normal operation and is expected.**

In the baseline RC4000 manual the option to choose the polarization prior to a LOCATE is discussed. For controllers with the external modem software option, this step will be skipped and the movement to the start of the scan will begin.

3.2.2.4 Store

This option is not available on the external modem software.

3.2.2.5 Recall

This option is not available on the external modem software.

3.2.2.6 Delete

This option is not available on the external modem software.

3.2.2.8 Settings

In addition to what is discussed in the RC4000 baseline manual, the external modem will have REM as a locate source. This will be selected by default and should not be changed on antennas that have only the external modem as a locate source.

3.3 Programming Group

3.3.1 Configuration Mode

3.3.1.1 Normal Access Items

3.3.1.1.3 Preset Satellites

When using an external modem as a locate source, the preset satellite list will not be used. Instead the modem will provide the appropriate information to the controller.

3.3.1.2 Installation Access Items

3.3.1.2.8 Autopeak

In addition to the items described in the RC4000 baseline manual, the external modem software option will allow for the selection of REM as a locate source. This option will be selected by default and should not need to be changed.

3.3.1.2.9 Remote Sig Factors

This screen will only be available on controllers with the external modem software option and covers the configuration items for the external modem.

```
                                CONFIG-REM
THRES: 100      TIME:1.0
SCAN RG: 30     SRCH AZ: 3   SRCH EL: 3
MINIMUM SIGNAL THRESHOLD <0-4095>
```

THRES: MINIMUM SIGNAL THRESHOLD <0-4095>

The threshold item defines what the minimum signal strength indication from the modem is required for the LOCATE system to “recognize” that a satellite is present.

TIME: LOCK TIME <0.1 – 9.9> SECONDS

This item defines how long the RC4000 will wait after each step before sampling signal strength. Increasing this value may be required to allow the modem to provide a signal strength output.

SCAN RG: SCAN RANGE <1-30 DEGREES>

This item defines how many degrees to either side of the nominal azimuth target the controller will scan during the LOCATE operation.

SRCH AZ: SPIRAL SEARCH AZIM LIMIT <1 – 20 DEGREES>**SRCH EL: SPIRAL SEARCH ELEV LIMIT <1 – 15 DEGREES>**

These items would only be used for satellites that are in inclined orbits.

4 Support

4.2 Troubleshooting

4.2.7 External Modem

This troubleshooting section is in addition to what is listed in the RC4000 baseline manual and is specific to the external modem software.

- **Unable to connect to the RC4000 Antenna Controller from PC**
 - Verify the following on the RC4000
 - RC4000 is powered on
 - RC4000 is connected via Ethernet cable to the network switch
 - Static IP address set to 192.168.1.1
 - Netmask set to 255.255.255.0
 - Verify the following on the Network Switch
 - Network Switch is powered on
 - All cables are connected
 - Verify the following on the PC
 - Computer is powered on
 - Computer is connected via Ethernet cable to the network switch
 - Static IP address is set to 192.168.1.2
 - Netmask set to 255.255.255.0

- **Unable to connect to external modem from PC**
 - Verify the following on the modem
 - Modem is powered on
 - Modem is connected via Ethernet cable to the network switch
 - Static IP address is set to 192.168.1.5
 - Netmask set to 255.255.255.0
 - Verify the following on the Network Switch
 - Network Switch is powered on
 - All cables are connected
 - Verify the following on the PC
 - Computer is powered on
 - Computer is connected via Ethernet cable to the network switch
 - Static IP address is set to 192.168.1.2
 - Netmask set to 255.255.255.0

- **No communication between modem and RC4000 Antenna Controller**
 - Verify the following on the RC4000
 - RC4000 is powered on
 - RC4000 is connected via Ethernet cable to the network switch
 - Static IP address set to 192.168.1.1
 - Netmask set to 255.255.255.0
 - GUI Port set to 6767
 - Modem Listen Port set to 1986
 - Verify the following on the Network Switch
 - Network Switch is powered on
 - All cables are connected
 - Verify the following on the modem
 - Modem is powered on
 - Modem is connected via Ethernet cable to the network switch
 - Static IP address is set to 192.168.1.5
 - ACU IP address is set to 192.168.1.1
 - ACU port is set to 1986