



Commands Reference Manual for FH915/FH2400 radio modems

Part Number xxxx

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ABOUT THIS MANUAL

Welcome to the FH915/2400 Commands Reference Manual!



This manual provides a complete list of the commands applied to the Frequency-Hopping Spread Spectrum radio modem family with 915 MHz and 2400 MHz frequency bands. It describes the syntax for each command and functions they perform. Also this reference contains examples of the use of the commands.

Symbols and typographic conventions

The information in this manual complies with several typographic conventions to make reading the material easier. Table below specifies all the text styles used in this manual.

Text format	Description
The <i>set</i> command...	This format is used in definitions or when it is necessary to emphasize that the marked term is technical jargon
Select the Send Text File item...	Titles of dialog windows/boxes, names of menu options and other GUI components
Type the baud rate 115200	This format is used to enter various string information (e.g., a baud rate) as well as operator commands

Also, in this manual you will find two levels of special visual cues to certain types of information. These symbols are given in the following table.

Graphic element	Explanation
	Vital information about the current topic that the user is recommended to take note
	This symbol describes the sequence of steps that the user must take

Screen Captures

This manual includes sample screen captures. Your actual screen can look slightly different from the sample screen due to the settings you have specified. This is normal and not a cause for concern.

Using This Manual

The contents of this manual are organized into the following two chapters:

Chapter One: Preliminary Considerations

- tells the user about the steps he/she should perform before using these commands.

Chapter Two: Using Radio Modem Commands

- gives information about how to enter commands through a command line. Also, this chapter describes the purpose and format of each command and provides examples of how one can use the commands.

Supplemental Manuals

Once you have a TPS receiver with embedded FH915 or FH2400 radio modem, you will need to supplement this manual with the manual that is written specially for the receiver you have purchased.

Technical Support

Occasionally, users encounter problems during the using of the FH radio modem. Should you have any problems with this device or the usage of the commands described in this document, please contact TPS Customer Support.

To get in contact with TPS Customer Support, please use the following e-mail addresses:

hardware@topconps.com or support@topconps.com.

PRELIMINARY CONSIDERATIONS

Before you begin configuring your radio modem with the commands, you should become aware of the steps required to gain access to the radio modem.

In This Chapter

This chapter includes the following topics:

Enabling Daisy Chain	2
Disabling Daisy Chain	7

Enabling Daisy Chain

To completely understand why one needs to activate *Daisy Chain*, some background information is needed. The radio modem embedded into your receiver and a device (PC, handheld, etc.) through which you are going to configure the modem are not directly connected but are both connected to your receiver via different serial ports. In this way, you are able to establish a communication link between the modem and a control device through the receiver using Daisy Chain mode. After you set up Daisy Chain between the two receiver's ports connected with the modem and the control device, respectively, your control device will be able to manage the modem.

Below is the list of commands need to be issued to access your radio modem.

```
#OFF#
%%set,cur/term/echo,/dev/null
%%set,cur/term/imode,cmd
%%dm,dev/ser/c
%%set,dev/ser/c/rate,57600
%%set,dev/ser/c/echo,/dev/null
%%set,dev/ser/c/imode,echo
%%set,dev/ser/c/echo,/cur/term
%%set,cur/term/eoff,"#OFF#"
%%set,cur/term/imode,echo
%%set,cur/term/echo,/dev/ser/c
```



In this list the baud rate of the modem's serial port is 57600. If your modem uses the baud rate other than 57600, replace 57600 with the value appropriate to your modem's port. Refer to the modem/fh/brport parameter on page 12 for information about the baud rates supported by the FH modem

To make it easier and faster for you to enter the above commands, save them into one ASCII file. It can be done by using any text editor, for example, Notepad.




Before activating Daisy Chain please refer to the next topic to learn how to bring the ports back to command mode



Currently there is a limitation to the daisy chaining support: It is strongly recommended that you do not use PC-CDU's terminal (i.e., the Manual Mode window) for sending the commands, documented above, to the receiver. You should use a communication program like HyperTerminal which comes with Microsoft Windows.



To enable Daisy Chain using HyperTerminal, take the following steps:

- Step 1. To open HyperTerminal, click Windows **Start** menu () , point to **Programs**, and then choose **Accessories ► Communications ► HyperTerminal**. Alternatively, you can enter `hypertm.exe` in the Windows **Run** menu to start the program.
- Step 2. The **Connection Description** window appears. Type in a name for the connection (for example, `Modem connection`) in the **Name** field and select an icon to symbolize your connection type (see Figure 1-1). Click **OK**.

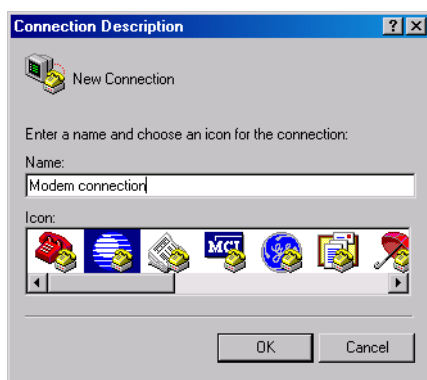


Figure 1-1. Connection Description window

Step 3. The **Connect To** window will appear. From the **Connect using** drop down list, select COM# (where # is the computer serial port your receiver is connected to) and then click **OK** (Figure 1-2).



Figure 1-2. Connect To window

Step 4. The **COM# Properties** window appears. Verify the settings on the **Port Settings** tab. They should be as follows:

- **Bits per second** - 115200
- **Data bits** - 8
- **Parity** - None
- **Stop bits** - 1
- **Flow control** - None

Click **OK** (Figure 1-3).

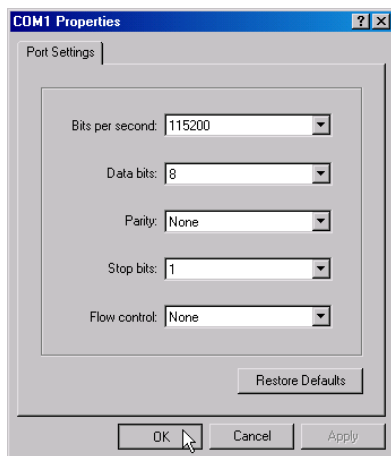



Figure 1-3. COM# Properties window

Step 5. The **Main HyperTerminal** window brings up. Click **File ► Properties** to go to the **Properties** window, or alternatively click on the  icon. Then select the **Settings** tab and finally click the **ASCII Setup** button (see Figure 1-4).

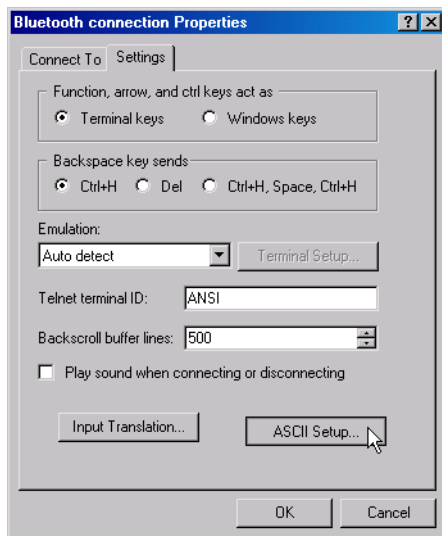


Figure 1-4. Properties - Click ASCII Setup

Step 6. On the **ASCII Setup** window, select the **Echo typed characters locally** and **Wrap lines that exceed terminal width** check boxes and then click **OK** (see Figure 1-5).

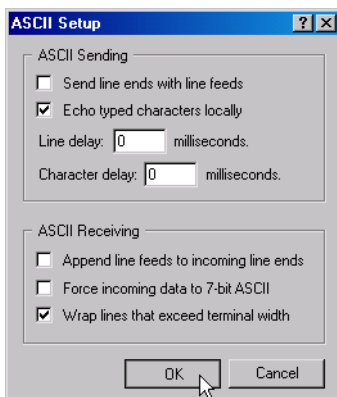


Figure 1-5. Select necessary settings and click OK.

Step 7. Click **OK** on the **Properties** window to return to the **Main HyperTerminal** window.

Step 8. From the **Main** window, select **Transfer ► Send Text File**. The **Send Text File** window will appear. Navigate to the location of the file that contains the commands enabling Daisy Chain. Highlight the appropriate file and click **Open**.

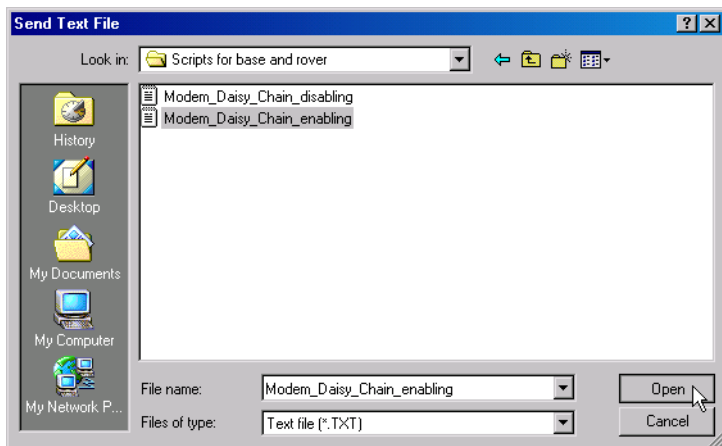
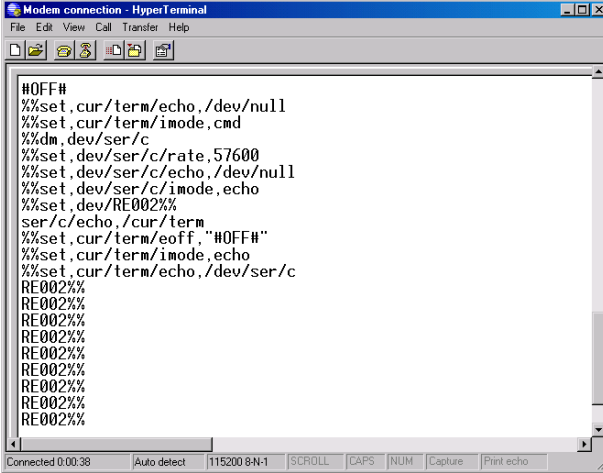


Figure 1-6. Send Text File window - Enable Daisy Chain

The commands will output to the receiver (Figure 1-7).



```
#OFF#
%%set,cur/term/echo,/dev/null
%%set,cur/term/imode,cmd
%%dm,dev/ser/c
%%set,dev/ser/c/rate,57600
%%set,dev/ser/c/echo,/dev/null
%%set,dev/ser/c/imode,echo
%%set,dev/RE002%%
ser/c/echo,/cur/term
%%set,cur/term/eoff,"#OFF#"
%%set,cur/term/imode,echo
%%set,cur/term/echo,/dev/ser/c
RE002%%
RE002%%
RE002%%
RE002%%
RE002%%
RE002%%
RE002%%
RE002%%
RE002%%
RE002%%
```

Figure 1-7. Daisy Chain activated

Once the output is complete, you can configure the radio modem using the commands described in Chapter II on page 9.

Disabling Daisy Chain

After you have made the necessary changes in the radio modem, you should return the receiver's ports which are currently in Daisy Chain mode to Command mode.



It can be done by following these steps:

Step 1. Save the commands that follow into an ASCII file (for example, `Modem_Daisy_Chain_disabling`).

```
#OFF#
%%set,cur/term/echo,/dev/null
%%set,cur/term/imode,cmd
%%set,dev/ser/c/echo,/dev/null
%%set,dev/ser/c/imode,cmd
```

Step 2. From the **Main** window of the HyperTerminal program, select **Transfer ► Send Text File**. The **Send Text File** window will appear. Navigate to the location of the file

that contains the commands disabling Daisy Chain. Highlight the appropriate file and click **Open** (Figure 1-8).

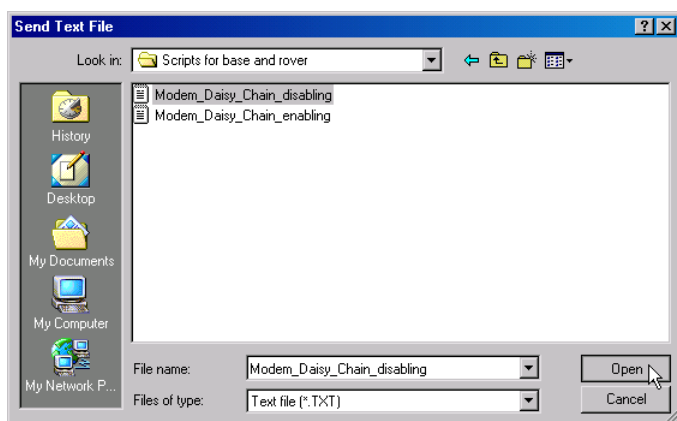


Figure 1-8. Send Text File - Disable Daisy Chain

The commands will start outputting to the receiver. Once the output is complete, the receiver's ports will return to Command mode (Figure 1-9).

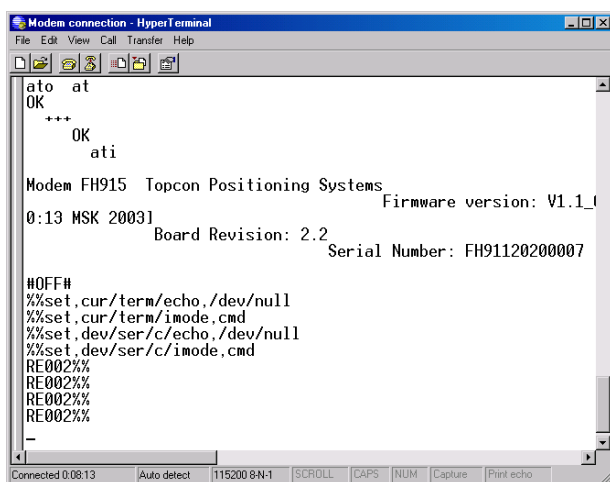


Figure 1-9. Daisy Chain deactivated

CHAPTER II

USING RADIO MODEM COMMANDS

This chapter lists all the commands used to configure your radio modem and also describes how to employ them. The commands are arranged alphabetically.

In This Chapter

This chapter contains the following topic:

Commands Reference	10
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Commands Reference

This chapter goes into the details of the format of the commands used by the operator to change/query a variety of modem settings. Please bear in mind the following rules when sending the commands to your radio modem:

- 1. Press <Enter> after each command. The exception is +++, which does not require <Enter>.
- 2. All responses to the commands end with <CR><LF> characters. The exception is the response to ATI, which ends with <CR><LF><LF>.
- 3. Putting the %% characters immediately before the command will cause the modem to generate reply which indicates whether the command is accepted or not. Do not use %% before the +++, ATI, and ATO commands.

+++

This command switches your modem from the operating mode to the command mode. Use the command mode to adjust various modem settings.

Structure	+++
Reply	OK - positive acknowledgment

ATI/ati

This command shows the information about the radio modem. This information includes: modem name, modem firmware version, board revision, and serial number. The command is not case sensitive.

Structure	ATI
Example	ati or ATI
Reply	A log containing information about the modem - positive acknowledgment Error in Command - negative acknowledgment

ATO/ato

This command is used to revert the modem to the operating mode. This command is not case sensitive. When the modem is in the operating mode, the only command it recognizes is +++.

Structure	ATO
Example	ato or ATO
Reply	OK - positive acknowledgment, Error in Command - negative acknowledgment

modem/fh/base

With this command the user assigns the operating channel number to the modem. It allows the use of up to five simultaneously transmitted radio modems on your jobsite without interference between them.

Structure	set,modem/fh/base,N, where N is the channel number, from 1 to 5. print,modem/fh/base
Example	set,modem/fh/base,1 - specify the operation channel number print,modem/fh/base - queries the channel number that is currently being used by your radio modem
Reply to set	%%OK -> base=N - positive acknowledgment, where N is the channel number Error in Command - negative acknowledgment. This reply indicates that the command has been typed incorrectly. Error in Argument - negative acknowledgment. This shows that the argument is not correct.
Reply to print	base=N - positive acknowledgment, where N is the channel number Error in Command - negative acknowledgment

modem/fh/brport

This command is used to specify the baud rate of the modem's serial port.

Structure	<code>set,modem/fh/brport,N</code> , where N is a number between 1 and 4. Each number corresponds to a particular baud rate: 1 stands for 57600 baud, 2 stands for 38400, 3 stands for 19200, 4 stands for 9600 <code>print,modem/fh/brport</code>
Example	<code>set,modem/fh/brport,1</code> - assigns the baud rate of the modem's serial port to 57600. <code>print,modem/fh/brport</code> - queries the current baud rate
Reply to set	<code>%%OK -> brport=M</code> - positive acknowledgment, where M is the current baud rate Error in Command - negative acknowledgment Error in Argument - negative acknowledgment
Reply to print	<code>brport=M</code> , where M is the current baud rate Error in Command- negative acknowledgment

modem/fh/power

This command specifies the radio transmission power of the modem, in watts. Currently there are two transmit power levels available: 250 mW and 1 W.

Structure	<code>set,modem/fh/power,N</code> , where N is 0 or 1. Zero stands for 1 W, unity stands for 250 mW. <code>print,modem/fh/power</code>
Example	<code>set,modem/fh/power,0</code> - assigns the transmit power level to 1 W <code>print,modem/fh/power</code>
Reply to set	<code>%%OK -> power=M</code> - positive acknowledgment, where M is the current power level Error in Command - negative acknowledgment Error in Argument - negative acknowledgment
Reply to print	<code>power=M</code> - positive acknowledgment, where M is the current power level Error in Command - negative acknowledgment

modem/fh/rcts

This command enables/disables RTS/CTS hardware flow control.

Structure	set,modem/fh/rcts,N, where N is 0 or 1. Zero stands for none (i.e., hardware handshaking is disabled), unity stands for RTS/CTS (i.e., hardware handshaking is enabled). print,modem/fh/rcts
Example	set,modem/fh/rcts,1 - activates RTS/CTS hardware handshaking print,modem/fh/rcts
Reply to set	%%OK -> rcts=M - positive acknowledgment, where M is the current hardware handshaking status Error in Command - negative acknowledgment Error in Argument - negative acknowledgment
Reply to print	rcts=M - positive acknowledgment, where M is the current hardware handshaking status Error in Command - negative acknowledgment

modem/fh/reset

With this command the operator resets the radio modem.

Structure	set,modem/fh/reset
Example	set,modem/fh/reset - performs the reset procedure
Reply	%%OK -> Reset - positive acknowledgment, the modem has been reset Error in Command - negative acknowledgment



After executing this command, the modem reverts to the operating mode. To put the modem in the command mode, type the +++ command

modem/fh/rlink

This commands allows the user to specify the rate at which data is transmitted over the RF link.

Structure	<code>set,modem/fh/rlink,N</code> , where N is a number between 0 and 4. 0 stands for 9600 baud, 1 stands for 12000 baud, 2 stands for 17000 baud, 3 stands for 24000, 4 stands for 51000. <code>print,modem/fh/rlink</code>
Example	<code>set,modem/fh/rlink,0</code> <code>print,modem/fh/rlink</code>
Reply to set	<code>%%OK -> rlink=M</code> - positive acknowledgment, where M is the current link rate Error in Command - negative acknowledgment Error in Argument - negative acknowledgment
Reply to print	<code>rlink=M</code> - positive acknowledgment, where M is the current link rate Error in Command - negative acknowledgment



The selection of 9600 baud provides the maximum reliability for data communication but it is achieved at the cost of reducing data throughput. If, for some reason, you need to have the maximum throughput, use 51000 baud, but please remember, that this link rate has the lowest reliability for data communication

modem/fh/type

This command specifies the mode in which the radio modem will be functioning. The FH modem supports three modes: **OFF** means that the modem is turned off, **Receiver** means that the modem is used for picking up the radio signals transmitted by the reference station's

modem, and **Transmitter** means that the modem broadcasts data to the rover modem(s).

Structure	set,modem/fh/type,N, where N is a number between 0 and 2. 0 stands for OFF, 1 stands for Receiver, 2 stands for Transmitter. print,modem/fh/type
Example	set,modem/fh/type,1 print,modem/fh/type
Reply to set	%%OK -> type=M - positive acknowledgment, where M is one of the modes Error in Command - negative acknowledgment Error in Argument - negative acknowledgment
Reply to print	type=M - positive acknowledgment, where M is one of the modes Error in Command - negative acknowledgment Error in Argument - negative acknowledgment

