CRFC

Comtech RF Control –Transceiver/Amplifier M&C Utility User Guide

Software Version 1.1.3

IMPORTANT NOTE: The information contained in this document supersedes all previously published information regarding this product. Product specifications are subject to change without prior notice.

Part Number MN-CRFC Revision 1

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Comtech RF Control –Transceiver/Amplifier M&C Utility User Guide

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PREFACE

About this Manual

This manual provides installation and operation information for Comtech EF Data's CRFC (**C**omtech **RF C**ontrol) software utility, used with the following Comtech EF Data RF products (for detailed operational information about each of these products, refer to the respective product's Installation and Operation Manual):

- CSAT-5060/-6070 C-Band Transceivers
- XSAT-7080 X-Band Transceivers
- KST2000A/B Ku-Band Satellite Transceivers
- HPOD (High-Power Outdoor) Amplifiers
- LPOD (Low-Power Outdoor) C-/X-/Ku-Band Outdoor Amplifiers / BUCs
- SPOD (Smart Power Outdoor) Amplifiers

Disclaimer

Comtech EF Data has reviewed this manual thoroughly in order to provide an easy-to-use guide to your equipment. All statements, technical information, and recommendations in this manual and in any guides or related documents are believed reliable, but the accuracy and completeness thereof are not guaranteed or warranted, and they are not intended to be, nor should they be understood to be, representations or warranties concerning the products described. Further, Comtech EF Data reserves the right to make changes in the specifications of the products described in this manual at any time without notice and without obligation to notify any person of such changes.

If you have any questions regarding your equipment or the information in this manual, please contact the Comtech EF Data Customer Support Department.

Reporting Comments or Suggestions Concerning this Manual

Comments and suggestions regarding the content and design of this manual are appreciated. To submit comments, please contact the Comtech EF Data Technical Publications Department:

TechnicalPublications@comtechefdata.com

Conventions and References

Warnings, Cautions, and Notes

A <u>WARNING</u> gives information about a possible hazard that MAY CAUSE DEATH or SERIOUS INJURY.

A <u>CAUTION</u> gives information about a possible hazard that MAY CAUSE INJURY or PROPERTY DAMAGE.

A <u>NOTE</u> gives important information about a task or the equipment.

A <u>REFERENCE</u> directs the user to additional information about a task or the equipment.

Trademarks

Product names mentioned in this manual may be trademarks or registered trademarks of their respective companies and are hereby acknowledged.

The user should carefully review the following information:

Safety and Compliance

The CSAT-5060 and XSAT-7080 transceiver prime power supply inputs use Neutral Fusing - Double pole / Neutral Fusing.

The CRFC software utility is used with equipment that has been designed to minimize exposure of personnel to hazards.

The operators and technicians must:

- Know how to work around, with and on high voltage equipment.
- Exercise every precaution to ensure personnel safety.
- Exercise extreme care when working near high voltages.
- Be familiar with the warnings presented in this manual.

Installation Guidelines Regarding Power Line Quality

Carefully review these installation guidelines to ensure a reliable installation. This information is derived from Comtech EF Data's extensive experience with the varying quality of the AC power grid around the world.

- **Surge suppression:** High voltage surges can cause failure of the power supply. These surges are typically caused by circuit switching on the main AC power grid, erratic generator operation, and also by lightning strikes. While the transceiver does have built in surge suppression, if the unit will be installed in a location with questionable power grid quality, Comtech EF Data recommends installation of additional power conditioning/surge suppression at the power junction box.

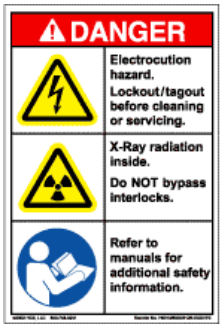
- **Grounding:** The transceiver provides a grounding terminal. This is provided to allow the user to ground the transceiver to the antenna's grounding network. All components installed at the antenna should be grounded to a common grounding point at the antenna.

- **Electrical welding:** If welding needs to take place at the antenna, disconnect all cables from the transceiver except for the ground wire. Cap all RF connections with terminations. This will prevent damage to the input/output circuitry of the transceiver.

- **Lightning:** Lightning strikes on or around the antenna will generate extremely high voltages on all cables connected to the transceiver. Depending on the severity of the strike, the transceiver's internal surge protection combined with the recommended external suppression may protect the transceiver's power supply. However, if the installation will be in an area with a high probability of lightning strikes, Comtech EF Data recommends the installation of surge suppression on the RF and IF cables.

For further information, contact the Comtech EF Data Customer Support Department.

Examples of Multi-Hazard Notices



Statement of RoHS Compliance

The RoHS (***R**estriction of **H**azardous **S**ubstances*) directive 2002/95/EC restricts the use of six hazardous materials found in electrical and electronic products.

Restricted materials are hazardous to the environment and pollute landfills, and are dangerous in terms of occupational exposure during manufacturing and recycling.

The Desktop or Laptop PC to be used as the delivery platform for CEFD's CRFC software utility should be certified to be free of the following substances mandated under RoHS: **lead (Pb)**, **mercury (Hg)**, **cadmium (Cd)**, **hexavalent chromium (Cr6+)**, **polybrominated biphenyls (PBB)** and **polybrominated disphenyl ethers (PBDE)**.

End User License Agreement

The following End User License Agreement (EULA) is considered to be accepted upon reading this manual for the first time:

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The CRFC Version 1.1.1 software installed herein is provided to you through Comtech EF Data Corporation ("CEFD"), for use exclusively with CEFD's CSAT-5060, CSAT-6070, XSAT-7080, HPOD, SPOD, and KST2000A/B RF products, sold separately. CEFD, the owner of the CRFC software, grants you a non-exclusive, non-transferable license to use CRFC Version 1.1.1 only for its intended purpose. This license includes, but is not limited to, the CRFC software Version 1.1.1, and any documentation files accompanying the software, and any on-line or electronic documentation (collectively, all of these things are "CRFC"), provided that: (i) CRFC is used only with the accompanying CEFD CSAT-5060, CSAT-6070, XSAT-7080, HPOD, SPOD, and KST2000A/B RF products; (ii) CRFC is NOT modified; (iii) all copyright notices are maintained on CRFC; and (iv) you agree to be bound by the terms of this EULA. Any future software upgrades to this 1.1.1 version of CRFC will be covered by either a "paid for" maintenance agreement with CEFD or as part of a "paid for" software upgrade. Software upgrades obtained from any source other than CEFD will be considered a license infringement, and will render your license to use CRFC void.

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9. Termination

This EULA is effective for so long as you own and operate the CEFD CRFC for its intended purpose with CEFD's CSAT-5060, CSAT-6070, XSAT-7080, HPOD, SPOD, and KST2000A/B RF products, sold separately. You may terminate this EULA at any time by destroying or returning to CEFD all copies of CRFC in your possession or under your control. CEFD may terminate this EULA for any reason, including, but not limited to, if CEFD finds that you have violated any of the terms or conditions of this EULA, including upgrading this software from a source other than CEFD. Upon receiving notification of termination by CEFD, you agree to return to CEFD all copies of CRFC and to certify in writing that all known copies, including backup copies, have been destroyed. All provisions relating to confidentiality, proprietary rights, and non-disclosure shall survive the termination of this CRFC EULA, and termination will in no event affect any liability or obligation which arose prior thereto.

10. Notice

All notices to CEFD shall be in writing and shall be made either via e-mail or conventional mail. Notices to CEFD must be sent to the attention of Customer Service at techsupport@comtechefdata.com, if by e-mail, or at Comtech EF Data Corporation, 2114 West 7th Street, Tempe, AZ 85821 USA if by conventional mail. Notices to you may be sent either to the e-mail address, or to the conventional mail address, if supplied to CEFD or posted as a notice on our Web site located at www.comtechefdata.com.

Any notices or communication under this EULA will be deemed delivered to the party receiving such communication (i) two business days after deposit with a commercial overnight carrier, with written verification of receipt; (ii) five business days after the mailing date, if sent by conventional US mail, return receipt requested; or (iii) on the delivery date if transmitted by confirmed e-mail.

11. General

This EULA shall be construed, interpreted and governed by the laws of the State of Maryland without regard to conflicts of law provisions thereof. Notwithstanding, the parties agree that none of the provisions in this EULA will be governed by the Uniform Computer Information Transactions Act ("UCITA") as enacted by the State of Maryland or any other jurisdiction. The exclusive forum for any disputes arising out of or relating to this EULA shall be an appropriate state court sitting in Montgomery County, Maryland, or a federal court sitting in the State of Maryland, USA. You may not transfer or assign this EULA or any of your rights or obligations hereunder to any third party. Any waiver or modification of this EULA shall only be effective if it is in writing and signed by both parties hereto. If any part of this EULA is held invalid or unenforceable, that portion shall be construed in a manner consistent with applicable law to reflect, as nearly as possible, the original intentions of the parties, and the remaining portions shall remain in full force and effect. This EULA shall constitute the entire Agreement between the parties hereto.

Getting Help

Review the End User License Agreement before contacting Comtech EF Data Technical Support or Customer Service.

Contacting Comtech EF Data

Contact Comtech EF Data for:

- ***Technical Support –*** Product support or training.
- ***Customer Service –*** Information on returning an in-warranty or out-of-warranty product for upgrade or repair. **Be prepared to provide the product model number and its serial number.**

Contact Comtech EF Data Customer & Technical Support during normal business hours (Monday through Friday, 8 A.M. to 5 P.M Mountain Standard Time (MST)):

For:		Contact:
CRFC Technical Support and Service	**Telephone**	**+1.480.333.4357**
	Email	**service@comtechefdata.com**
	Fax	**+1.480.333.2161**
Comtech EF Data Web Site	**Main Page**	**http://www.comtechefdata.com**
	Customer and Technical Support	**http://www.comtechefdata.com/support.asp**
	RMA (Return Material Authorization)	**http://www.comtechefdata.com/rmaform.asp**
Comtech EF Data Main Number		**+1.480.333.2200**
Mailing Address		**2114 West 7th Street Tempe, Arizona 85281 USA**

Returning a Product for Upgrade or Repair

Step	Task
1	Go to the Comtech EF Data **Service** page (http://www.comtechefdata.com/service.asp) and read the **Return Material Authorization** section in its entirety.
2	Request a Return Material Authorization Number: • *On the Comtech EF Data **Service** page:* Select the **Return Material Authorization** hyperlink. • *On the Comtech EF Data **Support** page: (http://www.comtechefdata.com/support.asp):* Click **[Send RMA Request]** (http://www.comtechefdata.com/rmaform.asp); • Fill out the RMA form completely; • Click **[Send Email]**. • ***Alternately:*** o Send an e-mail providing this same detailed information to Comtech EF Data Customer Service (**service@comtechefdata.com**). o Contact Comtech EF Data Customer & Technical Support by phone or fax.
3	Pack the product in its original shipping carton and protective packaging.
4	Ship the product back to Comtech EF Data. **Shipping charges should be prepaid.**

Chapter 1. INTRODUCTION

1.1 Overview

The CRFC (**C**omtech **RF C**ontrol) Transceiver/Amplifier M&C Utility is Windows-based software that permits M&C (monitor and control) of several Comtech EF Data (CEFD) transceiver and amplifier systems.

The transceiver and amplifier systems must have serial communications interfaces. The CRFC operates with standalone and 1:1 redundant systems. In this manual, these systems are known as RF equipment.

Use the CRFC to monitor and control the RF equipment:

- Monitor the alarm systems.
- Log any alarms that occur.
- Send remote commands to and receive remote query results from the Up and Down converters.
- Change the attenuator settings.

1.2 Minimum Operator Knowledge Requirements

YOU MUST:

- Know how to operate the RF equipment that you will use with the CRFC.
- Know how to operate the Windows-based computer that you will supply and use to host the CRFC software utility. In this manual, the computer is known as the PC.
- Read and understand the installation and operation manuals for this software utility and for each type of RF equipment that you will use with the CRFC.

1.3 Compatible CEFD RF Equipment

The RF equipment that is compatible with the CRFC is sold separately:

- **CSAT-5060 C-Band Transceivers:**
  - **5 to 25 Watt, 50 Watt, 100/125 Watt units**
- **CSAT-6070 C-Band Transceivers:**
  - **5 to 25 Watt, 50 Watt, 100/125 Watt units**
- **XSAT-7080 X-Band Transceivers:**
  - **5 to 25 Watt, 50 Watt, 100 Watt units**
- **KST-2000A/B Ku-Band Transceivers**
- **HPOD C-, X-, and Ku-Band Amplifiers**
- **SPOD C-, X-, and Ku-Band SSPAs (Solid-State Power Amplifiers)**
- **LPOD C-, X-, and Ku-Band Outdoor Amplifiers/Block Up Converters:**
  - **PS-1, PS-1.5, and PS-2 units**
- **AS/0490 Redundancy Switch Box**

1.4 Minimum Hardware and Software Requirements

You must supply the following items:

- Desktop or Laptop PC with serial COM port
- Microsoft Windows and .NET Framework 2.0 SP2 (Service Pack 2)

  Note that Microsoft Windows .NET Framework 4.0 is *NOT COMPATIBLE* for use with the CRFC, but may be co-installed on your PC with .NET Framework 2.0 SP2

- 9-pin to 19-pin / 26-pin Serial Adapter Cable

The CRFC operates on the PC. The serial adapter cable connects the COM port on the PC to the COMM/REMOTE port on the RF equipment.

The next chapter gives instructions on how to install and set up the CRFC.

Chapter 2. SETUP

2.1 Setup Overview

Do these steps to prepare the CRFC utility for use with the RF equipment:

1. Install the CRFC utility software on your PC.
2. Connect the adapter cable between the serial COM port on your PC and the COMM/REMOTE port on the RF equipment.
3. Energize the RF equipment.
4. Start the CRFC utility.
5. Complete the CRFC Initial Startup and Connection Configuration.

2.2 Required Items

The CD that contains the CRFC ".exe" file.
(Download the ".exe" file from the CEFD website as an alternative.)

This User Guide (CEFD P/N MN-CRFC)

PC or Laptop (User-supplied)

9-pin to 19-pin / 26-pin Serial Adapter Cable (User-supplied)*

*Each RF unit requires an applicable serial adapter cable (known hereafter as the adapter cable). If the adapter cable must be fabricated, refer to the RF unit product manual for the specified connector pinout data.

2.3 Installing the CRFC

To install or update the CRFC, copy the ".exe" file from the source to your PC.

2.3.1 Where to Get the CRFC

Get the CRFC from any of these sources:

- CD
- CEFD website download *
- E-mail *
- USB storage *

** Also get updates to the CRFC from this source.*

2.3.2 Copying the CRFC to the PC

Do these steps to copy the CRFC to the PC:

1. Create a working folder (or directory) on the PC. You may want to name the folder or directory "CRFC".
2. Copy the CRFC ".exe" file from the source to the working folder on the PC.
3. If the source is the CEFD website download, then do these steps:
   a. Go to **www.comtechefdata.com**
   b. Select the **Software Downloads** icon or the hyperlink under the **Support** tab
   c. Select the **Utilities and Demo Software** icon
   d. Select the applicable CRFC archive file hyperlink

The downloadable files are stored in two archive formats:
***.exe (self-extracting)**
***.zip (compressed)**

If your firewall does not allow you to download *.exe files, download the *.zip file instead.

4. Follow the prompts to copy the archive file to the working folder on the PC.
5. Open the archive file.
6. Extract the CRFC ".exe" file into the working folder created in Step 1.

2.4 Connecting the CRFC to the RF Equipment

Throughout this manual, "COMM/REMOTE port" refers to the transceiver or amplifier M&C communications port.

1. Connect the adapter cable to the 9-pin serial (COM) port on the PC.

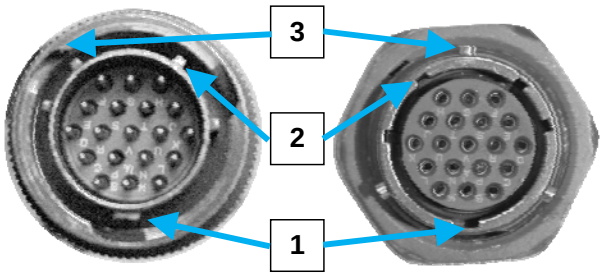
2. Connect the adapter cable circular connector to the mating remote M&C port on the RF unit.

Note that the pin count and the "J-number" for the remote M&C port on the RF unit varies among CEFD products:

RF Product	M&C Port Name	Number of Pins
CSAT, XSAT Transceivers	J5 COMM	19
KST-2000A/B Transceiver	J2 M/C or J2 REMOTE	26
HPOD, SPOD, LPOD Amplifiers	J6 COM1	19
AS/0490 Redundancy Switch Box	J5 M&C	19

3. Lock the circular connector on the COMM/REMOTE port on the RF unit.

2.4.1 About the Circular Connector



3	Sleeve Lock features
2	Secondary Alignment features
1	Primary Alignment features

Engage all of the alignment and lock features between the male connector (on the adapter cable) and female socket (the RF unit COMM port).

To install the male connector into the female connector:

1. Engage the primary and secondary alignment tabs on the male connector with the mating cutouts on the female socket.

2. Push the male connector into the female socket.

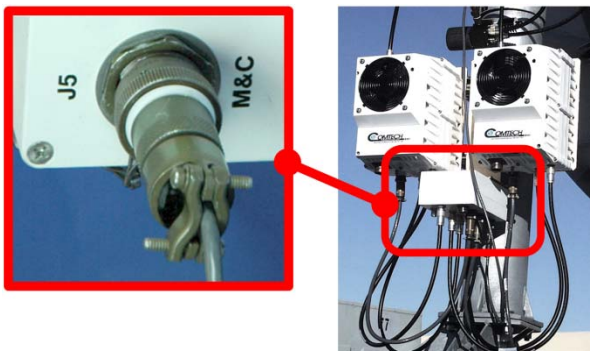
3. Turn the male connector sleeve clockwise until the sleeve lock cutouts engage fully with the female socket tabs and you hear a “click” sound.

2.4.2 Connecting the CRFC to a Standalone RF System

If the RF unit is in a standalone configuration, connect the adapter cable circular connector directly to the M&C port on the RF unit:

2.4.3 Connecting the CRFC to a Redundant RF System

If the RF unit is in a redundant configuration that uses the AS/0490 Redundancy Switch Box, connect the adapter cable circular connector directly to the **J5 M&C** port on the switch box:



2.5 Energizing the RF Equipment

If the waveguide is not terminated correctly, it transmits dangerous levels of electromagnetic radiation. THIS CAN CAUSE INJURY. Before you energize or operate the CSAT-5060 or XSAT-7080, make sure to correctly terminate the waveguide on the J2 RF OUTPUT port.

CEFD transceivers and amplifiers do not have a Power On/Off switch. Use the J3 AC POWER connector to energize the system.

1. Make sure the CRFC is installed and the RF equipment is connected correctly to the PC.
2. Connect the **J3 AC POWER** connector to the applicable prime power source.
3. **Energize** all components in the system.

2.6 Operating the CRFC

The CRFC icon is located on the Desktop of the PC or in the working folder you created during installation.

Double-click the CRFC icon to start the CRFC and open the **CRFC Startup** window.

The appearance of the CRFC depends on the setup and configuration of the host PC's OS and graphical user interface (GUI).

2.6.1 CRFC Startup Window

Use the **CRFC Startup** window to:

- Configure a new device connection
- Open or change an existing device connection configuration

Click **New Device Connection** to configure the first M&C connection for an RF device.

See the next section for New Device Connection configuration instructions.

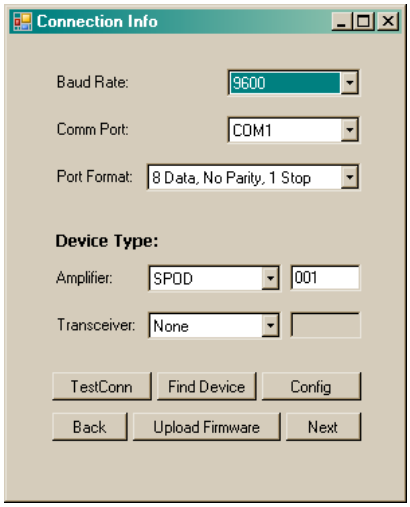
Click **Existing Device Connection** to:

- Open a device connection configuration file that is stored on the PC
- Change an existing device connection configuration

See Chapter 3 for instructions on using the **Existing Device Connection** window.

2.6.2 Connection Info Window – Configuring a New Device Connection

If **New Device Connection** is selected, the **Connection Info** window opened to show default settings for the **Baud Rate**, **Comm Port**, **Port Format**, and **Device Type**.



If the device connection is new, the Device Type fields show **NONE**. If a **Device Type** is **NONE**, the related **Address** text box is disabled.

These buttons are active:

- **TestConn** (PC Serial Port ←→RF Unit)
- **Find Device** (HPOD / SPOD / LPOD amplifier, CSAT / XSAT / KST transceiver)
- **Config** (Serial Config)
- **Upload Firmware** (RF Unit)

Baud Rate

Use the drop-down list to select the baud rate that the RF device will use. The baud rates differ for each unit. Rates may include **300**, **600**, **1200**, **2400**, **4800**, **9600**, **19200**, or **38400**. The default Baud Rate is **9600**.

Comm Port

Use the drop-down list to select the serial COM port that the PC will use for this connection. Choices are **COM1**, **COM2**, **COM3**, or **COM4**. The default is **COM1**.

Port Format

Use the drop-down list to select the asynchronous character format that the serial COM port (on the PC) will use. Choices are: **8 Data, No Parity, 1 Stop; 7 Data, Even Parity, 2 Stop**; and **7 Data, Odd Parity, 2 Stop.**

The default port format for all devices except the KST2000A/B family of transceivers is* 8 Data, No Parity, 1 Stop*. For all KST RF devices, the default port format is* 7 Data, Even Parity, 2 Stop*.

Device Type

Use the drop-down list to select the RF **Device Type**. Choices are:

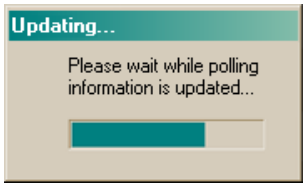
Amplifier				Transceiver			
NONE	SPOD	HPOD	LPOD	NONE	CSAT	XSAT	KST

(Device Type | Address)

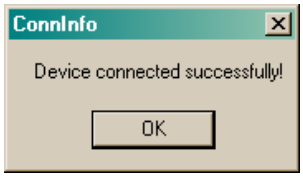
After selecting a **Device Type**, enter an **Address** for that device. In EIA-232 and EIA-485 applications, a range from **0001** to **9999** is permitted for device addresses.

TestConn

Click **TestConn** to validate the PC serial port-to-RF device connection. You are instructed to wait while the connection is polled:



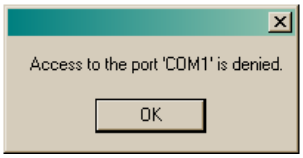
Once polled, if communication between the PC and RF device is properly set up, this message displays:



This message displays if there is no connection between the PC and the RF device (e.g., the adapter cable is not properly connected, or there is no power supplied to the RF device):

This message displays if an RF device other than what was selected with **Device Type** is recognized:

This message displays if the COM port is not properly configured for operation with the RF device:



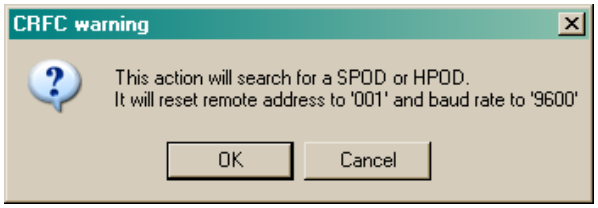
Find Device

Click **Find Device** to automatically detect:

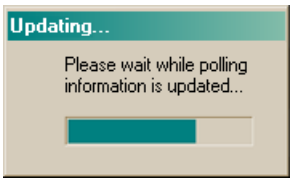
- Which device is connected
- What baud rate the device uses
- Which COM port the device uses

1. **In this current version, the CRFC identifies the HPOD and SPOD units by their applicable model numbers. The CRFC does not identify the HPOD or SPOD by name.**

2. **When you use Find Device, this message displays:**



Click OK to proceed. You are instructed to wait while the connection is polled:



Once polled, when the CRFC finds an RF device, a window like this example displays:

The address is reset to 0001 for the device. Use the Device Type text box for that device to assign a different address if needed.

If an RF device is not found, this window displays:

Config

Click **Config** to open the **Serial Config** window.

Back

Click **Back** to return to the **CRFC Startup** window.

Upload Firmware

Click **Upload Firmware** to update the firmware for the RF equipment.

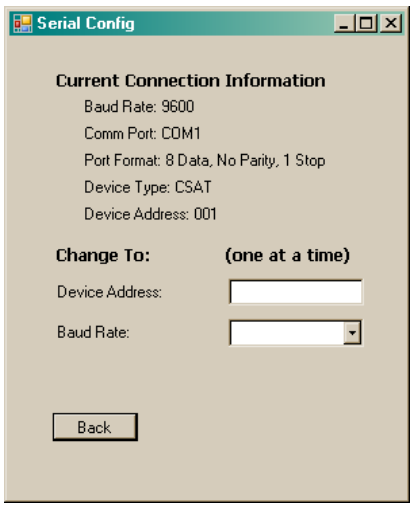
Each RF device uses specified firmware. Get the correct firmware update from Comtech EF Data and then store it on the PC before using this function. See the Firmware Updating section of the Installation and Operation Manual for your RF device for further instructions.

Next

Click **Next** to open the **Redundancy** window.

2.6.3 Serial Config Window

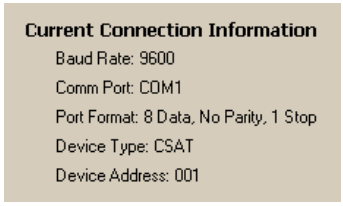
Use the **Serial Config** window to view Current Connection Information, or change the Device Address and the Baud Rate. The KST device also lets you change the Port Format.



You can change only one setting at a time.

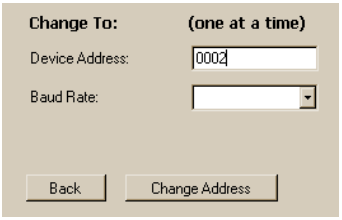
Current Connection Information

This section shows the current settings for the active RF device connection.



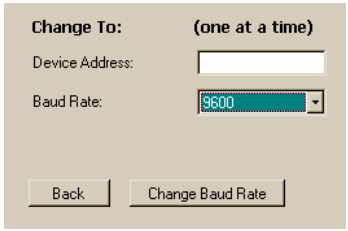
Change To: Device Address

In EIA-232 and EIA-485 applications, a range from **0001** to **9999** is permitted for device addresses. The **Change Address** button shows once this value is entered in the **Device Address** text box. Click **Change Address** to save.



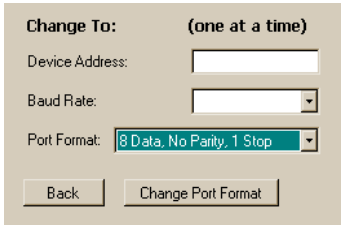
Change To: Baud Rate

Use the drop-down list to select the Baud Rate. The default is **9600**. Use the drop-down list to select the baud rate that the RF device will use. The baud rates differ for each unit. Rates may include **300**, **600**, **1200**, **2400**, **4800**, **9600**, **19200**, or **38400**. The **Change Baud Rate** button shows once this rate is selected. Click **Change Baud Rate** to save.



Change To: Port Format (KST devices only)

Use the drop-down list to select the Port Format. Choices are: **8 Data, No Parity, 1 Stop; 7 Data, Even Parity, 2 Stop**; and **7 Data, Odd Parity, 2 Stop. T**he **Change Port Format** button shows once this format is selected. Click **Change Port Format** to save.



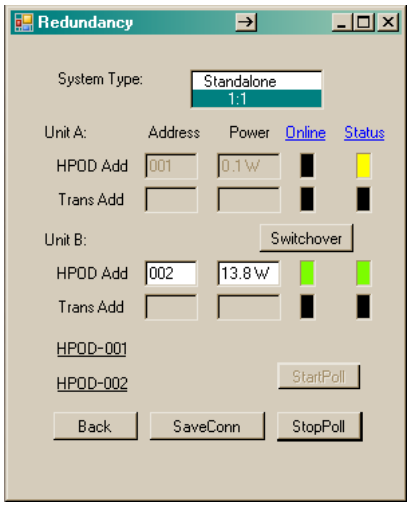
Back

Click **Back** to return to the **Connection Info** window.

2.6.4 Redundancy Window

In this current version, the CRFC operates with Standalone or 1:1 Redundancy systems.

The **Redundancy** window is opened by clicking **Next** in the **Connection Info** window.



Use the **Redundancy** window to:

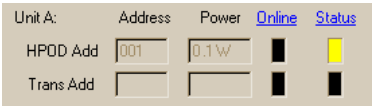
- Select the system type (**Standalone** or **1:1** Redundancy)
- Assign the address or addresses for the applicable device or devices.

System Type

Select **Standalone** or **1:1**.

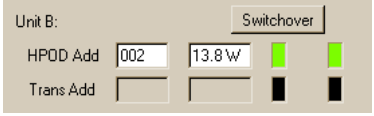
Unit A

If the **System Type** is **Standalone**, only the **Unit A** settings are active.



Unit B

If the **System Type** is **1:1**, both the **Unit A** and **Unit B** settings are active.

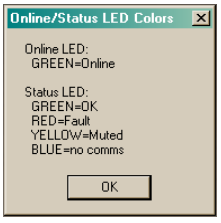


Switchover

Click **Switchover** to force switchover of the online unit. This button is only enabled for HPODs in 1:1 redundancy configuration.

Online and Status Indicators

Click the **Online** or **Status** hyperlinks to display the reference to these online LEDs:



More specifically, the LED colors show the operating status of the polled devices:

Green	**Online** LED: The unit is Online. **Status** LED: The unit is not muted and it has good communication. (No communication issues are sensed.)
Red	(**Status** LED only) Major faults are sensed.
Yellow	(**Status** LED only) The unit is muted or minor faults are sensed.
Blue	(**Status** LED only) The unit has no communication. (No communication is sensed.)

RF Device Hyperlinks

Select a device hyperlink to go to its **Device Information** window. Use this window to:

- Examine general information
- Change the configuration
- Monitor the operating status
- Examine the stored events

See Chapter 3 for instructions on using these device-specific windows.

If a device has no communication when you select its hyperlink, this warning displays:

***To continue the polling, click* Yes*. To end the polling, click* No.**

StartPoll

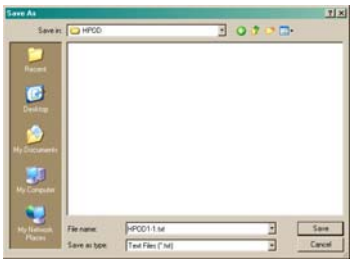
Select the **StartPoll** button to poll the devices. When polling starts, the **Address** fields become inactive. After the polling is successful, the related device hyperlink is activated.

StopPoll

Select the **StopPoll** button to stop polling the devices. After polling is stopped, the unit address fields are activated and you can change them.

SaveConn

Click **SaveConn** to save the device connection configuration to the PC. The **Save As** window opens. Enter a file name and click **Save**. This creates a configuration text file. This file is recalled or changed using the **Existing Device Connection** button found in the window.



See Chapter 3 for instructions on using the **Existing Device Connection** window.

Back

Click **Back** to return to the **Connection Info** window.

Initial setup of the CRFC is now complete. Proceed to Chapter 3 for detailed instructions on using the CRFC for monitor and control of your specific RF equipment.

Notes:

Chapter 3. CRFC DEVICE M&C

3.1 CRFC Device M&C Overview

Use this chapter to learn how to the CRFC to monitor and control each type of RF equipment.

1. **Read and understand the installation and operational manuals for the RF equipment that will be used with the CRFC.**
2. **You should have already set up the CRFC for initial operation with your specific RF device. See Chapter 2 for this procedure.**
3. **The appearance of the CRFC depends on the host PC Windows OS Display Properties settings.**
4. **The CRFC tabs and windows may be different for each type of RF device.**

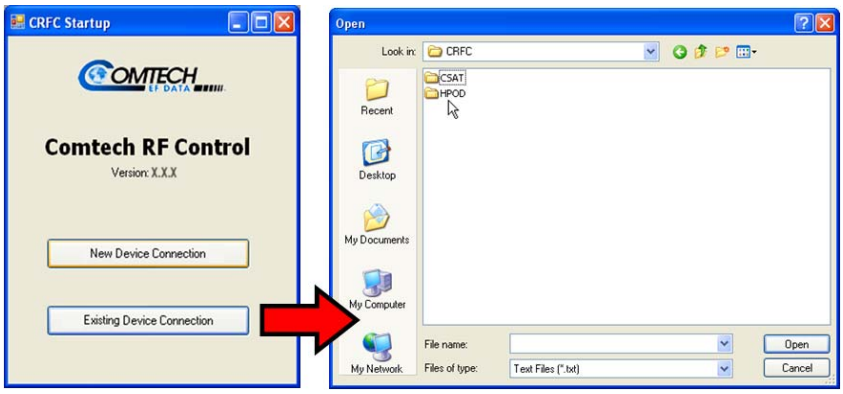
3.2 CRFC Startup Window – Changing an Existing Device Connection

From the **CRFC Startup** window, click **Existing Device Connection** to:

- First, open a device connection configuration file that is stored on the PC
- Then, change the settings as needed using the **Connection Info**, **Redundancy**, and **Device Information** windows.

Click **Existing Device Connection**. The **Open** window displays.

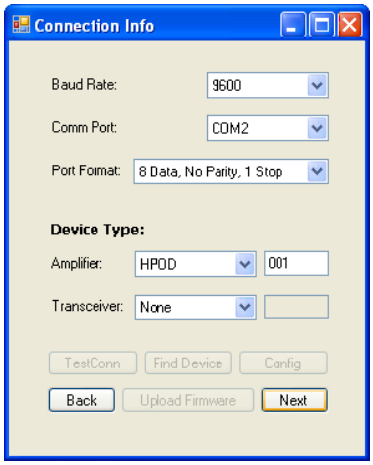
Select the text file that you previously created for your RF device configuration, and then click **Open**.



This file opens to recall the configuration settings saved from your initial **New Device Connection** setup session, and then opens the **Connection Info** window.

3.2.1 Connection Info Window with Existing Device Connection

Once a configuration file is opened, the **Connection Info** window opens with settings that were previously stored.



These buttons are ***not*** active:

- **TestConn**
- **Find Device**
- **Config**
- **Upload Firmware**

If the device connection is new, the device types show **NONE***. If a* **Device Type** *is* **NONE***, the related* **Address** *text box is inactive.*

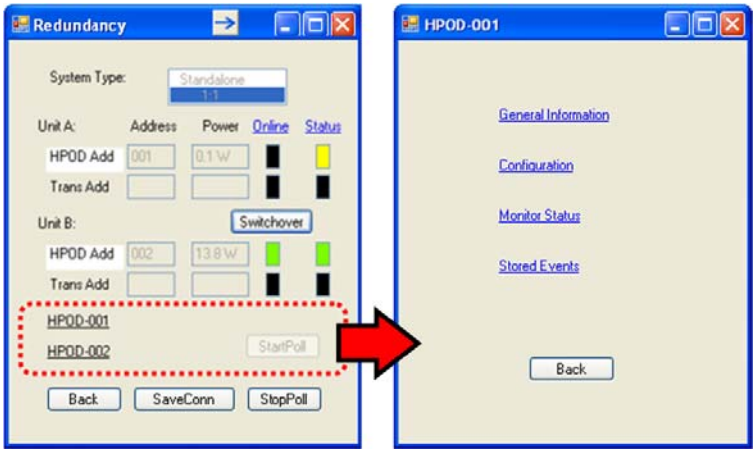
Click **Next** to open the **Redundancy** window.

3.2.2 Redundancy Window – Poll and Select Your Device

In the **Redundancy** window, click **StartPoll.**

Once the window is populated with the active RF device hyperlink (or hyperlinks for 1:1 setups), you are ready to use the CRFC for RF device monitor and control.

Select an available device hyperlink to access its related **Device Information** window.



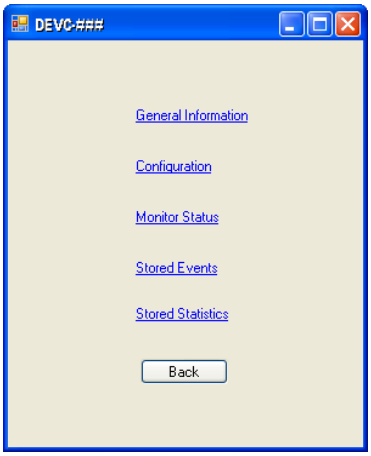
You may return to this page at any time to click* StopPoll*. This effectively turns off 'streaming' communication between the PC and the active RF device.

3.2.3 CRFC Device Information Window – Typical Operations

The features explained here are typical for all RF device-specific CRFC **Device Information** top-level and nested windows. For CRFC operation specific to an RF device, see the chapter sections that follow.

3.2.3.1 Window Hyperlinks

A typical top-level **Device Information** window provides these hyperlinks:



- **General Information**
- **Configuration**
- **Monitor Status**
- **Stored Events** (when available)
- **Stored Statistics** (when available)

Select a hyperlink to display the related window. Otherwise, click **Back** to return to the **Redundancy** window.

General Information

The **General Information** window displays data that identifies the active RF device.

Configuration

The **Configuration** hyperlink provides access to several RF device settings configuration window tabs.

Monitor Status

The **Monitor Status** hyperlink provides access to a number of *read-only* summary and detailed RF device system operation window tabs.

Stored Events

The **Stored Events** window, when available, provides control over how the CRFC displays and manages stored operating events.

Stored Statistics

The **Stored Statistics** window, when available, provides control over how the CRFC displays and manages stored operating statistics.

3.2.3.2 Navigation Buttons

Most CRFC windows will feature some or all of these navigation buttons.

Back

- From the top-level **Device Information** window – click **Back** to return to the **Redundancy** window.
- From any nested **Device Information** window – click **Back** to return to the top-level **Device Information** window.

Refresh

Click **Refresh** to get new status data from the active RF device.

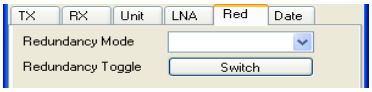
Apply

Click **Apply** to save any changes made to the active window settings.

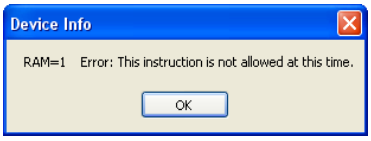
When you use the* Apply *button to save changes, the new settings overwrite any stored settings.

3.2.3.3 Remote Command Error

If the CRFC does not permit a remote command, the applicable text field or drop-down menu is blank:



If a remote command is not available, an error message like this example displays:



Click **OK** to close the error message.

Refer to the installation and operational manual for the RF device that will be used with the CRFC for the available serial remote commands.

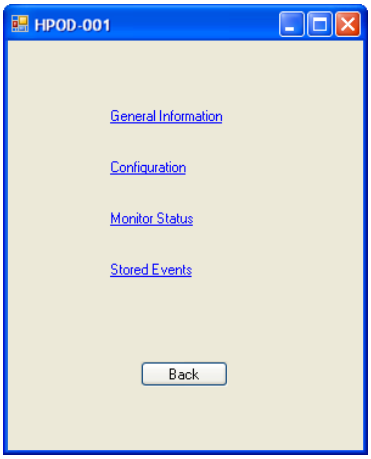
3.3 CRFC Amplifier Operations

3.3.1 Using the CRFC with HPOD/SPOD Amplifiers

This section shows operation that is typical for using the CRFC with the Comtech EF Data HPOD and SPOD families of amplifiers. These examples show the CRFC when it detects an HPOD amplifier as the active RF device.

3.3.1.1 Top-level Device Information Window

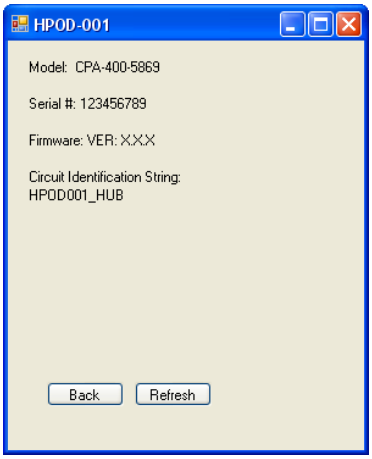
Select the **General Information**, **Configuration**, **Monitor Status**, or **Stored Events** hyperlink to continue.



3.3.1.2 General Information Window

Use this window to see this data for the amplifier:

- **Model Number**
- **Serial Number**
- **Firmware Version:** The firmware that is operating on this amplifier.
- **Circuit Identification String (CID):** The unique label created for this amplifier using the **Configuration | Utility** window.



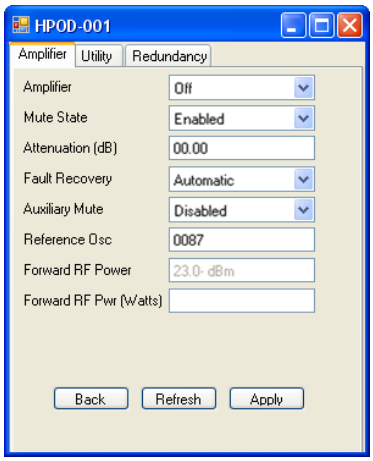
3.3.1.3 Configuration Windows

The **Configuration** hyperlink provides access to several amplifier settings window tabs. The **Configuration | Amplifier** window is the top-level window here. Otherwise, click the **Utility** or **Redundancy** tab to continue.

Typical for all* Configuration *windows, when you use the* Apply *button to save changes, the new settings overwrite any stored settings.

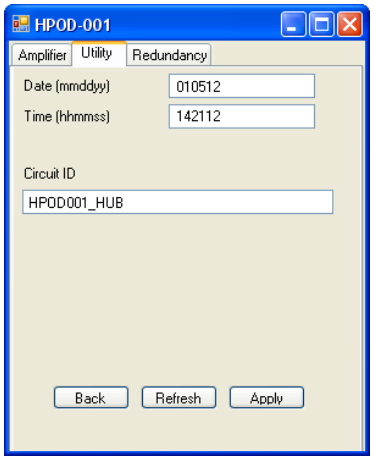
3.3.1.3.1 Configuration | Amplifier Window

Use this window to see or change these settings.



3.3.1.3.2 Configuration | Utility Window

Use this window to see or change these settings.



Date (mmddyy)

Type the date into the text box. Use the format specified.

Time (hhmmss)

Type the time into the text box. Use the format specified.

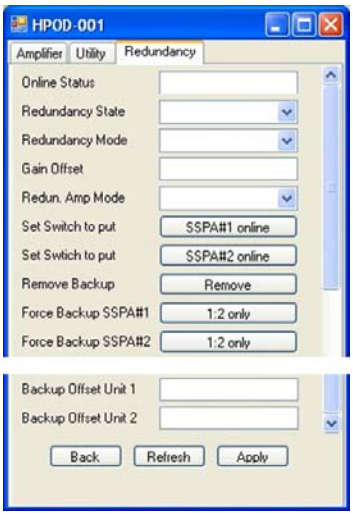
Circuit ID

Type a label into the text box. The maximum number of characters for this label is 24.

3.3.1.3.3 Configuration | Redundancy Window

Use this window to set the switch control for the amplifier 1:1 redundancy configuration.

Use the scroll bar to see more data.



3.3.1.4 Monitor Status Windows

The **Monitor Status** hyperlink provides access to a number of summary or detailed system operation window tabs. The **Monitor Status | Status** window is the top-level window here. Otherwise, click the **Events** or **FETs** tab to continue. (The **Low Power** window is not operating at this time.)

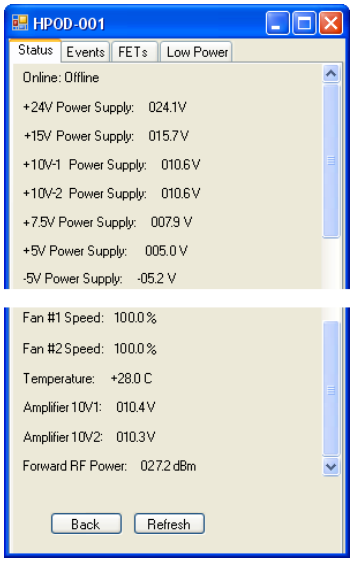
Typical for all* Monitor Status *windows:

1. ***All information is* read-only.**
2. ***When you use the* Apply *button to save changes, the new settings overwrite any stored settings.***
3. ***Click* Refresh *to get new status data from the amplifier.***

3.3.1.4.1 Monitor Status | Status Window

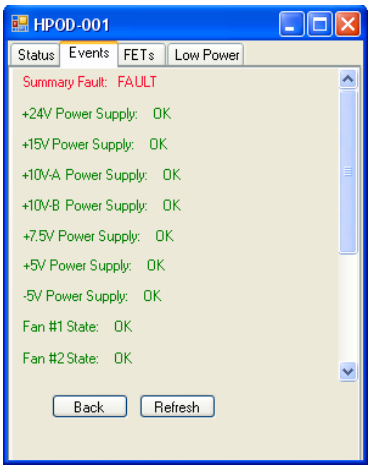
Use this window to see the real-time operating status results for a number of features.

Use the scroll bar to see all of the available data.



3.3.1.4.2 Monitor Status | Events Window

Use this window to see the summary status results for a number of feature operations.

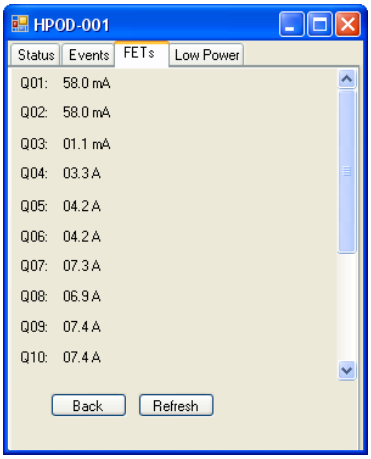


Colors alert you to the current status:
Green = OK
Red = FAULT

Use the scroll bar to see all of the available data.

3.3.1.4.3 Monitor Status | FETs Window

Use this window to see a summary of the actual operating currents for all FETs (**F**ield **E**ffect **T**ransistors) installed in the amplifier.

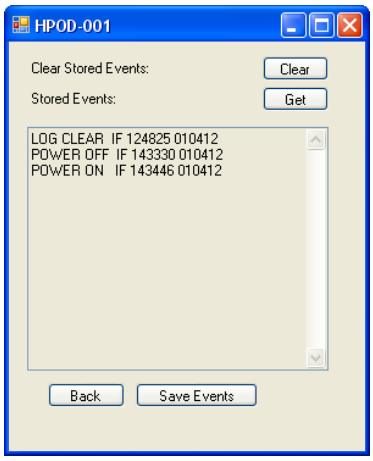


Use the scroll bar to see all of the available data.

3.3.1.4.4 Monitor Status | Low Power Window

This window is not operating in this current release.

3.3.1.5 Stored Events Window



Use this window to see a summary of events that were recorded for the amplifier.

Each event is time-stamped in the form **hhmmss**, and date-stamped in the form **mmddyy**.

Use the scroll bar to see all of the available data.

Clear Stored Events:

Click **Clear** to delete the contents of the event log.

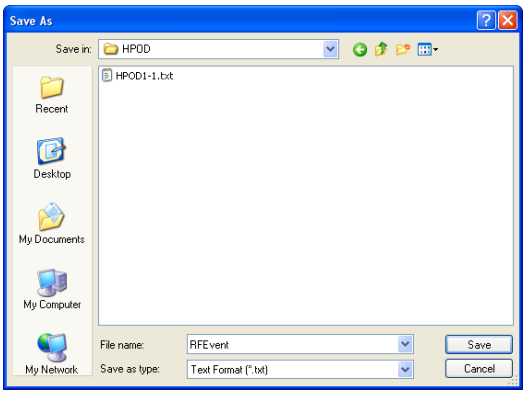
If faults exist on the active RF device, the faults will get new times and new log entries.

Stored Events:

Click **Get** to get all events. If there are no new events, this message shows: "**No New Events**".

Save Events

Click **Save Events** to save a text file of your events log to the PC. The **Save As** window opens. Enter a file name and click **Save**.



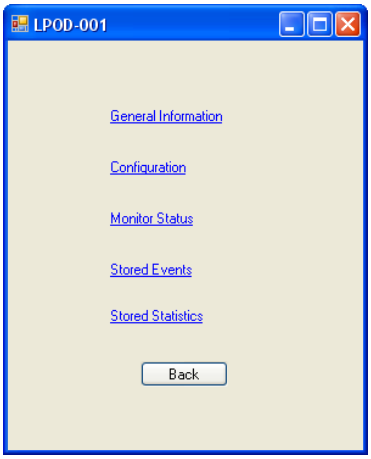
Notes:

3.3.2 Using the CRFC with LPOD Amplifiers/Block Up Converters (BUCs)

This section shows operation that is typical for using the CRFC with the Comtech EF Data LPOD family of outdoor amplifiers/BUCs.

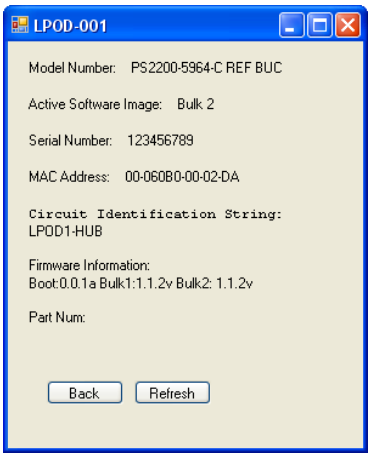
3.3.2.1 Top-level Device Information Window

Select the **General Information**, **Configuration**, **Monitor Status**, **Stored Events**, or **Stored Statistics** hyperlink to continue.



3.3.2.2 General Information Window

The **General Information** window shows this data for the LPOD:



- **Model Number:** The LPOD product plus any installed options.
- **Active Software Image:** The active software image load (Bulk 1 or Bulk 2).
- **Serial Number:** The 9-digit unit serial number.
- **MAC Address:** The unique factory-assigned MAC address.
- **Circuit Identification String (CID):** The unique label created for this LPOD using the **Configuration | Utility** window.
- **Firmware Information:** The firmware versions for the bootrom and software images (Bulk 1 and Bulk 2).
- **Part Number**

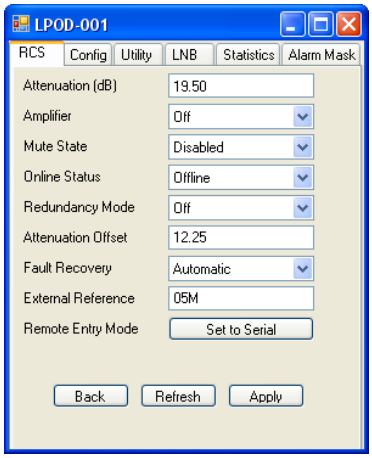
3.3.2.3 Configuration Windows

The **Configuration** hyperlink provides access to several LPOD settings configuration window tabs. The **Configuration | RCS** window is the top-level window here. Otherwise, click the **Config**, **Utility**, **LNB**, **Statistics**, or **Alarm Mask** tab to continue.

Typical for all* Configuration *windows, when you use the* Apply *button to save changes, the new settings overwrite any stored settings.

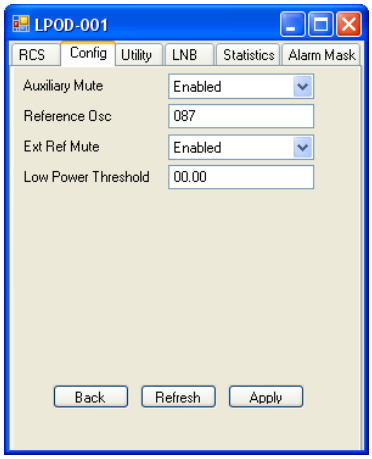
3.3.2.3.1 Configuration | RCS Window

Use this window to see or change the LPOD Retrieve Configuration Status settings.



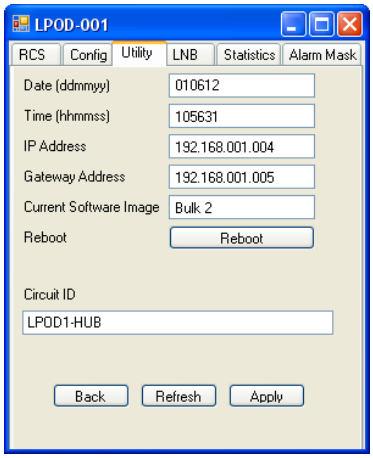
3.3.2.3.2 Configuration | Config Window

Use this window to see or change these LPOD operational settings.



3.3.2.3.3 Configuration | Utility Window

Use this window to see or change the displayed settings.



Date (ddmmyy)

Type the date into the text box. Use the format specified.

Time (hhmmss)

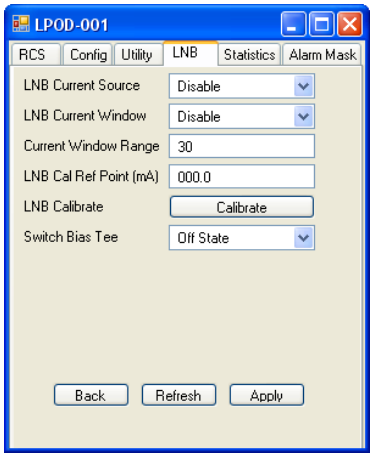
Type the time into the text box. Use the format specified.

Circuit ID

Type a label into the text box. The maximum number of characters for this label is 24.

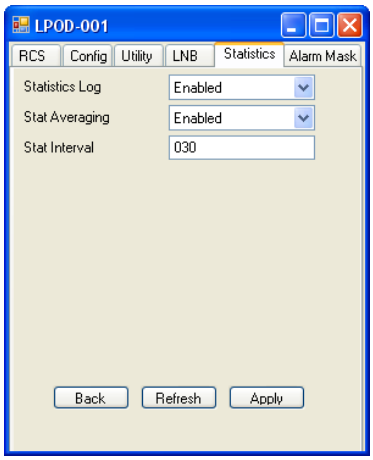
3.3.2.3.4 Configuration | LNB Window

Use this window to see or change the settings for the LNB (Low-Noise Block Down Converter).



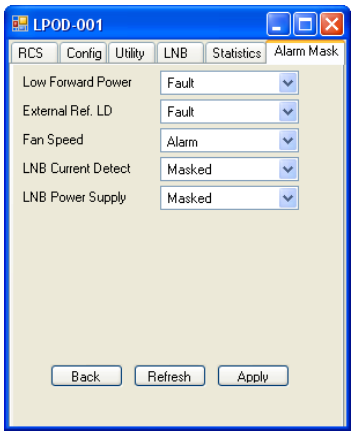
3.3.2.3.5 Configuration | Statistics Window

Use this window to set how statistics are handled and displayed by the LPOD.



3.3.2.3.6 Configuration | Alarm Mask Window

Use this window to set several LPOD alarm masks. These mask settings determine how the LPOD triggers and reports events.



3.3.2.4 Monitor Status Windows

The **Monitor Status** hyperlink provides access to three summary or detailed LPOD system operation window tabs. The **Monitor Status | Status** window is the top-level window here. Otherwise, click the **Events** or **FETs** tab to continue.

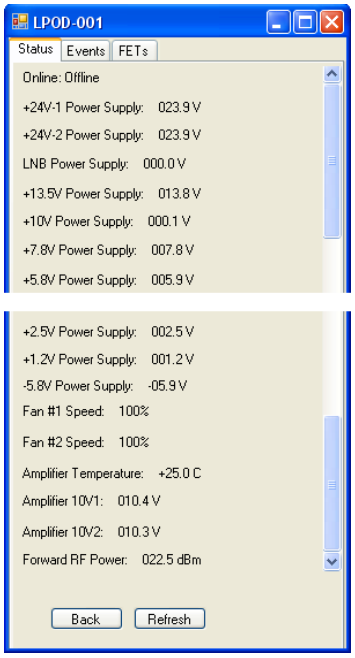
Typical for all* Monitor Status *windows:

1. ***All information is* read-only.**
2. ***When you use the* Apply *button to save changes, the new settings overwrite any stored settings.***
3. ***Click* Refresh *to get new status data from the LPOD.***

3.3.2.4.1 Monitor Status | Status Window

Use this window to see the real-time operating status results for a number of features.

Use the scroll bar to see all of the available data.

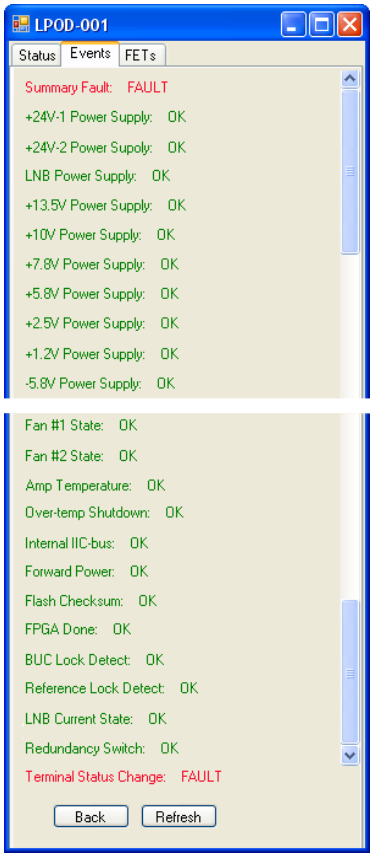


3.3.2.4.2 Monitor Status | Events Window

Use this window to see the summary status results for a number of feature operations.

Colors alert you to the current status:
Green = OK
Red = FAULT

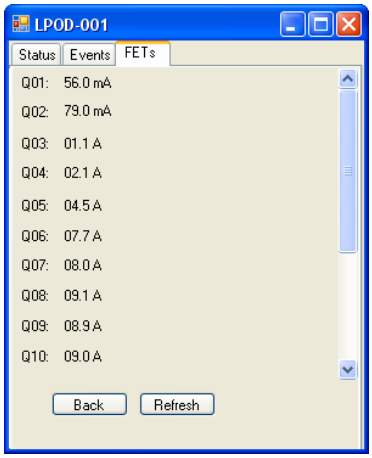
Use the scroll bar to see all of the available data.



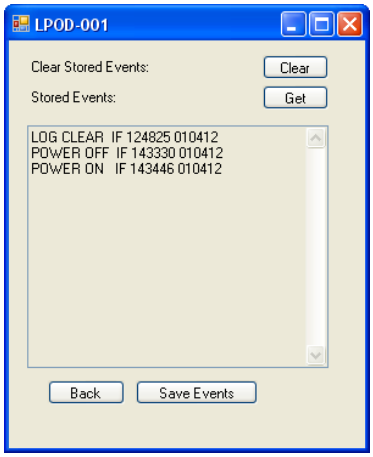
3.3.2.4.3 Monitor Status | FETs Window

Use this window to see a summary of the actual operating currents for all installed FETs (**F**ield **E**ffect **T**ransistors).

Use the scroll bar to see all of the available data.



3.3.2.5 Stored Events Window



Use this window to see a summary of events that are recorded for the LPOD.

Each event is time-stamped in the form **hhmmss**, and date-stamped in the form **mmddyy**.

Use the scroll bar to see all of the available data.

Clear Stored Events:

Click **Clear** to delete the contents of the event log.

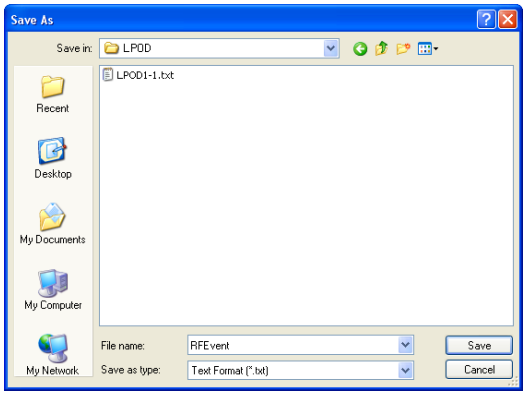
If faults exist on the active RF device, the faults will get new times and new log entries.

Stored Events:

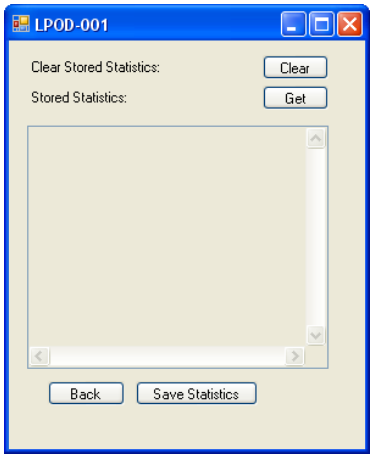
Click **Get** to get all events. If there are no new events, this message shows: "**No New Events**".

Save Events

Click **Save Events** to save a text file of your events log to the PC. The **Save As** window opens. Enter a file name and click **Save**.



3.3.2.6 Stored Statistics Window



Use this window to see a summary of statistics that are compiled for the LPOD.

Each statistic is time-stamped in the form **hhmmss**, and date-stamped in the form **mmddyy**.

Use the scroll bar to see all of the available data.

Clear Stored Statistics:

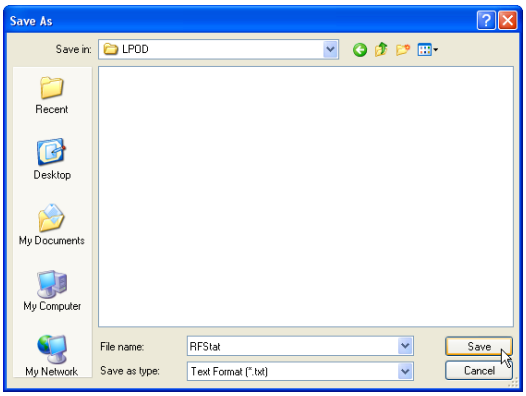
Click **Clear** to delete the contents of the statistics log.

Stored Statistics:

Click **Get** to get all statistics. If there are no new events, this message shows: "**No New Entry**".

Save Statistics

Click **Save Statistics** to save a text file of your statistics log to the PC. The **Save As** window opens. Enter a file name and click **Save**.



Notes:

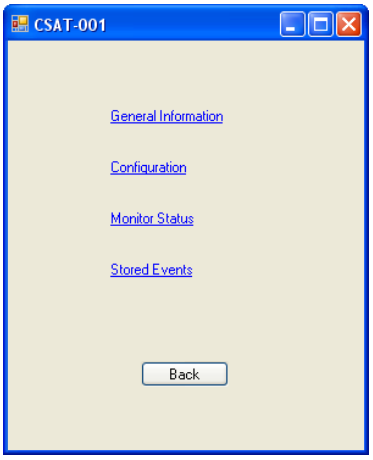
3.4 CRFC Transceiver Operations

3.4.1 Using the CRFC with CSAT/XSAT Transceivers

This section shows operation that is typical for using the CRFC with the Comtech EF Data CSAT and XSAT families of transceivers. These examples show the CRFC when it detects a CSAT-5060 transceiver as the active RF device.

3.4.1.1 Top-level Device Information Window

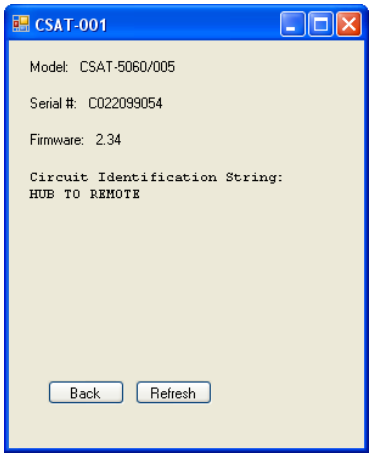
Select the **General Information**, **Configuration**, **Monitor Status**, or **Stored Events** hyperlink to continue.



3.4.1.2 General Information Window

This window shows this data for this transceiver:

- **Model Number**
- **Serial Number**
- **Firmware Version:** The firmware that is operating on the transceiver.
- **Circuit Identification String (CID):** Use the **Configuration | Unit** window to create a unique identification label for the transceiver.



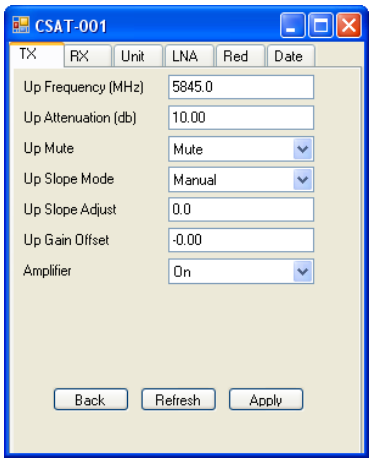
3.4.1.3 Configuration Windows

The **Configuration** hyperlink provides access to several transceiver settings configuration window tabs. The **Configuration | Tx** window is the top-level window here. Otherwise, click the **Rx**, **Unit**, **LNA**, **Red**, or **Date** tab to continue.

Typical for all* Configuration *windows, when you use the* Apply *button to save changes, the new settings overwrite any stored settings.

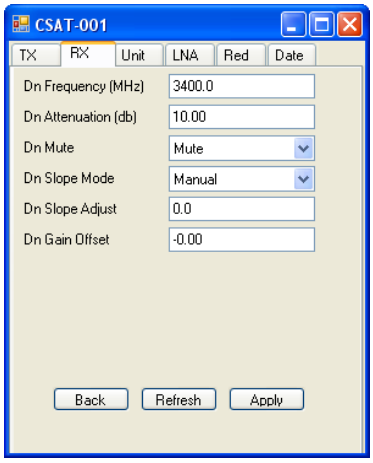
3.4.1.3.1 Configuration | Tx Window

Use this window to see or change the settings for the Tx (Up Converter).

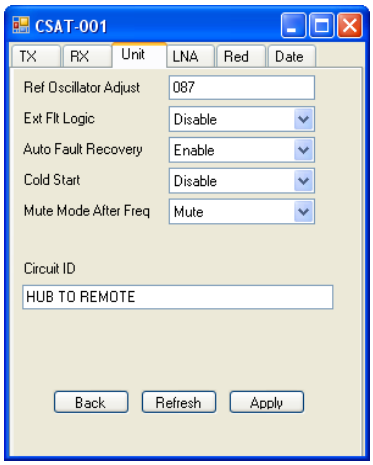


3.4.1.3.2 Configuration | Rx Window

Use this window to see or change the settings for the Rx (Down Converter).



3.4.1.3.3 Configuration | Unit Window

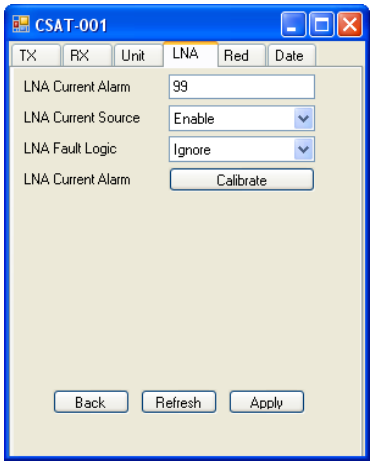


Use this window to see or change the settings for the system functions.

Circuit ID

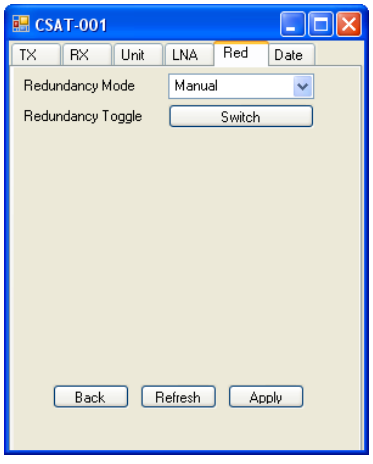
Type a label into the text box. The maximum number of characters for this label is 24.

3.4.1.3.4 Configuration | LNA (Low-Noise Amplifier) Window



Use this window to see or change the settings for the LNA (Low-Noise Amplifier).

3.4.1.3.5 Configuration | Red (Redundancy) Window



Use this window to set switch control for the transceiver 1:1 redundancy configuration.

Redundancy Mode

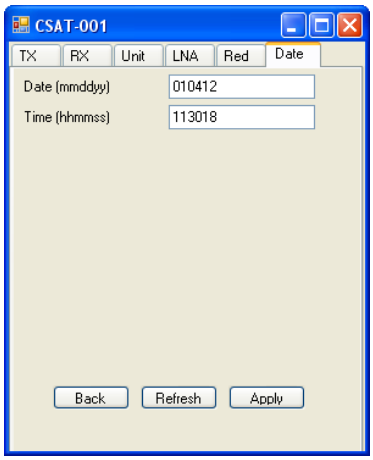
Use the drop-down list to select the operating mode as **Manual** or **Automatic**.

Redundancy Toggle

Click **Switch** to change to the standby transceiver.

3.4.1.3.6 Configuration | Date Window

Use this window to change the date and time settings for the transceiver.



Date (mmddyy)

Type the date into the text box. Use the format specified.

Time (hhmmss)

Type the time into the text box. Use the format specified.

3.4.1.4 Monitor Status Windows

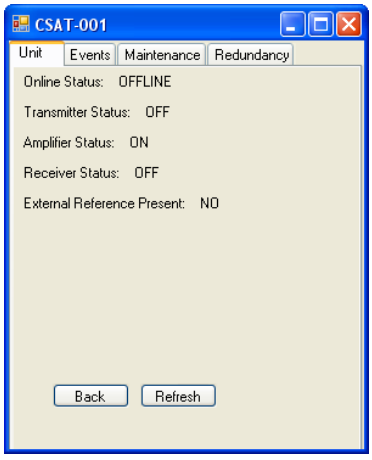
The **Monitor Status** hyperlink provides access to several summary or detailed transceiver system operation window tabs. The **Monitor Status | Unit** window is the top-level window here. Otherwise, click the **Events**, **Maintenance**, or **Redundancy** tab to continue.

Typical for all* Monitor Status *windows:

1. ***All information is* read-only.**
2. ***When you use the* Apply *button to save changes, the new settings overwrite any stored settings.***
3. ***Click* Refresh *to get new status data from the transceiver.***

3.4.1.4.1 Monitor Status | Unit Window

Use this window to view summaries of the unit status.

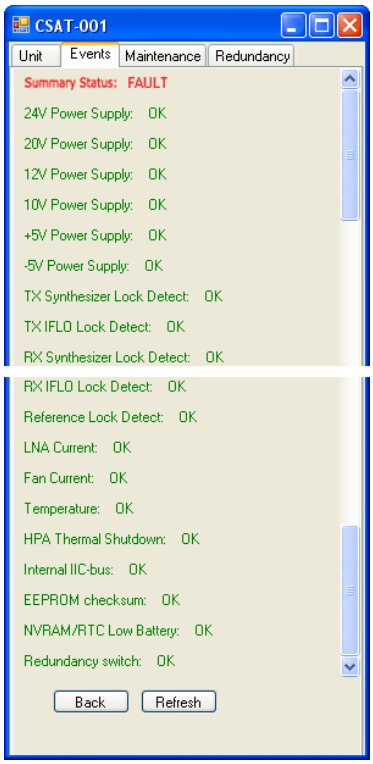


3.4.1.4.2 Monitor Status | Events Window

Use this window to see the summary status results for a number of operation functions.

Colors alert you to the current status:
Green = OK
Red = FAULT

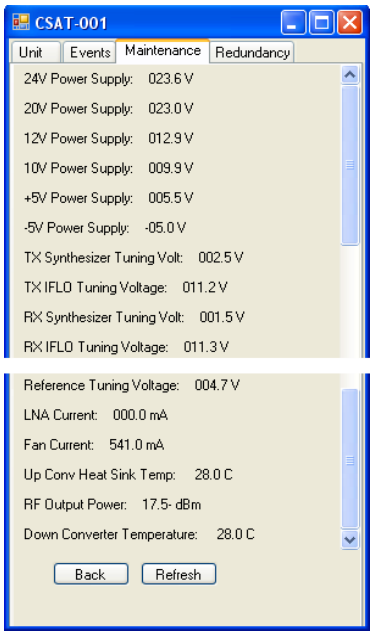
Use the scroll bar to see all of the available data.



3.4.1.4.3 Monitor Status | Maintenance Window

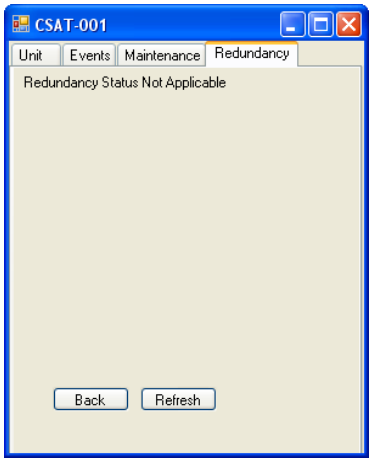
Use this window to see the real-time status results for a number of function operations.

Use the scroll bar to see all of the available data.



3.4.1.4.4 Monitor Status | Redundancy Window

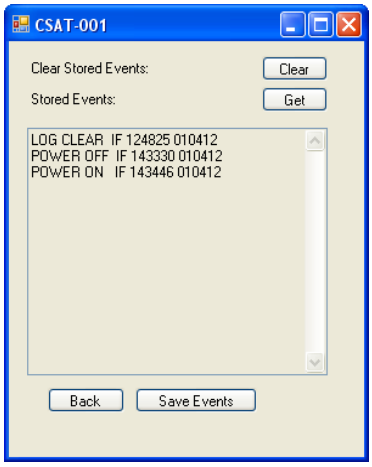
Use this window to see a summary of redundancy status.



3.4.1.5 Stored Events Window

Use this window to see a summary of events that were recorded for this transceiver.

Each event is time-stamped in the form hhmmss, and date-stamped in the form mmddyy.



Clear Stored Events:

Click **Clear** to delete the contents of the event log.

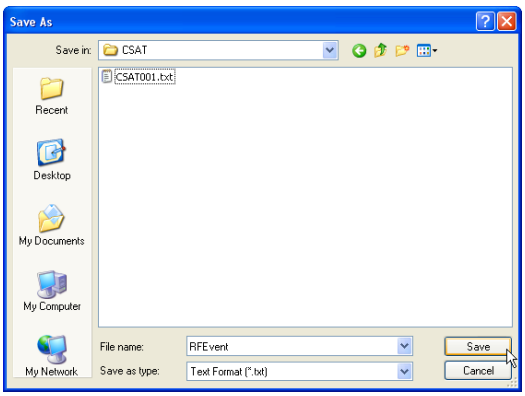
If faults exist on the active RF device, the faults will get new times and new log entries.

Stored Events:

Click **Get** to get all events. If there are no new events, this message shows: "**No New Events**".

Save Events

Click **Save Events** to save a text file of your events log to the PC. The **Save As** window opens. Enter a file name and click **Save**.



3.4.2 Using the CRFC with KST-2000A/B Transceivers

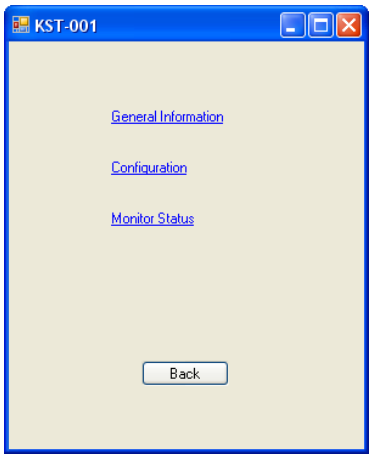
This section shows CRFC operation that is typical for the KST-2000A/B Ku-Band Transceivers.

Make sure to configure the PC serial (COM) port to 9600 bps, 7 data bits, Even parity, 2 stop bits (7-E-2). See Chapter 2 for this procedure.

3.4.2.1 Top-level Device Information Window

(**Stored Events** or **Stored Statistics** hyperlinks are not provided for KST2000A/B transceivers.)

Select the **General Information**, **Configuration**, or **Monitor Status** hyperlink to continue.

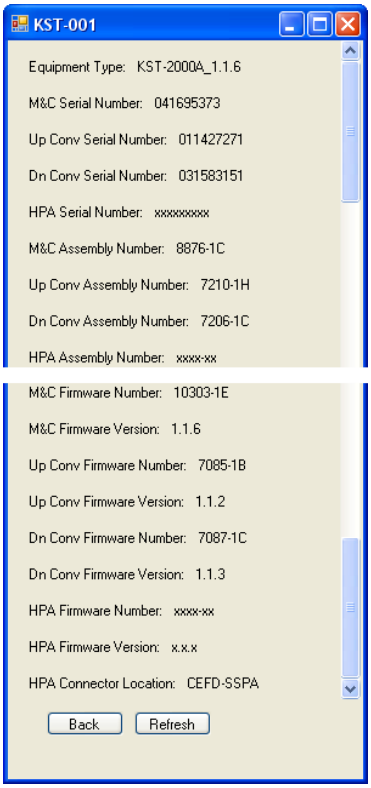


3.4.2.2 General Information Window

This window shows identifying data for this transceiver.

Use the scroll bar to see all of the available data. This information is provided:

- Equipment Type
- M&C Serial #
- Up Conv Serial #
- Dn Conv Serial #
- HPA Serial #
- M&C Assy #
- Up Conv Assy #
- Dn Conv Assy #
- HPA Assy #
- M&C Firmware #
- M&C Firmware Ver.
- Up Conv Firmware #
- Up Conv Firmware Ver.
- Dn Conv Firmware #
- Dn Conv Firmware Ver.
- HPA Firmware #
- HPA Firmware Ver.
- HPA Connector Loc



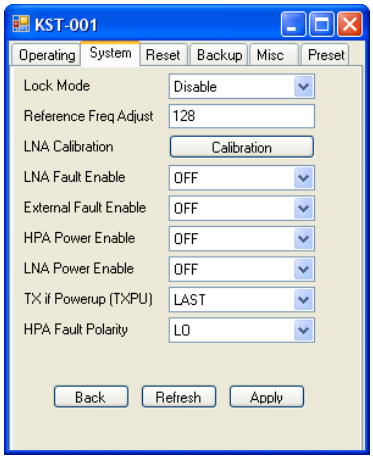
3.4.2.3 Configuration Windows

The **Configuration** hyperlink provides access to several transceiver settings configuration window tabs. The **Configuration | Operating** window is the top-level window here. Otherwise, click the **System**, **Reset**, **Backup**, **Misc**, or **Preset** tab to continue.

Typical for all* Configuration *windows, when you use the* Apply *button to save changes, the new settings overwrite any stored settings.

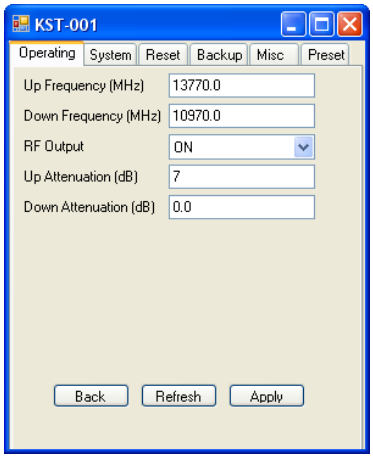
3.4.2.3.1 Configuration | Operating Window

Use this window to see or change the settings shown here.



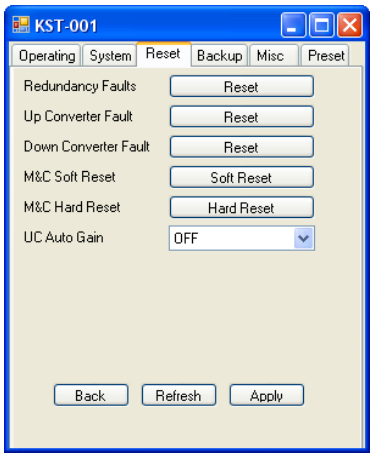
3.4.2.3.2 Configuration | System Window

Use this window to see or change the settings shown here.



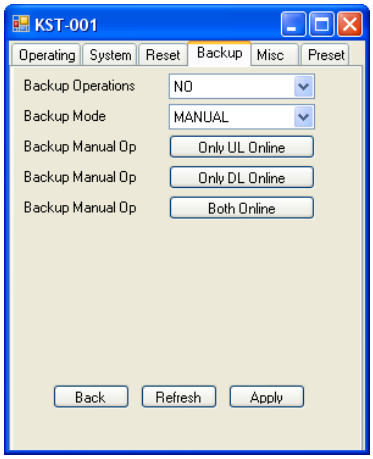
3.4.2.3.3 Configuration | Reset Window

Use this window to see or change the settings shown here.



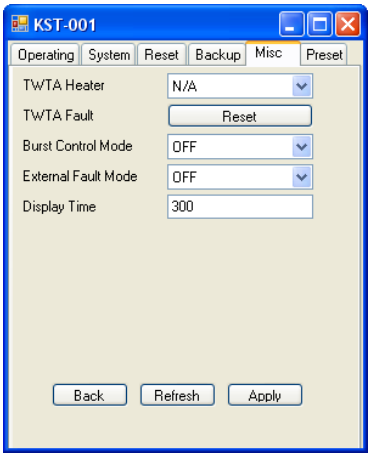
3.4.2.3.4 Configuration | Backup Window

Use this window to see or change the backup (1:1 Redundancy) configuration settings shown here.



3.4.2.3.5 Configuration | Misc Window

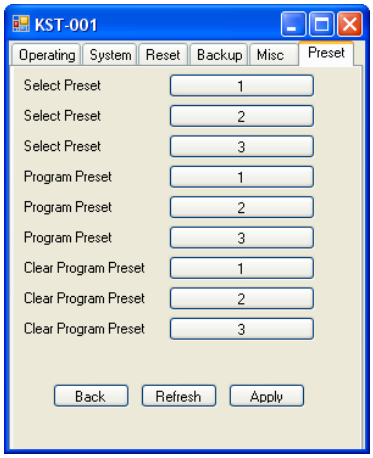
Use this window to see or change the settings shown here.



Display Time ***refers to the number of seconds that the KST2000A/B display remains lit.***

3.4.2.3.6 Configuration | Preset Window

Use this window select (execute), program, or clear the three available Operations Preset buttons.



3.4.2.4 Monitor Status Windows

The **Monitor Status** hyperlink provides access to several summary or detailed transceiver system operation window tabs. The **Monitor Status | Status1** window is the top-level window here. Otherwise, click the **Status2**, **Maintenance**, **Backup**, or **Preset** tab to continue.

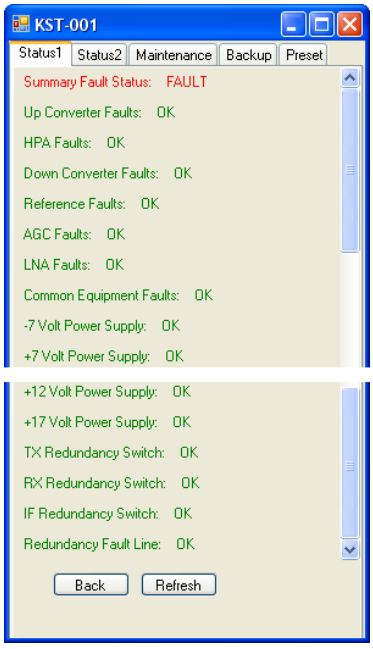
Typical for all* Monitor Status *windows:

1. ***All information is* read-only.**
2. ***Click* Refresh *to get new status data from the transceiver.***

3.4.2.4.1 Monitor Status | Status1 Window

Use this window to see the first of the summary status results for a number of operation functions.

Colors alert you to the current status:
Green = OK
Red = FAULT



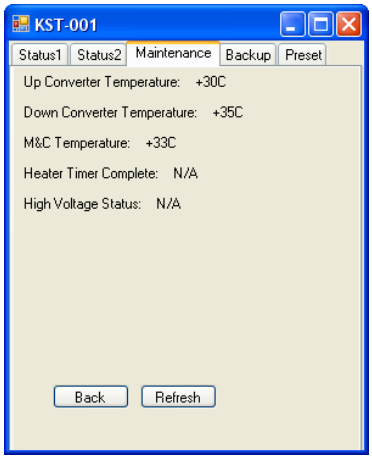
3.4.2.4.2 Monitor Status | Status2 Window

Use this window to see the continuation of the summary status results for a number of operation functions.

Colors alert you to the current status:
Green = OK
Red = FAULT

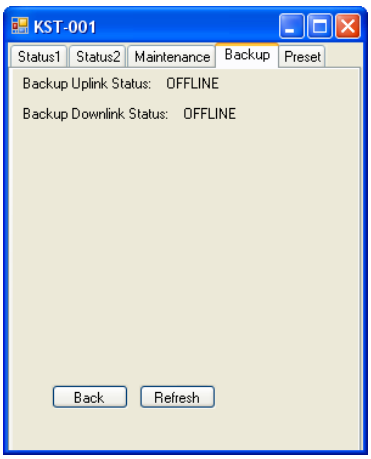
3.4.2.4.3 Monitor Status | Maintenance Window

Use this window to see the real-time status results for a number of function operations.



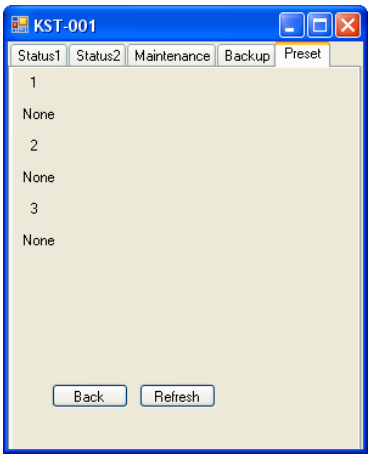
3.4.2.4.4 Monitor Status | Backup Window

Use this window to see the real-time status of the backup (1:1 Redundancy) setup.



3.4.2.4.5 Monitor Status | Preset Window

Use this window to see the current configuration for the three preset control buttons provided in the **Configuration | Preset** window.



METRIC CONVERSIONS

Units of Length

Unit	Millimeter	Centimeter	Inch	Foot	Yard	Meter	Kilometer	Mile
1 millimeter	1	0.1	0.0394	0.0033	0.0011	0.001	1×10^{-6}	6.214×10^{-7}
1 centimeter	10	1	0.3937	0.0328	0.0109	0.01	1×10^{-5}	6.214×10^{-6}
1 inch	25.4	2.54	1	0.0833	0.0278	0.0254	2.54×10^{-5}	1.578×10^{-5}
1 foot	304.8	30.48	12	1	0.3333	0.3048	3.048×10^{-4}	1.894×10^{-4}
1 yard	914.4	91.44	36	3	1	0.9144	9.144×10^{-4}	5.682×10^{-4}
1 meter	1000	100	39.37	3.2808	1.0936	1	0.001	6.214×10^{-4}
1 kilometer	1×10^{6}	1×10^{5}	3.938×10^{4}	3.281	1093	1000	1	0.6214
1 mile	1.609×10^{6}	1.609×10^{5}	6.336×10^{4}	5280	1760	1609	1.609	1

Temperature Conversions

Temperature	° Fahrenheit	° Centigrade
Water freezes	32	0
Water boils	212	100
Absolute zero	-459.69	-273.16

Formulas
° C = (F - 32) * 0.555
° F = (C * 1.8) + 32

Units of Weight

Unit	Gram	Ounce Avoirdupois	Ounce Troy	Pound Avoirdupois	Pound Troy	Kilogram
1 gram	—	0.03527	0.03215	0.002205	0.002679	0.001
1 oz. avoir.	28.35	—	0.9115	0.0625	0.07595	0.02835
1 oz. troy	31.10	1.097	—	0.06857	0.08333	0.03110
1 lb. avoir.	453.6	16.0	14.58	—	1.215	0.4536
1 lb. Troy	373.2	13.17	12.0	0.8229	—	0.3732
1 kilogram	1.0×10^{3}	35.27	32.15	2.205	2.679	—

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