LA-UR-13-28414
Approved for public release; distribution is unlimited.

Title: Multi-Instrument Collect User’s Manual Version 2.0.0.9

Author(s): Longo, Joseph Francis
Pelowitz, David G.
Wenz, Tracy R.
Hansen, Walter J.
Moore, Peggy J.

Intended for: Software Documentation

Issued: 2013-11-01

Acknowledgements:

Originated by the Safeguards Science and Technology Group, Nuclear Engineering and Nonproliferation Division. Maintained by Group DSA-3: Defense Systems Analysis and Surveillance.

Special thanks to Peter Santi, PhD. LANL/NEN-1 and Kory Budlong-Sylvester, PhD. LANL/GS-NNS.

Sponsorship:

This work was supported by the United States Member State Support Program to IAEA Safeguards; the U.S. Department of Energy, Office of Nonproliferation and National Security, International Safeguards Division and the U.S. Department of Energy, Office of Safeguards and Security.

Table of Contents

TABLE OF FIGURES

1. Purpose

This document explains the purpose, installation, and technical operation of the Multi-Instrument Collect software program and family of utilities. It does not attempt to provide operational instructions which will be installation specific.

2. Overview

The Multi-Instrument Collect, MIC, program is designed for unattended collection and saving of data from multiple, distributed data acquisition instruments. It is highly configurable, supporting collection of data from up to 128 instruments on up to 128 communications channels. MIC also provides the ability to copy data to removable disks for exporting the data it collects. MIC is a complex state-of-the-art multi-tasking application. It is designed to function on a fast multi-processor system but can run adequately on a single-processor platform.

Multi-Instrument Collect Version 2.0.0.0 runs in unattended mode on a machine with one or more Pentium processors running the Windows XP or above operating system. The program collects data from the data acquisition instruments via one or more Intelligent Local Operating Network (ILON), IPX Ethernet network, or serial communications lines (not all instruments supported on all three types). Data collection is automatic and will continue until the operator intervenes. An auxiliary program, Multi-Program Startup Service (MPSS), will automatically execute MIC when it detects MIC is not running. All raw data are stored in files, one per day per instrument, on the hard disk. Critical events and maintenance files are also kept, one per day per instrument, on the hard disk. Each record is time stamped. MIC has the ability to transmit limited state of health data in real-time to multiple receivers via an attached network. The network may be connected to the internet, allowing state of health monitoring anywhere in the world or it may be limited to a local Ethernet segment or it may be deactivated completely. MIC may be configured to also generate a state-of-health file at a user defined interval.

MIC also supports control of an American Power Conversion smart uninterruptible power system. Implementing this capability can extend the duration of non-loss of data for those instruments that employ standalone operation during a power failure by a factor of ten or more.

It is expected that approximately every 30 days the collected data will be copied to removable disks for export to a post-acquisition review program and for off-system archiving. An auxiliary support program, MicXfer.exe, can be configured to automatically transfer the files MIC creates to another system.

3. References

1.	D. Pelowitz, *Multi-Instrument Collect Software Requirements Specification*, (Apr. 6, 1997) Multi-SRS-001.000.
2.	D. Pelowitz, *Multi-Instrument Collect Installation Guide*, (Sep. 21, 1999).
3.	B. Harker, *GRAND Collect Users Manual*, (Oct. 13, 1995), GCOL-UM-001.001
4.	R. Parker and S. Klosterbuer, *MiniGRAND User Manual (01.12)*, (Feb. 2008), LA-UR-05-7643.
5.	R. Parker, *Intelligent Local Node (ILON) User Manual (2.23)*, (May 2007), LA-UR-05-7595.
6.	R. Parker, J. Longo, *SD Card Use on the Dragonball MiniGRAND*, (Mar. 29, 2012), LA-CP-12-0380

4. Ancillary Programs

There a number of support programs which enhance the functionality of Multi-Instrument Collect. Each program provides a function or capability which is more appropriately done in a separate program rather than imbedded in MIC. Separate sections exist in this document for each of these programs.

Multi-Program Startup Service, MPSS, and **Multi-Program Startup USER**, MPSU, are Windows OS service applications which periodically verify each program on a user-specified list is currently running. When MPSS or MPSU discovers an identified program is not running it will restart the program. Because they run as a service it is inconsequential whether a user is logged on; either way the program will be executed (started). Although this program is used to ensure MIC is always running, MIC may be run without MPSS or MPSU. MPSS and MPSU are fully configurable and may be used to ensure near continuous operation of any application. MPSS is intended to run under the system account and MPSU under an NT user account.

MicXfer is a Windows NT® service style application which automatically and periodically copies files from a set of source locations to a set of destination locations. Source or destination locations may be on the same system or on different computer systems connected via a network. MicXfer looks at the archive attribute of each source file and if it is on it then copies the file to the destination and clears the source file's archive bit. An application writing to the source file will automatically turn the archive bit back on. MicXfer is used to copy MIC's output files to another system for both archival and remote analysis purposes. MicXfer is fully configurable using a program called MicXferC and may be used to transfer files from programs other than MIC. MicXfer must be run under a user account if it is going to be configured to transfer files to another computer system. In this case when run on Windows XP or above the account should have Administrator privileges. MIC may be run without MicXfer running.

MicXferC is a Windows application used to configure MicXfer. It is used to modify the MicXfer.ini file used by MicXfer and to verify MicXfer has read the new settings.

WatchMicXfer is a Windows application that receives and displays messages from MicXfer. It is used to watch each of the file transfer actions of MicXfer. MicXfer can be configured to send UDP packets to multiple destinations where WatchMicXfer may be configured to catch the packets and display them.

Tracker is a Windows application which receives and displays limited state of health information sent by MIC and displays it. Tracker presents a dialog box very similar to the main dialog box of MIC. Typically, Tracker will be run on a system remote from the MIC computer and connected via a network with UDP transfer capabilities (TCP/IP installed). MIC will function normally even if it is sending state of health information to a system which is not turned on or one on which Tracker is not running. In the MIC.INI file MIC may be configured to activate or deactivate this function. Only state of health information is transmitted and MIC does not listen for any information being sent back into it.

Dump is a 32-bit console application utility which performs simple statistical analysis of the binary data files MIC creates. It may also be used to create an ASCII file depicting the contents of one or more of the binary data files. This program is used for trouble shooting an instrument or MIC's support of an instrument and is not necessary for normal operations. This utility is deprecated; see MICDump.

MICDump is a Windows application which may be used to create an ASCII file depicting the contents of one or more of the binary data files. This program is used for trouble shooting an instrument and is not necessary for normal operations. This utility replaces the Dump console application and is much easier to use.

MICSqrt is a Windows application which may be used to create MiniGRAND setup files. One needs only to drag and drop a MIC state of health file onto the application to create a file which may later be sent to the MiniGRAND to configure it.

MsgUtil is a Windows application which deciphers individual messages received from each of the supported instruments. MIC will execute the program when a MIC user requests a detailed

breakdown of a specific message. MsgUtil may be executed independently of MIC. MIC can function normally without MsgUtil installed. In this case when the MIC user requests a detailed breakdown of a specific message the request will be ignored.

DelFi is a Windows application which deletes files in a set of directories after they reach a provided age. It is configured via the DelFi.INI file and uses the file's last modified date. MIC can function normally without DelFi installed.

EZ-Copy and EZ-Move are Windows applications which assist the user in copying or moving files from one or more source directories to destination directories. The files can be selected based on date as encoded in the name or based on the last modified date. MIC can function normally without EZ-Copy or EZ-Move installed.

Run EZ-Copy is a Windows application designed to force EZ-Copy to run once per day after access to a remote location has been verified.

CopyAll is a Windows application which assists the user in copying files from one or more source directories to destination directories. It is INI file driven with a "one-button" interface. Unlike EZ-Copy it must be configured by editing the INI file and cannot select files based on date.

5. Installation

5.1. System Requirements

The following resources are the minimum required by the Multi-Instrument Collect program:

- Pentium processor or above (two or more processors recommended but not required),
- 32 MB memory or above (64 MB or above recommended),
- Hard disk (sized to accommodate long term storage requirements),
- 1.44 MB 3.5 inch floppy disk drive or other removable media (ZIP, JAZ or other large removable media recommended, USB is supported),
- Microsoft Windows XP, version 2002, Service Pack 1 or above,
- One or more functional serial ports,
- If DSPEC Plus support is used an Ethernet network connection with IPX is required along with the ORTEC MAESTRO product to configure it,
- If JSR camera support is used a functional parallel port is also required,
- If installing from a CD a CD drive must be available, and
- Memory, disk storage, to meet Microsoft's requirements for the operating system being used.

5.2. Procedure

MIC Version 2.0.0.0 (and onward) is the first version of MIC to incorporate Microsoft's Component Object Model (COM) architecture. Prior MIC versions consisted of one executable (MIC.EXE). Version 2.0.0.0 and higher consist of the MIC client (MicMgr.exe) and multiple components implemented as DLL's. MicMgr must be installed from the install CD and then configured to reflect the requirements of a specific facility. There are five required steps to install the MIC system, and a few optional steps:

1) (Required) Run "Setup.exe" from the install CD.
2) (Required) In MIC add user--password pairs through the MIC Access Control menu item.
3) (Required) In MIC add the communications support objects necessary to support the site configuration.
4) (Required) In MIC add and configure the instrument support objects necessary to support the site configuration.
5) (Required if APC UPS being used) Set the APC UPS shutdown grace period and test power cycle capability).
6) (Recommended) Configure the system clock to NOT automatically adjust for daylight savings time.
7) (Recommended) After configuration, copy all the INI files from the MIC installation directory onto removable media for removal and safe-keeping.
8) (If required) Edit the MIC.INI file to turn on UDP packets to each target TRACKER.exe system.

9) (If required – this should have been accomplished automatically by the Setup.exe program) Run "MPSS -i" to install the Multi-Program Startup Service which can be set to force MIC to always be running. If an older version of MPSS is currently running first run "MPSS -u" to uninstall the service then copy the new version from the CD and install it using "MPSS -i".

10) (If required – this should have been accomplished automatically by the Setup.exe program) Edit "MPSS.INI to include MIC in its list of programs to execute when needed.

11) (If required) Run "MicXfer –i" to install MicXfer to copy files to another location. If an older version of MicXfer is currently running run "MicXfer -u" to uninstall the service then copy the new version from the CD and install it using "MicXfer -i". Set the MicXfer service to run in an account with administrator privileges(this is critical if running on XP and MicXfer will be transferring files to another computer).

12) (If required) Run MicXferC to configure MicXfer to include source and destination locations for each type of file to be automatically copied.

13) (If required) In the Administrative Tools/Services applet of the XP Control Panel select the Multi-Program Startup Service and click on "Start". Verify it is set to start "automatic" and is using the system account. Verify it is operating correctly as indicated in the appropriate section.

14) (If required) In the Administrative Tools/Services applet of the XP Control Panel double click on the MIC File Xfer Service and verify it is set to run "automatically" and in a valid user account—"System Account" will not have the correct permissions to write to other systems! This account must be set up with the same password on each of the target systems referenced in the MicXfer.INI file.

15) (If required) In the Administrative Tools/Services applet of the NT Control Panel select the "MIC File Xfer Service" and click on "Start". Verify correct operation as indicated in the appropriate section.

16) (If required) Install Tracker on all systems which will monitor MIC, or are required to generate an html file, and configure the MIC.INI and each TRACKER.INI appropriately. Each of these installations will need the IP address of the MIC system as well as the UDP PORT set in the MIC.INI NETWORK section.

5.3. Files

All files supporting the MIC system may be installed in the same directory. A unique directory name not used by other applications such as "C:\MIC" should be used. The automated installation procedure will place all of the appropriate files there. The configuration of the individual instrument support objects define directories in which the instrument associated files (data and state of health) will be placed. MIC will automatically create these data directories if they don't exist.

There are two files critical to MIC operations: MICMgr.EXE and MIC.INI. MICMgr.EXE is the client program that controls all of the components and MIC.INI is a standard windows initialization file containing the current MIC configuration. The MIC.INI file may be edited by a knowledgeable user employing any editor which creates a simple ASCII file. See the Files section for the contents of this file. When MIC is initially executed the file will be created and will contain default configuration items. Most of the items in the MIC.INI file will be set via program configuration or instrument configuration dialogs although there are a few items which for safety reasons may only be set by editing the file.

Most of the ancillary support programs have an executable file and an associated configuration file. In all cases the configuration files are ASCII, DOS text files which may be edited by hand using any editor that can save the file as ASCII.

Instantiating MIC support of various instruments causes the creation of section entries in the MIC.INI file as well as instrument specific files. Generally, associated with each instrument will be a binary data file, a critical events file, and a performance file. The instrument data files will be created in the directories identified during instrument support configuration.

Each of these files are listed below:

Filename	Contents	Format	Created
MICMgr.EXE	MIC client program	Windows Executable	At installation
CoAPCUPSISO.dll	Component supporting the APC UPS instrument.	Windows .dll	At installation
CoAquilaUPSISO.dll	Component supporting the Aquila UPS instrument.	Windows .dll	At installation
CoColorButton.dll	Component to implement the colored buttons on the main dialog.	Windows .dll	At installation
CoDirectSerialCSO.dll	Component supporting Direct Serial (RS-232) communications	Windows .dll	At installation
CoDSPECISO.dll	Component supporting the DSPEC instrument.	Windows .dll	At installation
CoEOSSCSO.dll	Component EOSS seal communications.	Windows .dll	At installation
CoEOSSISO.dll	Component supporting EOSS seals.	Windows .dll	At installation
MIC_EOSSReader.exe	Client app for direct EOSS Seals querying using Dr. Neumann software.	Windows Executable	At installation
CoEventISO.dll	Component supporting the Event instrument.	Windows .dll	At installation
CoGrandISO.dll	Component supporting the GRAND family of instruments.	Windows .dll	At installation
CoILONCSO.dll	Component supporting ILON communications	Windows .dll	At installation
CoIPXCSO.dll	Component supporting IPX Ethernet communications	Windows .dll	At installation
CoISRISO.dll	Component supporting the ISR and AMSR instruments.	Windows .dll	At installation
CoJSRISO.dll	Component supporting the JSR instrument.	Windows .dll	At installation
CoMCAISO.dll	Component supporting the MCA instrument	Windows .dll	At installation
CoWatchISO.dll	Component supporting the WATCHER instrument	Windows .dll	At installation
MIC.INI	MIC configuration information	Standard INI file	First execution of MICMgr.exe
CLSIDLIST.INI	Guid definition file	Standard INI	At installation

Filename	Contents	Format	Created
		file	
MsgUtil.EXE	Message utility program	Windows Executable	At installation
MPSS.EXE	Multi-Program Startup Service	Windows NT Service	At installation
MPSS.INI	MPSS configuration information	Standard INI file (ASCII)	Edited during installation
MPSU.EXE	Multi-Program Startup USER	Windows NT Service	At installation
MPSU.INI	MPSU configuration information	Standard INI file (ASCII)	Edited during installation
MicXfer.EXE	MultiInstrument Collect File Transfer Service	Windows NT Service	At installation
MicXfer.INI	MicXfer configuration information	Standard INI file	Edited during installation
MicXferC.EXE	MultiInstrument Collect File Transfer Service Configuration program	Windows Executable	At installation
WatchMicXfer.EXE	Program to receive action messages from MicXfer	Windows Executable	At installation
Tracker.EXE	Tracker program used to receive state of health information.	Windows Executable	At installation
Tracker.INI	Tracker configuration information	Standard INI file (ASCII)	Edited during installation
DelFi.EXE	DelFi program used to delete files after they have reached a provided age.	Windows Executable	At installation
DelFi.INI	DelFi configuration information	Standard INI file	Edited during installation
Dump.exe	Create a text version of a binary data file	Windows Executable	At Installation
MICDump.exe	Create a text version of a binary data file	Windows Executable	At Installation
EZ-Copy.EXE	EZ-Copy program used to copy selected files based on date.	Windows Executable	At installation
EZ-Copy.INI	EZ-Copy configuration information	Standard INI file	Automatically modified during use
RunEZCpy.exe	Run EZCopy program used to force EZ-Copy to run once per day	Windows Executable	At Installation

Filename	Contents	Format	Created
RunEZCpy.INI	RunEZCpy configuration information	Standard INI file	Automatically created and modified during use
CopyAll.EXE	CopyAll program used to copy files based on directory.	Windows Executable	At installation
CopyAll.INI	CopyAll configuration information	Standard INI file	At installation
*.CEV	Critical events files supporting most instruments	ASCII	During MIC operations by each instrument
*.PFM	Performance files supporting instruments	ASCII	During MIC operations by each instrument
*.BID	Safeguards data file supporting GRAND and MiniGRAND instruments	Binary	During MIC operations by each GRAND/MiniGRAND
*.CHN	Spectrum data file	Binary	During MIC operations by each DSPEC or MiniADC
*.ISR	Safeguards data file supporting ISR/AMSR instruments	Binary	During MIC operations by each ISR/AMSR
*.JSR	Safeguards data file supporting JSR-12 type instruments	Binary	During MIC operations by each JSR-12
*.MCA	Safeguards data file supporting Multi-Channel Analyzer type instruments	Binary	During MIC operations by each MCA
*.ESS	Safeguards data file supporting Dr. Neumann EOSS Seals	Binary	During MIC operations by each EOSS ISO
*.rlog	Dr. Neumann EOSS Seals Reader Log	ASCII	
*.DMP	Listing of all communications with a specific instrument	ASCII	During MIC operation by each instrument (when requested)
*.dlg	Screen dump of dialog box or each tab page's text.	ASCII	At completion of copy data action
*.txt	Screen dump of dialog box or each tab page's text	ASCII	At user request to Snapshot to File
*.ip	Inspection period log file	Standard INI file (ASCII)	At completion of copy data action
Age.log	Automatic file archive aging activity log	ASCII	Appended to when

Filename	Contents	Format	Created
			an archived file is aged

6. Operation

How to install, configure, and use Multi-Instrument Collect is covered here.

6.1. Starting Multi-Instrument Collect

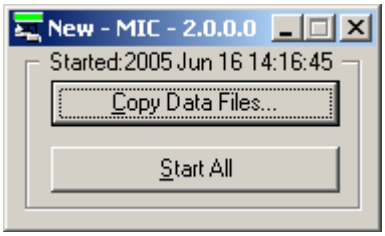


Figure 1 MIC ICON and Initial Main Dialog

Normally, MIC will be automatically started by the Multi-Program Startup Service, MPSS, and will continue running even when no one is logged on to the XP system. There may be only one instance of MIC on the system at any one time. Attempting to start a second MIC while the first MIC is running will cause an error message to be displayed and the second instance will abort.

To manually start the Multi-Instrument Collect software double click on the MIC icon on the Windows desktop or click on the MicMgr.exe entry in the installation directory.

If MIC has never been executed on this system or if the MIC.INI file cannot be found then the initial main screen will only contain two buttons: "Copy Data Files…" and "Pause Data Dumping". After MIC has been configured a button will be displayed for each instrument being supported. Near the top of the dialog is the date and time MIC was started.

Many of the menu and button actions in MIC are password controlled. A dialog box will be presented. Generally, if the user has provided a valid user and password within the last two minutes then the user will not be prompted to provide them again.

6.2. Multi-Instrument Collect About Dialog

In the drop down menu is the option to display the standard "About MIC" dialog. This dialog also provides a list of registered instrument support and communications support objects along with their versions and creation dates.

6.3. Multi-Instrument Collect Configuration

6.3.1. Establishing a User – Password pair

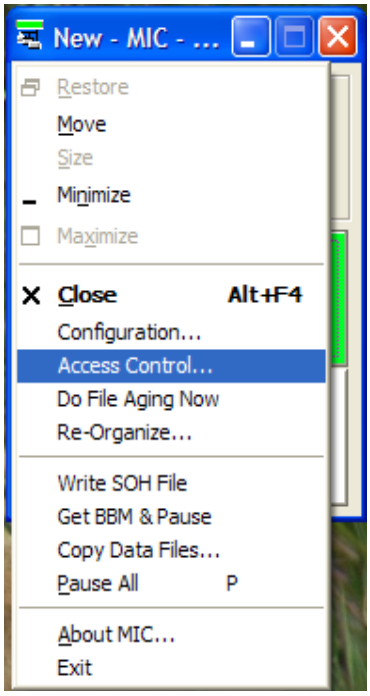


Figure 2 Selecting Access Control

Many of the functions of MIC cannot be accomplished without entering a user name and password — particularly those which could jeopardize normal data collection. To establish the first user – password pair left click on the icon in the upper left of the main dialog box and select the "Access Control" menu item. In the ensuing dialog box enter a user's name and enter the associated password twice as indicated. Click on the "Ok" button. All subsequent additions of user - password pairs will require entering a valid user name and password prior to establishing a new user—password pair or editing an existing one. All users have the same access level to the password protected MIC functions with one exception; the "Re-Organize…" option is accessible only via the [SUPERUSER] INI section's user – password pairs. If more user – password pairs are desired they may be entered now or at

a later date. If the passwords are lost or forgotten then deleting the [USER] and [SUPERUSER] sections in the MIC.INI file will configure MIC to allow the user to reestablish new passwords.

6.3.2. General Configuration

There are a handful of MIC configuration options of which by nature are not associated directly with a specific instrument support or with a specific communications support. To access these options left click on the icon in the upper left corner of the MIC main dialog box and then select "Configuration…". A dialog box allowing modification of each of these items will be displayed. Each item in the "Multi-Instrument Collect: Configure" dialog box should be reviewed and set appropriately for this installation.

Facility Name:

Enter the name of the facility in this item. The entry will be displayed at the top of the main dialog box and will be included at the beginning of the file name for the inspection period file, dialog snapshot file, and the copy files subdirectory file names.

Default Destination for Copy:

The "Copy Data Files" feature uses the destination drive and path entered here for the Copy processing default target drive and path. This default value may be changed during the "Copy Data Files" operation by the user.

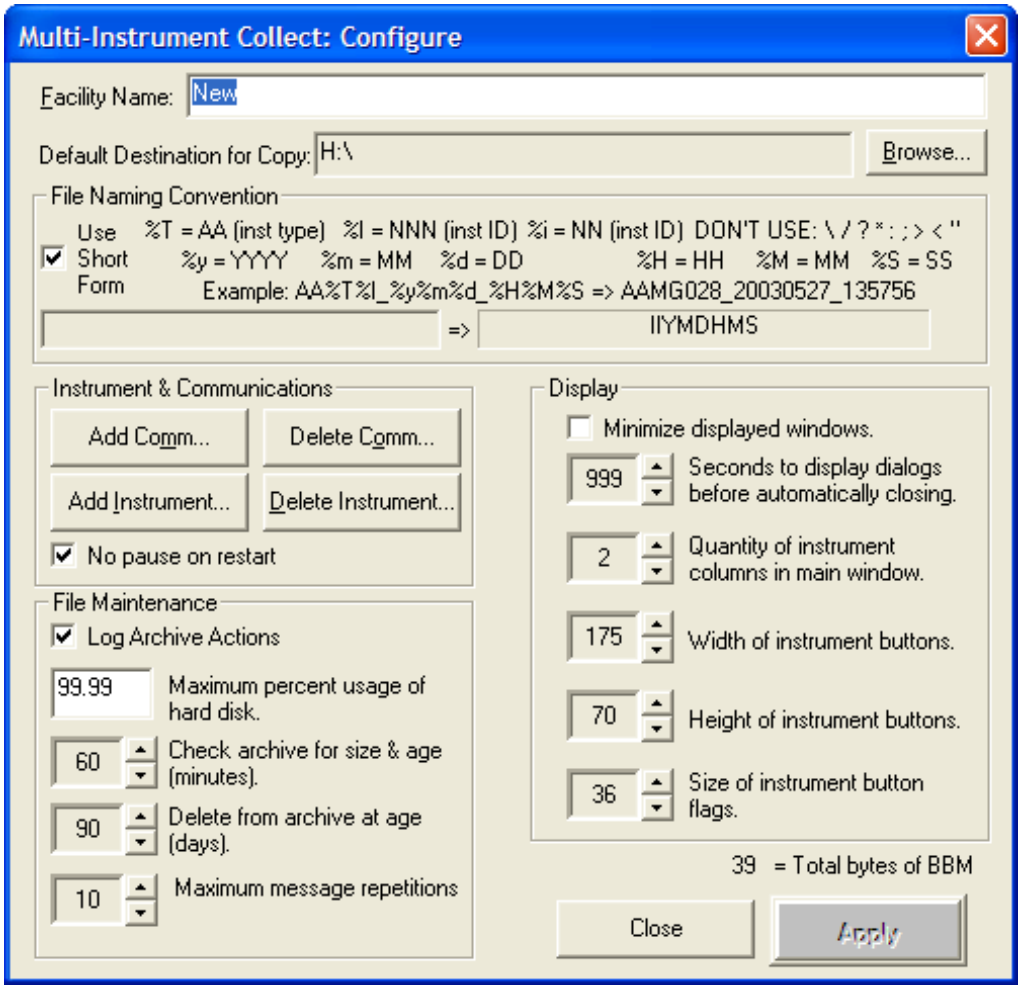


Figure 3 MIC Configuration Dialog Box

File Naming Convention section

Two file naming conventions are available for the Instrument Support Objects output files: short form or long form. When the short form is selected the pattern "IIYMDhmm" is used. In this case II is the two character instrument ID also referred to as the station ID, "Y" is the units of year based on 2000 using 0-9 and then a-z, "M" is the month using 1-9 and then a-c, "D" is the day of month using 1-9 and a-v, "h" is hours of the day using a-x, "mm" is minutes in the hour. When using the long form the user has complete control on what information is included in the file name. Each Instrument Support Object type has a two character type associated with it. Using "%T" will cause that two character string to be placed into the file name. The instrument ID as a two digit or as a three digit element, the year, month, day, hour, minute, and second all may be included in the file name. Although hours, minutes, and seconds may be requested, all of the existing PFM, CEV, and data files (with the exception of the CHN files) ignore the actual hours minutes and seconds and instead use zeros. This is because there is only one file generated per day for each of these. With the exception of the "Don't Use" characters shown in the dialog box any other character may be included in the file name.

Instrument & Communications section

The Add and Delete buttons provide access to the instantiation of communications support and instrument support objects. All instruments must connect via some type of communications. Consequently, a communications support object must be created prior to creating an associated instrument support object which will use it. The creation of both communication and instrument support objects is covered in a later section. The "No Pause On Restart" check box controls when the configured instrument control objects begin (after program startup) attempting to talk to the physical instruments. If this it is checked, as shown above, then when MIC is restarted it will immediately begin talking to the configured instruments. If is not checked then when MIC begins running then talking to an instrument is controlled by the configuration of each individual instrument support object.

File Maintenance section

Checking the "Log Archive Actions" option, as it is depicted above, will cause MIC to append an entry in the AGE.LOG file each time a file is deleted due to age. Only those files which have been copied to removable media or another location via the Copy Data Files button on the main dialog box become targets of the file aging process. These files reside in "Archive" subdirectories under their normal creation directory and are considered archive files. The "Maximum percent usage of hard disk" should be set close to 100. MIC periodically checks how much disk space remains. If the free percentage is below the percentage indicated here then MIC will attempt to delete the oldest files which have been copied—the archive files. How often MIC checks the archives is controlled by the "Check Archive For Size & Age" item on this dialog box. MIC will automatically delete any archived file older than the age set in the "Delete from archive at age" item. The final item in this section is the "Maximum message repetitions". Most of the error conditions or configuration mismatches that MIC can detect are sent from the instrument to MIC multiple times each day. To prevent the CEV and PFM files from becoming very large this value may be set to a low number. Each message is counted and when the limit is reached a comment is appended to the message indicating that no more of that particular message will be placed into the CEV or PFM file. This is not true for certain critical messages.

Display section

This section controls the general look of MIC and in particular the main dialog box. The "Minimize Displayed Windows" when checked causes MIC to keep the number of windows open at an absolute minimum. For example, opening a dialog box which in turn opens another dialog box normally leaves both dialog boxes displayed. In the case where this item is checked the first dialog box will not be displayed while the second box is open. When the second box is closed the first will be redisplayed if appropriate. Dialog boxes will automatically close with the assumption that, if appropriate, any configuration changes are discarded (not applied). Setting the "Seconds to display…" item controls how quickly a dialog box automatically closes. For each instrument support object created a button will be displayed on the main dialog box. By modifying the "Quantity of instrument columns…" value, the MIC main dialog box may be changed from a tall single column of buttons to a wide row of buttons or anything in between. The "Width…" and "Height…" items control the size of the instrument buttons. The "Size of Instrument Button Flags" controls the size of the state of health icons displayed on the bottom of each instrument button.

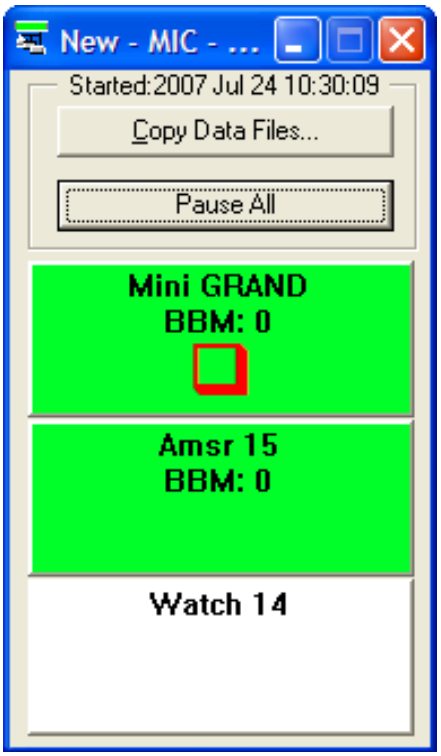


Figure 4 MIC Main Dialog Box

None of the changes become effective until after the "Apply" button has been clicked on. This button has a special boarder indicating it is a password protected function. When it is clicked on the user will be prompted for a user – password combination before the values will become active. When configuration has been completed and the new values have been applied, click on the "Close" button.

Total Bytes of BBM section

Periodically, MIC accumulates the total bytes in the battery backed up memory from each of the instruments and displays this value. This total is useful for trouble shooting when there are a large number of instruments being supported.

6.3.3. Communications Configuration

A communication support object must be created prior to creating an instrument support object which will use it. Only the instrument support objects have buttons on the main dialog box; the communications support objects do not. To see what communications objects have been created select "Configuration" on the menu and then click on the "Delete Com" button. All of the communications objects will be shown and the dialog box may be closed without destroying any communications objects.

In the configuration dialog box (shown in Figure 3), click on the "Add Comm…" button. The "New Communications (CSO)" dialog as illustrated in Figure 5 will be presented. The entries in the "Comm Type" window delineate the communications components that are available for use. Nominally, the selections are: ILON Network, Serial Direct to Instrument, and ORTEC IPX Network. As communications components are added to or removed from the MIC component collection, the specific items in this list may change. Select the desired type.

Each communications support object's configuration is stored in the MIC.INI file in a unique section. The name of that section and the name that this communications object will be referred to when creating instrument objects must be entered in the "Comm Name" item.

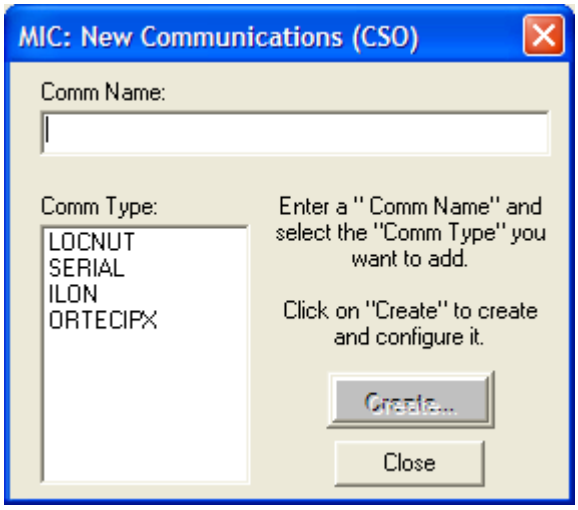


Figure 5 New Communications (CSO) Dialog

In the "Comm Name" entry window, type a name for the communications object to be created. Typical names might be "ILON Net 2", "Com 1", or "ILON on Com 6". When instantiating multiple (128 maximum) communications objects use names which will assist in identifying the correct communications object when attaching new instrument support objects to it

When a name has been entered and a type has been selected, the "Create" button will become active. At this point, confirm your actions by clicking on the "Create" button. Select a different type of communications component type, edit the name, or dismiss the dialog without creating a communications object by clicking on the "Close" button.

6.3.3.1. ILON Communications Setup

If "ILON" has been selected (indicating "ILON Network") then the ILON creation dialog will be presented as illustrated by Figure 6. An ILON Network communications support object may be used to send "I'm Ok" messages to a Watchdog ILON. If this communications support object will be sending these "heart beat" messages to an ILON, select the "Node" number of the target ILON and check the "Participate" check box.

Figure 6 Adding an ILON Communications Support Object

Select appropriate Port, Parity, Data Bits, Stop Bits, and Baud Rate for the ILON connected directly to the port selected. An ILON will typically use 9600, None, 8, and 1. Click on the "Create" button to instantiate the communications support object. Typical names might be "ILON Net 2", "Com 1", or "ILON on Com 6".

Note: When configuring an ILON for a GPS EVENT node, the ILON ID should be used for the node ID,

6.3.3.2. Direct Serial Communications Setup

If "DIRECT_SERIAL" has been selected (indicating a non-networked RS-232 connection directly into one of the physical ports on the collect computer) then the "Add New Serial Port Communications" dialog will be presented as illustrated in Figure 7.

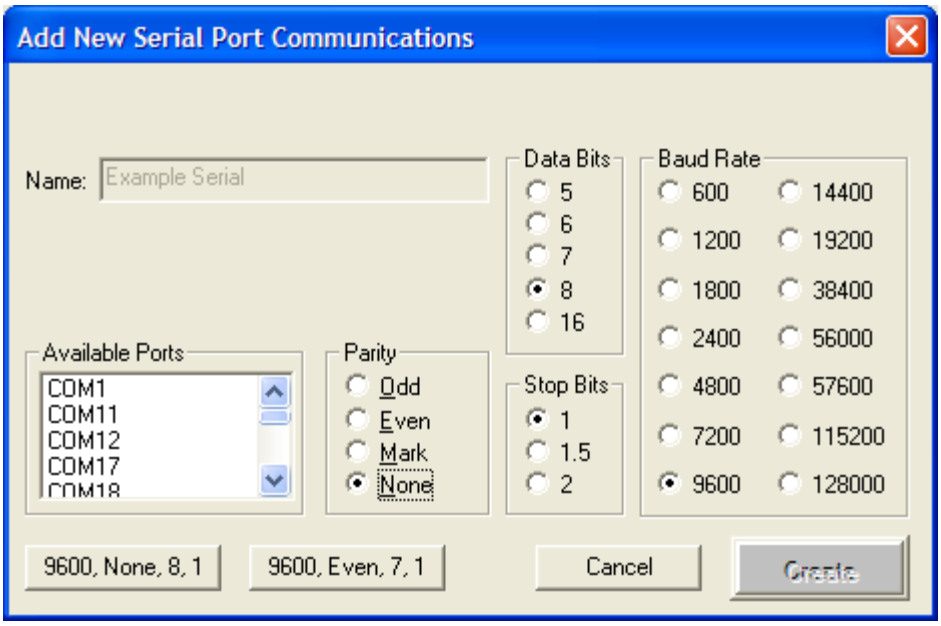


Figure 7 Adding a Direct Serial Communications Support Object

Select appropriate Port, Parity, Data Bits, Stop Bits, and Baud Rate for the device connected directly to the port selected. **The APC UPS's should be set for 2400, None, 8, and 1.**) Click on the "Create" button to instantiate the communications support object. When instantiating multiple (128 maximum) communications objects use names which will assist in identifying the correct communications object when attaching new instrument support objects to it.

6.3.3.3. IPX Ethernet Communications Setup

If "IPX" has been selected then the "Add New Serial Port Communications" dialog will be presented as illustrated by Figure 8.

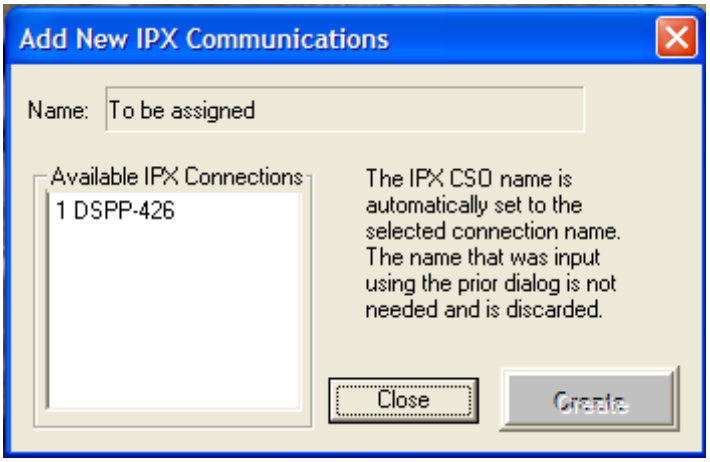


Figure 8 Adding an IPX Ethernet Communications Support Object - Step 1

It is necessary to run the ORTEC program MCBCon32.exe prior to configuring MIC for IPX connections. This COTS program is provided with each DSPEC; it queries for the IPX network connections visible to the collect computer and writes the IPX configuration

information into the MCBCON32.INI configuration file in the windows system directory of the MIC collect computer. When the MCBCON32.INI file is properly set up and accurately describes the system configuration comprising the MIC collect computer, the IPX network, and the DSPEC instruments attached to that network, the list of connections can be accurately presented in the "Available IPX Connections" list. Figure 8 illustrates that the IPX discovery process has detected one DSPEC on the network that has an internal name of "DSPP-426". The IPX CSO name selected from the "Available IPX Connections" list corresponds one-to-one with a specific DSPEC on the network; the serial number of the DSPEC is given by the last 3 digits of the port name.

When the IPX Connection is selected from the list, the name of the communications object that was input by the installer (using the dialog illustrated in Figure 5) is discarded and replaced with the detected name of the detected connection. See Figure 9. Although the CSO setup forces the installer to use the hard-coded internal name for the IPX CSO, the instrument support object for the DSPEC may be named anything that is descriptive in the context of the system layout.

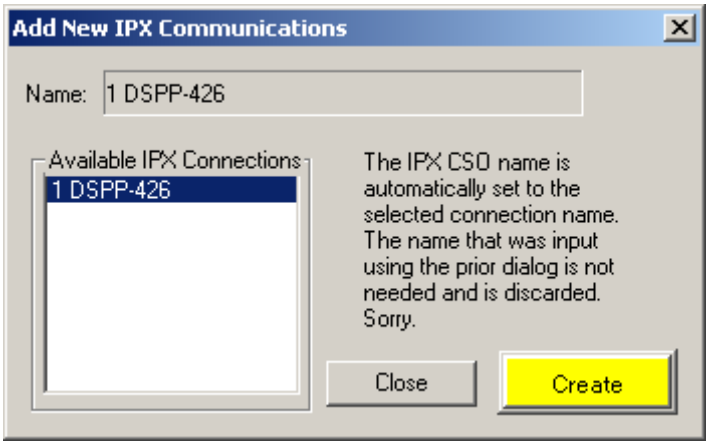


Figure 9 Adding an IPX Ethernet Communications Support Object - Step 2

6.3.4. Instrument Support Configuration

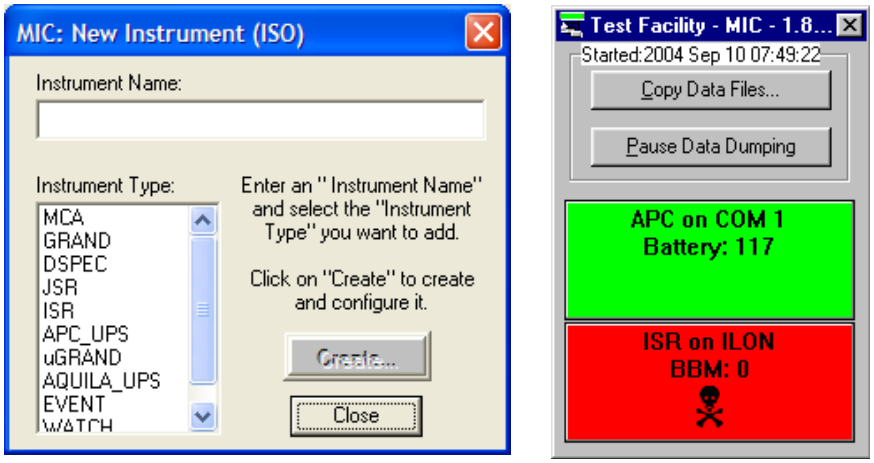


Figure 10 New Instrument Dialog Box & MIC's Main Dialog Box with Two Instruments

All instrument objects need a communications object with which to connect. The communication object must be instantiated prior to creating the instrument object. In the configuration dialog box shown in Figure 3, click on the "Add Instrument…" button. The "MIC: New Instrument" dialog will allow the user to establish a name for the instrument and the type of instrument. The name will be displayed at the top of the instrument button displayed, as shown, on the MIC main dialog box.

Each instrument type requires a unique configuration. When the "Create" button is clicked, the configuration dialog box for that instrument type will be displayed. See the appropriate section for configuration of each instrument type. The APC_UPS type provides support for an American Power Conversion Un-interruptible Power Supply. The DSPEC type provides support for an ORTEC DSPEC-Plus digital spectrometer. The Event type instrument is a pseudo-instrument. It provides a means for logging trigger signals sent from an instrument through an ILON to another device. It also can collect data from a GPS ILON node and VACOSS seals. The GRAND type provides support for a GRAND3 or MiniGRAND. The ISR provides support for an Intelligent Shift Register (ISR) or for the Advanced Multiplicity Shift Register (AMSR). The MCA provides support for a 1KADC / Multi-Channel Analyzer. The JSR provides support for a JSR-12. The WATCH type instrument is a pseudo-instrument. It isn't really supporting any specific instrument type but instead is used to tap into and display the data stream between MIC and an instrument support object. The type of instrument support objects displayed (and consequently creatable) are determined by the instrument components (implemented in DLL files) registered in the system registry, which is usually done automatically at system installation.

6.3.5. Manual Configurations

There are a small number of configuration items which may be set only by directly editing the MIC.INI file. These are items which will change very seldom, which usually the default setting is adequate, or which MIC has direct control over and should be changed only by an advanced user. For example, configuring MIC to send state of health information over a network is done by manually editing the MIC.INI file. See the section on the MIC.INI file for a complete description.

6.4. The Re-Organize Instrument Buttons Dialog

"Re-Organize" is a "supervisor password" protected action. It allows the user to move instruments from one communications support object to another and to change the order in which instrument support objects are displayed. Also on this dialog is a check box that turns on or off hiding all of the "Watch" windows. The Watch windows typically use a significant amount of computer time to maintain. It is strongly recommended that the watch windows are turned off for normal operations and only activated for maintenance purposes. Another option on this dialog provides editing an instrument name. To apply changes made in this dialog MIC must be shut down and restarted. The "Apply Now (Stop & Restart)" button will shut MIC down and immediately restart it.

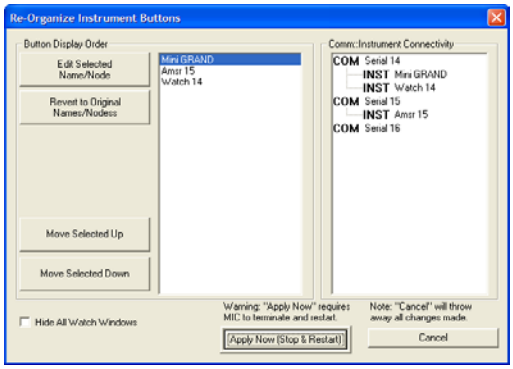


Figure 11 Re-Organize Dialog

6.5. The Multi-Instrument Collect Main Dialog

The Multi-Instrument Collect Main Dialog consists of: buttons to control pausing all instrument support objects and to provide access to copy data functions, colored buttons for each of the instantiated support objects, and a drop down dialog box accessed by clicking on the title bar.

6.5.1. Menu Selections

A drop down menu is available by left clicking on the icon in the upper left corner of the main dialog box. All of the selections are for MIC in general. Specific instrument support object configurations are changed by clicking on the colored button for that instrument.

Selecting "About MIC" will display the standard "about" dialog box which also includes the version of MIC.

The "Configuration" option is used to add and delete communications support objects or instrument support objects. It also provides access to MIC configuration items which are not instrument specific.

"Access Control" is used to manage user names and the associated passwords. Through this menu item new users may be added and existing users may be deleted.

"Do File Aging Now" forces MIC to immediately check to see if it needs to delete any of the archived files. This can be convenient if the disk drive is nearly full. No dialog showing this action is provided; but, if on the "Configuration" dialog "Log Archive Actions" has been checked then an entry will be added to the "Age.log" for each file deleted.

"Re-Organize" is a "supervisor password" protected action. It allows the user to move instruments from one communications support object to another and to change the order in which instrument support objects are displayed.

"Write SOH File" provides a dialog box that allows the user to establish the type of State-Of-Health file MIC should generate and how often it should perform this action. Selecting the "Write SOH File" presents a dialog box allowing the user to select how often to generate a SOH file, whether to generate one once per day at a specific time, what to include in the SOH file, the file name, and the location of the file.

"Get BBM & Pause" causes MIC to transfer all data stored in each instruments' battery-backed memory (BBM) to MIC. Each ISO pauses after the data is fully transferred to MIC. Each ISO starts back up from the paused mode automatically, based on the configuration settings for that ISO. This pause interval is customized for instruments with BBM using the "Maximum Pause Time" setting on the "Modify Parameters" tab page in MIC interval. See also the MAXPAUSE ini file entry for each instrument.

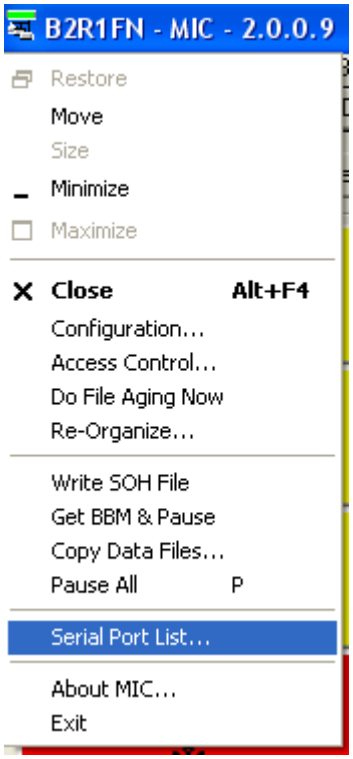


Figure 12 The Drop Down Menu

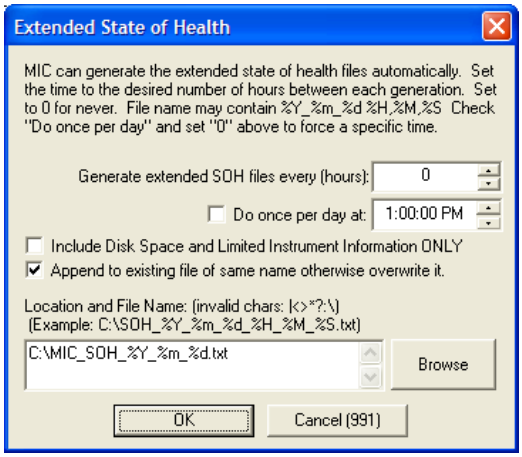


Figure 13 The Extended State of Health Dialog.

A MIC Configuration item, PAUSE_ALL_TIME, (§ 7.2) specifies the maximum length of time to pause all instruments while waiting for the instrument to finish a BBM transfer. Each instrument MAXPAUSE value takes priority over the MIC PAUSE_ALL_TIME setting.

The buttons "Copy Data Files…" and "Pause Data Dumping" are duplicated as buttons on the main dialog box only if "Minimize Displayed Windows" is not checked in the Configuration dialog box. The function of these two buttons is discussed below.

"Serial Port List…", scans the computer for serial ports, present each port with 'in use' status in a simple pop-up list. As a diagnostic tool, this feature may assist in identifying Serial Port access and naming issue on 64-bit Windows OS.

6.5.2. All Instruments Buttons

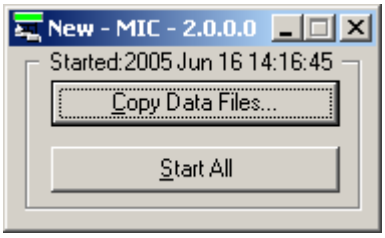


Figure 14 All Instrument Buttons

There are two buttons near the top of the main dialog box. These buttons will be displayed only if the "Minimize Displayed Windows" is not checked in the Configuration dialog box.

6.5.2.1. Pause All or Start All Button

Clicking on the "Pause All" button commands all of the instrument support objects to stop talking to the instruments. With the exception of the JSR-12 and the DSPEC, the instruments will continue to operate normally by collecting data and saving it in their battery backed up memory. Each instrument support object has a configuration item which limits the duration of this "pause", MAXPAUSE. When that time has been exceeded the instrument support object will automatically resume querying the instrument for status and retrieving data from the instrument. Properly configuring the instrument support object's maximum pause time assures no data loss will occur (except for the JSR-12 and the DSPEC-Plus, both lack battery backed up memory). While in pause mode each of the instrument buttons face color will be gray. When an instrument automatically returns to non-pause mode the associated button will begin tracking the state by changing to green, yellow, or red as described above. When the "Pause All" button is pressed and all of the instrument support objects have gone into pause mode the text on the button will change to "Start All". Clicking on this button while in this state will cause all instruments to immediately change into the non-paused mode.

6.5.2.2. Copy Data Files Button

The "Copy Data Files…" button is used to make one or more copies of the accumulated data. Typically, files will be copied to removable media such as a floppy, ZIP, JAZ, or USB thumb drive for off-site analysis and storage. The process begins by downloading all of the data in all of the instruments' battery backed up memory (BBM). One or more identical copies of the data may then be created. Finally, after successful copying, the copied files are moved from their creation directory into an "archive" sub-directory. The copied files will be automatically deleted from the archive directory during the file aging process according to the configuration settings. If a file has been copied and subsequently moved to the archive directory and then data needs to be added to the file, then the file will be moved back into the original directory and the data added. Thus, data will never be deleted unless it has been copied.

When the "Copy Data Files…" button is activated the user will be presented with a dialog box prompting for copy information. In this dialog box on the left side are eight icons. Four are colored red, green, or are yellow pointing fingers and four are gray. The gray icons do not participate in the immediate requirements—only the red, green, and yellow ones do. In the subsequent dialog box the top four will be gray (inactive) and the bottom four will be active. These icons form a checklist of actions for completing the copy file activity. If a removable drive is attached to the computer while this dialog is displayed, the new drive will automatically become the default destination drive. Display after the "Default:" will change to the newly installed drive letter if the current default is a different drive. This change will also be written to the INI file so that in the future the default will probably match the removable drive.

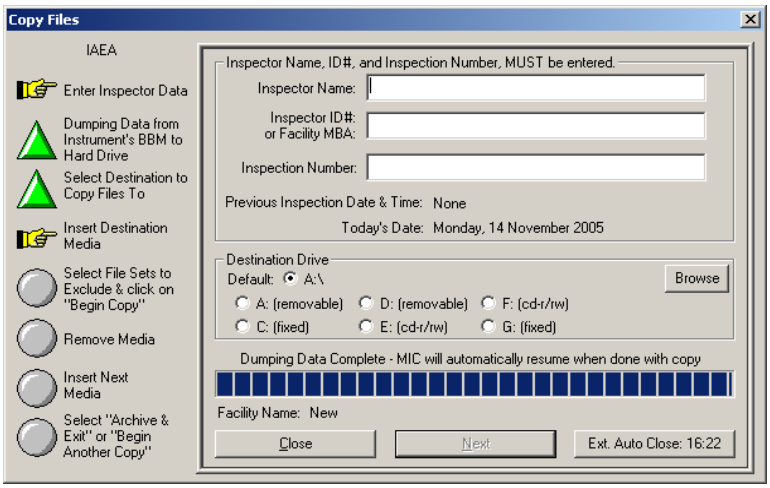


Figure 15 The First Copy Data Files Dialog Box

The top four must be green triangles before MIC will allow the user to continue with the remainder of the copy data activity. The green triangle indicates "accomplished" or "ok". The moving yellow pointing hand indicates MIC is waiting for user action on the associated item. The red circle indicates MIC is doing something which must be completed before allowing the user to go to the next dialog box. Initially the "Enter Inspector Data" will be a yellow pointing hand. The user must enter information in the "Inspector Name", "Inspector ID#", and "Inspection Number" fields to change the "Enter Inspector Data" icon from yellow hand to green triangle. In the example below MIC is also waiting for media to be placed in the E: drive. When the user inserts media into drive E: the yellow pointing hand will change to a green triangle. Initially the "Dumping Data from Instrument's BBM to Hard Drive" icon will be a red circle. When MIC detects that all of the data has been retrieved from the instruments' BBM then the red circle will change to a green triangle. In this dialog box the user is also given the option of selecting a different destination than the default. This activity may be aborted by clicking on the "Close" button. After all of the data has been moved from the instruments' BBM the time in the "Ext. Auto Close: xx

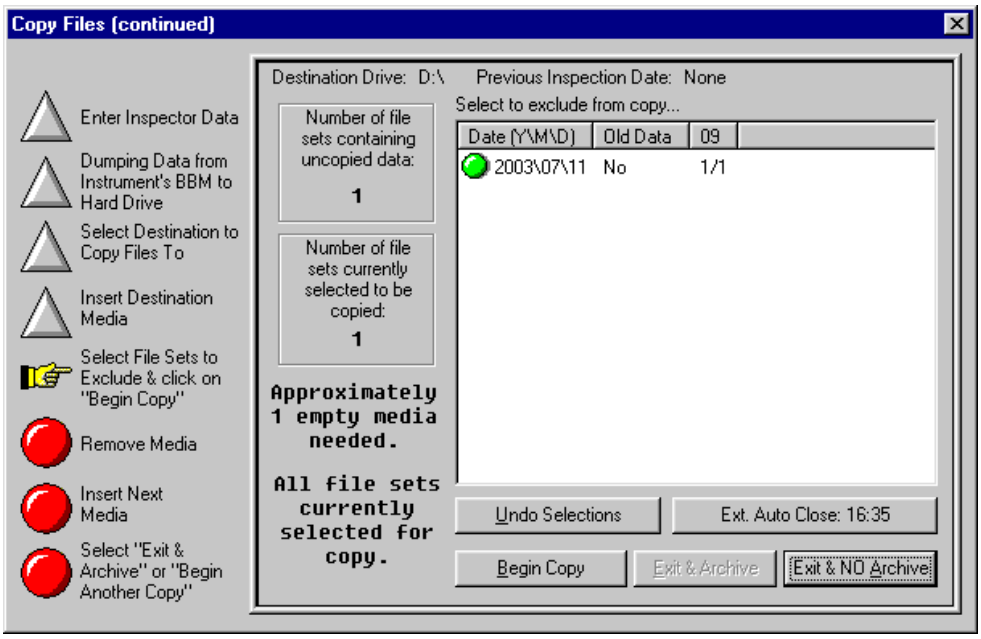


Figure 16 The Second Copy Data Files Dialog Box

:xx" will start counting down. If this value is allowed to reach zero then the dialog box will automatically close as though the user clicked on the "Close" button. Clicking on the "Ext. Auto Close" button will extend the auto close time by five minutes each time it is clicked to a maximum of 120 minutes. Clicking on the dialog box anywhere else will reset the auto-close time to the current default setting. When the top four icons are all green the "Next" button will become active and allow the user to move on to completing the copy files activity.

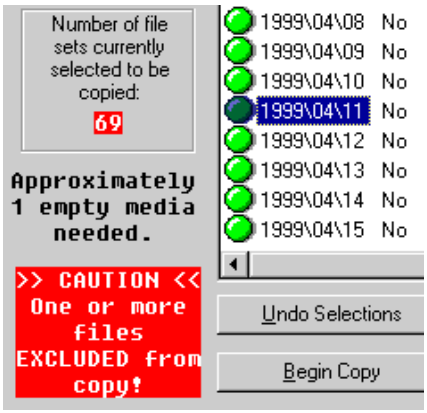


Figure 17 Election to NOT Copy a Days Data

Completing the copy activity is accomplished by clicking on the "Next" button. The Copy Files (continued) dialog box will be displayed. The bottom four icons on this dialog box are active and the top for are grayed out (inactive). The yellow "Select File Sets to Exclude & click on Begin Copy" indicates MIC is waiting for the user to do either action. On the right hand side of the dialog box is a list of files available to copy. One day for each instrument. The green dot indicates that the file contains only new data from the previous copy activity, as does the "Old Data" column. If one or more of the files for that day contain data previously copied then the green dot will show half green and half red and the "Old Data" column will be "Yes". This information is useful only to ensure all data has been copied. It means that the copied file for that day when merged with copied files from a previous copy activity will contain some of the same data. The entries to the right of the list box each contain two numbers separated by a slash, such as 3/3. This indicates that there are three files remaining to be copied of a total of three files. As each file is copied the number will be modified such as 3/3 will go to 2/3, then to 1/3, and finally to 0/3 indicating zero files remain to be copied of the original three.

The red icons on the left will change to yellow prompting for user action. The middle two are used when the data won't fit on a single removable media and the bottom icon indicates the copy activity has completed and the user may exit the copy activity or make another copy identical to the first.

Although not normally done, the user may elect to not copy a particular day's data by clicking on the date of one or more of the items in the list. This will select the item to NOT copy and will be indicated in the dialog box as an incomplete set.

Note that if the date information in this list doesn't appear correct, such as a large negative number for the year, you may not be copying all of the data. This can occur if the "File Naming Convention" in the "Configure" dialog box has been changed. In this case you must copy the other files using some other technique. Try EZCopy or write a Windows batch file to implement more complex data file backup procedures.

LEGACY OS WARNING: On Windows systems older than XP SP2 (*e.g.* Windows 2000, Windows NT, Windows XP SP1) when MIC prompts the user to remove the destination drive the user MUST safely remove the USB device by clicking on the small icon in the task bar notification area. The icon looks like a pc-card with a small green arrow above it.

6.5.3. Individual Instrument Buttons

The main dialog provides access to available information and control of the individual instrument support objects. A colored button is displayed for each instrument support object. Clicking on an instrument support object's button provides a dialog box displaying data specific to that instrument. These dialog boxes are described in the section for each instrument type. The colored buttons will change background color depending on the state of the instrument support object. Gray indicates MIC is not currently gathering information from the associated instrument, although the instrument may still be gathering data from its sensor and storing the data in the instrument's local battery backed up memory if it has one. A green button indicates the normal quiescent state of the instrument support object. When a command is sent to the instrument which requires a response the button background changes to yellow until an appropriate response is received at which time the button background changes back to green. When there is a communications problem between MIC and the instrument the background of the colored button is changed to red. Icons are displayed on the colored buttons to depict various instrument problems. The number of bytes in the instruments' battery backed up memory is also displayed on the button (battery reserve in minutes on the APC UPS support object). Because each instrument support object type may be different, a legend tab is provided on the instrument specific dialog box to explain the meaning for that instrument.

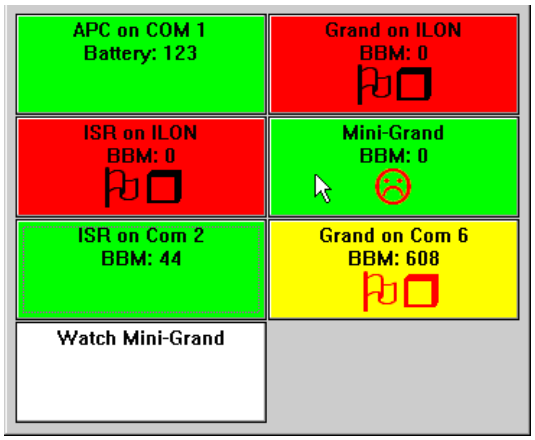


Figure 18 Instrument Buttons

7. Files

7.1. File Naming Convention

MIC supports two forms of data file naming, a short 8.3 fixed format and a long more readable variable format. The selection in made in the "Configure" dialog box. Caution should be exercised in selecting the correct form because only the newer versions of the review software can handle the long form. The user should verify the version of the review software can handle the new long form before selecting this option.

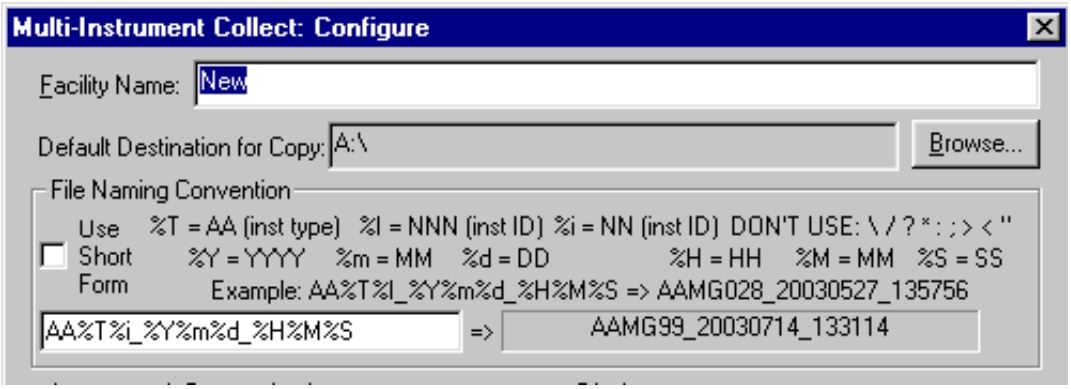


Figure 19 File Naming Convention of Configuration Dialog.

To configure the long form the user must create a template that MIC can use to build the name. As items are entered into the Configure dialog an example is built depicting the results. Variable items in the template are represented in Table 7.1. The template variables may be intermixed with other non-variable information. For example at "Test Facility" the long form could be set to "Test Facility %y %m %d at %H_%M_%S". This would yield a naming convention that would generate a file name that looks like: Test Facility 2003 07 13 at 07_31_22. Note that there are characters which cannot be included in the file name and that the file extension is NOT included; Each ISO will append an appropriate file extension. The ISOs which generate only one file of a particular type per day (*e.g.* PFM, CEV, BID, JSR, ISR) override the template's hours minutes and seconds with zeros. This is not the case for ISOs which generate such multiple data files in an single day (*e.g.* CHN).

Table 7.1 Long Form Variable Elements

Template	Description and Length	Resulting Examples
%T	Instrument Type (XX)	IS, DS, EV, MG, AC
%I or %i	Station ID (XXX or XX)	001 through 099 or 01 through 99
%y	Year (XXXX)	2003
%m	Month (XX)	01 through 12
%d	Day (XX)	01 through 31
%H	Hour (XX)	00 through 23
%M	Minute (XX)	00 through 59
%S	Second (XX)	00 through 59

Selecting "Use Short Form", the default selection, will cause all of the ISOs to use a standard file naming convention and which is limited to the common 8.3 format shown below.

The first part of the file name is described as IIYMDHmm where:

II = two character station id,
Y = last digit of the year (0-9), or 0-9 for 1990-1999 and A-Z for 2000-2025
M = month (1-9 then A - C = 1-12),
D = day of the month (1-9 then A - V = 1-31),
H = hour on a 24 hour clock (A-X = 0-23) (typically limited to 'a'), and
mm = two digit number indicating minutes of the hour (typically limited to '00').

Generally, there are three types of files created: performance, critical events, and data. The performance files and the critical events files are simple text files and use ".PFM" and ".CEV" respectively as their file extension. The data files are binary files and therefore cannot be viewed by a text based files editor. The file extension used for the data files is dependent on the instrument type: ".BID" for GRAND3 and MiniGRAND, ".ISR" for ISR and AMSR, ".MCA" for MCA and 1KADC, ".JSR" for JSR-12, and ".CHN" for DSPEC-Plus.

7.2. MIC.INI File

The MIC.INI file is where all of the MIC configuration information is saved. It is a standard windows initialization file and may be edited by a knowledgeable user with any editor which creates a simple text file. The file is organized into sections with each section having appropriate entries. Each section and entry in this file is discussed below. Each section begins with a section title enclosed in square brackets, "[" and "]". Each data item within a section consists of an item name and item value separated by an equal sign. For example, FACILITYNAME=Test Facility. Pre-pending a semicolon to the data item makes it a comment.

If the instrument-specific default section does not exist in the MIC.INI file, each instrument support object type writes its own default settings section into the MIC.INI file upon instantiation. Therefore, if an instrument type is not included in the overall system configuration, its default settings section will not appear in the MIC.INI file.

[CONFIGURATION]
Defines the start of the configuration section. This section contains non-instrument specific MIC configuration items.

BUTTONSWIDE=2
The number of columns in which to place the colored instrument support object buttons on the MIC main dialog box. This item is set via the Configuration dialog box.

FACILITYNAME=Test Facility
The name of the facility. This item is displayed on the main dialog box title and is set via the Configuration dialog box.

DEFAULTCOPYPATH=D:
The drive and optionally a path which MIC will use as the default destination during file copy activities. Normally this will be set to the drive letter of removable media type drive. It is set via the Configuration dialog box.

MINUTESTOCHECKARCHIVE=60
Controls how often in minutes MIC checks to see if it needs to delete archived files to keep the amount of free disk space as set below. This is set via the Configuration dialog box.

DAYSBEFOREDELFILES=90
Controls how old a file must be before it is considered for deletion during the check archive activity. Set via the Configuration dialog box.

MAXPERCENTDISKUSE=99.99
The maximum amount of disk usage in percent. MIC will detect when this value is exceeded during the automatic check archive activity and will delete only sufficient number of copied files from the archive subdirectories to bring the percent of disk use below the MAXPERCENT-DISKUSE value. Set via the Configuration dialog box.

HIDEWINDOWS=0
When set to '1' minimize displayed windows is on (checked). When set to '0' minimize displayed windows is considered off. Set via the Configuration dialog box.

LOGARCHIVEACT=0
When set to '1' all actions of the automatic check archive activity are logged to the "age.log" file in the same directory as the MicMgr.exe. Set via the Configuration dialog box.

DIALOGCLOSE=999
Contains the number of seconds until an automatically closing dialog box closes. Set via the Configuration dialog box.

MODE=IAEA
Controls the rules governing required information on the first dialog box of the Copy files activity. Any data other than "IAEA" will turn off IAEA copy rules. **This item defaults to this setting and must be set manually by editing the MIC.INI file.**

COMMUNICATIONS=ILON,SERIAL,IPX
This line in the MIC.INI is not used by MIC 2.0.0.0, but is retained for backward compatibility of the MIC.INI file.

INSTRUMENTS=GRAND,ISR,MCA,JSR,EVENT,WATCH,APC_UPS,DSPEC,AQUILA_UPS
This line in the MIC.INI is not used by MIC 2.0.0.0, but is retained for backward compatibility of the MIC.INI file.

BUTTONWIDTH=174
Controls the width in pixels of the colored instrument support object buttons on the MIC main dialog box. Set via the Configuration dialog box.

BUTTONFLAGSIZE=36
Controls the size in pixels of the colored icons on the bottom of the instrument support object buttons. Set via the Configuration dialog box.

BUTTONHEIGHT=70
Controls the height in pixels of the colored instrument support object buttons on the MIC main dialog box. Set via the Configuration dialog box.

FASTSTARTUP=1
Controls whether MIC starts up with instrument support objects in "pause" mode or not. '1' indicates MIC should start up with instrument support objects immediately attempting to take status from their associated instruments. This item is set via the Configuration dialog box. When turned off, set to 0, MIC will start up with all of the instrument support objects paused. Each instrument support object has a maximum pause duration in its configuration. When this

timer runs out the respective instrument support object will automatically begin collecting data from the associated instrument's battery backed up memory.

NORMALSHUTDOWN=0
This item is used to detect if MIC was shut down normally. If it was not shut down normally then MIC overrides the FASTSTARTUP parameter and immediately begins collecting data from the instruments. This item is set and cleared by MIC—no user modification is necessary.

IPDate=Thursday, 15 April 1999 13:21:43
The date and time of the previous copy files activity. This item is set by MIC—no user modification is necessary.

LAST_X=660
The horizontal position in pixels to initialize the MIC main dialog screen the next time is executed. This value is set by MIC—no user modification is necessary.

LAST_Y=245
The vertical position in pixels to initialize the MIC main dialog screen the next time is executed. This value is set by MIC—no user modification is necessary.

SOH_PATH=C:\MIC_SOH.TXT
The filename and path to write the current state of health of MIC to. This file will contain either the SOH_GOOD if all instrument buttons are green or the SOH_BAD string if any instrument button is red. It is updated every 30 seconds if there is a change.

SOH_GOOD=GOOD
Contains the string which is placed in the SOH_PATH file when all instrument buttons are green.

SOH_BAD=BAD
Contains the string which is placed in the SOH_PATH file when one or more instrument buttons are red.

SOH_BADTOGOOD=GOOD NOW
Contains the string which is placed in the SOH_PATH file when an instrument button was red but now is green.

SOH_PATH_EXT=C:\MIC_SOH_EXT.txt
The filename template and path to write the extended state of health file.

SOH_TIME_EXT=0
Controls how often the extended state of health file is written.

MAX_REP=10
Some instrument support objects can limit the number of like entries in the PFM or CEV files. This entry controls that limit.

VERSION=2.0.0.4
This entry is written by MIC on start up.

DOSHORTNAME=Yes
Flag to tell MIC to do the 8.3 short form for data file naming convention.

LONGNAMEFORM=AA%T%I_%Y%m%d_%H%M%S
The template used for the long form of the file naming convention.

AUTORESTARTCOUNT=0
If MIC is having problems starting up (*e.g.* a problem exist with all of the serial ports it uses) it will shut down and MPSS will restart it. This number is written by MIC to control whether to shutdown or not.

BUTTONFLAGS=O%»L<´
On some systems the button flags may be displayed incorrectly. MIC uses the WINGDING fonts to display these glyphs. On some international versions of Windows the WINGDINGs are different. You may change them by modifying this entry.

Hidewatch=No
This item controls the display or hiding of the "Watch" windows. It is set via the Re-Organize dialog box.

LAST_SET_DATE_TIME_COMMAND=OOB TIME SET – COLLECTs TIME:2004,12,24 23:05:59 MESSAGEs TIME:2004,12,24 23:07:45
This item is the most recent time sync message from an ILON communications support object. It shows both the collect computer's time and the time according to the ILON network. It is written to the MIC.INI file prior to attempting to set the collect system's time. This entry will not be present if a time sync message has not been received.

LAST_SET_DATE_TIME=2004,12,24 23:05:59 Done
This item is entered in the MIC.INI file after a time sync has been received from an ILON communications support object. There are four possible results: "Done", "FAILED", "Not Done (time diff. too large), and "Not Required". This entry will not be present if a time sync message has not been received.

SLOWSTART=0
When a large number of instruments are being supported it may be desirable to stagger the initial start or un-pause of dumping data from them. To activate this option change the 0 to the number of seconds between starting instruments to delay. This is an optional entry in the INI file. It may be added manually.

LAST_VALIDATION=MIC
Shows the most recent MIC user to successfully validate a command or apply a change to MIC.

PAUSE_ALL_TIME=1
Sets the time in minutes all instruments will be paused when the menu item "Get BBM & Pause" is selected.

[USERS]
Start of the USERS section containing the user—password pairs established via the Access Control dialog box. This section will contain one entry for each user—password pair.

Pelowitz=ABCDEFGHIJKLMNOP
Typical example of a user—password pair. For security the password is mangled. This item is set and cleared via the Access Control dialog box. A user—password pair cannot be created by adding a line to this section—only the Access Control dialog box may add or edit this entry. Because MIC generally will be running in a secure environment the purpose of the user—password pair is only to verify who the current user is and to prevent inadvertent operational changes which could jeopardize data collection. Also, because continued operations of MIC are

typically considered critical, it is a relatively simple task to bypass the built in password protection when needed. The technique is to comment out all of the entries in the [USERS] section by including a semicolon at the beginning of each (*e.g.* ";Pelowitz=…") and then selecting the Access Control menu option. In this case MIC will detect that there are no valid user—password pairs and will allow the creation of a new one. After using this technique the commented out user—password pairs should be re-activated by removing the semicolon. The addition of a SUPERUSER section adds a little complexity to this procedure as each of the entries in that section must be commented out also.

[SUPERUSERS]
Start of the SUPERUSERS section containing the supervisor—password pairs. This must be manually edited into the MIC.INI file. It will contain one entry for each supervisor—password pair. The supervisor--password pair is used to control access to functions which are particularly difficult to accomplish or which could significantly mangle the MIC configuration. For example "Re-Organize" is a SUPERUSER protected function. The entries in this section are identical in form as in the "USERS" section. The only method to create an entry in this section is to create the user--password pair in the "USERS" section and then cut and paste it into this section.

[NETWORK]
Start of the NETWORK control section. This section controls sending state of health information to a Tracker application across a network. The Tracker machine must be accessible via TCP/IP as UDP packets are used to send the information.

ACTIVE=1
If set to '0' MIC will not send out any information to any Tracker system. If set to '1' MIC will blindly send state of health information only on the port set below to each of the IP addresses set below. This item must be set manually by editing the MIC.INI file.

BEAT=0
The BEAT entry enables regular state of health (SOH) broadcast messages to occur, even if the underlying status of an instrument has not changed for some time. A 0 or negative value disables the feature. A UDP Tracker status update message is sent every BEAT seconds, minimum interval is 22 seconds. Enable this entry when using instrumentation with a steady status without much change, *e.g*. EOSS. MIC normally sends SOH information only when such state changes. Trackers listening for these changes may not reflect the current status if the Tracker was started *after* MIC sent SOH status. Some instruments, such as EOSS, may not reflect a state change for hours or days, and the listening Trackers will not reflect the current state of such instruments for that interval. This item must be set manually by editing the MIC.INI file.

MAILSLOT=\\workgroup\mailslot\WESTPIT1
The MAILSLOT functionality is not supported in MIC 2.0.0.0 or greater.

PORT=1030
Port to use when sending state of health information. This item must be set manually by editing the MIC.INI file. If ACTIVE above is set to 1, a UDP (User Datagram Packet) will be sent to each of the IP addresses listed below each time one of the colored buttons on the MIC main dialog box changes information. The "Tracker.exe" program should be running on the system the IP address refers to in order to display the state of health information in the packet. No other information is included in the packet other than what is displayed on the button face. Because this is a "blind" send there are no adverse effects on MIC if one or more of the destinations is not available or is not running Tracker. This entry must be entered manually by editing the MIC.INI file.

1=128.165.81.64
Typical entry IP address entry to send state of health information to. Multiple addresses may be used, but each require their own entry in the MIC.INI file. The keys on subsequent entries are monotonically increasing. Consequently, a second entry would be a separate line similar to "2=128.265.81.93". These entries must be entered manually by editing the MIC.INI file.

[IPX]
Beginning of the section that contains information describing the collect computer's IPX network configuration. The entries following the **CONFIG_FILE** entry below are inserted in the MIC.INI at the time the first IPX communications support object (CSO) is created.

CONFIG_FILE=C:\WINNT\MCBCON32.INI
This data item indicates the location of the configuration file for the collect computer's IPX network created.

```
[IPX_DETECTORS]
MAX=2
NAME001=1 DSPP-327
ADDR001=9 1 4 DSPP-327
TYPE001=DSPP-007
FEAT001=2402539839 1486770189 7568 0
NAME002=2 DSPP-359
ADDR002=9 1 4 DSPP-359
TYPE002=DSPP-007
FEAT002=2402539839 1486770189 7568 0
[IPX_GENERAL]
DATE=1048119230
```

Example entries. These entries in the MIC.INI file are an exact copy of the contents of the MCBCON32.INI configuration file. This MIC.INI section exists only if (1) an IPX-type communications support object has been selected for possible creation in the configuration dialog and (2) the MCBCON32.INI file exists and can be read. These entries are included in the MIC.INI file for documentation and printout purposes. Modifying them will not affect any operational changes for MIC; instead, MIC uses the values directly out of the MCBCON32.INI file. See Section 6.3.3.3 for further information.

[GRAND Default]
Beginning of "GRAND Default" section. This section exists only if a GRAND-type instrument has been selected for possible creation in the configuration dialog. This section contains default information MIC will use when creating a new GRAND3 or MiniGRAND instrument support object. During the initial creation of this type of instrument control object the user will be given an opportunity to modify each of the items as appropriate for the specific instrument being supported. All of the items in this section must be modified manually by editing the MIC.INI file. MIC will create a section similar to the GRAND Default section for each GRAND instrument support object instantiated.

SLOW_RESET=900
After a communications failure between MIC and an instrument this data item controls how soon, in seconds, MIC will attempt to reestablish communications with the instrument. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

BATVOLTH=14.5
Battery voltage limit (volts) above which the GRAND instrument support object will flag a battery voltage out of tolerance. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

BATVOLTL=11.3
Battery voltage limit (volts) below which the GRAND instrument support object will flag a battery voltage out of tolerance. Set via GRAND instrument support object's dialog box.

SUP_P15H=12.0
Plus 15 volt supply limit (volts) above which the GRAND instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

SUP_P15L=11.0
Plus 15 volt supply limit (volts) below which the GRAND instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

SUP_M15H=-11.0
Minus 15 volt supply limit (volts) above which the GRAND instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

SUP_M15L=-12.0
Minus 15 volt supply limit (volts) below which the GRAND instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

SUP_P05H=5.3
Plus 5 volt supply limit (volts) above which the GRAND instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

SUP_P05L=4.7
Plus 5 volt supply limit (volts) below which the GRAND instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

TIME_ERR=60
Maximum difference between MIC's computer time and the apparent time of an instrument clock before MIC flags the difference as out of tolerance. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

NODE=-1
Node address of the associated instrument on the communications support object to which this GRAND instrument support object is connected. In a specific instrument's section this is set via initial creation of the GRAND instrument support object. This item may be changed by deleting the GRAND instrument support object and creating a new one via the MIC Configuration dialog box or by editing the MIC.INI file directly.

;PORT=
Contains the name of the communications object this GRAND instrument support object is connected to. In a specific instrument's section this is set via initial creation of the instrument support object. This item may be changed by deleting the GRAND instrument support object and creating a new one via the MIC Configuration dialog box or by editing the MIC.INI file directly. Commented out only in the GRAND Default section.

MAXCYCLE=1000
A tuning parameter (milliseconds) used to control timing in the software state machine which directs the actions of the GRAND instrument support object. Normally set to 1 second (1000) but may be set as low as 500 milliseconds. Other control items are based on multiples of this value. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

MAXPAUSE=5400
The maximum duration of which the GRAND instrument support object will not talk to the associated instrument. When this time runs out the instrument support object will return to a normal command sequence. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

DO_DUMP=0
Flag to control writing to a dump file. When "1" all activity is written to the dump file. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

LOG_FILTER=0
Flag to control logging in appropriate PFM file transitions into and out of filtering. When "1' logging is turned on. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

LOG_MII=0
Flag to control logging in appropriate files transitions into and out of Measurement Intervals of Interest. When "1" logging is turned on. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

SAVE_LOC=C:\DATA\GRAND01
Location to save the performance, critical events, and data files. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

MAXINQUIRE=30
Maximum time (in multiples of maxcycle, see above) between sending INQUIRE2 commands to the instrument. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

MAXSTATUS=0
Maximum time (in multiples of maxcycle, see above) between sending DUMPSTAT commands to the instrument. In this case '0' indicates MIC should not repeatedly send the DUMPSTAT command as it does with the INQUIRE2 command. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

COMMFAIL=5
The number of re-transmissions of a command before GRAND instrument support object assumes a communications failure and attempts to take corrective measures such as resetting an ILON. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

AUTOTIMESET=1
Allows MIC to automatically set the instrument's date & time when the year reported by the instrument is less than 1990. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

TIMEOUT=5
The time (in multiples of maxcycle, see above) that the GRAND instrument support object should wait for a response to a transmitted command. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

BINARY_BBM=1
Sets the MiniGRAND instrument so that it reports data to MIC in binary format instead of ASCII format. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

MAXBBM=100
The number of bytes an instrument must report before the GRAND instrument support object begins retrieving data from the instrument's battery backed up memory. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

FILE_ID=01
The station ID number. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

```
SET_ACQ_MODE12="1F"
SET_ACQ_MODE1B="2"
SET_1B_ROM_CHECKSUM="0000"
SET_LLD_A="  0"
SET_LLD_B="  0"
SET_ULD_A="  0"
SET_ULD_B="  0"
SET_UNIT_ID="11"
SET_BOARD1_ID="07"
SET_BOARD2_ID="06"
SET_USER_ID="7777777"
SET_GAMMA1_MODE="A"
SET_GAMMA2_MODE="A"
SET_MAX_GAIN0="4194304"
SET_MAX_GAIN1="4194304"
SET_DISCONNECT_MODE="I"
SET_GRAND_USERVER="03.76"
SET_VERSION="03.76"
SET_ACQUIRE_TIME="    1"
SET_BUFFER_TOTAL="70"
SET_BUFFER_SAVE="50"
SET_NEUTRON_PULSEATHRESH="   100.0"
SET_NEUTRON_PULSEBTHRESH="   100.0"
SET_NEUTRON_PULSECTHRESH="   100.0"
SET_GAMMA_1THRESH="     100.0"
SET_GAMMA_2THRESH="     100.0"
SET_NOFILTERENTERMII_RUNS=" 3"
SET_NOFILTERENTERMII_SIGMA="3.0"
SET_ENTERMII_RUNS=" 3"
SET_ENTERMII_SIGMA="1.5"
SET_MII_EXIT="10"
SET_LOCAL_BACKGROUND_FIRST="25"
SET_LOCAL_BACKGROUND_LAST="30"
SET_ACQ_MODE1C="1f"
SET_1C_ROM_CHECKSUM="0000"
SET_FILTER_METHOD="0"
SET_TRIGGER_MODE="1"
SET_TAKE_OFFSET=" 24"
SET_TAKEOFFSETMAX=" 48"
SET_LOG_BATTERY=" 1"
SET_FILTERING_ENABLED="0"
SET_NEUTRON_A_LOWERLIMIT="0.200"
SET_NEUTRON_B_LOWERLIMIT="0.200"
SET_NEUTRON_C_LOWERLIMIT="0.200"
SET_GAMMA_1_LOWERLIMIT="  0.020"
SET_GAMMA_2_LOWERLIMIT="  0.020"
SET_SYNC_ENABLED="1"
SET_SYNC_TIME="04:30:30"
SET_SYNC_LOWERLIMIT=" 2"
SET_SYNC_UPPERLIMIT="5"
```

The above are all default data as expected to be received from the instrument. See the instrument user's manual.

```
SET4 SET4_GCR_TIME="2004.09.01 16:32:36"
SET4_COUNT_TIME="    1"
SET4_CONF_STATE="1"
SET4_BIAS_TYPE="4"
SET4_BIAS_SETPOINT="1234.0"
SET4_BAUD_RATE="9"
SET4_FRAME="5"
SET4_MODE_FLAGS1="FC"
SET4_MODE_FLAGS2="5A"
SET4_BATT_INTER="90"
SET4_FILTER_CONT="4"
SET4_IMMBUFF_SZ="25"
SET4_IMMBUFFSAVE_SZ="20"
SET4_LOCBG_SZ="15"
SET4_LOCBG_END=" 3"
SET4_STATUS_INT="    5"
SET4_INSP_ID=" 119646"
SET4_UNIT_ID="2A"
SET4_TIMESYNC_STATE="2"
SET4_TIMESYNC_HOUR="5030"
SET4_TIMESYNC_DAILY=" 72040"
SET4_TIMESYNC_LOWTOL=" 5"
SET4_TIMESYNC_UPPTOL=" 3"
SET4_FIRMWARE_VERSION="04.10"
SET4_FIRMWARE_CHKSUM="474B"
SET4_ISR_TIME="2004.09.01 16:32:36"
SET4_BAT_VOLT="12.2"
SET4_P5READ_VOLT=" 4.9"
SET4_P12READ_VOLT="11.9"
SET4_M12READ_VOLT="-12.0"
SET4_ACPOWER_STAT="0"
SET4_BIASREAD_VOLT="1342.0"
SET4_IONREAD_VOLT="260.0"
SET4_ONBOARDREAD_TEMP=" 78.1"
SET4_OFFBOARDREAD_TEMP="238.3"
SET4_IIR_TIME="2004.09.01 16:32:36"
SET4_MPB_ID="0000089131A9"
SET4_MPBXILINX_VER="21"
SET4_DCMSER_NUM="FD"
SET4_DCMBRD_TYPE="DF"
SET4_DCMXILINX_VER="01"
SET4_DCMACTEL_VER="03"
SET4_DCMPRESENCE="1"
SET4_TCPSER_NUM="FF"
SET4_TCPBRD_TYPE="FF"
SET4_TCPXILINX_VER="04"
SET4_TCPPRESENCE="1"
SET4_PSSER_NUM="FF"
SET4_PSBRD_VER="04"
SET4_PSBRD_TYPE="FF"
SET4_PSXILINX_VER="01"
SET4_DCMCR_TIME="2004.09.01 16:32:36"
SET4_OFFSET_MODE="1"
SET4_NOMOS_INTERVAL=" 45"
SET4_MAXOS_INTERVAL="128"
```

```
SET4_G0_GAINMODE="1"
SET4_G0_MAXFIX="11"
SET4_G0_PRES=" 5"
SET4_G1_GAINMODE="1"
SET4_G1_MAXFIX="11"
SET4_G1_PRES=" 8"
SET4_ICHV_SETPOINT="255.0"
SET4_ICHV_CONFIG="1"
SET4_GUNCERT_MULT=" 0.002"
SET4_TCR_TIME="2004.09.01 16:32:36"
SET4_TRIGGER4_LOGIC="1"
SET4_TRIGGER4_CHTYPE="8700000000000000"
SET4_TRIGGER5_LOGIC="1"
SET4_TRIGGER5_CHTYPE="8182000000000000"
SET4_TRIGGER6_LOGIC="0"
SET4_TRIGGER6_CHTYPE="8090A00000000000"
SET4_TRIGGER7_LOGIC="1"
SET4_TRIGGER7_CHTYPE="8092A10000000000"
SET4_CH0_TIME="2004.09.01 16:32:36"
SET4_CH0_USED="0"
SET4_CH0_T1TYPEDIR=""
SET4_CH0_T1VALUE=""
SET4_CH0_T1EEV=""
SET4_CH0_T2TYPEDIR=""
SET4_CH0_T2VALUE=""
SET4_CH0_T2EEV=""
SET4_CH0_CHANGMULT=""
SET4_CH0_CHANGENTCNT=""
SET4_CH0_FILTERLIM=""
SET4_CH0_HYSTER=""
SET4_CH1_TIME="2004.09.01 16:32:36"
SET4_CH1_USED="1"
SET4_CH1_T1TYPEDIR="2"
SET4_CH1_T1VALUE="    100.0"
SET4_CH1_T1EEV="3A"
SET4_CH1_T2TYPEDIR="1"
SET4_CH1_T2VALUE="    555.0"
SET4_CH1_T2EEV="CD"
SET4_CH1_CHANGMULT=" 1.5"
SET4_CH1_CHANGENTCNT="3"
SET4_CH1_FILTERLIM=" 0.2000"
SET4_CH1_HYSTER=" 80"
SET4_CH2_TIME="2004.09.01 16:32:37"
SET4_CH2_USED="1"
SET4_CH2_T1TYPEDIR="2"
SET4_CH2_T1VALUE="    100.0"
SET4_CH2_T1EEV="3A"
SET4_CH2_T2TYPEDIR="2"
SET4_CH2_T2VALUE="    100.0"
SET4_CH2_T2EEV="3A"
SET4_CH2_CHANGMULT=" 1.5"
SET4_CH2_CHANGENTCNT="3"
SET4_CH2_FILTERLIM=" 0.2000"
SET4_CH2_HYSTER=" 80"
SET4_CH3_TIME="2004.09.01 16:32:37"
```

```
SET4_CH3_USED="0"
SET4_CH3_T1TYPEDIR=""
SET4_CH3_T1VALUE=""
SET4_CH3_T1EEV=""
SET4_CH3_T2TYPEDIR=""
SET4_CH3_T2VALUE=""
SET4_CH3_T2EEV=""
SET4_CH3_CHANGMULT=""
SET4_CH3_CHANGENTCNT=""
SET4_CH3_FILTERLIM=""
SET4_CH3_HYSTER=""
SET4_CH4_TIME="2004.09.01 16:32:37"
SET4_CH4_USED="1"
SET4_CH4_T1TYPEDIR="2"
SET4_CH4_T1VALUE="    100.0"
SET4_CH4_T1EEV="3A"
SET4_CH4_T2TYPEDIR="3"
SET4_CH4_T2VALUE="    105.6"
SET4_CH4_T2EEV="11"
SET4_CH4_CHANGMULT="75.0"
SET4_CH4_CHANGENTCNT="6"
SET4_CH4_FILTERLIM=" 0.0200"
SET4_CH4_HYSTER=" 80"
SET4_CH5_TIME=""
SET4_CH5_USED=""
SET4_CH5_T1TYPEDIR=""
SET4_CH5_T1VALUE=""
SET4_CH5_T1EEV=""
SET4_CH5_T2TYPEDIR=""
SET4_CH5_T2VALUE=""
SET4_CH5_T2EEV=""
SET4_CH5_CHANGMULT=""
SET4_CH5_CHANGENTCNT=""
SET4_CH5_FILTERLIM=""
SET4_CH5_HYSTER=""
```

The above are similar to the SET_ entries above except GRAND Monitor version 4.10 and above specific. They are default data as expected to be received from the instrument. See the instrument user's manual.

[ISR Default]

Beginning of "ISR Default" section. This section exists only if an ISR-type instrument has been selected for possible creation in the configuration dialog. This section contains default information MIC will use when creating a new ISR or AMSR instrument support object. During the initial creation of this type of instrument control object the user will be given an opportunity to modify each of the items as appropriate for the specific instrument being supported. All of the items in this section must be modified manually by editing the MIC.INI file. MIC will create a section similar to the ISR Default section for each ISR or AMSR instrument support object instantiated.

HIGHVOLTH=1800

Voltage if exceeded by the report from the ISR instrument is considered a reportable error.

HIGHVOLTL=1600

Voltage if reported by the ISR as being less than is considered a reportable error.

SLOW_RESET=900
After a communications failure between MIC and an instrument this data item controls how soon, in seconds, MIC will attempt to reestablish communications with the instrument. In a specific instrument's section this is set via ISR instrument support object's dialog box.

BATVOLTH=38.0
Battery voltage limit (volts) above which the ISR instrument support object will flag a battery voltage out of tolerance. In a specific instrument's section this is set via ISR instrument support object's dialog box.

BATVOLTL=18.0
Battery voltage limit (volts) below which the ISR instrument support object will flag a battery voltage out of tolerance. In a specific instrument's section this is set via ISR instrument support object's dialog box.

SUP_P15H=20.0
Plus 15 volt supply limit (volts) above which the ISR instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via ISR instrument support object's dialog box.

SUP_P15L=10.0
Plus 15 volt supply limit (volts) below which the ISR instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via ISR instrument support object's dialog box.

SUP_M15H=-14.0
Minus 15 volt supply limit (volts) above which the ISR instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via ISR instrument support object's dialog box.

SUP_M15L=-16.0
Minus 15 volt supply limit (volts) below which the ISR instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via ISR instrument support object's dialog box.

SUP_P05H=6.0
Plus 5 volt supply limit (volts) above which the ISR instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via ISR instrument support object's dialog box.

SUP_P05L=4.0
Plus 5 volt supply limit (volts) below which the ISR instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via ISR instrument support object's dialog box.

TIME_ERR=60
Maximum difference between MIC's computer time and the apparent time of an instrument clock before MIC flags the difference as out of tolerance. In a specific instrument's section this is set via ISR instrument support object's dialog box.

NODE=-1
Node address of the associated instrument on the communications support object this ISR instrument support object is connected to. In a specific instrument's section this is set via initial creation of the ISR instrument support object. This item may be changed by deleting the ISR

instrument support object and creating a new one via the MIC Configuration dialog box or by editing the MIC.INI file directly.

MAXCYCLE=1000
A tuning parameter (milliseconds) used to control timing in the software state machine which directs the actions of the ISR instrument support object. Normally set to 1 second (1000) but may be set as low as 500 milliseconds. Other control items are based on multiples of this value. In a specific instrument's section this is set via ISR instrument support object's dialog box.

MAXPAUSE=600
The maximum duration of which the ISR instrument support object will not talk to the associated instrument. When this time runs out the instrument support object will return to a normal command sequence. In a specific instrument's section this is set via ISR instrument support object's dialog box.

DO_DUMP=1
Flag to control writing to a dump file. When "1" all activity is written to the dump file. In a specific instrument's section this is set via ISR instrument support object's dialog box.

LOG_FILTER=1
Flag to control logging in appropriate PFM file transitions into and out of filtering. When "1' logging is turned on. In a specific instrument's section this is set via ISR instrument support object's dialog box.

LOG_MII=1
Flag to control logging in appropriate files transitions into and out of Measurement Intervals of Interest. When "1" logging is turned on. In a specific instrument's section this is set via ISR instrument support object's dialog box.

SAVE_LOC=C:\DATA\ISR01
Location to save the performance, critical events, and data files. In a specific instrument's section this is set via ISR instrument support object's dialog box.

PORT=
Contains the name of the communications object this ISR instrument support object is connected to. In a specific instrument's section this is set via initial creation of the instrument support object. This item may be changed by deleting the ISR instrument support object and creating a new one via the MIC Configuration dialog box or by editing the MIC.INI file directly. Commented out only in the ISR Default section.

MAXINQUIRE=10
Maximum time (in multiples of maxcycle, see above) between sending INQUIRE2 commands to the instrument. In a specific instrument's section this is set via ISR instrument support object's dialog box.

MAXSTATUS=0
Maximum time (in multiples of maxcycle, see above) between sending DUMPSTAT commands to the instrument. In this case '0' indicates MIC should not repeatedly send the DUMPSTAT command as it does with the INQUIRE2 command. In a specific instrument's section this is set via ISR instrument support object's dialog box.

COMMFAIL=5
The number of re-transmissions of a command before ISR instrument support object assumes a communications failure and attempts to take corrective measures such as resetting an ILON. In a specific instrument's section this is set via ISR instrument support object's dialog box.

AUTOTIMESET=1
Allows MIC to automatically set the instrument's date & time when the year reported by the instrument is less than 1990. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

TIMEOUT=5
The time (in multiples of maxcycle, see above) that the ISR instrument support object should wait for a response to a transmitted command. In a specific instrument's section this is set via ISR instrument support object's dialog box.

MAXBBM=1000
The number of bytes an instrument must report before the ISR instrument support object begins retrieving data from the instrument's battery backed up memory. In a specific instrument's section this is set via ISR instrument support object's dialog box.

FILE_ID=01
The station ID number. In a specific instrument's section this is set via ISR instrument support object's dialog box.

[MCA Default]
Beginning of "MCA Default" section. This section exists only if a MCA-type instrument has been selected for possible creation in the configuration dialog. This section contains default information MIC will use when creating a new MCA instrument support object. During the initial creation of this type of instrument control object the user will be given an opportunity to modify each of the items as appropriate for the specific instrument being supported. All of the items in this section must be modified manually by editing the MIC.INI file. MIC will create a section similar to the MCA Default section for each MCA instrument support object instantiated.

SLOW_RESET=900
After a communications failure between MIC and an instrument this data item controls how soon, in seconds, MIC will attempt to reestablish communications with the instrument. In a specific instrument's section this is set via MCA instrument support object's dialog box.

BATVOLTH=38.0
Battery voltage limit (volts) above which the MCA instrument support object will flag a battery voltage out of tolerance. In a specific instrument's section this is set via MCA instrument support object's dialog box.

BATVOLTL=18.0
Battery voltage limit (volts) below which the MCA instrument support object will flag a battery voltage out of tolerance. In a specific instrument's section this is set via MCA instrument support object's dialog box.

SUP_P15H=20.0
Plus 15 volt supply limit (volts) above which the MCA instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via MCA instrument support object's dialog box.

SUP_P15L=10.0
Plus 15 volt supply limit (volts) below which the MCA instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via MCA instrument support object's dialog box.

SUP_M15H=-14.0
Minus 15 volt supply limit (volts) above which the MCA instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via MCA instrument support object's dialog box.

SUP_M15L=-16.0
Minus 15 volt supply limit (volts) below which the MCA instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via MCA instrument support object's dialog box.

SUP_P05H=6.0
Plus 5 volt supply limit (volts) above which the MCA instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via MCA instrument support object's dialog box.

SUP_P05L=4.0
Plus 5 volt supply limit (volts) below which the MCA instrument support object will flag it as out of tolerance. In a specific instrument's section this is set via MCA instrument support object's dialog box.

TIME_ERR=60
Maximum difference between MIC's computer time and the apparent time of an instrument clock before MIC flags the difference as out of tolerance. In a specific instrument's section this is set via MCA instrument support object's dialog box.

NODE=-1
Node address of the associated instrument on the communications support object this MCA instrument support object is connected to. In a specific instrument's section this is set via initial creation of the MCA instrument support object. This item may be changed by deleting the MCA instrument support object and creating a new one via the MIC Configuration dialog box or by editing the MIC.INI file directly.

MAXCYCLE=1000
A tuning parameter (milliseconds) used to control timing in the software state machine which directs the actions of the MCA instrument support object. Normally set to 1 second (1000) but may be set as low as 500 milliseconds. Other control items are based on multiples of this value. In a specific instrument's section this is set via MCA instrument support object's dialog box.

MAXPAUSE=600
The maximum duration of which the MCA instrument support object will not talk to the associated instrument. When this time runs out the instrument support object will return to a normal command sequence. In a specific instrument's section this is set via MCA instrument support object's dialog box.

DO_DUMP=1
Flag to control writing to a dump file. When "1" all activity is written to the dump file. In a specific instrument's section this is set via MCA instrument support object's dialog box.

LOG_FILTER=1
Flag to control logging in appropriate PFM file transitions into and out of filtering. When "1' logging is turned on. In a specific instrument's section this is set via MCA instrument support object's dialog box.

CHAN1=U235
Text to associate with data channel 1. In a specific instrument's section this is set via MCA instrument support object's dialog box.

CHAN2=Cs137
Text to associate with data channel 2. In a specific instrument's section this is set via MCA instrument support object's dialog box.

CHAN3=U238
Text to associate with data channel 3. In a specific instrument's section this is set via MCA instrument support object's dialog box.

CHAN4=Gross Counts
Text to associate with data channel 4. In a specific instrument's section this is set via MCA instrument support object's dialog box.

CHAN5=Scaler
Text to associate with data channel 5. In a specific instrument's section this is set via MCA instrument support object's dialog box.

CHAN6=U235 / U238 Ratio
Text to associate with data channel 6. In a specific instrument's section this is set via MCA instrument support object's dialog box.

CHAN7=Cs137 / U238 Ratio
Text to associate with data channel 7. In a specific instrument's section this is set via MCA instrument support object's dialog box.

ALARM1=U235
Text to associate with alarm 1. In a specific instrument's section this is set via MCA instrument support object's dialog box.

ALARM2=Cs137
Text to associate with alarm 2. In a specific instrument's section this is set via MCA instrument support object's dialog box.

ALARM3=U238
Text to associate with alarm 3. In a specific instrument's section this is set via MCA instrument support object's dialog box.

ALARM4=Grs Cnts
Text to associate with alarm 4. In a specific instrument's section this is set via MCA instrument support object's dialog box.

ALARM5=Scaler
Text to associate with alarm 5. In a specific instrument's section this is set via MCA instrument support object's dialog box.

ALARM6=Ratio 1
Text to associate with alarm 6. In a specific instrument's section this is set via MCA instrument support object's dialog box.

ALARM7=Ratio 2
Text to associate with alarm 7. In a specific instrument's section this is set via MCA instrument support object's dialog box.

LOG_MII=1
Flag to control logging in appropriate files transitions into and out of Measurement Intervals of Interest. When "1" logging is turned on. In a specific instrument's section this is set via MCA instrument support object's dialog box.

SAVE_LOC=C:\DATA\MCA01
Location to save the performance, critical events, and data files. In a specific instrument's section this is set via MCA instrument support object's dialog box.

;PORT=
Contains the name of the communications object this MCA instrument support object is connected to. In a specific instrument's section this is set via initial creation of the instrument support object. This item may be changed by deleting the MCA instrument support object and creating a new one via the MIC Configuration dialog box or by editing the MIC.INI file directly. Commented out only in the MCA Default section.

MAXINQUIRE=10
Maximum time (in multiples of maxcycle, see above) between sending INQUIRE2 commands to the instrument. In a specific instrument's section this is set via MCA instrument support object's dialog box.

MAXSTATUS=0
Maximum time (in multiples of maxcycle, see above) between sending DUMPSTAT commands to the instrument. In this case '0' indicates MIC should not repeatedly send the DUMPSTAT command as it does with the INQUIRE2 command. In a specific instrument's section this is set via MCA instrument support object's dialog box.

COMMFAIL=5
The number of re-transmissions of a command before MCA instrument support object assumes a communications failure and attempts to take corrective measures such as resetting an ILON. In a specific instrument's section this is set via MCA instrument support object's dialog box.

TIMEOUT=5
The time (in multiples of maxcycle, see above) that the MCA instrument support object should wait for a response to a transmitted command. In a specific instrument's section this is set via MCA instrument support object's dialog box.

MAXBBM=1000
The number of bytes an instrument must report before the MCA instrument support object begins retrieving data from the instrument's battery backed up memory. In a specific instrument's section this is set via MCA instrument support object's dialog box.

AUTOTIMESET=1
Allows MIC to automatically set the instrument's date & time when the year reported by the instrument is less than 1990. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

FILE_ID=01
The station ID number. In a specific instrument's section this is set via MCA instrument support object's dialog box.

[JSR Default]
Beginning of "JSR Default" section. This section exists only if a JSR-type instrument has been selected for possible creation in the configuration dialog. This section contains default information MIC will use when creating a new JSR instrument support object. During the initial creation of this type of instrument control object the user will be given an opportunity to modify each of the items as appropriate for the specific instrument being supported. All of the items in this section must be modified manually by editing the MIC.INI file. MIC will create a section similar to the JSR Default section for the JSR instrument support object instantiated.

MAXPAUSE=60
The maximum duration in seconds which the instrument support object may be paused. At the end of this time the instrument support object restarts taking data from the instrument.

DO_DUMP=0
A flag set to either 1 or 0 to turn on or off respectively the creation and writing of a dump file.

SLOW_RESET=900
How often (in seconds) the instrument support object should attempt to restart an instrument.

SAVE_LOC=C:\DATA\JSR01
Path to the directory all of this instrument support object's files will be placed into.

;PORT=Com 2
Set to the name of the communications support object this JSR instrument will connect to.

FILE_ID=01
The first two characters (numeric) of the file names used for all of this instrument's files.

HIGHVOLTH=4999
Voltage if exceeded by the report from the JSR-12 instrument is considered a reportable error.

HIGHVOLTL=0
Voltage if reported by the JSR-12 as being less than is considered a reportable error.

NODE=-1
The ILON node associated with the JSR-12 instrument. Inconsequential if the instrument is not connected to an ILON communications object.

MAXCYCLE=200
The resolution in milliseconds the JSR instrument support object uses to control events involving the JSR-12. The 200 ms works well in most circumstances.

LOG_FILTER=1
Exists in section but function has not yet been implemented.

FLAGCOMM=0
Current status of communications error glyph on colored button.

FLAGOTHR=0
Current status of power or BBM error glyph on colored button. Not used by JSR-12 instrument support object.

FLAGTIME=0
Current status of time error between instrument and MIC computer. Not used by JSR-12 instrument support object.

COUNTTIMEUNIT=30
Combined with the "COUNTTIMEEXP" to form the duration in tenths of seconds MIC is expecting the instrument to accumulate data.

COUNTTIMEEXP=1
Combined with the "COUNTIMEUNIT" to form the duration in seconds MIC is expecting the instrument to accumulate data. For example, the 30 and 1 as shown here and above resolves to 3.0x10^1 or 30 seconds.

PREDELAY=6
The pre-delay value the instrument support object will set when doing an "Apply" parameters to the JSR-12 instrument. This value is also checked against the reported value and if they don't compare favorably then an error will be reported on the appropriate dialog box. 0 = 0.5, 1 = 1.0, 2 = 1.5, 3 = 2.0, 4 = 2.5, 5 = 3.0, 6 = 3.5, 7 = 4.0, 8 = 4.5, 9 = 5.0, A = 5.5, B = 6.0, C = 6.5, D = 7.0, E = 7.5, F = 8.0. This value is set via the "Modify Parameters" dialog box.

GATEWIDTH=64
The gate-width value the instrument support object will set when doing an "Apply" parameters to the JSR-12 instrument. This value is also checked against the reported value and if they don't compare favorably then an error will be reported on the appropriate dialog box.

HIGHV=1800
The high-voltage value the instrument support object will set when doing an "Apply" parameters to the JSR-12 instrument. This value is also checked against the reported value and if they don't compare favorably then an error will be reported on the appropriate dialog box.

REALSTHRESH=50
Rate of reported REALS (*e.g.* REALS / time) above which the binary file compression routine will not compress records and the point at which the camera trigger is generated if turned on.

TOTALSTHRESH=50
Rate of reported TOTALS (*e.g.* TOTALS / time) above which the binary file compression routine will not compress records and the point at which the camera trigger is generated if turned on.

TOTALS1THRESH=50
Rate of reported AUX TOTALS (*e.g.* AUX TOTALS / time) above which the binary file compression routine will not compress records and the point at which the camera trigger is generated if turned on.

SIGMATHRESH=50
Sigma test threshold (expressed in 10ths of units) above which the binary file compression routine will not compress records.

MAXCOMPRESS=25
The maximum number of data points allowed to be compressed into one data point.

CAMERA_PORT=PORT1
The parallel port the camera is attached to. This may be manually set to PORT1, PORT2, PORT3, or NONE. Port1 is at 0x378 (888), port2 is at 0x278 (632), and port3 is at 0x3bc (956).

CAMERA_PIN=2
The pin on the parallel port to toggle when triggering a connected camera.

CAMERA_TRIGGER_TYPE=RT1
Parameter includes nothing or one or more of "R", "T", and/or "1". This value controls which data items to use when triggering the camera. It turns on or off comparing to the REALS/time to REALSTHRESH, TOTALS/time to TOTALSTHRESH, and AUX TOTALS/time to TOTALS1THRESH values. The CAMERA_TRIGGER_TYPE is set during the JSR-12 instrument support object creation.

CAMERA_TRIGGER_HOLDOFF=0:0:0:10
Time in days:hours:minutes:seconds to hold off triggering the camera after the CAMERA_TRIGGER_THRESHOLD_RATE has been exceeded. All four items must be present in the string.

CAMERA_TRIGGER_SUPPRESS=0:0:5:0
The time in days:hours:minutes:seconds to prevent another follow-on camera trigger after one has been generated. All four items must be present in the string.

[DSPEC DEFAULT]
Beginning of "DSPEC Default" section. This section exists only if a DSPEC-type instrument has been selected for possible creation in the configuration dialog. This section contains default information MIC will use when creating a new DSPEC instrument support object. During the initial creation of this type of instrument control object the user will be given an opportunity to modify each of the items as appropriate for the specific instrument being supported. All of the items in this section must be modified manually by editing the MIC.INI file. MIC will create a section similar to the DSPEC Default section for the DSPEC instrument support object instantiated.

COMMFAIL=5
The number of re-transmissions of a command before DSPEC instrument support object assumes a communications failure and attempts to take corrective measures such as resetting an ILON. In a specific instrument's section this is set via DSPEC instrument support object's dialog box.

DO_DUMP=0
Flag to control writing to a dump file. When "1" all activity is written to the dump file. In a specific instrument's section this is set via ISR instrument support object's dialog box.

FILE_ID=01
The station ID number. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

FLAGCOMM=0
Saves the current status of the flag icon on the colored instrument support object button on MIC's main dialog box. This item is written by the instrument support object as the status changes; it is not necessary to manually modify this item.

FLAGOTHR=0
Saves the current status of the frowning face icon on the colored instrument support object button on MIC's main dialog box. This item is written by the instrument support object as the status changes; it is not necessary to manually modify this item.

FLAGTIME=0
Saves the current status of the clock icon on the colored instrument support object button on MIC's main dialog box. This item is written by the instrument support object as the status changes, it is not necessary to manually modify this item.

HV_FAIL=10
Sets the value of the actual high voltage reading below which a catastrophic failure is declared.

HVVOLTH=5000
Sets the high limit of the actual high voltage reading to be used during normal operations. Should the high voltage drift above this value, a cautionary visual alarm will be presented.

HVVOLTL=0
Sets the low limit of the actual high voltage reading to be used during normal operations. Should the high voltage drift below this value, a cautionary visual alarm will be presented.

LONGDWELL_SEC=30
The long dwell count time in seconds.

MAXPAUSE=600
The maximum duration of which the DSPEC instrument support object will not talk to the associated instrument. When this time runs out the instrument support object will return to a normal command sequence.

MAXSTATUS=0
Maximum time (in seconds) between sending a predetermined sequence of "show" commands to the instrument in order to obtain status information from the instrument. In this case '0' indicates MIC will not perform this periodic function.

PORT=
Contains the name of the communications object this DSPEC instrument support object is connected to. Commented out only in the DSPEC Default section.

QUIET=0
Represses the display of data associated with the Real Time Dwell. Values are 1 to suppress and 0 to not suppress.

REALTIMEDWELL_SEC=1
Defines the update period for the real time display. Normally set to 1 second. Other values may result in unacceptable behavior of the real time display and associated variable values presentation.

SAVE_LOC=C:\DATA\DSPEC01
Spectrum file storage location on collect computer.

SHORTDWELL_SEC=10
The short dwell count time in seconds.

SLOW_RESET = 900
How often to attempt to reestablish communications after communications has completely failed.

THRESHOLD=100
Default value for threshold counts. If one spectrum has counts greater than or equal to this value, the measurement type changes to long dwell and the spectrum is saved to disk.

TIMEOUT=5
The time (in multiples of seconds) that the DSPEC instrument support object should wait for a response to a transmitted command. In a specific instrument's section this is set via the DSPEC Modify Parameters instrument support object's dialog box.

SHOW_SPECTRA=1
Determines if the graphic of the spectral data will be presented in real-time. 1 = yes, 0 = no.

SET_BLRE_AUTOMATIC_ENABLE=ENABLE
Enables or disables the automatic determination of baseline restorer time constant. Values may be ENABLE or DISABLE.

SET_CORRECTION_FLAT=-0.03906
This sets the flattop correction to the value indicated.

SET_GAIN_CHANNEL=1234
Sets the center channel for the stabilizer gain peak.

SET_GAIN_COARSE=50
Coarse amplifier gain setting. Choices are 1, 2, 5, 10, 20, 50, and 100.

SET_GAIN_CONVERSION=8192
The number of channels in the gamma spectrum. Examples are 512, 1024, 2048, 4096, 8192 and 16384 .

SET_GAIN_FINE=0.345
Fine amplifier gain setting. Values can range from 0.333 to 1.0.

SET_GAIN_POLARITY=NEGATIVE
Polarity of input signal into preamplifier from the detector. Choices are POSITIVE or NEGATIVE.

SET_GAIN_STABILIZATION_ENABLE=ENABLE
Enables or disables the stabilization of the gain peak by the previously selected method, either Gauss mode or point mode. . Choices are POSITIVE or NEGATIVE.

SET_GAIN_WIDTH=42
Sets the width in channels for the stabilizer gain peak.

SET_GATE=OFF
Sets the usage of the ADC gate input signal. Choices are OFF, COINCIDENT, and ANTICOINCIDENT.

SET_HV=3000
Magnitude of high voltage setting for detector.

SET_HV_ENABLE=ENABLE
Whether the high voltage is turned on immediately when MIC controls DSPEC. Choices are ENABLED or DISABLED.

SET_HV_POLARITY=NEGATIVE
Polarity of high voltage setting. Choices are POSITIVE or NEGATIVE.

SET_MODE_STABILIZATION=POINT
Sets the method of stabilization for both gain and zero stabilization peaks. Choices are POINT and GAUSS.

SET_LLD=50
Sets the lower level discriminator to the indicated channel. Values must be between 0 and 16383.

SET_PZ=2183
Sets the pole zero to the value. The value must be between 0 and 4095.

SET_PZ_AUTOMATIC_ENABLE=ENABLE
Enables or disables the automatic pole zero mode. Choices are POSITIVE or NEGATIVE.

SET_SHAP_CUSP=1.0
Sets the cusp factor to the value. Valid values are 0.4 – 1.0.

SET_SHAP_FLAT=1.0
Sets the width of the flattop to the value. The value is in microseconds, ranging from 0.3 to 2.4.

SET_SHAP_RISE=4.0
Sets the rise time to the value. Value is in microseconds, ranging from 0.2 to 23.

SET_SHUTDOWN=ORTEC
Selection of the HV shutdown signal sent to DSPEC when detector is warm. Choices are either ORTEC or TTL.

SET_ULD=8191
Sets the upper level discriminator to the channel indicated.

SET_ZDT_ENABLE=DISABLE
Enables or disables the zero dead time mode. Choices are DISABLE and ENABLE.

[Event Default]
Beginning of "Event Default" section. This section exists only if an EVENT-type instrument has been selected for possible creation in the configuration dialog. This section contains default information MIC will use when creating a new EVENT instrument support object. During the initial creation of this type of instrument control object the user will be given an opportunity to modify each of the items as appropriate for the specific instrument being supported. All of the items in this section must be modified manually by editing the MIC.INI file. MIC will create a section similar to the EVENT Default section for the EVENT instrument support object instantiated.

SLOW_RESET=900
After a communications failure between MIC and an instrument this data item controls how soon, in seconds, MIC will attempt to reestablish communications with the instrument. In a specific instrument's section this is set via EVENT instrument support object's dialog box.

BATVOLTH=38.0
Battery voltage high limit. Voltages reported over this limit will be reported as an error condition.

BATVOLTL=18.0
Battery voltage lower limit. Voltages reported under this limit will be reported as an error condition.

SUP_P15H=20.0
Fifteen volt power high limit. Voltage reported over this limit will be reported as an error condition.

SUP_P15L=10.0
Fifteen volt power low limit. Voltage reported under this limit will be reported as an error condition.

SUP_M15H=-14.0
Negative fifteen volt high limit. Voltage reported over (more positive) this limit will be reported as an error condition.

SUP_M15L=-16.0
Negative fifteen voltage low limit. Voltage reported under (more negative) this limit will be reported as an error condition.

SUP_P05H=6.0
Five volt high limit. Voltage reported over this limit will be reported as an error condition.

SUP_P05L=4.0
Five volt low limit. Voltage reported under this limit will be reported as an error condition.

TIME_ERR=60
Maximum difference between the collect computer's clock and the apparent time on the EVENT instrument in seconds. Differences greater than this will be reported as an error condition.

NODE=-1
The ILON node number associated with the EVENT instrument.

PORT=
The ILON communications support object's name supporting the ILON net on which is the EVENT ILON.

MAXCYCLE=1000
EVENT ISO fine tuning parameter. This data item is the number of milliseconds between times the EVENT ISO triggers state events.

MAXPAUSE=600
The maximum duration the user may pause collection from the EVENT instrument. Note that this does not control whether or not the instrument is collecting data.

DO_DUMP=1
Flag to control writing a dump file or not.

LOG_FILTER=1
Flag to control logging of filter messages.

LOG_MII=1
Flag to control logging of entry to and exit from measurement interval of interest periods.

SAVE_LOC=C:\DATA\EVENT01
The location the long or short names files will be stored. Only one PFM or CEV file will be generated; one data file will be generated for each type of instrument the for which the EVENT ISO receives data.

MAXINQUIRE=10
How often to send an INQUIRE2 or equivalent to the EVENT instrument. Measured in units of MAXCYCLE.

MAXSTATUS=0
How often to request status from the EVENT instrument. Zero (0) means never. This is typically set to zero because the instrument can be configured to periodically send status automatically. Measured in units of MAXCYCLE

COMMFAIL=5
How many times to re-send a command before giving up.

TIMEOUT=5
Duration to wait for an acceptable response to return from a query to an instrument. Measured in units of MAXCYCLE.

MAXBBM=1000
Trigger point at which the EVENT ISO begins requesting the instrument begins sending BBM data. Typically this is set to zero.

AUTOTIMESET=0
Disallows MIC to automatically set the instrument's date & time when the year reported by the instrument is less than 1990. In a specific instrument's section this is set via GRAND instrument support object's dialog box.

FILE_ID=01
Station ID, used to form the file name for the CEV, PFM, and binary files.

[Communications]
Start of the Communications section. This section contains an entry for each communications support object instantiated. The form is "name=type". All of these entries are created and removed via the "Add Comm" and "Delete Comm" buttons on the Configuration dialog box. For each entry MIC will create a section in this file with a section name identical to the "name" portion of the entry in this section.

Com 1=SERIAL
Example entry. In this case a communications support object by the name of "Com 1" has been created and it is of type "SERIAL". Type "SERIAL" is communications support for an instrument directly connected to a serial port or through a pair of ILONs configured as an extension cord. Although the name is "Com 1" it could have been anything, such as "MyComPort" or "Expansion Com Port 7", it is not necessarily associated with the NT system's COM1 port. That association is established in the section of the same name, as well as other configuration items. Set via the Add Comm button on the Configuration dialog box.

ILON on COM3=ILON
Example entry. In this case a communication support object by the name of "ILON on COM3" has been created and is of type "ILON". Type "ILON" is communications support for an ILON network. The "COM3" portion of the name does not associate this ILON network with a WIndows system COM3 port. It has been included in the name for ease of use only. That association is in the section of the same name, as well as other configuration items. This entry established via the Add Comm button on the Configuration dialog box.

[Instruments]
Beginning of the Instruments section. This section contains an entry for each instrument instantiated. Like the communications section entries these entries have the form "name=type". When using the Add Instrument button on the Configuration dialog box an instrument support object entry is added to this section. A section with the same name as the "name" portion of this entry is also created. The new section will contain the configuration items for that instrument support object.

APC on COM 1=APC_UPS
Example entry. In this case an instrument support object by the name of "APC on COM 1" has been instantiated and it is of type "APC_UPS" which is the American Power Conversion Un-Interruptible Power Supply support instrument. A section by the name of "APC on COM 1" should have automatically been created in the INI file MIC during initial instantiation of the instrument support object. As with all entries in this section, if this entry is manually removed then the associated section should also be removed.

GRAND on ILON=GRAND
Example entry. In this case an instrument support object by the name of "GRAND on ILON"" has been instantiated. It is of type "GRAND" which is the instrument support object for GRAND3s and MiniGRAND instruments. This entry is automatically created by MIC during initial instantiation of the instrument support object. If this entry is manually removed then the associated section should also be removed.

ISR on ILON=ISR
Example entry. Instrument support object name is "ISR on ILON" and type is "ISR".

JSR on COM 7=JSR
Example entry. Instrument support object name is "JSR on COM 7" and type is "JSR". Only one JSR instrument support object may be instantiated and if one has been then none of the other instrument support objects may be instantiated with the exception of the WATCH pseudo-instrument.

MiniGRAND=GRAND
Example entry. Instrument support object name is "MiniGRAND" and type is "GRAND".

[Com 1]
Beginning of a typical communications support object configuration section. There must be an entry in the "[communications]" section with a name identical to this section's name (*e.g.* "Com 1=SERIAL"). This section will be automatically created when MIC initially instantiates the "Com 1" communications support object.

Longbreak=YES
This configuration item controls if the communications object may send a long break to the instrument connected to it. Some instruments support reset via the long break mechanism. The entry is set automatically via the create communications object dialog box depending on the type of communications support object.

Parity=NONE
Selects the type of parity used by this communications support object. Set via the create communications object dialog box. Typically, all instruments and ILONs will use no parity although caution should be exercised in setting this value because other values such as "EVEN" may be used.

StopBits=1
Selects the number of stop bits used by this communications support object. Set via the create communications object dialog box. Typically, all instruments and ILONs will use 1 stop bit.

DataBits=8
Selects the number of data bits used by this communications support object. Set via the create communications object dialog box. Typically, all instruments and ILONs will use 8 data bits. Caution should be used as some directly connected instruments may use 7 data bits.

BaudRate=2400
Selects the baud rate used by this communications support object. Set via the create communications object dialog box. Typically, instruments and ILONs will operate at 9600 baud (although other baud rates are possible) and APC UPSs will run at 2400 baud.

Port=COM1
Selects the NT port to be used by this communications support object. This is the actual NT communications port and may be COM1 through COM255. Set via the create communications object dialog box.

[APC on COM 1]
Beginning of a typical instrument support object configuration section. There must be an entry in the "[instruments]" section with a name identical to this section's name (*e.g.* "APC on COM 1"). This section will be automatically created when MIC initially instantiates the "APC on COM 1" instrument support object.

TAKE_STATUS=1
Sets the period (in minutes) that this instrument support object should query the un-interruptible power supply system for status. Set via the instrument support object's dialog box.

RESTART_INTERVAL=10
Sets the amount of time (in 6 minute intervals) between automatic power up sequences of the UPS system during power loss periods.

DELAY_START=10
Sets the delay (in seconds) between when a power fail is detected and the instrument support objects begins its shutdown sequence.

POWERDOWNSYS=1
When set to '1', allows this instrument support object to shut down NT. Set via the instrument support object's dialog box.

MAXPAUSE=600
Sets the maximum pause time (in seconds) for this instrument. If a power failure occurs while the instrument is paused then it will immediately return to normal status. Set via the instrument support object's dialog box.

PORT=Com 1
Sets the communications support object to which this instrument support object is connected. In this case the instrument support object will send commands and receive commands from the communications support object named "Com 1". Set via the initial instrument support object creation dialog.

NODE=0
Sets the ILON node on the communications support object which this instrument support object will use when talking to the communications support object. Not significant when the communications support object is of type "SERIAL" (*e.g.* when the instrument or UPS system is not on a network but is directly connected to a serial port on the MIC computer).

INSTID=01
Establishes the identification number associated with this instantiation of the instrument support object. It is optionally used in the file name of all of the ISO output files. This number should be unique among all instruments at a facility. Set via the initial instrument support object creation dialog.

SAVELOC=c:\data\apcups01
Sets the path to the location that PFM files will be generated in. Usually this path includes the INSTID. Set via the initial instrument support object creation dialog.

UDPPORT=0
THIS FEATURE IS CURRENTLY NOT SUPPORTED. Sets UDP port number used to receive data from MicXfer. This capability is used by the APC UPS only when it detects an Aquila UPS is attached. It is used to tell the Aquila UPS that files are being copied via MicXfer, there are no files to be copied, or MicXfer file copy is failing. Set manually by editing the MIC.INI file.

SHUTDOWNSERVICE1=c:\mic\mpss.exe -e
The APC UPS has the ability to execute any number of programs during a power failure immediately prior to telling the operating system to shutdown. This is useful to prevent data loss. In this example the APC UPS will execute the Multi-Program Startup Service with a command line parameter that tells it to stop the service. See the section on MPSS for other MPSS command line parameters. The number at the end of the SHUTDOWNSERVICE represents a monotonically increasing index for each entry. The ISO will perform each until the last number or a gap is discovered. For example if 1, 2, 3, 4, 6, and 7 are used then only 1, 2, 3 and 4 will be executed--6 and 7 will not be run. The ISO may be configured to run any program during shutdown. If the path or command line parameter contain a blank then the entire path or parameter should be enclosed in quotes. Set manually by editing the MIC.INI file.

SHUTDOWNSERVICE2=c:\mic\micxfer.exe -e
This example is identical to the MPSS example above except that the MicXfer service is stopped. Set manually by editing the MIC.INI file.

SHUTDOWNSERVICE3=SC_CLOSE "App Names"
This example uses a special flag, SC_CLOSE. The flag must be exactly as shown here. If the APC_UPS ISO detects this flag as the first parameter it will attempt to find an application window with a title of the second parameter and will send an SC_CLOSE message to that application. This is useful to shutdown applications that should be running. In this example if a window with a title of "App Names" is found it will be sent the message to close. Set manually by editing the MIC.INI file.

SHUTDOWNSERVICE4=WM_QUIT "App Names"
This example is very similar to the SC_CLOSE example above. The difference is that a message telling the application to immediately quit is sent. This message can be dangerous to use and may cause data loss in the target application. Set manually by editing the MIC.INI file.

SHUTDOWNSERVICE4= C:\WINNT4\system32\net.exe stop "Multi-Program Startup Service"
This example is more complex than the previous in that three parameters are used and the last contains blanks. It instructs the APC_UPS to execute the "net" command found in the path shown and pass that application two parameters: "stop" and "Multi-Program Startup Service". It is an example of controlling a service via the "net.exe" command. In the earlier examples the "-e" parameter was used to tell a service to stop. This command line parameter control capability doesn't exist in all services. Using the "net" command gets around this short coming and can be used with services such as GemCommServer or DCMPoll. The last parameter must match exactly the name as shown in the services dialog accessed through the "Control Panel". Set manually by editing the MIC.INI file.

[ILON on COM3]
Example entry of ILON communications support object. Many of the configuration items are identical to those listed in the SERIAL communications support object "COM 1" listed above. Only those items which are different are discussed below.

Longbreak=YES
Parity=NONE
StopBits=1
DataBits=8
BaudRate=9600
Port=COM3

WATCHDOG=0
Flags if this communications support object should send "Ok" messages to a watchdog ILON every 30 seconds or not. If "0" no messages are sent; if '1' messages are sent. Set during initial instantiation of the communications support object via the "Add Comm" button on the Configuration dialog box.

WATCHDOGPORT=1
The port on the ILON network to send the "Ok" messages to. Set during initial instantiation of the communications support object via the "Add Comm button on the Configuration dialog box.

[GRAND on ILON]
Example of a GRAND instrument support object configuration section. This section's name indicates the GRAND is connected to an ILON network. The actual connection is established in the "Port=" entry below. Many of the configuration items are identical to those listed in the "GRAND Default" section. Only those items which are different are discussed below.

BATVOLTH=38.0
BATVOLTL=18.0
SUP_P15H=20.0
SUP_P15L=10.0
SUP_M15H=-14.0
SUP_M15L=-16.0
SUP_P05H=6.0
SUP_P05L=4.0
TIME_ERR=60
SLOW_RESET=900

NODE=1
MAXCYCLE=1000
MAXPAUSE=999
DO_DUMP=0
LOG_FILTER=1
LOG_MII=1
See GRAND DEFAULT section.

PORT=ILON on COM3
Establishes the communications support object to which this instrument support object is connected. The "ILON on COM3" portion of the entry must be identical to the name of a communications support object which appears in the "Communications" section of the INI file. This item is written by the Add Instrument activity in the Configuration dialog box.

MAXINQUIRE=10
MAXSTATUS=0
COMMFAIL=5
TIMEOUT=5
MAXBBM=0
FILE_ID=01
SAVE_LOC=C:\DATA\GRAND01
FLAGCOMM=1
Saves the current status of the flag icon on the colored instrument support object button on MIC's main dialog box. This item is written by the instrument support object as the status changes; it is not necessary to manually modify this item.

FLAGOTHR=0
Saves the current status of the frowning face icon on the colored instrument support object button on MIC's main dialog box. This item is written by the instrument support object as the status changes; it is not necessary to manually modify this item.

FLAGTIME=0
Saves the current status of the clock icon on the colored instrument support object button on MIC's main dialog box. This item is written by the instrument support object as the status changes, it is not necessary to manually modify this item.

[ISR on ILON]
Example of a ISR instrument support object connected to an ILON network. Many of the configuration items are identical to those listed in the "ISR Default" section. Only those items which are different are discussed below.

HIGHVOLTH=4999
HIGHVOLTL=0
BATVOLTH=38.0
BATVOLTL=18.0
SUP_P15H=20.0
SUP_P15L=10.0
SUP_M15H=-14.0
SUP_M15L=-16.0
SUP_P05H=6.0
SUP_P05L=4.0
TIME_ERR=60
SLOW_RESET=900
NODE=3
MAXCYCLE=1000

MAXPAUSE=99999
DO_DUMP=0
LOG_FILTER=1
PORT=ILON on COM3
MAXINQUIRE=10
MAXSTATUS=0
COMMFAIL=5
TIMEOUT=5
MAXBBM=0
FILE_ID=03
SAVE_LOC=C:\DATA\ISR03
FLAGCOMM=1
Saves the current status of the flag icon on the colored instrument support object button on MIC's main dialog box. This item is written by the instrument support object.

FLAGOTHR=0
Saves the current status of the frowning face icon on the colored instrument support object button on MIC's main dialog box. This item is written by the instrument support object.

FLAGTIME=0
Saves the current status of the clock icon on the colored instrument support object button on MIC's main dialog box. This item is written by the instrument support object.

7.3. CLSIDLIST.INI File

The CLSIDLIST.INI file contains the unique class identifiers (CLSID's) for the libraries that define the different types of instruments and communications objects that MIC 2.0 supports. The CLSIDLIST.INI file contains the data used by the MIC Manager to insert CLSID's into MIC.INI files generated prior to MIC 2.0.0.0. The CLSID's are coordinated with the name of the object type embedded in the library file. The object types in the libraries are intentionally defined to be the same as they were in the pre-MIC 2.0.0.0 versions.

When MIC Manager determines that the CLSID that it needs to identify the appropriate library is not in the MIC.INI, MIC Manager will extract the CLSID from the CLSIDLIST.INI file and insert it in the appropriate section of the MIC.INI file.

This update of an older MIC.INI file is automatic and will only be done once.

MIC.INI files produced by MIC 2.0.0.0 and above are backward compatible with older versions of MIC.

7.4. *.TXT Files

The *.TXT files are created when the user clicks on the "Snapshot Status to File" button on a instrument support object's dialog box. After being prompted for a file name and location the printable contents of that instrument support object's dialog box are copied to a text file. This file may be printed, faxed, or emailed and is intended for use during instrument trouble shooting. The extended state of health may also use the .TXT extension.

7.5. *.DLG Files

The *.DLG files are text files automatically created when the user completes the "Copy Files" activity. It encapsulates in a printable, faxable, email-able form all of the text on all of the instruments' dialog boxes. It also includes some MIC internal information such as instrument state machine's current state. The naming convention is: FacilityName_MMMYYYYDD.DLG where FacilityName is the current facility name setting, MMM is the three character abbreviation for the month, YYYY is the four digit year, and DD is the two digit day of the month.

7.6. *.IP Files

The inspection period file is created automatically when the user completes the "Copy Files" activity. Like the *.DLG file it encapsulates in a printable, faxable, email-able form information about the file copy activity. To support easy automated processing of this file it is in a standard Windows initialization file format and contains two sections. The first, [GENERAL], contains information about this inspection period and the instruments MIC is configured to support. The "INSTRUMENTx=" entries enumerate all of the instruments instantiated. Each entry contains the type of instrument, the instrument ID, and the name given the instrument support object. The second section, [FILES], contains a log of every file copied during the copy files activity. During the copy activity all files are copied without modification as indicated by the "=COPYFILE" append to the log entry. In pre-2.0.0.0 PFM and CEV files are concatenated in temporal order to fill the media. As each file was concatenated it is logged and "=INFILE" was appended to the log entry to indicate what has transpired. In post-2.0.0.0 all files are copied as indicated.

```
[GENERAL]
FACILITY=Test Facility
PREVIOUS=Monday, 08 March 1999 12:23:19
DATE_TIME=Thursday, 15 April 1999 13:21:43
INSPECTOR_NAME=David Pelowitz
INSPECTOR_ID=02890881
INSPECTION_NUMBER=10 Jan 2006
MIC_VERSION=2.0.0.4
INSTRUMENT1=GRAND,01,GRAND on Node1
INSTRUMENT2=ISR,02,ISR in Room 305


[FILES]
1=C:\DATA\G01\0193Na00.BID=COPYFILE
2=C:\DATA\G01\0193Oa00.BID=COPYFILE
3=C:\DATA\G01\0193Pa00.BID=COPYFILE
4=C:\DATA\G01\0193Qa00.BID=COPYFILE
5=C:\DATA\G01\0193Ra00.BID=COPYFILE
6=C:\DATA\G01\0193Sa00.BID=COPYFILE
7=C:\DATA\G01\0193Ta00.BID=COPYFILE
8=C:\DATA\G01\0193Ua00.BID=COPYFILE
9=C:\DATA\G01\0193Va00.BID=COPYFILE
10=C:\DATA\G01\01941a00.BID=COPYFILE
11=C:\DATA\G01\0194Ca00.BID=COPYFILE
12=C:\DATA\G01\0194Da00.BID=COPYFILE
13=C:\DATA\G01\01929a00.PFM=COPYFILE
14=C:\DATA\G01\0192Ma00.PFM=COPYFILE
15=C:\DATA\G01\0193Fa00.PFM=COPYFILE
16=C:\DATA\G01\0193Ha00.PFM=COPYFILE
17=C:\DATA\G01\0193Na00.PFM=COPYFILE
.
.
.
```

7.7. Instrument Specific Files

7.7.1. Performance Files (PFM)

The Performance Files are text files containing date and time stamped performance information and may be read by any text editor which supports simple text only files. One file is created for each day using the configured file naming convention with a file extension of ".pfm". The information in these files is gleaned from the various status messages as well as the status bytes in the safeguards data messages sent by the instrument. See the section on each instrument for a list of all possible entries for the specific instrument type.

7.7.2. Critical Events Files (CEV)

The Critical Events Files are text files containing date and time stamped information critical to the acquisition of safeguard information and may be read by any text editor which supports simple text only files. The standard file naming convention is used with a file extension of ".cev". They contain a subset of the information in the PFM files. The APC UPS and AQUILA UPS instrument support objects do not create CEV files. The information in these files are gleaned from the various status messages as well as the status bytes in the safeguards data messages sent by the instrument. See the section on each instrument for a list of all possible entries for the specific instrument type.

7.7.3. DUMP Files

Dump files are optionally created by instrument support objects. The dump files are intended for debugging purposes only as they can become very large. All communications between the instrument and the associated instrument support object are date and time stamped and recorded in this file. The file is a simple text file and may be read by any text editor which support simple text only files. The standard naming convention is used with a file extension of ".dmp". The following is an excerpt from a dump file:

```
1999/04/07 23:59:41 DUMPBBM
1999/04/07 23:59:41 151491609604 0     0.0     0.0     0.00.000e+14.29e-50.000e+11.91e-5    17ba3
1999/04/07 23:59:42 151491609605 0     0.0     0.0     0.00.000e+14.62e-50.000e+11.91e-5    179a1
1999/04/07 23:59:42 151491609606 0     0.0     0.0     0.00.000e+13.08e-50.000e+11.91e-5    179a1
1999/04/07 23:59:42 151491609607 0     0.0     0.0     0.00.000e+14.62e-50.000e+11.91e-5    17ba3
1999/04/07 23:59:42 151491609608 0     0.0     0.0     0.00.000e+14.62e-50.000e+11.91e-5    17ca4
1999/04/07 23:59:42 1667
1999/04/07 23:59:42 DUMPOK
1999/04/07 23:59:42 17     038
1999/04/07 23:59:43 INQUIRE2
1999/04/07 23:59:43 1e149160961220 080    38a2
1999/04/07 23:59:53 INQUIRE2
1999/04/07 23:59:53 1e149160962220 080   456b7
```

Sample DUMP file contents

7.7.4. Binary Data Files

The binary data files are the safeguards information for the instrument. The DSPEC-Plus files are spectra and use the file extension ".CHN"; GRAND3 and MiniGRAND's files use the file extension ".bid"; the ISR and the AMSR's files use the file extension ".isr"; the JSR-12 files use the file extension ".jsr"; and the MCA's files use the file extension ".mca". The

MCA also writes spectra in either .CHN, .TXT, or .CSV format. The contents and format of each of these files is discussed in the section for the specific instrument type.

7.7.5. INI Files Other than MIC.INI

All other INI files are covered in the program's section which uses or creates it.

Program Name	INI file
MicXfer	MicXfer.INI
WatchMicXfer	WatchMicXfer.INI
MPSS	Mpss.INI
MPSU	Mpsu.INI
Tracker	Tracker.INI and others
EZ-Copy	EZ-Copy.INI and others
EZ-Move	EZ-Move.INI and others

7.8. MIC State-Of-Health Files

Multi-Instrument Collect is capable of generating two types of State-Of-Health, SOH, files. The simplest contains one of three strings gleaned from the MIC.INI file. The extensive SOH contains all available information.

The simple SOH file only indicates if there is or was significant problems with one or more of the instruments. If any of the instrument support objects turned the associated colored button red then the file would contain the string associated with the "SOH_BAD=" entry in the MIC.INI file (usually "BAD"). If the circumstances causing the problem have terminated and the instrument is no longer reporting red then the string associated in the MIC.INI file with "SOH_BADTOGOOD=" (usually "GOOD NOW") will be written in the SOH file. If neither of these circumstances have occurred then the string from the MIC.INI file associated with "SOH_GOOD=" (usually "GOOD") will be written. The name and location of this SOH file is the string associated with the "SOH_PATH=" string in the MIC.INI file (usually "C:\MICSOH.TXT"). This file is updated every time the status changes for any of the instrument support objects. It is also updated at the beginning of each day. Creation of this file cannot be turned off. There are no MIC dialogs supporting these configuration items. To modify them edit the MIC.INI file directly.

The second or extended SOH file contains far more information than the simple SOH file. MIC may be configured to create this file as often as once per hour, once per day at a specific time, or its creation may be turned off altogether. It is configured via a dialog accessed from the drop down menu (click on the title bar icon and select "Write SOH File..."). The file name may contain year, month, day, hour, minute, and second information as needed. This capability allows MIC to create a new file each time, append to an existing file, or to overwrite an existing file of the same name. MIC may be configured to include only disk space and limited instrument information or it may be configured to include disk space, a summary of the instrument status, and all of the text from all of the associated tabs on each of the instruments support objects. The file contents beyond the disk and summary portion is identical to that generated when the user selects "Snapshot Status To File" button on an instrument support objects' dialog box. Another configuration option is to append new SOH information to an existing SOH file. For example, suppose the file name were configured to include the year, month, and day but not the hour, minute, and second, and the "Append to exiting..." were selected and MIC was configured

to generate one file each hour. Throughout the day as each hourly SOH file was generated it would be appended to the others for that day; leaving only one large SOH file for each day.

The following is an example of Extended State-Of-Health file. When it was created MIC was configured with a MiniGRAND Instrument Support Object and an ISR / AMSR Instrument Support Object. Both also have associated watch windows. The MiniGRAND was running a monitor version after 4.0+ which added a new set of status messages dropping many of the old status messages. This change precipitates numerous changes to the GRAND/MiniGRAND support object in MIC. Many of the tabbed pages are different and subsequently so is the information included in this file. Comments have been inserted in the form of "Notes:" (the comments will not be in an actual file):

```
//This is only an example.
New - MIC - 2.0.0.4           //MIC Title
2007.07.23 15:53:04           //Date and time of this SOH

Drive Status:                 //Information on Disk Space
A:\, Access Drive Failed Possibly no disk in removable drive.
C:\, Total Number Of Free Bytes:  96347451392, Total Number Of Bytes: 146771894272
D:\, Total Number Of Free Bytes: 115368849408, Total Number Of Bytes: 146812989440
E:\, Access Drive Failed Possibly no disk in removable drive.
F:\, Access Drive Failed Possibly no disk in removable drive.
G:\, Access Drive Failed Possibly no disk in removable drive.
H:\, Total Number Of Free Bytes:    225984512, Total Number Of Bytes:   1039892480
Z:\, Total Number Of Free Bytes: 393660596224, Total Number Of Bytes: 399557787648

MIC Main Dialog Status:       //Information on the MIC front panel buttons
TYPE and NAME of instrument              :  color  bell    time    flag    bbm/pwr disk    flash
square
GRAND                          Mini GRAND:  GREEN
BBM: 0
ISR                               Amsr 15:  GREEN
BBM: 0
WATCH                            Watch 15:  WHITE
WATCH                            Watch 14:  WHITE

//If MIC is configured to provide disk space and limited instrument information ONLY then the
//remainder of this example will not be provided.  It will be included only if MIC is configured
//to include it.

MIC.INI Non-Instrument Specific Sections:
[Configuration]
  BUTTONSWIDE=2
  FACILITYNAME=New
  DEFAULTCOPYPATH=H:\
  MINUTESTOCHECKARCHIVE=60
  DAYSBEFOREDELFILES=90
  MAXPERCENTDISKUSE=99.99
  HIDEWINDOWS=0
  LOGARCHIVEACT=1
  DOSHORTNAME=Yes

//Note: Many of the data items have been removed for brevity.

  LONGNAMEFORM=AA%T%I_%y%m%d_%H%M%S
  LAST_X=1175
  LAST_Y=54
  AUTORESTARTCOUNT=0
  SLOWSTART=0
  BUTTONFLAGS=O%»L<´
  SOH_LIMITED_EXT=No
  SOH_APPEND=Yes
  SOH_DAILY=No
  SOH_DAILYAT=13:00:00
  SOH_TIME_EXT_LAST=07/17/2007 13:09:21
  Last_Validation=mic
```

```
  PAUSE_ALL_TIME=1

[Users]
  mic=WNAH@RJBTLDVNFXPH@RJ

[SuperUsers]
  mic=WNAH@RJBTLDVNFXPH@RJ

[NETWORK]
  ACTIVE=0
  PORT=1028
  1=128.165.81.64
  2=65.19.37.88

[Communications]
  Serial 14=SERIAL
  Serial 15=SERIAL
  Serial 16=SERIAL

[Instruments]
  Mini GRAND=GRAND
  Amsr 15=ISR
  Watch 15=WATCH
  Watch 14=WATCH


* = Displayed in RED (reading out of tolerance)
# = Displayed in YELLOW (configuration doesn't match)
Mini GRAND =====  Monday, July 23, 2007 - 15:53:05  ================
SUMMARY
 GRAND\MiniGRAND Setup
  Battery Voltage (Min / Cur / Max):  14.4   14.4   14.4
  +12 Volt Supply (Min / Cur / Max):  11.6   11.6   11.6
  -12 Volt Supply (Min / Cur / Max): -11.8  -11.8  -11.8
   +5 Volt Supply (Min / Cur / Max):   5.0    5.0    5.0
 Data Status
   Measurement Interval of Interest: Not in MII
                     External Power: Ok
                            Battery: Ok
          Battery Backed Up Memory: Ok
  Last INQUIRE Status (Y.M.D H:M:S): 2007.07.23 15:53:06 Delta: 00:00:10
  Recent Commands and Responses:
  DUMPBBBM
  15175328580300     0.0     0.0     0.00.000e+00.00e+00.000e+00.00e+0   5077--
  15175328585300     0.0     0.0     0.00.000e+00.00e+00.000e+00.00e+0   507c--
  15175328590300     0.0     0.0     0.00.000e+00.00e+00.000e+00.00e+0   5078--
  DUMPOK
  17     038
Mini GRAND =====  Monday, July 23, 2007 - 15:53:05  ================
MG SETUP
Most Recent General Status Record, Instrument Status Record, and Battery Record
                      Battery Interval (min.): 15
                       Status Interval (min.):  1440
PC HV Set Point 1600.0  Pulse Counter HV Bias: 1763.0  1763.0  1763.0
IC HV Set Point    0.0    Ion Chamber HV Bias:    0.0     0.0     0.0
    Count Time:      1        Battery Voltage:   14.4    14.4    14.4
   Mode Flag 1:     3C        +12 Volt Supply:   11.6    11.6    11.6
   Mode Flag 2:     00        -12 Volt Supply:  -11.8   -11.8   -11.8
                              +5 Volt Supply:    5.0     5.0     5.0
       Offset Date & Time: 2007.07.22 22:35:23
          ISR Date & Time: 2007.07.23 14:17:32
          GSR Date & Time: 2007.07.23 14:17:32
      Battery Date & Time:
          Time Sync State: 1
              Hourly Time: 3030
               Daily Time:  43030
          Upper Tolerance:  5
          Lower Tolerance:  2
Most Recent Instrument Status and Dual Current Mode Records
```

```
    Dual Ion Date & Time: 2007.07.23 14:17:32
 Gamma Uncert. Multiplier:  0.010
                          Gamma1   Gamma2
               Gain Mode:      0        0
      Max or Fixed Index:      0        0
      Present Gain Index:      0        0
             Offset Mode:      0          HV Config:      0
        Nominal Interval:     24   Maximum Interval:     72
  GRAND Program Version Num:  04.22
              ROM Checksum:   8B05
 Checksum, Length, or Authentication Error Received in Message:

Mini GRAND =====  Monday, July 23, 2007 - 15:53:05  ================
DATA STATUS
 Last INQUIRE Status (Y.M.D H:M:S):
 2007.07.23 15:53:06 Delta: 00:00:10
                     Main Unit ID: 55
           External Power Present: Ok
                        Operation: Normal
    Bytes of Data in GRAND Memory:      0
              Data Filter Status: Filtering
   Measurement Interval of Interest: Not in MII
         Battery Backed Up Memory: Ok
                          Battery: Ok
Most Recent ACQUIRE Records
 Date of Record (Y/M/D): 2007.07.23 2007.07.23 2007.07.23 2007.07.23
 Time of Record (H:M:S):   15:51:43   15:50:53   15:50:03   15:49:13
    Pulse A Count Rate:        0.0        0.0        0.0        0.0
    Pulse B Count Rate:        0.0        0.0        0.0        0.0
    Pulse C Count Rate:        0.0        0.0        0.0        0.0
   Gamma 1 Gross Gammas:   0.000e+0   0.000e+0   0.000e+0   0.000e+0
Gamma 1 Sigma/Int. Temp:    0.00e+0    0.00e+0    0.00e+0    0.00e+0
   Gamma 2 Gross Gammas:   0.000e+0   0.000e+0   0.000e+0   0.000e+0
Gamma 2 Sigma/Ext. Temp:    0.00e+0    0.00e+0    0.00e+0    0.00e+0
 Duration Data Acquired:         50         50         50         50
Mini GRAND =====  Monday, July 23, 2007 - 15:53:05  ================
TRIGGER PARAMETERS
  Most Recent Trigger Configuration Record
  Date/Time of Record (Y.M.D H:M:S): 2007.07.23 14:17:32
            Logic     Channel / Type
     Pin 4:   0  8/7  9/7  A/7  B/7  C/7  0/0  0/0  0/0
     Pin 5:   0  0/0  0/0  0/0  0/0  0/0  0/0  0/0  0/0
     Pin 6:   0  0/0  0/0  0/0  0/0  0/0  0/0  0/0  0/0
     Pin 7:   0  0/0  0/0  0/0  0/0  0/0  0/0  0/0  0/0
  Most Recent Channel Config. Records
                            Ch 0    Not Used    Not Used        Ch 3    Not Used        Ch 5
    Thresh 1 Type::Dir:         2                                   2
        Thresh 1 Value:     100.0                               100.0
   Thresh 1 Entry::Exit:        3A                                  3A
    Thresh 2 Type::Dir:         2                                   2
        Thresh 2 Value:     100.0                               100.0
   Thresh 2 Entry::Exit:        3A                                  3A
  Chng. Sig. Multiplier:       1.5                                 1.5
   Chng. Sig. Entry Pt.:         3                                   3
         Filter Limit:    0.2000                              0.0200
           Hysteresis:        80                                  80
Mini GRAND =====  Monday, July 23, 2007 - 15:53:05  ================
Instrument Settings
  Item: Reported(instrument) :: Desired(INI file)
        General Config Record (41): 2007.07.23 14:17:32 :: 2007.07.19 08:57:07
                    -Count Time:     1 ::     1
                -Configured State: 1 :: 1
                       -Bias Type: 4 :: 4
                  -Bias Set Point: 1600.0 :: 1600.0
                       -Baud Rate: 9 :: 9
                           -Frame: 5 :: 5
                     -Mode Flags 1: 3C :: 3C
                     -Mode Flags 2: 00 :: 00
               -Battery Rec. Int.: 15 :: 15
```

```
                    -Filter Control: 3 :: 3
                   -Imm. Buff. Size: 70 :: 70
               -Imm. Buff. Save Size: 50 :: 50
              -Local Background Size: 25 :: 25
               -Local Background End:  5 ::  5
                  -Status Rec Intvl.:  1440 ::  1440
                           -Insp. ID: 7777777 :: 7777777
                            -Unit ID: 55 :: 55
                     -Time Sync State: 1 :: 1
                    -Hourly Sync Time: 3030 :: 3030
                     -Daily Sync Time:  43030 ::  43030
                      -Sync. Low Tol.:  2 ::  2
                       -Sync. Up Tol.:  5 ::  5
                      -Firmware Vers.: 04.22 :: 04.22
                      -Firmware Cksm.: 8B05 :: 8B05
      Instrument Status Record (42): 2007.07.23 14:17:32 :: 2007.07.19 08:57:07
           -Battery Voltage Reading: 14.4 :: 14.4
                   -+5 Volt Reading:  5.0 ::  5.0
                  -+12 Volt Reading: 11.6 :: 11.6
                  --12 Volt Reading: -11.8 :: -11.8
                   -AC Power Status: 0 :: 2
              -Bias Voltage Reading: 1763.0 :: 1763.0
             -ION Chamber V. Reading:   0.0 ::   0.0
                      -On Board Temp:  82.0 ::  80.1
                     -Off Board Temp: 125.0 :: 123.0
        Instrument Info Record (43): 2007.07.23 14:17:32 :: 2007.07.19 08:57:07
                               -MPB ID: 000008912965 :: 000008912965
                     -MPB Xilinx Ver: 21 :: 21
                       -DCM Ser. Num: C6 :: C6
                     -DCM Board Type: C4 :: C4
                     -DCM Xilinx Ver: C7 :: C7
                      -DCM Actel Ver: D7 :: D7
                        -DCM Presence: 0 :: 0
                        -TPC Ser. Num: FB :: FB
                     -TPC Board Type: FF :: FF
                     -TPC Xilinx Ver: 04 :: 04
                        -TPC Presence: 1 :: 1
                       -PS Serial Num: FF :: FF
                        -PS Board Ver: 04 :: 04
                       -PS Board Type: FF :: FF
                       -PS Xilinx Ver: 01 :: 01
Dual Current Mode Config Record (44): 2007.07.23 14:17:32 :: 2007.07.19 08:57:08
                         -Offset Mode: 0 :: 0
            -Nominal Offset Interval:  24 ::  24
            -Maximum Offset Interval:  72 ::  72
               -Gamma Ch 0 Gain Mode: 0 :: 0
-Gamma Ch 0 Max or Fixed Gain Index:  0 ::  0
     -Gamma Ch 0 Present Gain Index:  0 ::  0
               -Gamma Ch 1 Gain Mode: 0 :: 0
-Gamma Ch 1 Max or Fixed Gain Index:  0 ::  0
     -Gamma Ch 1 Present Gain Index:  0 ::  0
          -Ion Chamber HV Set Point:   0.0 ::   0.0
       -Ion Chamber HV Config State: 0 :: 0
     -Gamma Uncertaintly multiplier:  0.010 ::  0.010
  Trigger Configuration Record (45): 2007.07.23 14:17:32 :: 2007.07.19 08:57:08
                -Trigger Pin 4 Logic: 0 :: 0
              -Trigger Pin 4 Ch/Type: 8797A7B7C7000000 :: 8797A7B7C7000000
                -Trigger Pin 5 Logic: 0 :: 0
              -Trigger Pin 5 Ch/Type: 0000000000000000 :: 0000000000000000
                -Trigger Pin 6 Logic: 0 :: 0
              -Trigger Pin 6 Ch/Type: 0000000000000000 :: 0000000000000000
                -Trigger Pin 7 Logic: 0 :: 0
              -Trigger Pin 7 Ch/Type: 0000000000000000 :: 0000000000000000
Channel 0 Configuration Record (46): 2007.07.23 14:17:32 :: 2007.07.19 08:57:08
                  -Used for Analysis: 1 :: 1
    -Threshold 1 Type and Direction: 2 :: 2
                 -Threshold 1 value:     100.0 ::     100.0
     -Threshold 1 entry\exit values: 3A :: 3A
    -Threshold 2 Type and Direction: 2 :: 2
```

```
                -Threshold 2 value:     100.0 ::     100.0
     -Threshold 2 entry\exit values: 3A :: 3A
           -Changing Sig Multiplier:  1.5 ::  1.5
          -Changing Sig Entry Count: 3 :: 3
                      -Filter Limit:  0.2000 ::  0.2000
                        -Hysteresis:  80 ::  80
Channel 1 Configuration Record (47): 2007.07.23 14:17:32 :: 2007.07.19 08:57:08
                -Used for Analysis: 0 :: 0
    -Threshold 1 Type and Direction:  ::
                -Threshold 1 value:  ::
     -Threshold 1 entry\exit values:  ::
    -Threshold 2 Type and Direction:  ::
                -Threshold 2 value:  ::
     -Threshold 2 entry\exit values:  ::
           -Changing Sig Multiplier:  ::
          -Changing Sig Entry Count:  ::
                      -Filter Limit:  ::
                        -Hysteresis:  ::
Channel 2 Configuration Record (48): 2007.07.23 14:17:32 :: 2007.07.19 08:57:08
                -Used for Analysis: 0 :: 0
    -Threshold 1 Type and Direction:  ::
                -Threshold 1 value:  ::
     -Threshold 1 entry\exit values:  ::
    -Threshold 2 Type and Direction:  ::
                -Threshold 2 value:  ::
     -Threshold 2 entry\exit values:  ::
           -Changing Sig Multiplier:  ::
          -Changing Sig Entry Count:  ::
                      -Filter Limit:  ::
                        -Hysteresis:  ::
Channel 3 Configuration Record (49): 2007.07.23 14:17:33 :: 2007.07.19 08:57:08
                -Used for Analysis: 1 :: 1
    -Threshold 1 Type and Direction: 2 :: 2
                -Threshold 1 value:     100.0 ::     100.0
     -Threshold 1 entry\exit values: 3A :: 3A
    -Threshold 2 Type and Direction: 2 :: 2
                -Threshold 2 value:     100.0 ::     100.0
     -Threshold 2 entry\exit values: 3A :: 3A
           -Changing Sig Multiplier:  1.5 ::  1.5
          -Changing Sig Entry Count: 3 :: 3
                      -Filter Limit:  0.0200 ::  0.0200
                        -Hysteresis:  80 ::  80
Channel 4 Configuration Record (4a): 2007.07.23 14:17:33 :: 2007.07.19 08:57:08
                -Used for Analysis: 0 :: 0
    -Threshold 1 Type and Direction:  ::
                -Threshold 1 value:  ::
     -Threshold 1 entry\exit values:  ::
    -Threshold 2 Type and Direction:  ::
                -Threshold 2 value:  ::
     -Threshold 2 entry\exit values:  ::
           -Changing Sig Multiplier:  ::
          -Changing Sig Entry Count:  ::
                      -Filter Limit:  ::
                        -Hysteresis:  ::
Channel 5 Configuration Record (4b):  ::
                -Used for Analysis:  ::
    -Threshold 1 Type and Direction:  ::
                -Threshold 1 value:  ::
     -Threshold 1 entry\exit values:  ::
    -Threshold 2 Type and Direction:  ::
                -Threshold 2 value:  ::
     -Threshold 2 entry\exit values:  ::
           -Changing Sig Multiplier:  ::
          -Changing Sig Entry Count:  ::
                      -Filter Limit:  ::
                        -Hysteresis:  ::
Mini GRAND =====  Monday, July 23, 2007 - 15:53:05  ================

CURRENT CONFIGURATION (from INI file)
```

```
  BATVOLTH=14.5
  BATVOLTL=11.3
  SUP_P15H=12.0
  SUP_P15L=11.0

//Note: Items removed for brevity.

  SET4_CH5_T1EEV=""
  SET4_CH5_T2TYPEDIR=""
  SET4_CH5_T2VALUE=""
  SET4_CH5_T2EEV=""
  SET4_CH5_CHANGMULT=""
  SET4_CH5_CHANGENTCNT=""
  SET4_CH5_FILTERLIM=""
  SET4_CH5_HYSTER=""
  CLSID={480F3443-0896-4971-8E65-AC3754192FE9}
  FLAGOTHR=0
  FLAGCOMM=0
  FLAGTIME=0
MIC Instrument Status:
  Registered with communications object: Yes
  Checksum Error Count: 0
  Communications Error Count: 5
  About to send INQUIRE2, DUMPBBM, or DUMPSTAT. (2000)
Mini GRAND =====  Monday, July 23, 2007 - 15:53:05  ================
=========================================================

* = Item is displayed RED
Amsr 15 =====  Monday, July 23, 2007 - 15:53:05  ================
SUMMARY
 ISR Setup
     High Voltage (Min / Cur / Max):    1677     1678     1678
  Battery Voltage (Min / Cur / Max):    11.6     11.6     11.6
  +12 Volt Supply (Min / Cur / Max):    12.2     12.2     12.2
  -12 Volt Supply (Min / Cur / Max):   -11.9    -11.9    -11.9
   +5 Volt Supply (Min / Cur / Max):     4.8      4.8      4.8
 Data Status
                     External Power: Ok
                            Battery: Ok
           Battery Backed Up Memory: Ok
   Last INQUIRE Status (Y.M.D H:M:S: 2007.07.23 15:52:53 Delta: 00:00:09
  Recent Commands and Responses:
  4 - INQUIRE2
  1E1753285953000080     07E
  4 - INQUIRE2
  1E1753285963000080     07F
  4 - INQUIRE2
  1E1753285973000080     080
Amsr 15 =====  Monday, July 23, 2007 - 15:53:05  ================
ISR SETUP
 Most Recent STATUS SR Record
          Date & Time (Y.M.D H:M:S): 2007.07.23 15:36:17
                     External Power: Ok
                            Battery: Ok
                               Baud: 9600
                           Port Set: 8N
              High Voltage Set Point: 1680
                          Pre-Delay: 4.50
                         Gate Width: 64.00
                 Count Time (Seconds): 5.0
           Temperature On Board (C): 44
          Temperature Off Board (C): 0
     High Voltage (Min / Cur / Max): 1677  1678  1678
  Battery Voltage (Min / Cur / Max): 11.6  11.6  11.6
  +12 Volt Supply (Min / Cur / Max): 12.2  12.2  12.2
  -12 Volt Supply (Min / Cur / Max): -11.9  -11.9  -11.9
   +5 Volt Supply (Min / Cur / Max): 4.8  4.8  4.8
 Trigger Signal Records, Most Recent/Previous
 Chan. 0:   /
```

```
 Chan. 1:   /
 Chan. 2:   /
 Chan. 3:   /
 Sig. Ch:   /
 Checksum or Length Error in Any Message: No
Amsr 15 =====  Monday, July 23, 2007 - 15:53:05  ================
DATA STATUS
 Most Recent Response To INQUIRE2
   Date & Time (Y.M.D H:M:S): 2007.07.23 15:52:53 Delta: 00:00:09
               Main Unit ID: 00
     Bytes of Data in Memory: 0
      External Power Present: Ok
                     Battery: Ok
    Battery Backed Up Memory: Ok
          Data Filter Status: Not Filtered
                        LON: Ok
 Most Recent ACQUIRE Records Received
      Show Rates
  Date of Data Record (Y/M/D):  2007.07.23  2007.07.23  2007.07.23  2007.07.23
  Time of Data Record (H:M:S):    15:49:41    15:49:36    15:49:31    15:49:26
   Julian Time Auxillary Byte:           0           0           0           0
     Battery - External Power:     OK - OK     OK - OK     OK - OK     OK - OK
                      Totals: 0.0000e+000 0.0000e+000 0.0000e+000 0.0000e+000
           Auxillary 1 Totals: 0.0000e+000 0.0000e+000 0.0000e+000 0.0000e+000
           Auxillary 2 Totals: 0.0000e+000 0.0000e+000 0.0000e+000 0.0000e+000
          Reals + Accidentals: 0.0000e+000 0.0000e+000 0.0000e+000 0.0000e+000
                  Accidentals: 0.0000e+000 0.0000e+000 0.0000e+000 0.0000e+000
                        Reals: 0.0000e+000 0.0000e+000 0.0000e+000 0.0000e+000
                 Elapsed Time:         5.0         5.0         5.0         5.0
Amsr 15 =====  Monday, July 23, 2007 - 15:53:05  ================
Most Recent Monitor Parameters Status Record
 Date & Time (Y.M.D H:M:S): 2007.07.23 15:36:17
 Immediate Buffer Size / Save Size: Total: 70, Save: 50
       Local Background Definition: First 25 of last 30
              No Filter Condition:  3 runs > 3.0 sigma from background
                Filtering Enabled: No
                    Filter Method: 1st Point
   Trigger 0
           Trigger Type & Polarity: Pulse High
  Trigger Delay(Sec) & Width(mSec):   0 & 300
   Trigger 1
           Trigger Type & Polarity: Pulse High
  Trigger Delay(Sec) & Width(mSec):   0 & 300
   Trigger 2
           Trigger Type & Polarity: Pulse High
  Trigger Delay(Sec) & Width(mSec):   0 & 300
   Trigger 3
           Trigger Type & Polarity: Pulse High
  Trigger Delay(Sec) & Width(mSec):   0 & 300
   Trigger 4
           Trigger Type & Polarity: Pulse High
  Trigger Delay(Sec) & Width(mSec):   0 & 300
                           Totals Ch1/Aux. 1 Ch2/Aux. 2 Ch3/Reals  Ch0
  Filtering Threshold/Sigma:    No / No    No / No    No / No    No / No
             High Threshold:          0          0          0          0
                  Low Limit:     0.0000     0.0000     0.0000     0.0000
      Triggering Sigma Test:         No         No         No         No
  A/T Test Totals Threshold:  100.0
    A/T Test Bias Limit ():  0.1
       A/T Test Sigma Limit: 3.0
                 Synchronization Enabled: Yes - Hourly
        Synchronization Time (hh:mm:ss): 04:30:30
  Synchronization Lower Limit (Seconds):  2
  Synchronization Upper Limit (Minutes):  5
           Status Check Every (Minutes): 1440
       Log Battery Info Every (Minutes): 15
        ISR User Program Version Number:
Amsr 15 =====  Monday, July 23, 2007 - 15:53:05  ================
MODIFY PARAMETERS -- Caution: These values may not have been applied!
```

```
 Communications
  Port: Serial 15
  Node: -1

 File Output
  Location: C:\DATA\ISR01
  Station ID: 01
  Log Data Filtering Msgs: Yes
             Do Dump File: No
 Error Limits
                        High     Low
   Battery (28 Volt):   30.0    10.0
     +15 Volt Supply:   20.0    10.0
     -15 Volt Supply:  -10.0   -20.0
      +5 Volt Supply:    6.0     4.0
  Time Delta (Sec.):     20
  Slow Reset (Sec.):    900

 General
     Message Cycle Time (mSec): 1000
      Maximum Pause Time (Sec): 600
           Maximum BBM (Bytes): 1000
  # of Retransmits Before Fail: 5
    Allow Auto Date & Time Set: Yes
          Inquire Every(units): 10
     Response Time-Out (units): 5
     Take Status Every (units): 0
Amsr 15 =====  Monday, July 23, 2007 - 15:53:05  ================
CURRENT CONFIGURATION (from INI file)
 SLOW_RESET=900
 PORT=Serial 15
 NODE=-1
 SAVE_LOC=C:\DATA\ISR01
 FILE_ID=01
 LOG_FILTER=1
 DO_DUMP=0
 HIGHVOLTH=1800
 HIGHVOLTL=1600

//Note: Items removed for brevity.

 MAXINQUIRE=10
 MAXSTATUS=0
 COMMFAIL=5
 FLAGTIME=0
 FLAGCOMM=0
 FLAGOTHR=0
Amsr 15 =====  Monday, July 23, 2007 - 15:53:05  ================
MIC Instrument Status:
  Registered with communications object:Yes
  Checksum Error Count: 0
  Communications Error Count: 5
  Break Message filter on:No
  Invalid Time Count filter on:No
  Timeout Message filter on:No
  About to send INQUIRE2, DUMPBBM, or DUMPSTAT. (2000)
Amsr 15 =====  Monday, July 23, 2007 - 15:53:05  ================
=========================================================

New - MIC - 2.0.0.4
2007.07.23 15:53:04
END OF FILE
```

8. GRAND3 and MINIGRAND

GRAND3 and MiniGRAND support is through the GRAND instrument support object. The objective of this support object is to copy data placed in the GRAND3 or MiniGRAND's battery backed up memory to the collect computer's hard drive. To this end it will display recently received information and will detect improper mode of operation of the instrument. If the instrument has been placed in any mode other than "monitor" mode then it will command the instrument into the correct mode. If for some reason the instrument stops responding to the support object then a long break reset sequence will be sent.

8.1. Configuration

To establish and configure a GRAND3 or MiniGRAND instrument support object select the "Configuration" menu option (left click on the icon in MIC's main dialog title bar) and click on the "Add Instrument" button. Because the new instrument support object must connect to an existing communications object, create one by using the "Add Comm" button prior to continuing. After clicking on the "Add Instrument" button the user will be prompted for the type and the name of the new instrument support object.

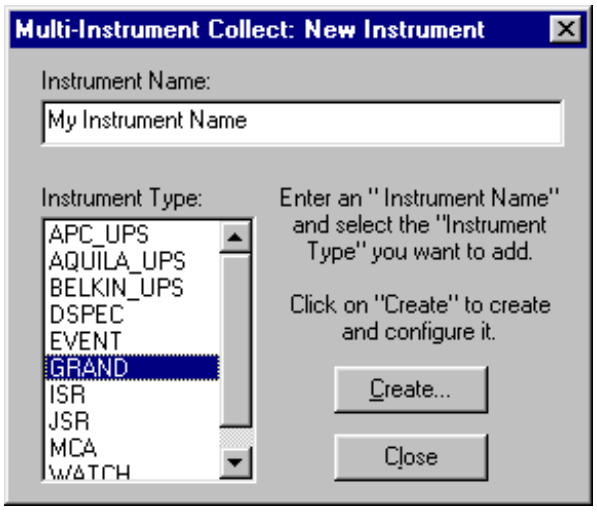


Figure 20 Add Instrument Dialog

To create a GRAND or MiniGRAND instrument support object click on the "GRAND" entry in the "Instrument Type" window and enter a name in the "Instrument Name" window—the "Create" button will become active. Click on it to continue or select "Close" to exit without creating the support object. If "Create" was selected then the GRAND configuration dialog box will be presented.

Note: The MiniGRAND is capable of acquiring data from pulse detectors at **sub-second** intervals. Special care is required when configuring MIC to collect from a MiniGRAND using this feature; from the MiniGRAND User Guide, § 2.2.2.1.1. Fast Acquisitions:

> "This capability is called fast-acquisition mode, and allows count times as low as 300 milliseconds. When the instrument is in fast-acquisition mode, the current channels, normally connected to ion chambers, are ignored in order to free up processor time for the high-speed pulse acquisitions. Because of the volume of data generated, **the instrument should be connected to MIC via a direct serial connection and operated at 115200 baud**, otherwise the data will be acquired by the instrument faster than it can be collected by MIC, and will overflow."

Also see MiniGRAND User Guide, § 4.6. Fast Acquisition Mode (version 4.20+).

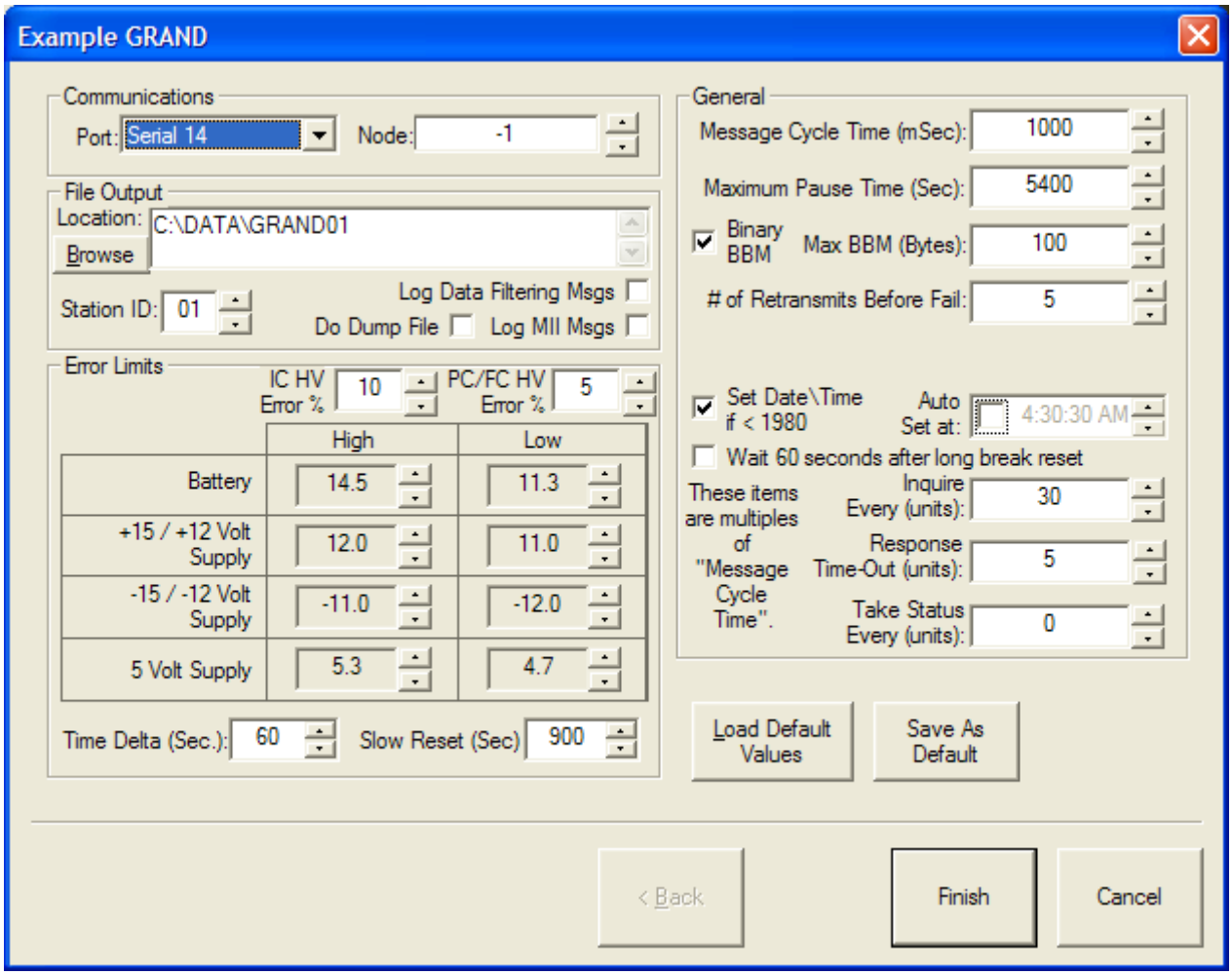


Figure 21 GRAND Configuration Dialog

Each of the data items in the GRAND configuration dialog need to be set or at least verified. The "Extend Auto Close" button in the lower right corner indicates the time until this dialog box automatically aborts the creation process and closes. If more time is required, click on the button, as needed, to extend the time by 5 minutes to a maximum of 120 minutes. In the "Communications" area set the "Port" to the desired communications support object and the "Node" to the appropriate node for the selected communications support object. When simple serial communications support objects are used the "Node" attribute is inconsequential. The GRAND Instrument Support Object may only use the "serial direct" or ILON Communications Support Objects.

Set the data items in the "File Output" area to appropriate settings. Set the location which the GRAND instrument support object should write the files for this instrument. The "Station ID" must be unique among all instruments! Typically, "Do Dump File" should be set to not selected. Do not attempt to include any portion of the actual file name here--only the path. The MIC file naming convention selected will be used for all output files.

Adjust all of the data items in the "Error Limits" area as needed.[1] The voltage high and low settings are used by MIC to flag an out-of-tolerance condition for the associated instrument. "Time Delta" sets the tolerance between the MIC computer's clock and the instrument's clock. When the GRAND instrument support object detects the difference between instrument's clock and the computer's clock is greater than the number of seconds set here then an error will be flagged in red and entered into the appropriate CEV and PFM file. When the difference transitions to less than the set value an entry in the CEV and PFM files will indicate the delta is now in tolerance. The Instrument Setup button will open a dialog box that allows you to set the expected value of a large number of parameters that are received back from the instrument. When Finish or Close is selected this supplemental dialog box will go away. All of the items on the supplemental dialog box may be adjusted later.

In the General area the "Message Cycle Time" data item should be set to the number milliseconds between timing messages sent to the portion of the GRAND instrument support object which controls the command sequence to the instrument. Generally, this should be left at 1000 (1 second). The "Maximum Pause Time" controls the maximum duration which the GRAND instrument support object may be held in pause mode. When in pause mode the associated instrument will still be accumulating data but MIC will not ask the instrument for status. When the pause time runs out the instrument support object will automatically resume normal operations of asking for status and responding accordingly. The "Maximum BBM" data item is the point at which the GRAND instrument support object begins to dump the associated instrument's battery backed up memory to the .BID file on the MIC computer. Once this trigger point is reached the dump sequence will continue until the associated instrument reports 0 bytes in BBM. This value should be set to a low number to allow maximum instrument autonomy. The "# of Retransmits Before Fail" is set to control how many repeats of a command the GRAND instrument support object should attempt prior to assuming a communications failure.

The next item down is "Set Date \ Time when < 1990". When the internal battery fails in the GRAND instrument and subsequently has been reset (*e.g.* experienced a power loss) the internal clock may have been reset to January 1, 1982. The GRAND instrument support object can detect this and force the instrument's clock to match the collect computer's time. Set this item to checked to allow this feature. Immediately to the right of this control is the "Auto Set at" control. If checked and MIC detects the instrument's time is out of tolerance then at the time set in this control (or shortly thereafter) the instrument's time will automatically be reset to match the collect computer's time.

The "Wait 60 seconds after long break reset" sets a special flag that forces the ISO to pause for 60 seconds after sending a long break to an instrument. Some configurations of the GRAND instrument require this pause. Don't activate it unless you are having restart problems after a long break is sent.

[1] IC HV and PC/FC HV stand for "Ion Chamber High Voltage and Pulse Counting/Fission Chamber High Voltage respectively.

The bottom three data items in this section are units of "Message Cycle Time" listed above. Consequently, if the "Message Cycle Time" is set to 1000 mSec. then these three values will be in seconds. The "Inquire Every (units)" data item controls how often to send INQUIRE2 messages to the associated instrument. The "Response Time-Out (units)" sets the duration the GRAND instrument support object should wait for a response to a command such as INQUIRE2 or DUMPBBM. The "Take Status Every (units)" controls how often the GRAND instrument support object should send a DUMPSTAT command to the associated instrument. Setting this value to 0 indicates a DUMPSTAT will not be periodically sent to the instrument. An exception to this is that no matter what the "Take Status Every…" is set to, when MIC detects the start of a new PFM file, one DUMPSTAT command will be sent to the instrument. This ensures the DUMPSTAT information will be included near the beginning of each PFM file.

Figure 22 GRAND Colored Button from MIC Main Dialog

After all values have been set or verified click on the "Finish" button. Prior to actually creating the new GRAND instrument support object the user will be prompted for a valid user name—password pair.

The creation of the GRAND3 or MiniGRAND instrument support object will be accompanied by the addition of a colored button on the MIC main dialog.

8.2. Use

A colored button on the MIC main dialog will exist for each GRAND3 or MiniGRAND instrument support object and one instrument support object should be created for each actual instrument being supported. The background color of the button on the MIC main dialog indicates the current state of the instrument support object. Red signifies the instrument support object is having a problem communicating with the associated instrument. Green is the normal quiescent state and yellow indicates a command has been sent to the instrument but an acceptable response has not yet been received back. The title of the instrument support object is presented at the top of the button and the number of bytes in battery backed up memory (as reported by the instrument) is also displayed. In the lower portion of the button icons will be displayed to indicate various state of health information. Clicking on the button will cause a multi-page tabbed dialog box to be displayed. If no information has been received from the instrument then the tabs for both pre Monitor 4.10 and post Monitor 4.10 will be displayed. As soon as sufficient information has been received to know which Monitor version is in the instrument the unneeded tabs will be removed.

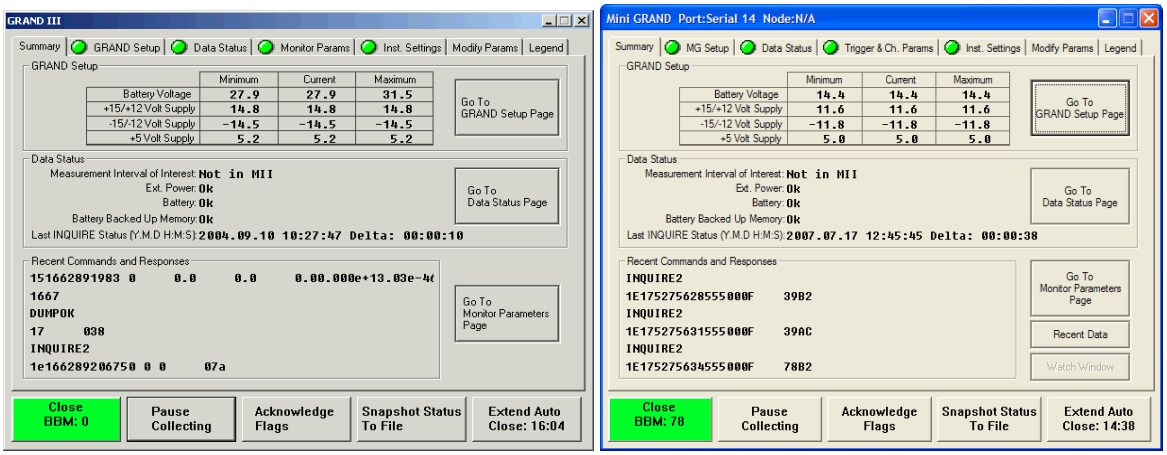


Figure 23 GRAND3 or MiniGRAND ISO Dialog Box (pre-Monitor 4.10 and post-Monitor 4.10)

For the pre Monitor 4.10 instrument this dialog provides a "Summary", "GRAND Setup", "Data Status", "Monitor Parameters", "Modify Parameters", "Inst. Settings", and "Legend" tabs. For the post Monitor 4.10 "GRAND Setup" is replaced with "MG Setup", "Monitor Params" is replaced with "Trigger & Ch. Params". Each tab displays data items associated with various classes of messages received from an instrument. On the Summary tab is a set of data items repeated from other tabs. These items are critical items which if are out of tolerance safeguard information may be lost. Each item is associated with a tab page and will be displayed in white with red background if out of tolerance. If any of the items on a tab page are out of tolerance then the green round icon on the associated tab will change to a red rectangle. The user may go directly to that tab by clicking on it. All flagged data items will stay red until canceled by clicking on the "Acknowledge Flags" button at the bottom of the dialog box. In the lower portion of the Summary tab is the "Recent Commands and Responses" area. This area scrolls up as commands are sent and responses are received—with the newest command or response displayed on the bottom. Clicking on one of the lines in this area will execute the MsgUtil.exe from the MicMgr.exe program's directory which in turn will display the components of the message. On the right is a button (as of version 2.0.0.4) that will display a graph of selected data items.

At the bottom of the dialog box are five buttons. The "Close" button is a colored button similar to the one on the MIC main dialog. It displays the currently reported bytes in battery backed up memory and it tracks the color of the main dialog button. The Pause Collecting button controls changing the state of the GRAND instrument support object from paused to normal and back. Clicking on "Acknowledge Flags" will turn off all red flagged items, consequently returning them to their black bold text. "Snapshot Status To File" will copy all of the text from all of the tabs (with the exception of the Legend tab) to a text file. Clicking on the "Extend Auto Close:" button will add five minutes to the automatic close countdown up to a maximum of 120 minutes.

The second tab, "GRAND Setup" or "MG Setup" provides information provided by the target GRAND3 or MiniGRAND instrument about the current setup. Also on this tab near the bottom is the "Checksum, Length, or Authentication Error in Message and Communications Status" area. In this area a time stamped copy of the most recent message with a checksum failure, message length error, or authentication error will be displayed. Also if a message acknowledgement is received from an ILON network but the message response is not received then this window will indicate so.

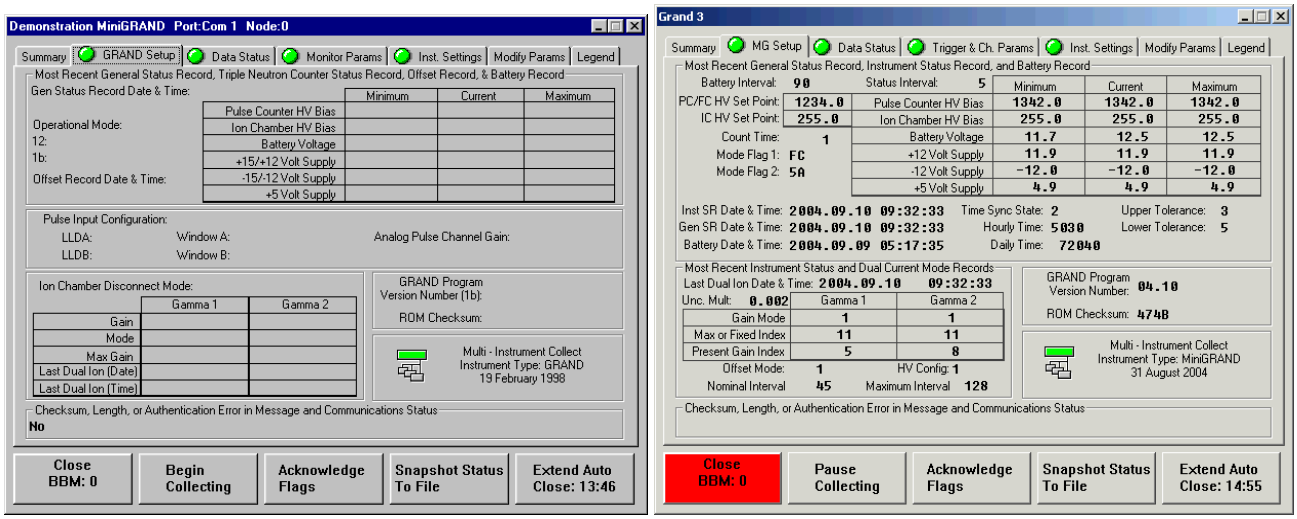


Figure 24 GRAND3 or MiniGRAND GRAND Setup Tab (pre 4.10 and post 4.10)

The third tab is the "Data Status" page. Information provided in the most recent INQUIRE2 response is provided on this page along with the difference between the MIC computer's time and the apparent GRAND3 or MiniGRAND's clock. The "Delta" is computed by taking the difference between the time stamp on the INQUIRE2 or INQUIRE3 response and the time of the collect computer's clock at the time of message receipt. The four most recent ACQUIRE records are presented in the bottom portion with the most recent on the left. When a new ACQUIRE record is received the data in the three columns on the left are all shifted right one column and the new record's data is placed in the left hand column.

Some items report error states or have limits associated with them. If the data item indicates an error or the item is out of tolerance then it will be displayed in a white font with a red background. In this case the situation can be acknowledged by clicking on the "Acknowledge Flags" button. The green icon on the tab will change to a red rectangle if there are any un-acknowledged items on the page and will return to a green sphere when acknowledged.

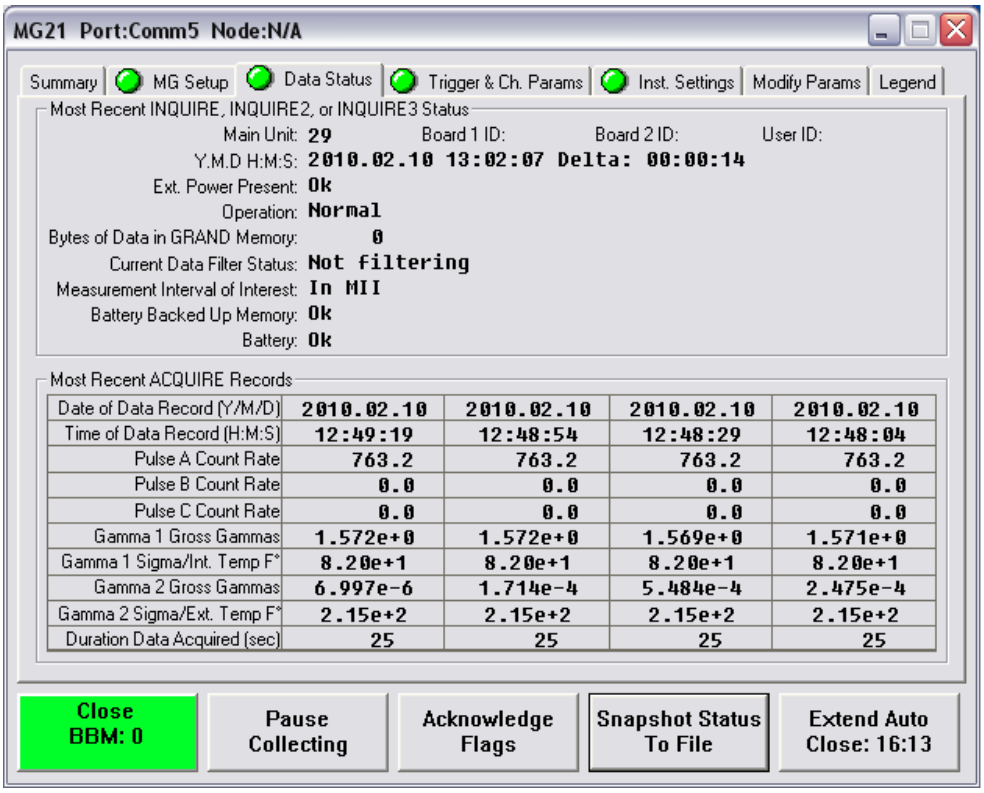


Figure 25 GRAND3 or MiniGRAND Data Status Tab

For MiniGRANDs only, the values observed in the Gamma 1 Sigma/Int. Temp F° and Gamma 2 Sigma/Ext. Temp F° fields have tow interpretations. When the first MiniGRAND Mode Flag is set to enable internal and external temperature values, the internal processor board temperature is reported in the Gamma 1 Sigma field, hence the "Int. Temp F°" signifier. Similarly, an external temperature sensor may be attached to the MiniGRAND, and the value from that sensor appears in the Gamma 2 Sigma/Ext. Temp F° field. For additional details, please see the MiniGRAND User Guide, § 11.10, General Configuration Record (41).

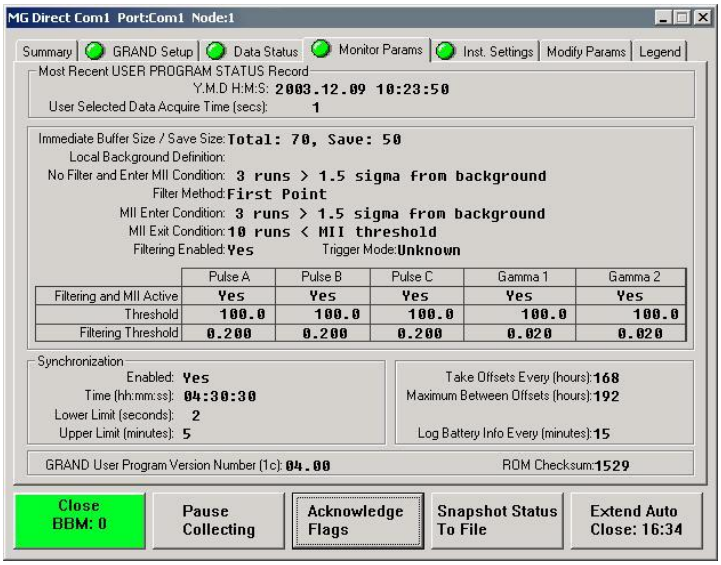


Figure 26 GRAND3 or MiniGRAND Monitor Parameters Tab (pre 4.10)

The fourth tab (pre 4.10), "Monitor Parameters" presents information provided by the GRAND3 or MiniGRAND instrument as reported in the various status records. If a specific item has not been received then the item will be blank.

The fourth tab when supporting a MiniGRAND with Monitor 4.10 or above loaded is the "Trigger & Ch. Params" tab. See the instrument documentation for the meaning of each of the data items. If a specific item has not been received or is set as not active then the item will be blank.

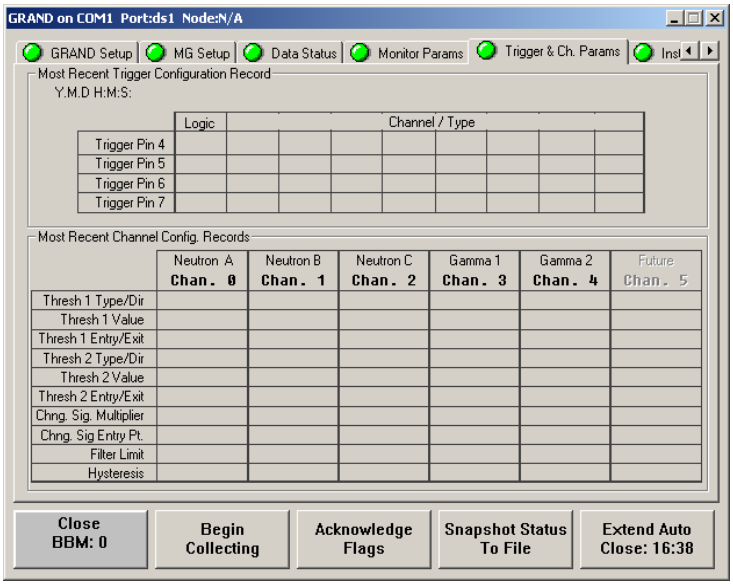


Figure 27 MiniGRAND Trigger & Ch. Params Tab (post 4.10)

8.2.1. Trigger Details

Event triggers detected on the MiniGRAND can activate up to four parallel-port pins. These pins are set on input bits 4-7 and correspond to connector pins 17-20. These pins are high (+5 volts) when inactive and trigger on a falling edge when a trigger condition is reached. Trigger pins may be configured at two levels. The first level describes the contribution one channel makes to determining the state of the trigger pin. The second level allows up to eight combinations of the first level to determine the state of the pin. For full details on triggers and command configure codes for triggering see the MiniGRAND User Guide, § 4.5. Triggers, and § 9. Channel and Trigger Configuration. Configuration of the MiniGRAND triggers can be set using a MIC Watch window for the instrument.

ILONs can also detect trigger conditions from MiniGRANDs, causing an ILON to send alerts over an ILON network. To configure an ILON to detect an incoming signal, edit the ILON configuration using the ICfg application, parameters on the Binary Input Configuration tab (see the ILON User Guide, § 4.3.2 ICfg, and § 7.9 Binary input configuration). The triggers will need to be set to the corresponding pins 4-7 that were set up in the MiniGRAND and to sense a high to low voltage edge. A destination node/s and relevant bit mask may be declared on the input configuration tab, and when a trigger is received by the ILON, the ILON signals the destination node/s that a trigger has happened. The bit mask sent to the specified destination node/s identifies which output bit at that node should be changed as a result of changes to the corresponding input pin at the triggered node. Refer to the ILON User Guide, § 7.10 Binary output configuration, for more details on configuring output pin behavior.

The fifth tab, "Inst. Settings" provides a listing of all instrument settings provided by the instrument. It also provides a comparison between the reported and the desired values. The desired values are saved in the instrument support object's section in the MIC.INI file. The desired values may be edited. The reported values may be saved as desired values by clicking on the appropriate button. There exist hidden columns on the right. These may be displayed by scrolling to the right. One of the right hand columns contain the INI file item name the row will be stored under. Another column contains the command one may use to change the associated parameter on the instrument. In the post 4.10 version the entries are organized by message type. The user may double click on an item or select an item and click on the "Edit" button to modify the "Desired (INI file)" table entry.

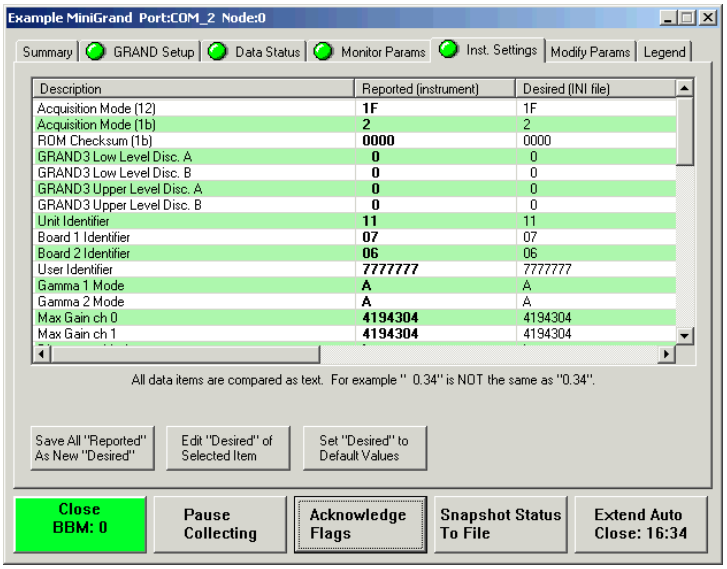


Figure 28 GRAND III/MiniGRAND Instrument Settings Tab (pre 4.10)

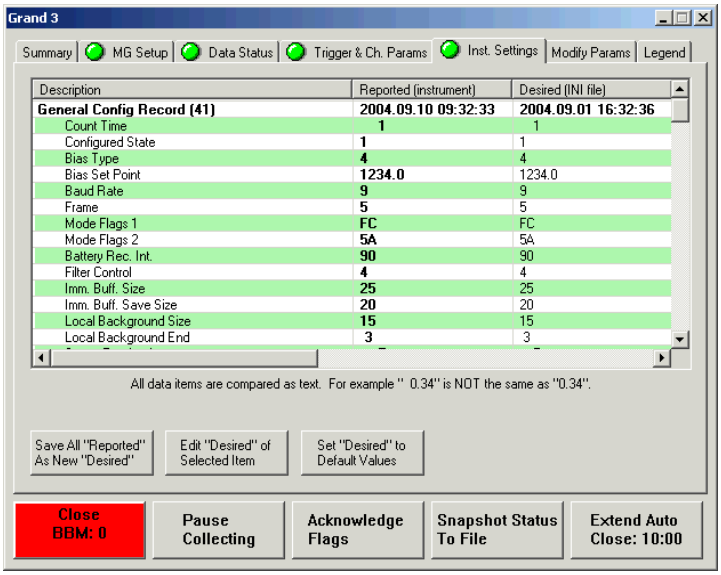


Figure 29 MiniGRAND Instrument Settings Tab (post 4.10)

The sixth tab, "Modify Parameters", is nearly identical to the initial configuration dialog. At this point the user no longer has the option to change the "Communications" area information. The "Force Instrument Date & Time to Computer's" button has been added. This button is accessible only if the instrument support object is in pause mode. The "Set Date\Time if < 1980 and "Auto Set at:" control automatically setting the instruments time and should be used only if the instrument is not being time set by other means. The default values for each data item may be reloaded by clicking on the "Load Default Values" or the user may click on the "Reset to Last Applied" forcing all data items to return to the currently applied values. After adjusting any of the data items they must be applied by clicking on the "Apply" button. The border around the apply button indicates applying the changes is a password protected function.

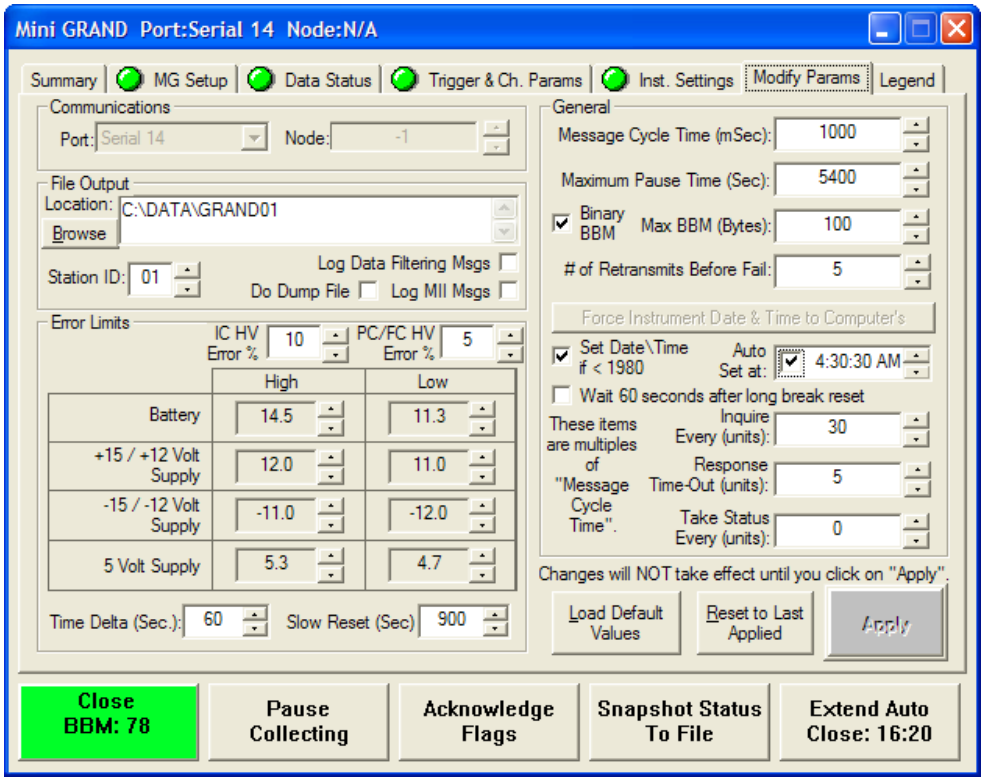


Figure 30 GRAND3 and MiniGRAND Modify Parameters Tab

The Legend tab provides a list of the meaning of each of the button face colors and the icons which are displayed on the colored buttons. The contents displayed in this tab may be modified by the user. When the legend page is created GRAND ISO will first look for a rich text format (.rtf) file with the name of the instrument and with the .rtf extension. In the example, GRAND ISO would look for and if found display the file "GRAND III.rtf". If that file is not found then it will look for "GRAND.rtf" and display it if found. If neither of these files are found then the GRAND ISO will display a built in version of the file. The user may edit "default.rtf" supplied during the install of MIC, saving it with the instrument name or GRAND.rtf to customize the display. It is also possible to select all of the text in this display, copy it (using control-c), and paste it into a Microsoft Word document. Be sure to save the results of your editing as a "Rich Text Format" file.

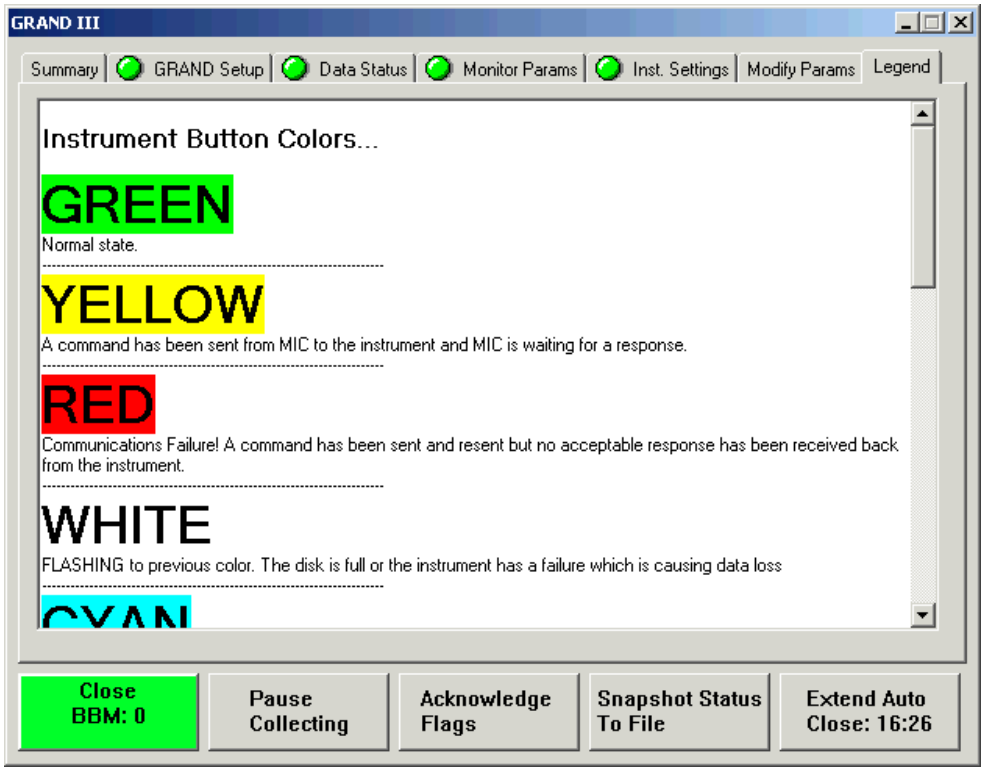


Figure 31 GRAND3 and MiniGRAND Legend Tab

The following is a copy of the default.rtf file. In the electronic version of this document the user may copy this section and paste it into a new Microsoft Word document, edit it and use "Save As…" to save it as a Rich Text Format file.

Instrument Button Colors...

GREEN
Normal state.

YELLOW
A command has been sent from MIC to the instrument and MIC is waiting for a response.

RED
Communications Failure! A command has been sent and resent but no acceptable response has been received back from the instrument.

WHITE
FLASHING to previous color. The disk is full or the instrument has a failure which is causing data loss
---
CYAN
Some instruments cannot respond to MIC during initialization. This is a wait state that MIC may enter for a short period to allow the instrument to finish initializing.

GRAY

MIC has been instructed not to talk to the instrument. In all cases this state will eventuall revert to a normal operational state.

==========

Instrument Button ICONs...

Square: One or more of the tabbed pages have a data item out of tolerance or a configuration mismatch

Clock: The difference between MIC's time and the instrument's time is greater than the user set tolerance

Flag: MIC has sent and resent a command with no acceptable response and consequently commanded a long break reset in an attempt to reinitialize the instrument or a Hard Checksum Error occurred.

Bell: The instrument is currently reporting a "Measurement Interval of Interest" or equivalent.

Face: The instrument has reported either a power problem or a battery backed up memory problem.

Floppy Disk & Flashing: MIC has stopped writing to disk and talking to the instrument. This can be caused by the hard drive being too full, the maximum use of the hard drive set too low, or disk write failure.

Skull and Cross Bones: The instrument has repeatedly failed to respond to commands and long break resets. MIC will attempt to reset it every 15 minutes or instrument is in a state which is causing DATA LOSS.

Bomb: Configuration Error. Instrument support object could not connect to communications object. Edit the MIC.INI file or delete the instrument object and recreate it to correct this problem.

==========

NOTE: This information may be modified by editing "default.rtf" in the MIC install directory. An instrument specific display may be created by saving the modified "default.rtf" with the instrument's name. For example, "GRAND 3.rtf" or "Room 257.rtf". Be sure to save the edited file as type Rich Text Format (*.rtf). The Button ICONS are from the WINGDINGS font.

The following cross reference shows which messages can turn on which ICONS.

Activated and deactivated by a flag in the response message (14, 1e, or 4e) to an Inquire2.

Activated by a failure during an attempt to write a data record (15) to disk. The attempt to write to disk is done only at the end of a single DUMPBBM or DUMPBBBM cycle.

Activated by response message (14, 1e, or 4e) to an Inquire2.

Activated by a "hard" checksum error in any message containing a checksum. Also activated when a Long Break Set is sent. This icon is changed to when MIC goes into slow reset because of multiple Long Break reset attempts have not reactivated the instrument. It will attempt to restart the instrument/ILON every 15 minutes.

Activated by a Status Record (12) when battery low flag is received or reported battery voltage is out of the MIC configured tolerance, when the +5 voltage reported is out of the MIC configured tolerance,

when the +12 voltage reported is out of the MIC configured tolerance, when the -12 voltage reported is out of the MIC configured tolerance, when the External Power flag asserts power failure.

8.3. Performance (PFM) File

Performance Files are text files containing date and time stamped performance information messages. One file is created each day using the configured file naming convention with a file extension of ".pfm".

All of the possible entries for GRAND3 and MiniGRAND type instrument performance files are listed below. The format is the same for all entries: "YYYY.MM.DD hh.mm.ss X nnnnn msg<cr><lf>". Where "YYYY" is the four digit year, "MM" is the two digit month, DD is the two digit day of month, "hh" is the hour, "mm" is the minute, and "ss" is the seconds of date and time. The "X" indicates where the date and time originate; "C" designates the MIC computer and "G" designates the GRAND instrument. "nnnnn" is a five digit identifier (ID) unique to that instrument and that specific message. (This ID is intended to support automated data analysis of the file.) The "msg" portion is the text of the message. All lines terminate with a carriage return character followed by a line-feed character.

The number in parenthesis at the end of some of the entries is the message type generated by the instrument that caused the performance file entry. The notation %s, %02x, and others in the message represent information received from the instrument. For example, %s is a text string, %02x is byte value represented as a hexadecimal number, and %f is a floating-point number.

Under some circumstances a status message may arrive (*e.g.* from BBM) with a date time older than one which has already been received (*e.g.* from a DUMPSTAT command). If this occurs the older message will be placed into the PFM with the phrase "**Note: A newer message has been received.**" appended to it. This late arrival processing will only occur for those messages indicated in the "Stale" column.

If the maximum messages count for a specific message has been reached then the phrase "**(further occurrences not included)**" will be appended to the last message for that day. Only the messages indicated in the "Limited" column are restricted in this fashion. The message counts will all be returned to zero at the beginning of each day and anytime MIC is restarted.

In the table below, the CEV column indicates that the associated message will also be written to the CEV file (see following section).

Some of the entries below contain notes to the reader. These notes will NOT be included in the message written to the file.

Stale	Limited	CEV	ID	Message
			15310	"Bad LParam Address Received (OOB)" *NOTE: This should never happen and indicates a message could not be read.*
			15320	"OOB: %s" *NOTE: A message from the CSO to the ISO and not from the associated instrument.*
			15330	"Bad LParam Address Received (1000)"
			15340	"Apparent Comm Fault During DUMPBBBM MsgType=%02x MsgLength=%02x"
			15350	"Message Type Unknown: Message Type=%02x"
			15360	"CHECKSUM ERROR"

Stale	Limited	CEV	ID	Message
			15370	"%s" *NOTE: Contains the message with the CHECKSUM ERROR.*
	Yes	Yes	15410	"STATUS CHANGE - EXTERNAL POWER LOSS Since last status record (12)"
	Yes	Yes	15420	"STATUS CHANGE - BATTERY LOW (12)"
	Yes	Yes	15430	"STATUS CHANGE - BATTERY OK (12)"
	Yes	Yes	15440	"SETUP FAILURE - ACQ_MODE (12)"
	Yes	Yes	15480	"SETUP FAILURE - LLD A (12)"
	Yes	Yes	15490	"SETUP FAILURE - ULD A (12)"
	Yes	Yes	15500	"SETUP FAILURE - LLD B (12)"
	Yes	Yes	15510	"SETUP FAILURE - ULD B (12)"
	Yes	Yes	15520	"STATUS CHANGE - BATTERY OUT OF TOLERANCE (12)"
	Yes	Yes	15530	"STATUS CHANGE - BATTERY IN TOLERANCE (12)"
	Yes	Yes	15540	"STATUS CHANGE - PLUS 5 VOLT SUPPLY OUT OF TOLERANCE (12)"
	Yes	Yes	15550	"STATUS CHANGE - PLUS 5 VOLT SUPPLY NOT OUT OF TOLERANCE (12)"
	Yes	Yes	15560	"STATUS CHANGE - PLUS 12 VOLT SUPPLY OUT OF TOLERANCE (12)"
	Yes	Yes	15570	"STATUS CHANGE - PLUS 12 VOLT SUPPLY NOT OUT OF TOLERANCE (12)"
	Yes	Yes	15580	"STATUS CHANGE - MINUS 12 VOLT SUPPLY OUT OF TOLERANCE (12)"
	Yes	Yes	15590	"STATUS CHANGE - MINUS 12 VOLT SUPPLY NOT OUT OF TOLERANCE (12)"
Yes			15600	"%s" *NOTE: Contains Status Record 12.*
	Yes	Yes	15630	"STATUS CHANGE - EXTERNAL POWER LOSS Since last status record (12)"
	Yes	Yes	15640	"STATUS CHANGE - BATTERY LOW (12)"
	Yes	Yes	15650	"STATUS CHANGE - BATTERY OK (12)"
	Yes	Yes	15660	"SETUP FAILURE - ACQ_MODE (12)"
	Yes	Yes	15700	"SETUP FAILURE - LLD_A (12)"
	Yes	Yes	15710	"SETUP FAILURE - ULD_A (12)"
	Yes	Yes	15720	"SETUP FAILURE - LLD_B (12)"
	Yes	Yes	15730	"SETUP FAILURE - ULD_B (12)"
	Yes	Yes	15740	"STATUS CHANGE - BATTERY OUT OF TOLERANCE (12)"
	Yes	Yes	15750	"STATUS CHANGE - BATTERY IN TOLERANCE (12)"
	Yes	Yes	15760	"STATUS CHANGE - PLUS 5 VOLT SUPPLY OUT OF TOLERANCE (12)"
	Yes	Yes	15770	"STATUS CHANGE - PLUS 5 VOLT SUPPLY NOT OUT OF TOLERANCE (12)"
	Yes	Yes	15780	"STATUS CHANGE - PLUS 12 VOLT SUPPLY OUT OF TOLERANCE (12)"
	Yes	Yes	15790	"STATUS CHANGE - PLUS 12 VOLT SUPPLY NOT OUT OF TOLERANCE (12)"

Stale	Limited	CEV	ID	Message
	Yes	Yes	15800	"STATUS CHANGE - MINUS 12 VOLT SUPPLY OUT OF TOLERANCE (12)"
	Yes	Yes	15810	"STATUS CHANGE - MINUS 12 VOLT SUPPLY NOT OUT OF TOLERANCE (12)"
Yes			15820	"%s" *NOTE: Contains Status Record 12.*
Yes			15840	"%s" *NOTE: Contains Offset Record 13.*
	Yes	Yes	15850	"STATUS CHANGE - External Power Off (14)"
	Yes	Yes	15860	"STATUS CHANGE - External Power On (14)"
	Yes	Yes	15870	"STATUS CHANGE - BATTERY LOW (14)"
	Yes	Yes	15880	"STATUS CHANGE - BATTERY OK (14)"
	Yes		15890	"STATUS CHANGE - COUNT RATE TAMPER (14)"
	Yes		15900	"STATUS CHANGE - NO COUNT RATE TAMPER (14)"
	Yes		15910	"STATUS CHANGE - RMS SIGMA TAMPER (14)"
	Yes		15920	"STATUS CHANGE - NO RMS SIGMA TAMPER (14)"
	Yes	Yes	15930	"STATUS CHANGE - BATTERY BACKED UP MEMORY ERROR (14)"
	Yes	Yes	15940	"STATUS CHANGE - NO BATTERY BACKED UP MEMORY ERROR (14)"
	Yes		15950	"STATUS CHANGE - COLD START (14)"
	Yes		15960	"STATUS CHANGE - NORMAL START (14)"
	Yes		15970	"STATUS CHANGE - IN MEASUREMENT INTERVAL OF INTEREST [BELL icon on] (14)"
	Yes		15980	"STATUS CHANGE - NOT IN MEASUREMENT INTERVAL OF INTEREST [BELL icon off] (14)"
	Yes	Yes	15990	"SETUP FAILURE - UNIT ID (14)"
	Yes	Yes	16000	"SETUP FAILURE - BOARD1 ID (14)"
	Yes	Yes	16010	"SETUP FAILURE - BOARD2 ID (14)"
	Yes	Yes	16020	"SETUP FAILURE - USER ID (14)"
	Yes	Yes	16050	"STATUS CHANGE - BATTERY OUT OF TOLERANCE (18)"
	Yes	Yes	16060	"STATUS CHANGE - BATTERY IN TOLERANCE (18)"
Yes			16090	"%s" *NOTE: Contains Battery Record 18.*
	Yes	Yes	16100	"SETUP FAILURE - PULSE INPUT CONF (19)"
	Yes	Yes	16110	"SETUP FAILURE - LLD A (19)"
	Yes	Yes	16120	"SETUP FAILURE - LLD B (19)"
	Yes	Yes	16130	"SETUP FAILURE - ULD A (19)"
	Yes	Yes	16140	"SETUP FAILURE - ULD B (19)"
	Yes	Yes	16150	"SETUP FAILURE - ANALOG PULSE CHAN GAIN (19)"
Yes			16160	"%s" *NOTE: Contains Triple Neutron Status Record 19.*
	Yes	Yes	16180	"SETUP FAILURE - GAMMA 1 MODE (1a)"
	Yes	Yes	16190	"SETUP FAILURE - GAMMA 2 MODE (1a)"

Stale	Limited	CEV	ID	Message
	Yes	Yes	16200	"SETUP FAILURE - GAMMA MAX GAIN0 (1a)"
	Yes	Yes	16210	"SETUP FAILURE - GAMMA MAX GAIN1 (1a)"
	Yes	Yes	16220	"SETUP FAILURE - DISCONNECT MODE (1a)"
Yes			16230	"%s" *NOTE: Contains Dual Ion Record 1a.*
	Yes	Yes	16250	"SETUP FAILURE - UNIT ID(1b)"
	Yes	Yes	16280	"STATUS CHANGE - EXTERNAL POWER LOSS Since last status record (1b)"
	Yes	Yes	16290	"STATUS CHANGE - BATTERY LOW (1b)"
	Yes	Yes	16300	"STATUS CHANGE - BATTERY OK (1b)"
	Yes	Yes	16310	"SETUP FAILURE - VERSION (1b)"
	Yes	Yes	16320	"SETUP FAILURE - USERID (1b)"
	Yes	Yes	16330	"SETUP FAILURE - BOARD1 (1b)"
	Yes	Yes	16340	"SETUP FAILURE - BOARD2 (1b)"
	Yes	Yes	16350	"SETUP FAILURE - ACQ MODE (1b)"
	Yes	Yes	16360	"STATUS CHANGE - BATTERY OUT OF TOLERANCE (1b)"
	Yes	Yes	16360	"STATUS CHANGE - BATTERY OUT OF TOLERANCE (42)"
	Yes	Yes	16370	"STATUS CHANGE - BATTERY IN TOLERANCE (1b)"
	Yes	Yes	16370	"STATUS CHANGE - BATTERY IN TOLERANCE (42)"
	Yes	Yes	16380	"STATUS CHANGE - PLUS 5 VOLT SUPPLY OUT OF TOLERANCE (1b)"
	Yes	Yes	16380	"STATUS CHANGE - PLUS 5 VOLT SUPPLY OUT OF TOLERANCE (42)"
	Yes	Yes	16390	"STATUS CHANGE - PLUS 5 VOLT SUPPLY NOT OUT OF TOLERANCE (1b)"
	Yes	Yes	16390	"STATUS CHANGE - PLUS 5 VOLT SUPPLY NOT OUT OF TOLERANCE (42)"
	Yes	Yes	16400	"STATUS CHANGE - PLUS 15 VOLT SUPPLY OUT OF TOLERANCE (1b)"
	Yes	Yes	16400	"STATUS CHANGE - PLUS 15 VOLT SUPPLY OUT OF TOLERANCE (42)"
	Yes	Yes	16410	"STATUS CHANGE - PLUS 15 VOLT SUPPLY NOT OUT OF TOLERANCE (1b)"
	Yes	Yes	16410	"STATUS CHANGE - PLUS 15 VOLT SUPPLY NOT OUT OF TOLERANCE (42)"
	Yes	Yes	16420	"STATUS CHANGE - MINUS 15 VOLT SUPPLY OUT OF TOLERANCE (1b)"
	Yes	Yes	16420	"STATUS CHANGE - MINUS 15 VOLT SUPPLY OUT OF TOLERANCE (42)"
	Yes	Yes	16430	"STATUS CHANGE - MINUS 15 VOLT SUPPLY NOT OUT OF TOLERANCE (1b)"
	Yes	Yes	16430	"STATUS CHANGE - MINUS 15 VOLT SUPPLY NOT OUT OF TOLERANCE (42)"
	Yes	Yes	16440	"SETUP FAILURE - 1B ROM CHECKSUM (1b)"
Yes			16450	"%s" *NOTE: Contains General Status Record 1b.*
	Yes	Yes	16470	"SETUP FAILURE - GRAND USER VERSION (1c)"

Stale	Limited	CEV	ID	Message
	Yes	Yes	16480	"SETUP FAILURE - ACQUIRE TIME (1c)"
	Yes	Yes	16490	"SETUP FAILURE - BUFFER TOTAL (1c)"
	Yes	Yes	16500	"SETUP FAILURE - BUFFER SAVE (1c)"
	Yes	Yes	16510	"SETUP FAILURE - NEUTRON PULSE A THRESHOLD (1c)"
	Yes	Yes	16520	"SETUP FAILURE - NEUTRON PULSE B THRESHOLD (1c)"
	Yes	Yes	16530	"SETUP FAILURE - NEUTRON PULSE C THRESHOLD (1c)"
	Yes	Yes	16540	"SETUP FAILURE - GAMMA 1 THRESHOLD (1c)"
	Yes	Yes	16550	"SETUP FAILURE - GAMMA 2 THRESHOLD (1c)"
	Yes	Yes	16560	"SETUP FAILURE - NO FILTER ENTER MII RUNS (1c)"
	Yes	Yes	16570	"SETUP FAILURE - NO FILTER ENTER MII SIGMA (1c)"
	Yes	Yes	16580	"SETUP FAILURE - ENTER MII RUNS (1c)"
	Yes	Yes	16590	"SETUP FAILURE - ENTER MII SIGMA (1c)"
	Yes	Yes	16600	"SETUP FAILURE - MII EXIT (1c)"
	Yes	Yes	16610	"SETUP FAILURE - LOCAL BACKGROUND FIRST(1c)"
	Yes	Yes	16620	"SETUP FAILURE - LOCAL BACKGROUND LAST(1c)"
	Yes	Yes	16630	"SETUP FAILURE - PULSEA FLAG (1c)"
	Yes	Yes	16640	"SETUP FAILURE - PULSEB FLAG (1c)"
	Yes	Yes	16650	"SETUP FAILURE - PULSEC FLAG (1c)"
	Yes	Yes	16660	"SETUP FAILURE - GAMMA1 FLAG (1c)"
	Yes	Yes	16670	"SETUP FAILURE - GAMMA2 FLAG (1c)"
	Yes	Yes	16680	"SETUP FAILURE - ROM CHECKSUM (1c)"
Yes			16690	"%s" *NOTE: Contains Monitor A Record 1c.*
Yes			16700	"%s" *NOTE: Contains Triple Neutron 2 Record 1d.*
	Yes	Yes	16720	"Year less then 1990"
		Yes	16740	"%s" *NOTE: Contains first ID2 Record after start new file.*
	Yes	Yes	16750	"STATUS CHANGE - Time Out of Tolerance (1e)"
	Yes	Yes	16750	"STATUS CHANGE - Time Out of Tolerance (4e)"
	Yes	Yes	16760	"STATUS CHANGE - Time In Tolerance (1e)"
	Yes	Yes	16760	"STATUS CHANGE - Time In Tolerance (4e)"
	Yes	Yes	16770	"SETUP FAILURE - UNIT ID (1b)"
	Yes	Yes	16770	"SETUP FAILURE - UNIT ID (1e)"
	Yes	Yes	16780	"STATUS CHANGE - External Power Off (1e)"
	Yes	Yes	16780	"STATUS CHANGE - External Power Off (4e)"
	Yes	Yes	16790	"STATUS CHANGE - External Power On (1e)"
	Yes	Yes	16790	"STATUS CHANGE - External Power On (4e)"
	Yes	Yes	16800	"STATUS CHANGE - BATTERY LOW (1e)"
	Yes	Yes	16800	"STATUS CHANGE - BATTERY LOW (4e)"

Stale	Limited	CEV	ID	Message
	Yes	Yes	16810	"STATUS CHANGE - BATTERY OK (1e)"
	Yes	Yes	16810	"STATUS CHANGE - BATTERY OK (4e)"
	Yes		16820	"STATUS CHANGE - COUNT RATE TAMPER (1e)"
	Yes		16821	"STATUS CHANGE - Changing Signal (1e)"
	Yes		16821	"STATUS CHANGE - Changing Signal (4e)"
	Yes		16830	"STATUS CHANGE - NO COUNT RATE TAMPER (1e)"
	Yes		16831	"STATUS CHANGE - No Changing Signal (1e)"
	Yes		16831	"STATUS CHANGE - No Changing Signal (4e)"
	Yes		16840	"STATUS CHANGE - RMS SIGMA TAMPER (1e)"
	Yes		16841	"STATUS CHANGE - Threshold Event (1e)"
	Yes		16841	"STATUS CHANGE - Threshold Event (4e)"
	Yes		16850	"STATUS CHANGE - NO RMS SIGMA TAMPER (1e)"
	Yes		16851	"STATUS CHANGE - No Threshold Event (1e)"
	Yes		16851	"STATUS CHANGE - No Threshold Event (4e)"
	Yes	Yes	16860	"STATUS CHANGE - BATTERY BACKED UP MEMORY ERROR (1e)"
	Yes	Yes	16860	"STATUS CHANGE - BATTERY BACKED UP MEMORY ERROR (4e)"
		Yes	16870	"STATUS CHANGE (cont) - Could not write value to BBM"
		Yes	16880	"STATUS CHANGE (cont) - Number of bytes for opcode wrong"
		Yes	16890	"STATUS CHANGE (cont) - BBM is filled"
		Yes	16900	"STATUS CHANGE (cont) - Invalid opcode read from BBM"
	Yes	Yes	16910	"STATUS CHANGE - NO BATTERY BACKED UP MEMORY ERROR (1e)"
	Yes	Yes	16910	"STATUS CHANGE - NO BATTERY BACKED UP MEMORY ERROR (4e)"
	Yes		16920	"STATUS CHANGE - COLD START (1e)"
	Yes		16920	"STATUS CHANGE - COLD START (4e)"
	Yes		16930	"STATUS CHANGE - NORMAL START (1e)"
	Yes		16930	"STATUS CHANGE - NORMAL START (4e)"
	Yes		16940	"STATUS CHANGE - In MEASUREMENT INTERVAL OF INTEREST [BELL icon on] (1e)"
	Yes		16940	"STATUS CHANGE - In MEASUREMENT INTERVAL OF INTEREST [BELL icon on] (4e)"
	Yes		16950	"STATUS CHANGE - Out of MEASUREMENT INTERVAL OF INTEREST [BELL icon off] (1e)"
	Yes		16950	"STATUS CHANGE - Out of MEASUREMENT INTERVAL OF INTEREST [BELL icon off] (4e)"
	Yes		16960	"STATUS CHANGE - DATA NOT FILTERED (1e)"
	Yes		16960	"STATUS CHANGE - DATA NOT FILTERED (4e)"
	Yes		16970	"STATUS CHANGE - DATA FILTERED (1e)"
	Yes		16970	"STATUS CHANGE - DATA FILTERED (4e)"
			16980	"%s" *NOTE: Contains Monitor ID2 Record 1e.*

Stale	Limited	CEV	ID	Message
Yes			17010	"%s" *NOTE: Contains Information Record 30.*
	Yes	Yes	17030	"SETUP FAILURE - FILTER METHOD (31)"
	Yes	Yes	17040	"SETUP FAILURE - TAKE OFFSET (31)"
	Yes	Yes	17050	"SETUP FAILURE - TAKE OFFSET MAX (31)"
	Yes	Yes	17060	"SETUP FAILURE - LOG BATTERY (31)"
	Yes	Yes	17070	"SETUP FAILURE - FILTERING ENABLED (31)"
	Yes	Yes	17080	"SETUP FAILURE - NEUTRON A LOWER LIMIT (31)"
	Yes	Yes	17090	"SETUP FAILURE - NEUTRON B LOWER LIMIT (31)"
	Yes	Yes	17100	"SETUP FAILURE - NEUTRON C LOWER LIMIT (31)"
	Yes	Yes	17110	"SETUP FAILURE - GAMMA 1 LOWER LIMIT (31)"
	Yes	Yes	17120	"SETUP FAILURE - GAMMA 2 LOWER LIMIT (31)"
	Yes	Yes	17130	"SETUP FAILURE - TRIGGER MODE (31)"
	Yes	Yes	17140	"SETUP FAILURE - SYNC ENABLED (31)"
	Yes	Yes	17150	"SETUP FAILURE - SYNC TIME (31)"
	Yes	Yes	17160	"SETUP FAILURE - SYNC LOWER LIMIT (31)"
	Yes	Yes	17170	"SETUP FAILURE - SYNC UPPER LIMIT (31)"
Yes			17180	"%s" *NOTE: Contains Monitor B Record 31.*
			17190	"CHECKSUM ERROR"
			17200	"%s" *NOTE: Contains record with checksum error.*
			17210	"LENGTH ERROR"
			17220	"%s" *NOTE: Contains record with length error.*
		Yes	17230	"Auth. Failure: %Y/%m/%d %H:%M:%S "
		Yes	17231	"Auth. Mismatch: %Y/%m/%d %H:%M:%S Apparent Restart "
		Yes	17240	"Could not write to BID file [DISK icon on] "
		Yes	17250	"Successful write to BID file"
		Yes	17260	"Could not open BID file [DISK icon on] "
		Yes	17270	"GRAND Start new day"
	Yes	Yes	17280	"INVALID TIME %04d.%02d.%02d %02d:%02d:%02d" *NOTE: Time included*
		Yes	17290	"GRAND COLLECT Version %s started" *NOTE: Version will be included.*
		Yes	17300	"GRAND COLLECT Version %s started from abnormal shutdown"
		Yes	17330	"Grand Time %04d.%02d.%02d %02d:%02d:%02d C 727 Computer Time C - G = %.0f seconds"
	Yes		17340	"GRAND Timeout on receive DUMPLAST response"
			17370	"Acquire Record from DUMPLAST written in BID file (15)"
			17380	"Acquire Record Out Of Order (15)"
			17390	"Acquire Record from DUMPLAST in an EXCLUSION time (15)" *NOTE: Only in special build of MIC.*

Stale	Limited	CEV	ID	Message
	Yes		17420	"GRAND Timeout on receive ANALYZE response"
	Yes		17450	"GRAND Timeout on receive INQUIRE2 response"
	Yes		17460	"GRAND Timeout on receive INQUIRE2 response (msg filter on)"
	Yes		17520	"GRAND Timeout on INQUIRE2 command"
	Yes		17540	"GRAND Timeout on DUMPBBBM command"
	Yes		17550	"GRAND Timeout on DUMPBBM command"
			17580	"INSUFFICIENT NUMBER OF ACQUIRE RECORDS RECEIVED"
		Yes	17590	"HARD CHECKSUM ERROR"
		Yes	17610	"GRAND Multiple Timeout on DUMPOK -- assuming ok"
			17620	"Acquire Record Out Of Order (15)"
			17630	"Acquire Record in an EXCLUSION time (15)" *NOTE: Only included in special build of MIC.*
	Yes		17640	"GRAND Timeout on DUMPOK command"
			17660	"Acquire Record Out Of Order (15)"
		Yes	17670	"HARD CHECKSUM ERROR ON DUMPBBMOK"
	Yes		17690	"GRAND Timeout on DUMPSTAT command"
	Yes		17720	"GRAND Timeout on receive ANALYZE response"
		Yes	17740	"Forcing Instrument to Computer Time"
	Yes		17790	"GRAND Timeout on receive ANALYZE response"
		Yes	17810	"Forcing Instrument to Computer Time"
	Yes		17880	"GRAND Timeout on GRAND initialization"
	Yes	Yes	17930	"Local Break held off (start)"
	Yes	Yes	17940	"Local Break sent (start)"
	Yes	Yes	17950	"Break sent (start)"
	Yes	Yes	18020	"Break sent (end)"
		Yes	18050	"WRITE FAILURE on BID file, SUPPORT TERMINATED"
		Yes	18060	"Attempt restart from WRITE FAILURE on BID file"
	Yes		18061	"Configuration Failure [BOMB icon on]"
		Yes	18070	"GRAND COLLECT take data stopped."
			18071	"GRAND COLLECT Power Fail Drive BBM to Zero."
		Yes	18080	"GRAND COLLECT take data started."
		Yes	18090	"GRAND COLLECT stopped: Logon ID: %s MIC User ID: %s"
Yes			18100	"%s" *NOTE: Contains General Configuration Record 41.*
	Yes	Yes	18101	"SETUP FAILURE - COUNT_TIME (41)"
	Yes	Yes	18102	"SETUP FAILURE - BIAS_TYPE (41)"
	Yes	Yes	18103	"SETUP FAILURE - CONF_STATE (41)"
	Yes	Yes	18104	"SETUP FAILURE - BIAS_SETPOINT (41)"
	Yes	Yes	18105	"SETUP FAILURE - MODE_FLAGS1 (41)"

Stale	Limited	CEV	ID	Message
	Yes	Yes	18106	"SETUP FAILURE - MODE_FLAGS2 (41)"
	Yes	Yes	18107	"SETUP FAILURE - BATT_INTER (41)"
	Yes	Yes	18108	"SETUP FAILURE - FILTER_CONT (41)"
	Yes	Yes	18109	"SETUP FAILURE - IMMBUFF_SZ (41)"
	Yes	Yes	18110	"SETUP FAILURE - IMMBUFFSAVE_SZ (41)"
	Yes	Yes	18111	"SETUP FAILURE - LOCBG_SZ (41)"
	Yes	Yes	18112	"SETUP FAILURE - LOCBG_END (41)"
	Yes	Yes	18113	"SETUP FAILURE - STATUS_INT (41)"
	Yes	Yes	18114	"SETUP FAILURE - INST_ID (41)"
	Yes	Yes	18115	"SETUP FAILURE - UNIT_ID (41)"
	Yes	Yes	18116	"SETUP FAILURE - TIMESYNC_STATE (41)"
	Yes	Yes	18117	"SETUP FAILURE - TIMESYNC_HOUR (41)"
	Yes	Yes	18118	"SETUP FAILURE - TIMESYNC_DAILY (41)"
	Yes	Yes	18119	"SETUP FAILURE - TIMESYNC_LOWTOL (41)"
	Yes	Yes	18120	"SETUP FAILURE - TIMESYNC_UPPTOL (41)"
	Yes	Yes	18121	"SETUP FAILURE - FIRMWARE_VERSION (41)"
	Yes	Yes	18122	"SETUP FAILURE - FIRMWARE_CHKSUM (41)"
	Yes		18123	"BINARY GENERAL CONFIG RECORD FAILED FORMAT (Formatted): %s" *NOTE: Contains failed record.*
			18124	"BINARY GENERAL CONFIG RECORD FAILED FORMAT (Source): %s" *NOTE: Contains hex dump of failed record.*
Yes			18200	"%s" *NOTE: Contains Instrument Status Record 42.*
	Yes	Yes	18201	"STATUS CHANGE - FC HV > %2.0f%% ERROR (42)" *NOTE: Contains reported FC HV*
	Yes	Yes	18202	"STATUS CHANGE - FC HV < %2.0f%% ERROR (42)" *NOTE: Contains reported FC HV*
	Yes	Yes	18203	"STATUS CHANGE - IC HV > %2.0f%% ERROR (42)" *NOTE: Contains reported IC HV*
	Yes	Yes	18204	"STATUS CHANGE - IC HV < %2.0f%% ERROR (42)" *NOTE: Contains reported IC HV*
	Yes		18210	"BINARY INSTRUMENT STATUS RECORD FAILED FORMAT (Formatted): %s" *NOTE: Contains failed record.*
			18220	"BINARY INSTRUMENT STATUS RECORD FAILED FORMAT (Source): %s" *NOTE: Contains hex dump of failed record.*
Yes			18300	"%s" *NOTE: Contains Instrument Information Record 43*
	Yes		18310	"BINARY INSTRUMENT INFO RECORD FAILED FORMAT (Formatted): %s" *NOTE: Contains failed record.*
			18320	"BINARY INSTRUMENT INFO RECORD FAILED FORMAT (Source): %s" *NOTE: Contains hex dump of failed record.*

Stale	Limited	CEV	ID	Message
Yes			18400	"%s" *NOTE: Contains Dual Current Mode Config Record 44.*
	Yes	Yes	18401	"SETUP FAILURE - OFFSET_MODE (44)"
	Yes	Yes	18402	"SETUP FAILURE - NOM_OFFSET_INTERVAL (44)"
	Yes	Yes	18403	"SETUP FAILURE - MAX_OFFSET_INTERVAL (44)"
	Yes	Yes	18404	"SETUP FAILURE - GAMMA0_GAIN_MODE (44)"
	Yes	Yes	18405	"SETUP FAILURE - GAMMA0_MAX_FIX (44)"
	Yes	Yes	18406	"SETUP FAILURE - GAMMA1_GAIN_MODE (44)"
	Yes	Yes	18407	"SETUP FAILURE - GAMMA1_MAX_FIX (44)"
	Yes	Yes	18408	"STATUS CHANGE - IC HV > %2.0f%% ERROR (44)"
	Yes	Yes	18409	"STATUS CHANGE - IC HV < %2.0f%% ERROR (44)
	Yes		18410	"BINARY DUAL CURRENT MODE CONFIGURATION RECORD FAILED FORMAT (Formatted): %s" *NOTE: Contains failed record.*
	Yes	Yes	18410	"SETUP FAILURE - IC_HV_SETPOINT (44)"
			18420	"BINARY DUAL CURRENT MODE CONFIGURATION RECORD FAILED FORMAT (Source): %s" *NOTE: Contains hex dump of failed record.*
Yes			18500	"%s" *NOTE: Contains Trigger Configuration Record 45.*
	Yes	Yes	18501	"SETUP FAILURE - TRIGGER_4_LOGIC (45)"
	Yes	Yes	18502	"SETUP FAILURE - TRIGGER_4_CHAN_TYPE (45)"
	Yes	Yes	18503	"SETUP FAILURE - TRIGGER_5_LOGIC (45)"
	Yes	Yes	18504	"SETUP FAILURE - TRIGGER_5_CHAN_TYPE (45)"
	Yes	Yes	18505	"SETUP FAILURE - TRIGGER_6_LOGIC (45)"
	Yes	Yes	18506	"SETUP FAILURE - TRIGGER_6_CHAN_TYPE (45)"
	Yes	Yes	18507	"SETUP FAILURE - TRIGGER_7_LOGIC (45)"
	Yes	Yes	18508	"SETUP FAILURE - TRIGGER_7_CHAN_TYPE (45)"
	Yes		18510	"BINARY TRIGGER CONFIG RECORD FAILED FORMAT (Formatted): %s" *NOTE: Contains failed record.*
			18520	"BINARY TRIGGER CONFIG RECORD FAILED FORMAT (Source): %s" *NOTE: Contains hex dump of failed record.*
Yes			18600	"%s" *NOTE: Contains Channel 0 - 5 Configuration Record 46 - 4b.*
	Yes	Yes	18601	"SETUP FAILURE - CH0_USED (46)"
	Yes	Yes	18602	"SETUP FAILURE - CH0_T1TYPEDIR (46)"
	Yes	Yes	18603	"SETUP FAILURE - CH0_T1VALUE (46)"
	Yes	Yes	18604	"SETUP FAILURE - CH0_T1EEV (46)"
	Yes	Yes	18605	"SETUP FAILURE - CH0_T2TYPEDIR (46)"
	Yes	Yes	18606	"SETUP FAILURE - CH0_T2VALUE (46)"
	Yes	Yes	18607	"SETUP FAILURE - CH0_T2EEV (46)"
	Yes	Yes	18608	"SETUP FAILURE - CH0_CHANGMULT (46)"

Stale	Limited	CEV	ID	Message
	Yes	Yes	18609	"SETUP FAILURE - CH0_CHANGENTCNT (46)"
	Yes		18610	"BINARY CHANNEL CONFIG RECORD FAILED FORMAT (Formatted): %s" *NOTE: Contains failed record.*
	Yes	Yes	18611	"SETUP FAILURE - CH1_USED (47)"
	Yes	Yes	18612	"SETUP FAILURE - CH1_T1TYPEDIR (47)"
	Yes	Yes	18613	"SETUP FAILURE - CH1_T1VALUE (47)"
	Yes	Yes	18614	"SETUP FAILURE - CH1_T1EEV (47)"
	Yes	Yes	18615	"SETUP FAILURE - CH1_T2TYPEDIR (47)"
	Yes	Yes	18616	"SETUP FAILURE - CH1_T2VALUE (47)"
	Yes	Yes	18617	"SETUP FAILURE - CH1_T2EEV (47)"
	Yes	Yes	18619	"SETUP FAILURE - CH1_CHANGENTCNT (47)"
			18620	"BINARY CHANNEL CONFIG RECORD FAILED FORMAT (Source): %s" *NOTE: Contains hex dump of failed record.*
	Yes	Yes	18621	"SETUP FAILURE - CH2_USED (48)"
	Yes	Yes	18622	"SETUP FAILURE - CH2_T1TYPEDIR (48)"
	Yes	Yes	18623	"SETUP FAILURE - CH2_T1VALUE (48)"
	Yes	Yes	18624	"SETUP FAILURE - CH2_T1EEV (48)"
	Yes	Yes	18625	"SETUP FAILURE - CH2_T2TYPEDIR (48)"
	Yes	Yes	18626	"SETUP FAILURE - CH2_T2VALUE (48)"
	Yes	Yes	18627	"SETUP FAILURE - CH2_T2EEV (48)"
	Yes	Yes	18629	"SETUP FAILURE - CH2_CHANGENTCNT (48)"
	Yes	Yes	18631	"SETUP FAILURE - CH3_USED (49)"
	Yes	Yes	18632	"SETUP FAILURE - CH3_T1TYPEDIR (49)"
	Yes	Yes	18633	"SETUP FAILURE - CH3_T1VALUE (49)"
	Yes	Yes	18634	"SETUP FAILURE - CH3_T1EEV (49)"
	Yes	Yes	18635	"SETUP FAILURE - CH3_T2TYPEDIR (49)"
	Yes	Yes	18636	"SETUP FAILURE - CH3_T2VALUE (49)"
	Yes	Yes	18637	"SETUP FAILURE - CH3_T2EEV (49)"
	Yes	Yes	18639	"SETUP FAILURE - CH3_CHANGENTCNT (49)"
	Yes	Yes	18641	"SETUP FAILURE - CH4_USED (4a)"
	Yes	Yes	18642	"SETUP FAILURE - CH4_T1TYPEDIR (4a)"
	Yes	Yes	18643	"SETUP FAILURE - CH4_T1VALUE (4a)"
	Yes	Yes	18644	"SETUP FAILURE - CH4_T1EEV (4a)"
	Yes	Yes	18645	"SETUP FAILURE - CH4_T2TYPEDIR (4a)"
	Yes	Yes	18646	"SETUP FAILURE - CH4_T2VALUE (4a)"
	Yes	Yes	18647	"SETUP FAILURE - CH4_T2EEV (4a)"
	Yes	Yes	18649	"SETUP FAILURE - CH4_CHANGENTCNT (4a)"
	Yes	Yes	18651	"SETUP FAILURE - CH5_USED (4b)"

Stale	Limited	CEV	ID	Message
	Yes	Yes	18652	"SETUP FAILURE - CH5_T1TYPEDIR (4b)"
	Yes	Yes	18653	"SETUP FAILURE - CH5_T1VALUE (4b)"
	Yes	Yes	18654	"SETUP FAILURE - CH5_T1EEV (4b)"
	Yes	Yes	18655	"SETUP FAILURE - CH5_T2TYPEDIR (4b)"
	Yes	Yes	18656	"SETUP FAILURE - CH5_T2VALUE (4b)"
	Yes	Yes	18657	"SETUP FAILURE - CH5_T2EEV (4b)"
	Yes	Yes	18659	"SETUP FAILURE - CH5_CHANGENTCNT (4b)"
			18700	"%s" *NOTE: Contains ID3 Record 4e.*
	Yes	Yes	18710	"SETUP FAILURE - CH0_FILTERLIM (46)"
	Yes	Yes	18711	"SETUP FAILURE - CH0_HYSTER (46)"
	Yes	Yes	18718	"SETUP FAILURE - CH1_CHANGMULT (47)"
	Yes	Yes	18720	"SETUP FAILURE - CH1_FILTERLIM (47)"
	Yes	Yes	18721	"SETUP FAILURE - CH1_HYSTER (47)"
	Yes	Yes	18728	"SETUP FAILURE - CH2_CHANGMULT (48)"
	Yes	Yes	18730	"SETUP FAILURE - CH2_FILTERLIM (48)"
	Yes	Yes	18731	"SETUP FAILURE - CH2_HYSTER (48)"
	Yes	Yes	18738	"SETUP FAILURE - CH3_CHANGMULT (49)"
	Yes	Yes	18740	"SETUP FAILURE - CH3_FILTERLIM (49)"
	Yes	Yes	18741	"SETUP FAILURE - CH3_HYSTER (49)"
	Yes	Yes	18748	"SETUP FAILURE - CH4_CHANGMULT (4a)"
	Yes	Yes	18750	"SETUP FAILURE - CH4_FILTERLIM (4a)"
	Yes	Yes	18751	"SETUP FAILURE - CH4_HYSTER (4a)"
	Yes	Yes	18758	"SETUP FAILURE - CH5_CHANGMULT (4b)"
	Yes	Yes	18760	"SETUP FAILURE - CH5_FILTERLIM (4b)"
	Yes	Yes	18761	"SETUP FAILURE - CH5_HYSTER (4b)"
			18997	"User Changed all DESIRED in INI file to REPORTED"
			18998	"User Changed all DESIRED in INI file to DEFAULT"
			18999	"User Changed %s to %s" *NOTE: any time user changes desired value in Setup Data.*
	Yes		30000	"INQUIRE2 Response Record caused [TIME icon on]"
	Yes		30001	"A communications problem caused [FLAG, SKULL, or BOMB icon on]"
	Yes		30002	"A power or BBM problem caused [FROWN FACE icon on]"
	Yes		30003	"Icon turned on from previous execution of MIC [TIME icon on]"
	Yes		30004	"Icon turned on from previous execution of MIC [FROWN FACE icon on]"
	Yes		30005	"Icon turned on from previous execution of MIC [FLAG icon on]"
			30006	"Flags acknowledged by user. [FLAGS all off]"
	Yes		30008	"Attempting recovery from communications failure."

8.4. Critical Events (CEV) File

Critical Events Files are text files containing date and time stamped performance information of a more critical nature or possible loss of data. One file is created each day using the configured file naming convention with a file extension of ".cev". All potential entries in a CEV file are indicated in the above table.

8.5. BID File

BID files are the binary data files generated using safeguards data from the GRAND or MiniGRAND instruments. They are created by the GRAND instrument support object. The format is:

Record 1: Header
- 4 ASCII bytes - size of header that follows this field (69)
- 5 ASCII bytes - not used
- 5 ASCII bytes - MIC version number
- 3 ASCII bytes - Station id
- 3 ASCII bytes - year
- 3 ASCII bytes - month
- 3 ASCII bytes - day
- 47 ASCII bytes - spare for expansion (first four bytes contain ASCII year)

Record 2 to end of file: 36 byte data records for each data acquisition
- 4 byte unsigned long int - julian time, date of data acquisition
- 2 byte unsigned short - status byte (0-255)
- 4 byte single precision float - neutron channel A count rate
- 4 byte single precision float - neutron channel B count rate
- 4 byte single precision float - neutron channel C count rate
- 4 byte single precision float - gammas in gamma channel 1
- 4 byte single precision float - gamma channel 1 sigma
- 4 byte single precision float - gammas in gamma channel 2
- 4 byte single precision float - gamma channel 2 sigma
- 2 byte unsigned short - elapsed time

9. ISR & AMSR

ISR and AMSR support is through the ISR instrument support object. The objective of this support object is to copy data placed in the ISR or AMSR's battery backed up memory to the collect computer's hard drive. To this end it will display recently received information and will detect improper mode of operation of the instrument. If the instrument has been placed in any mode other than "monitor" mode then it will command the instrument into the correct mode. If for some reason the instrument stops responding to the support object then a reset sequence will be sent.

9.1. Configuration

To establish and configure an ISR or AMSR instrument support object select the "Configuration" menu option (left click on the icon in MIC's main dialog title bar) and click on the "Add Instrument" button. Because the new instrument support object will need to connect to an existing communications object—if it hasn't been created do so using the "Add Comm" button prior to continuing. After clicking on the "Add Instrument" button the user will be prompted for the type of instrument and the name of the instrument.

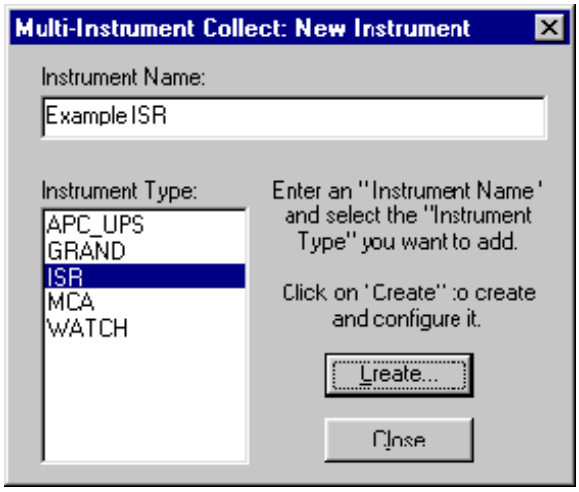


Figure 32 Add Instrument Dialog

To create an ISR or AMSR instrument support object click on the "ISR" entry in the "Instrument Type" window and enter a name in the "Instrument Name" window—the "Create" button will become active. Click on it to continue or select "Close" to exit without creating the support object. If "Create" was selected then the ISR configuration dialog box will be presented.

Each of the data items in the ISR configuration dialog need to be set or at least verified. The "Extend Auto Close" button in the lower right corner indicates the time until this dialog box automatically aborts the creation process and closes. If more time is needed click on the button to extend the time by 5 minutes to a maximum of 120 minutes. In the "Communications" area set the "Port" to the desired communications support object and the "Node" to the appropriate node for the selected communications support object. When simple serial communications support objects are used the "Node" attribute is inconsequential.

Set the data items in the "File Output" area to appropriate settings. Set the location which the ISR instrument support object should write the files for this instrument. The "Station ID" must be unique among all instruments! Typically, "Do Dump File" should be set to not selected.

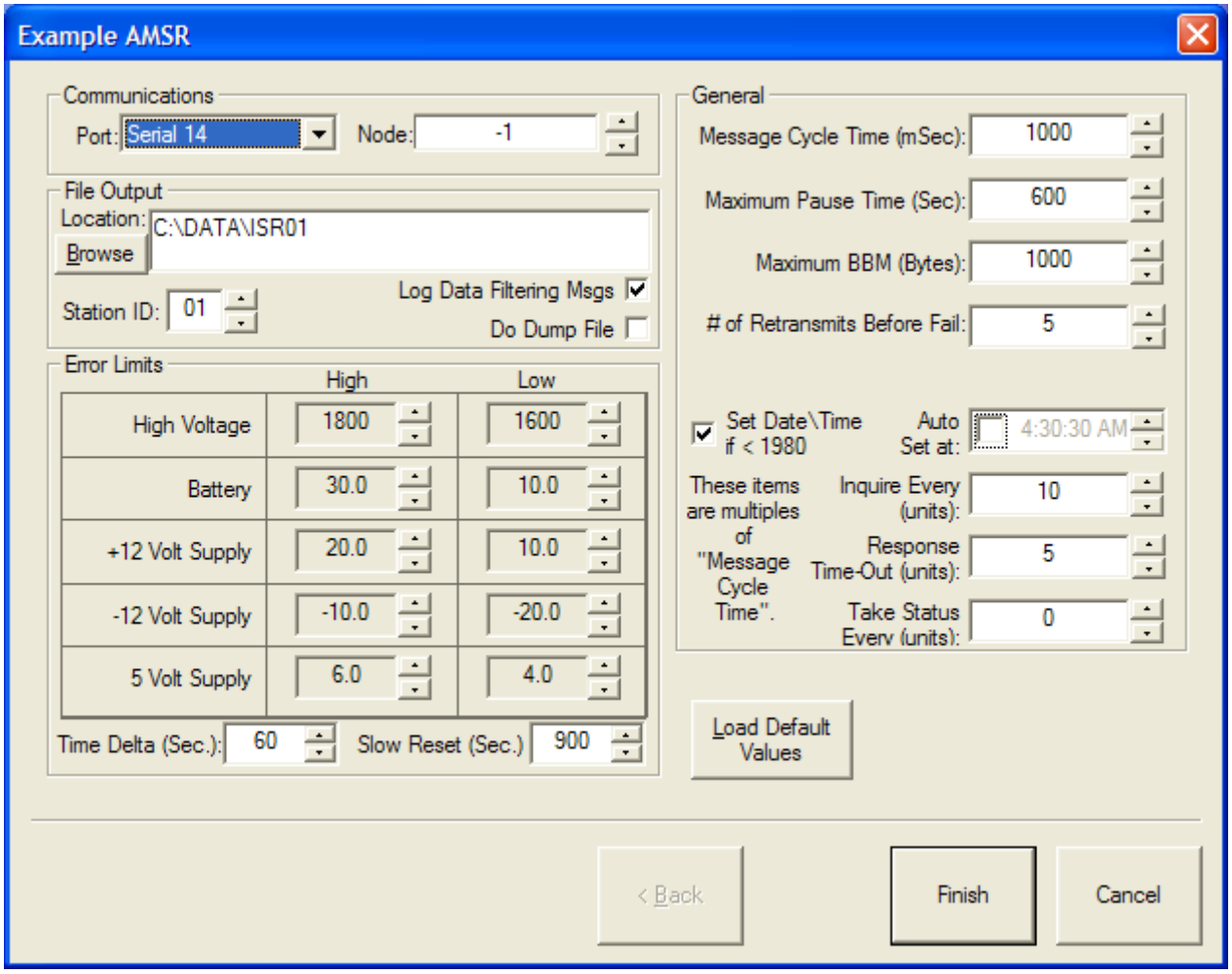


Figure 33 ISR / AMSR Configuration Dialog

Adjust all of the data items in the "Error Limits" area as needed. The voltage high and low settings are used by MIC to flag an out-of-tolerance condition for the associated instrument. "Time Delta" sets the tolerance between the MIC computer's clock and the instrument's clock. When the ISR instrument support object detects the difference between instrument's clock and the computer's clock is greater than the number of seconds set here then an error will be flagged in red and entered into the appropriate CEV or PFM file. When this occurs and if the Auto Set At has been selected then shortly after the selected time the instrument's time will be set automatically to the collect computer's time.

In the General area the "Message Cycle Time" data item should be set to the number milliseconds between timing messages sent to the portion of the ISR instrument support object which controls the command sequence to the instrument. Generally, this should be left at 1000 (1 second). The "Maximum Pause Time" controls the maximum duration which the ISR instrument support object may be held in pause mode. When in pause mode the associated instrument will still be accumulating data but MIC will not ask the instrument for status. When the pause time runs out the instrument support object will automatically resume normal operations of asking for status and responding accordingly. The "Maximum BBM" data item is the point at which the ISR instrument support object begins to dump the associated instrument's battery backed up memory to the .ISR file on the MIC computer. Once this trigger point is

reached the dump sequence will continue until the associated instrument reports 0 bytes in BBM. This value should be set to a low number to allow maximum instrument autonomy. The "# of Retransmits Before Fail" is set to control how many repeats of a command the ISR instrument support object should attempt prior to assuming a communications failure.

The bottom three data items in this section are units of "Message Cycle Time" listed above. Consequently, if the "Message Cycle Time" is set to 1000 mSec. then these three values will be in seconds. The "Inquire Every (units)" data item controls how often to send INQUIRE2 messages to the associated instrument. The "Response Time-Out (units)" sets the duration the ISR instrument support object should wait for a response to a command such as INQUIRE2 or DUMPBBM. The "Take Status Every (units)" controls how often the ISR instrument support object should send a DUMPSTAT command to the associated instrument. Setting this value to 0 tells MIC not to repetitively send a DUMPSTAT command. Near the start of a new PFM file one DUMPSTAT (3) command will be sent to the instrument regardless of this setting.

After all values have been set or verified click on the "Finish" button. Prior to actually creating the new ISR instrument support object the user will be prompted for a valid user name—password pair.

The creation of the ISR or AMSR instrument support object will be accompanied by the addition of a colored button on the MIC main dialog.

9.2. Use

A colored button on the MIC main dialog will exist for each ISR or AMSR instrument support object and one instrument support object should be created for each actual instrument being supported. The background color of the button on the MIC main dialog button indicates the current state of the instrument support object. Red signifies the instrument support object is having a problem communicating with the associated instrument. Green is the normal quiescent state and yellow indicates a command has been sent to the instrument but an acceptable response has not yet been received back. The title of the instrument support object is presented at the top of the button and the number of bytes in battery backed up memory (as reported by the instrument) is also displayed. In the lower portion of the button icons will be displayed to indicate various state of health information. Clicking on the button will cause a multi-page tabbed dialog box to be displayed.

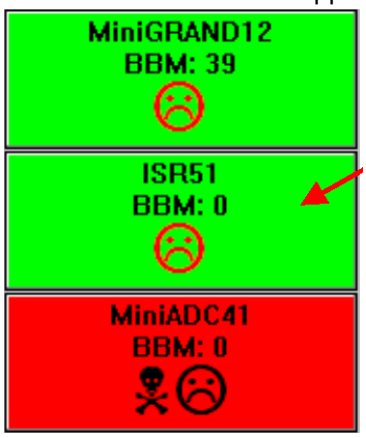


Figure 34 ISR Colored Button From MIC Main Dialog

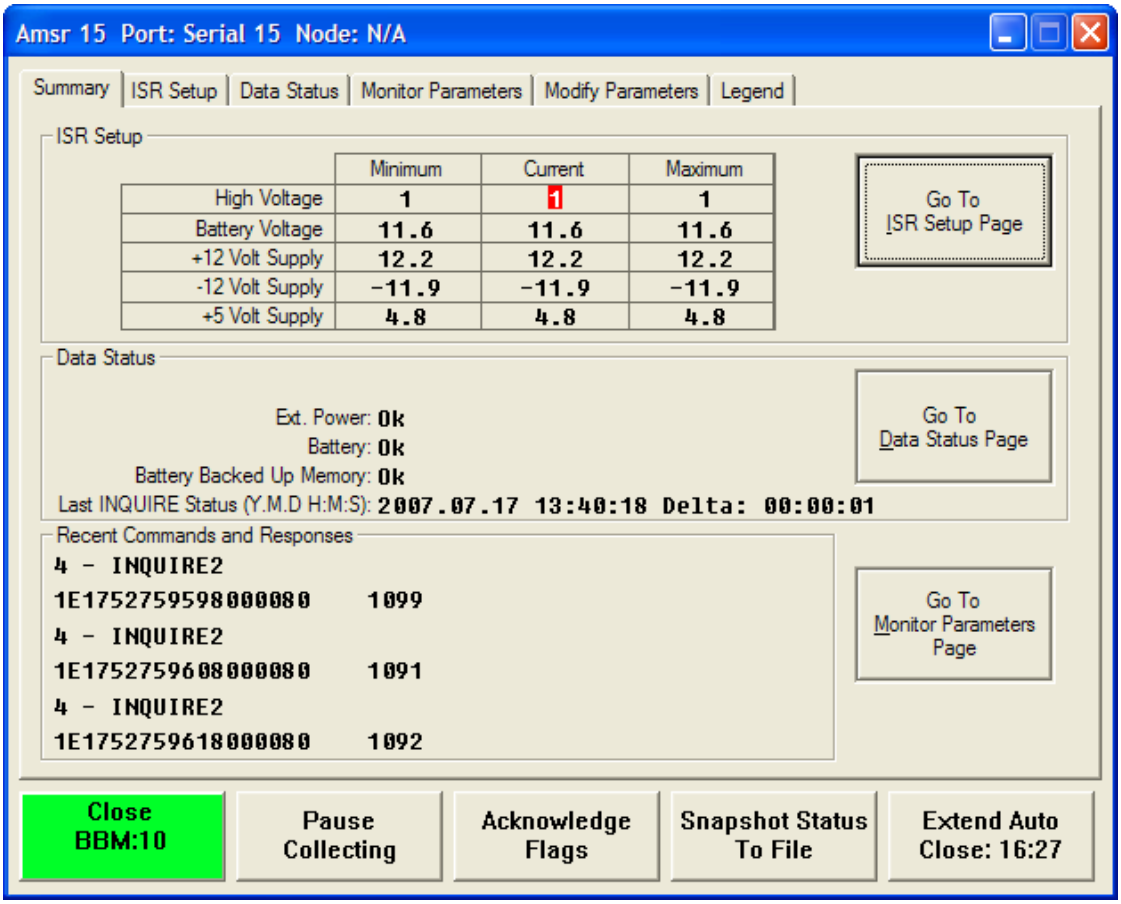


Figure 35 ISR or AMSR Instrument Support Object Dialog Box

This dialog provides a "Summary", "ISR Setup", "Data Status", "Monitor Parameters", "Modify Parameters", and "Legend" tabs very similar to the GRAND instrument support object's dialog box. Each tab displays data items associated with various classes of messages received from an instrument. On the Summary tab is a set of data items repeated from other tabs. These items are critical items which if out of tolerance safeguard information may be lost. Each item is associated with a tab page and will be displayed in white with red background if out of tolerance. If any of the items on a tab page are out of tolerance then the green round icon on the associated tab will change to a red rectangle. The user may go directly to that tab by clicking on it. All flagged data items will stay red until canceled by clicking on the "Acknowledge Flags" button at the bottom of the dialog box. In the lower portion of the Summary tab is the "Recent Commands and Responses" area. This area scrolls up as commands are sent and responses are received—with the newest command or response displayed on the bottom. Clicking on one of the lines in this area will execute the MsgUtil.exe from the MicMgr.exe program's directory which in turn will display the components of the message.

To facilitate rapid evaluation of the information on this tab it is nearly identical with the GRAND and MCA summary tabs.

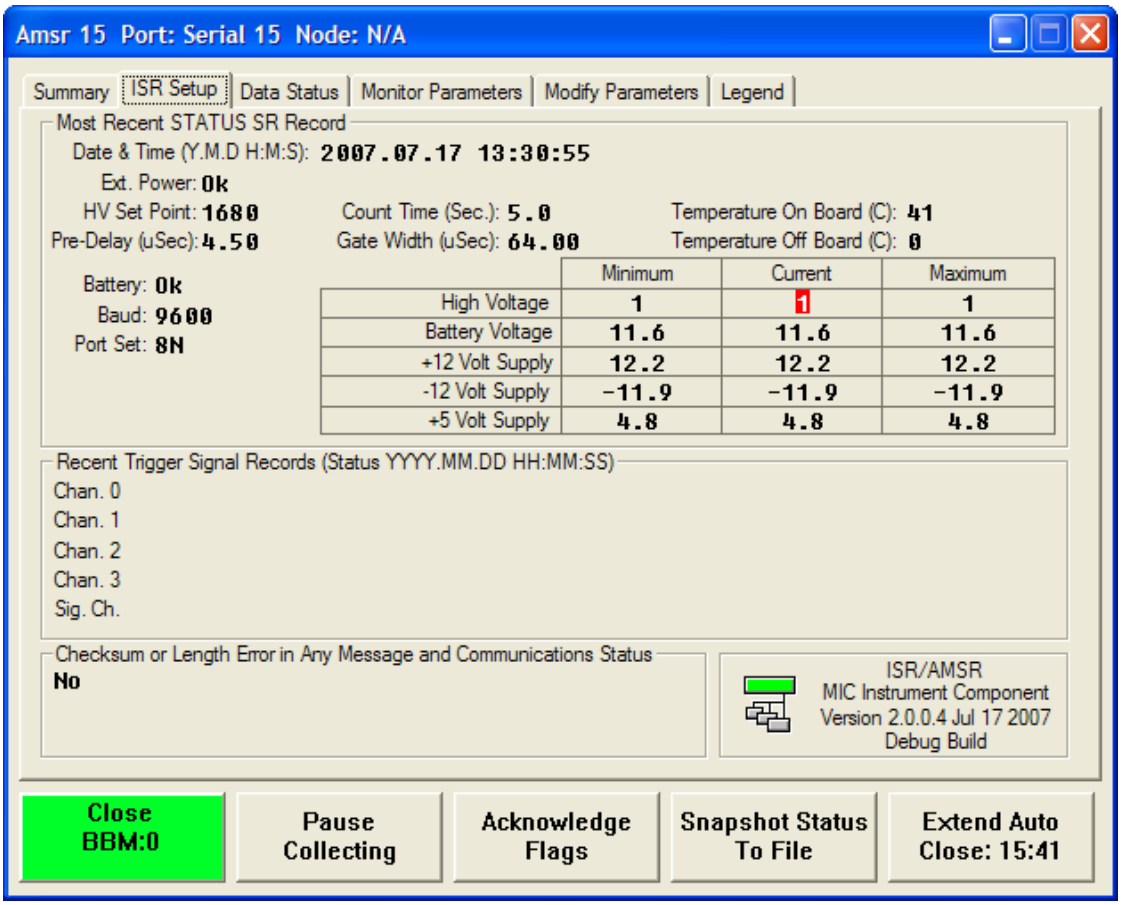


Figure 36 ISR or AMSR ISR Setup Tab

The second tab, "ISR Setup" provides information provided by the target ISR or AMSR instrument about the current setup. Also on this tab near the bottom is the "Checksum or Length Error in Any Message" area. In this area a time stamped copy of the most recent message with a checksum failure or message length error will be displayed. All out of tolerance or error indications on this page will be displayed in white letters with red background until the Acknowledge Flags button has been clicked on. Items which have not yet been received, such as the data in the "Recent Trigger Signal Records" area will be blank. This area will contain two columns displaying the previous and the current trigger signals state.

To the extent possible this tab is similar to the GRAND and MCA's Setup Tab.

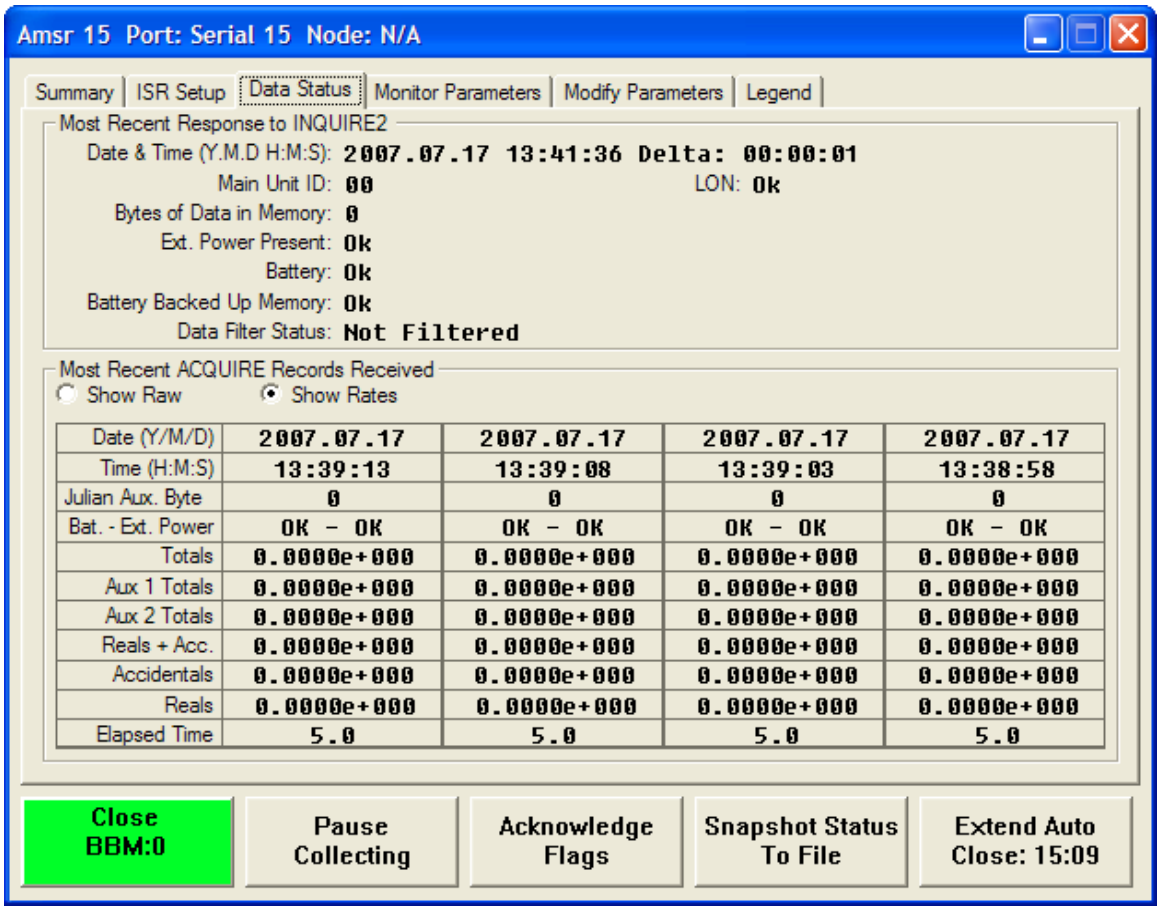


Figure 37 ISR or AMSR Data Status Tab

The third tab is the "Data Status" page. Information provided in the most recent INQUIRE2 response is provided on this page along with the apparent difference between the MIC computer's time and the ISR or AMSR clock. The "Delta" is computed by taking the difference between the time stamp on the INQUIRE2 response and the time of the collect computer's clock at the time of message receipt. The four most recent ACQUIRE records are presented in the bottom portion with the most recent on the left. When a new ACQUIRE record is received the data in the three columns on the left are all shifted right one column and the new record's data is placed in the left hand column.

Some items report error states or have limits associated with them. If the data item indicates an error or the item is out of tolerance then it will be displayed in a white font with a red background. In this case the situation can be acknowledged by clicking on the "Acknowledge Flags" button. The green icon on the tab will change to a red rectangle if there are any un-acknowledged items on the page and will return to a green sphere when acknowledged.

To the greatest extent possible this tab is similar to the Data Status tab of the GRAND and MCA Data Status tab.

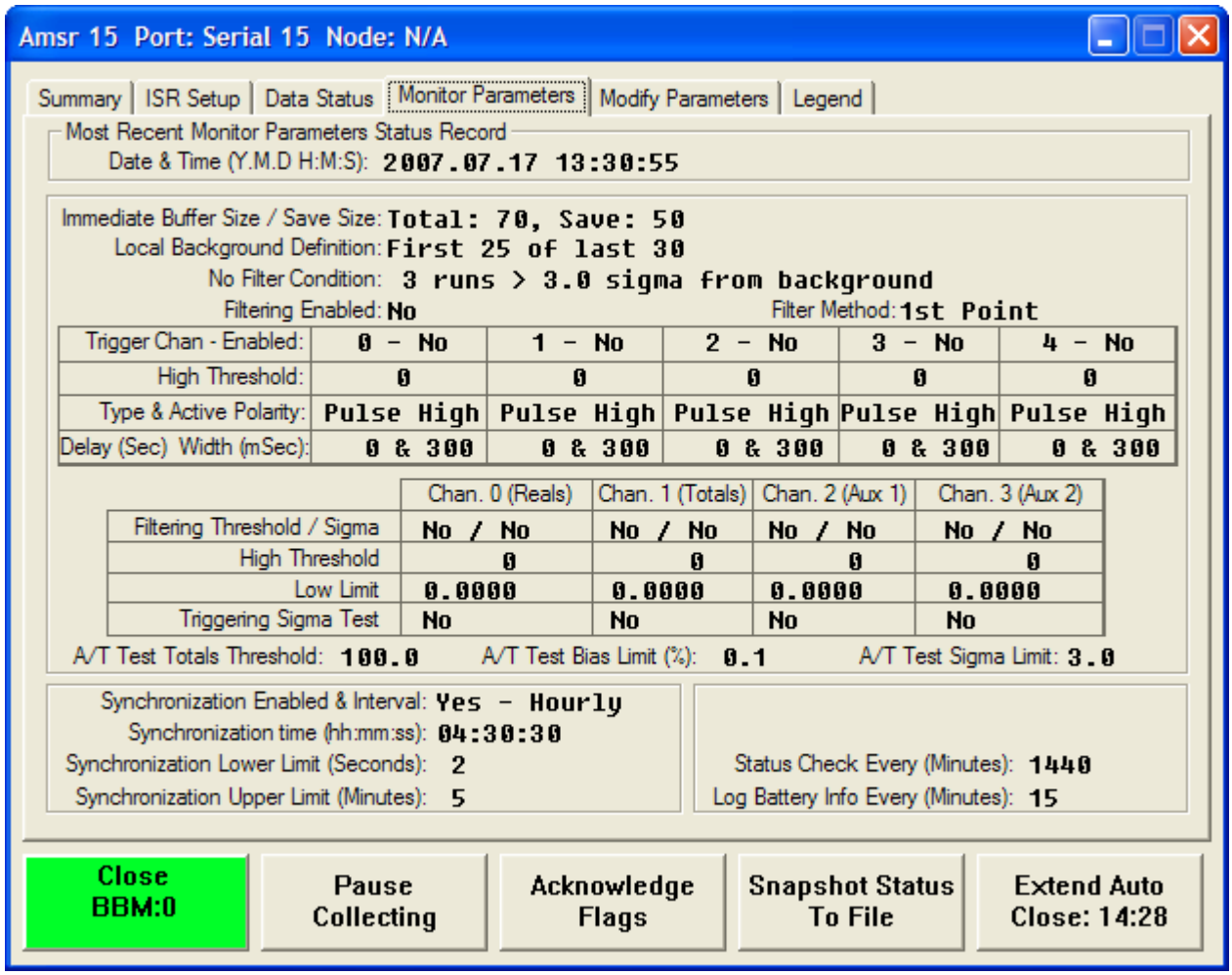


Figure 38 ISR or AMSR Monitor Parameters Tab

The fourth tab, "Monitor Parameters" presents information provided by the ISR or AMSR instrument as reported in the various status records. If a specific item has not been received then the item will be blank.

To the greatest extent possible the ISR/AMSR Monitor Parameters tab is similar to the GRAND and MCA's Monitor Parameters tab.

The fourth tab, "Modify Parameters", is nearly identical to the initial configuration dialog and to the GRAND and MCA's Modify Parameters tab. At this point the user no longer has the option

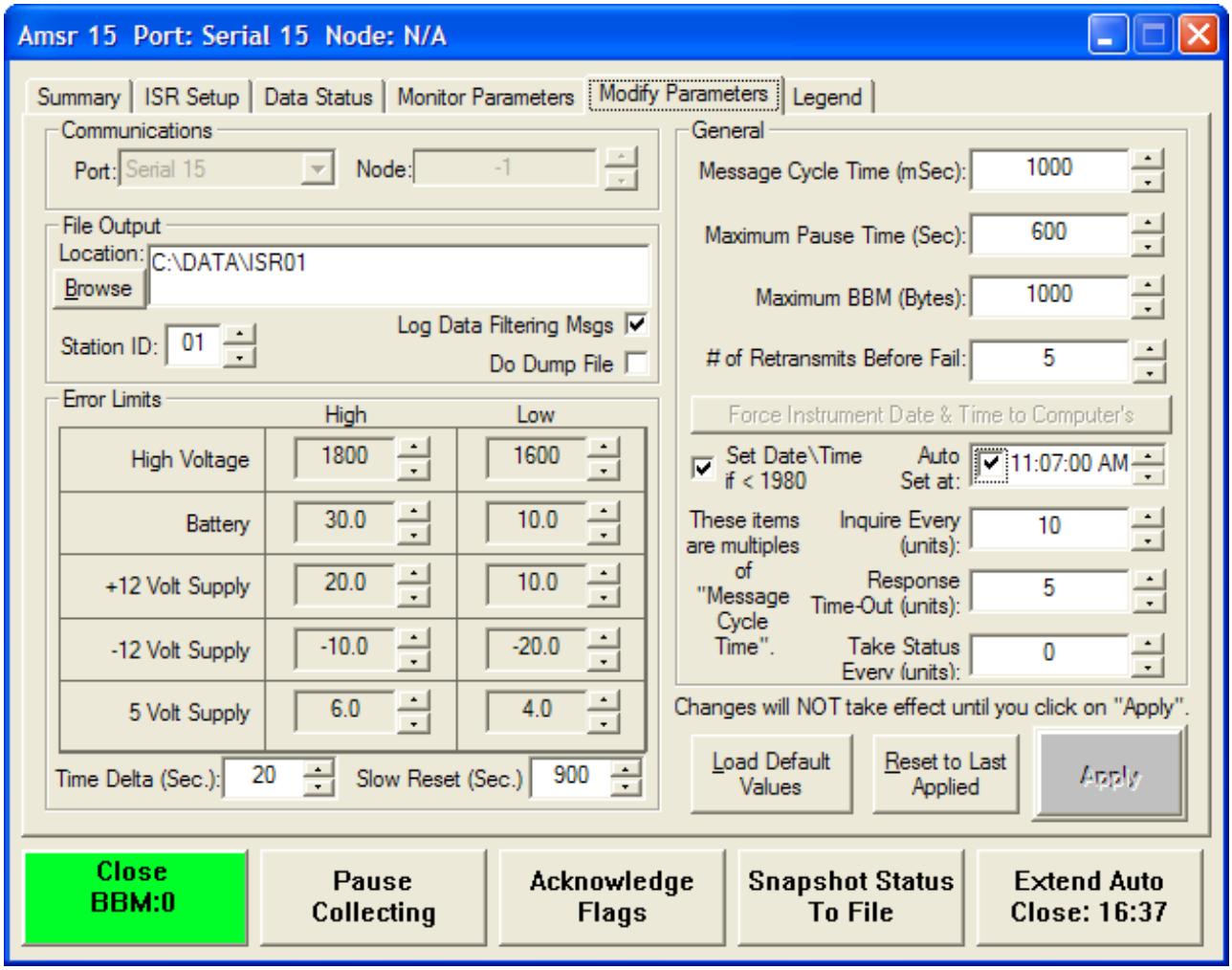


Figure 39 ISR or AMSR Modify Parameters Tab

to change the "Communications" area information. The "Force Instrument Date & Time to Computer's" button has been added. This button is accessible only if the instrument support object is in pause mode (placed there by clicking on the "Pause Collecting" button). The "Set Date\Time if < 1980" and the "Auto Set at:" control automatically setting the instrument's time and should not be used if other time setting techniques are employed. The default values for each data item may be reloaded by clicking on the "Load Default Values" or the user may click on the "Reset to Last Applied" forcing all data items to return to the currently applied values. After adjusting any of the data items they must be applied by clicking on the "Apply" button. The border around the apply button indicates applying the changes is a password protected function.

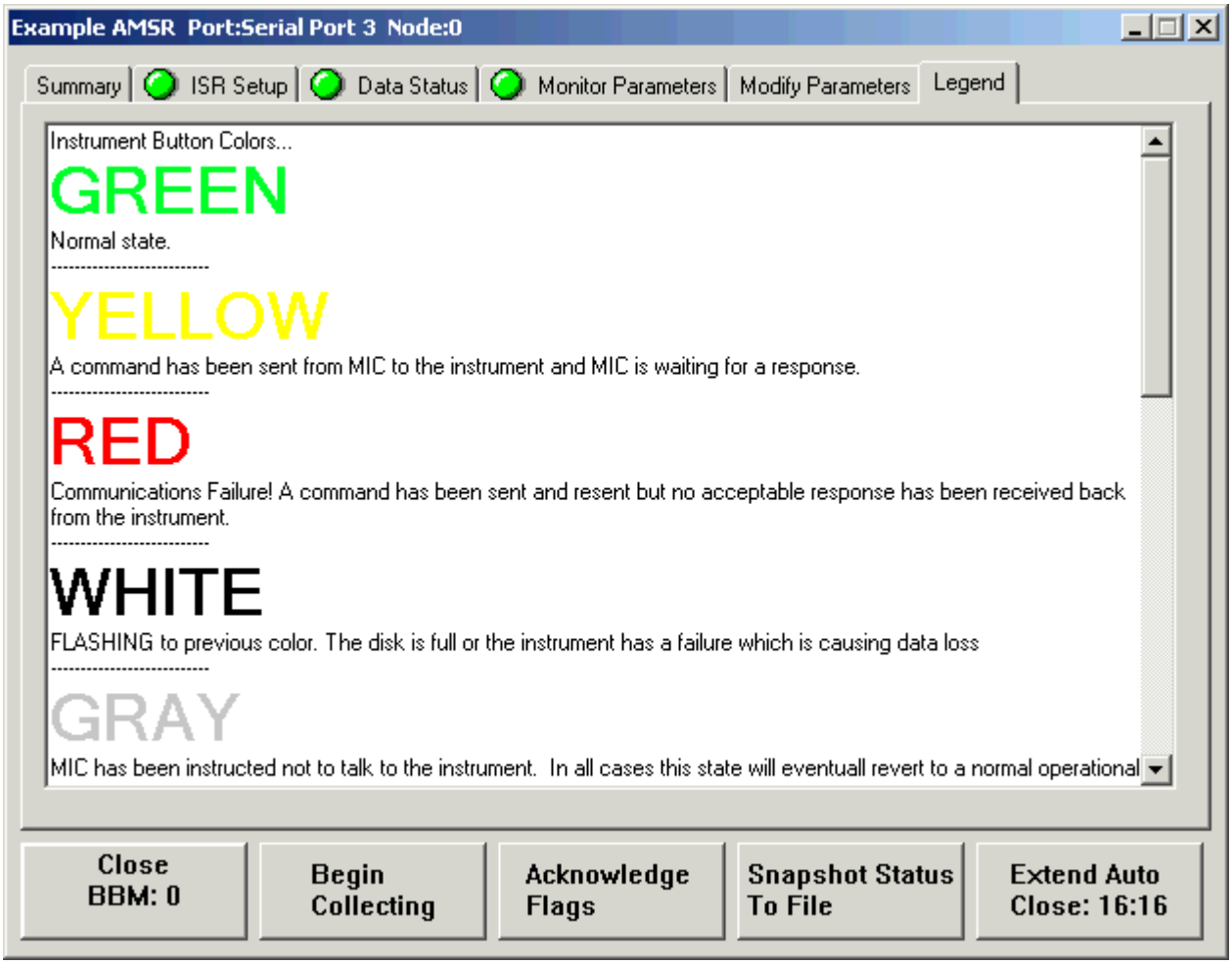


Figure 40 ISR and AMSR Legend Tab

The Legend tab provides a list of the meaning of each of the button face colors and the icons which are displayed on the colored buttons. The customization capabilities for this tab are identical to the GRAND and the MCA's Legend tab. The file displayed in this case has been edited so that the text is colored and the background is white. Reference the GRAND Legend tab for a complete discussion on how to change the information displayed here.

9.3. Performance (PFM) File

Performance Files are text files containing date and time stamped performance information messages. One file is created each day using the configured file naming convention with a file extension of ".pfm".

All of the possible entries for ISR and AMSR type instrument performance files are listed below. The format is the same for all entries: "YYYY.MM.DD hh.mm.dd X nnnnn msg<lf><cr>". Where "YYYY" is the four digit year, "MM" is the two digit month, "DD" is the two digit day of month, "hh" is the hour, "mm" is the minute, and "ss" is the second of date and time. The "X" indicates where the date and time originate; "C" designates the MIC computer and "I" designates the ISR or AMSR instrument. "nnnnn" is a five digit identifier (ID) unique to that instrument and that specific message. (This ID is intended to support automated data analysis of the file.) The "msg" portion is the text message of the entry. All lines terminate with a line-feed character followed by a carriage return character.

The number in parenthesis at the end of some of the entries is the message type generated by the instrument that caused the performance file entry. The notation %s, %02x, and others in the message represent information received from the instrument. For example, %s is a text string, %02x is byte value represented as a hexadecimal number, and %f is a floating-point number.

Under some circumstances a status message may arrive (*e.g.* from BBM) with a date time older than one which has already been received (*e.g.* from a DUMPSTAT command). If this occurs the older message will be placed into the PFM file with "**Note: A newer message has been received.**" appended to it. This late arrival processing will only occur for those messages indicated in the "Stale" column.

If the maximum messages count for a specific message has been reached then the phrase "**(further occurrences not included)**" will be appended to the last message for that day. Only the messages indicated in the "Limited" column are restricted in this fashion. The message counts will all be returned to zero at the beginning of each day and anytime MIC is restarted.

In the table below, the CEV column indicates that the associated message will also be written to the CEV file (see following section).

Some of the entries below contain notes to the reader. These notes will NOT be included in the message written to the file.

Stale	Limited	CEV	ID	Message
		Yes	16755	"DOING DAILY TIME SET. Delta: %f"
		Yes	21830	"ISR COLLECT Version %s started"
		Yes	21840	"ISR COLLECT Version %s started from abnormal shutdown"
		Yes	21860	"Unknown TYPE %s"
		Yes	21870	"ISR Start new day"
	Yes		21930	"ISR Timeout on receive DUMPLAST response"
	Yes		21940	"ISR Timeout on receive DUMPLAST response (msg filter on)"
			21960	"Acquire Record from DUMPLAST being written in ISR file (15)"
			21970	"Acquire Record Out Of Order (15)"
			21980	"Acquire Record from DUMPLAST failed to write to ISR file (15)"

Stale	Limited	CEV	ID	Message
			21990	"Acquire Record from DUMPLAST in an EXCLUSION time (15)"
	Yes		22010	"ISR Timeout on receive INQUIRE2 response"
	Yes		22020	"ISR Timeout on receive INQUIRE2 response (msg filter on)"
	Yes		22060	"ISR Timeout on receive ANALYZE response"
	Yes		22070	"ISR Timeout on receive ANALYZE response (msg filter on)"
	Yes		22130	"ISR Timeout on INQUIRE2 command"
	Yes		22140	"ISR Timeout on INQUIRE2 command (msg filter on)"
	Yes		22160	"ISR Timeout on DUMPBBM command"
	Yes		22170	"ISR Timeout on DUMPBBM command (msg filter on)"
			22180	"INSUFFICIENT NUMBER OF ACQUIRE RECORDS RECEIVED"
			22190	"INSUFFICIENT NUMBER OF RECORDS RECEIVED"
		Yes	22200	"HARD CHECKSUM ERROR"
			22220	"Acquire Record Out Of Order (15)"
			22230	"Acquire Record in an EXCLUSION time (15)"
	Yes		22240	"ISR Timeout on DUMPOK command"
	Yes		22250	"ISR Timeout on DUMPOK command (msg filter on)"
			22260	"Acquire Record Out Of Order (15)"
	Yes		22270	"ISR Timeout on DUMPSTAT command"
	Yes		22280	"ISR Timeout on DUMPSTAT command (msg filter on)"
			22290	"First 0 - STILL BUSY? sent"
		Yes	22310	"0 - STILL BUSY? Busy too long -- doing LBR"
			22320	"Timeout on 0 - STILL BUSY?"
	Yes		22340	"ISR Timeout on receive ANALYZE response"
	Yes		22350	"ISR Timeout on receive ANALYZE response (msg filter on)"
		Yes	22360	"Forcing Instrument to Computer Time"
	Yes		22370	"ISR Timeout on ISR initialization"
	Yes		22380	"ISR Timeout on ISR initialization (msg filter on)"
	Yes	Yes	22390	"Local Break held off (start)"
	Yes	Yes	22400	"Local Break sent (start)"
	Yes	Yes	22410	"Break sent (start)"
	Yes	Yes	22420	"Local Break held off (start) (msg filter on)"
	Yes	Yes	22430	"Local Break sent (start) (msg filter on)"
	Yes	Yes	22440	"Break sent (start) (msg filter on)"
	Yes	Yes	22480	"Break sent (end)"
	Yes	Yes	22490	"Break sent (end) (msg filter on)"
		Yes	22510	"WRITE FAILURE on ISR file"
		Yes	22520	"Attempt restart from WRITE FAILURE on ISR file"
			22525	"ISR COLLECT Power Fail Drive BBM to Zero."

Stale	Limited	CEV	ID	Message
		Yes	22530	"ISR COLLECT take data stopped."
		Yes	22540	"ISR COLLECT take data started."
		Yes	22550	"ISR COLLECT stopped: Logon ID: %s"
			22560	"OOB: %s"
			22570	"Bad LParam Address Received (OOB)"
			22580	"Bad LParam Address Received (1002)"
		Yes	22590	"STATUS CHANGE - External POWER Off (21)"
		Yes	22600	"STATUS CHANGE - External POWER On (21)"
		Yes	22610	"STATUS CHANGE - External POWER LOSS Since last status record (21)"
		Yes	22620	"STATUS CHANGE - BATTERY LOW (21)"
		Yes	22630	"STATUS CHANGE - BATTERY OK (21)"
		Yes	22640	"STATUS CHANGE - HIGH VOLTAGE OUT OF TOLERANCE (21)"
		Yes	22650	"STATUS CHANGE - HIGH VOLTAGE IN TOLERANCE (21)"
		Yes	22660	"STATUS CHANGE - BATTERY OUT OF TOLERANCE (21)"
		Yes	22670	"STATUS CHANGE - BATTERY IN TOLERANCE (21)"
		Yes	22680	"STATUS CHANGE - PLUS 5 VOLT SUPPLY OUT OF TOLERANCE (21)"
		Yes	22690	"STATUS CHANGE - PLUS 5 VOLT SUPPLY NOT OUT OF TOLERANCE (21)"
		Yes	22700	"STATUS CHANGE - PLUS 15 VOLT SUPPLY OUT OF TOLERANCE (21)"
		Yes	22710	"STATUS CHANGE - PLUS 15 VOLT SUPPLY NOT OUT OF TOLERANCE (21)"
		Yes	22720	"STATUS CHANGE - MINUS 15 VOLT SUPPLY OUT OF TOLERANCE (21)"
		Yes	22730	"STATUS CHANGE - MINUS 15 VOLT SUPPLY NOT OUT OF TOLERANCE (21)"
Yes			22740	"%s" *NOTE: Status record (type 21) inserted here. See ISR/AMSR documentation.*
			22750	"%s" *NOTE: Battery record (type 18) inserted here. See ISR/AMSR documentation.*
Yes			22760	"%s" *NOTE: Monitor Status record (type 22) inserted here. See ISR/AMSR documentation.*
		Yes	22770	"%s" *NOTE: Trigger Signal record (type 23) inserted here. See ISR/AMSR documentation.*
		Yes	22780	"INVALID TIME Filter On"
		Yes	22790	"INVALID TIME %Y.%m.%d %H:%M:%S"
		Yes	22791	"ISR Time %Y.%m.%d %H:%M:%S Computer Time C - I = %f seconds"
		Yes	22800	"%s" *NOTE: ID2 record (type 1e) inserted here. See ISR/AMSR*

Stale	Limited	CEV	ID	Message
				documentation.
		Yes	22810	"STATUS CHANGE - Time Out of Tolerance (1e)"
		Yes	22820	"STATUS CHANGE - Time In Tolerance (1e)"
		Yes	22830	"Computer's Time (1e)" *NOTE: From ID2 record (type 1e). See ISR/AMSR documentation.*
		Yes	22840	"Computer's Time (1e)"
		Yes	22850	"STATUS CHANGE - External Power Off (1e)"
		Yes	22860	"STATUS CHANGE - External Power On (1e)"
		Yes	22870	"STATUS CHANGE - BATTERY LOW (1e)"
		Yes	22880	"STATUS CHANGE - BATTERY OK (1e)"
		Yes	22890	"STATUS CHANGE - BATTERY BACKED UP MEMORY ERROR (1e)"
		Yes	22900	"STATUS CHANGE (cont) - Could not write value to BBM"
		Yes	22901	"STATUS CHANGE (cont) - BBM contains incorrect number of bytes for Opcode"
		Yes	22902	"STATUS CHANGE (cont) - BBM is filled"
		Yes	22903	"STATUS CHANGE (cont) - Invalid Opcode read from BBM"
		Yes	22910	"STATUS CHANGE - NO BATTERY BACKED UP MEMORY ERROR (1e)"
			22920	"STATUS CHANGE - DATA NOT FILTERED (1e)"
			22930	"STATUS CHANGE - DATA FILTERED (1e)"
			22940	"STATUS CHANGE - LON ERROR (1e)"
			22950	"STATUS CHANGE - LON OK (1e)"
			22960	"%s" *NOTE: ID2 record (type 1e) inserted here. See ISR/AMSR documentation.*
			22970	"INFORMATION RECORD - %s" *NOTE: Information record (type 30) inserted here. See ISR/AMSR documentation.*
			22980	"CHECKSUM ERROR -- %s" *NOTE: Any ISR/AMSR record inserted here. See ISR/AMSR documentation.*
			22990	"LENGTH ERROR -- %s" *NOTE: Any ISR/AMSR record inserted here. See ISR/AMSR documentation.*
		Yes	23000	"Could not write to ISR file"
		Yes	23010	"Successful write to ISR file"
		Yes	23020	"Could not open ISR file"

9.4. Critical Events (CEV) File

Critical Events Files are text files containing date and time stamped performance information of a more critical nature or possible loss of data. One file is created each day using the configured file naming convention with a file extension of ".cev". All potential entries in a CEV file are indicated in the above table.

9.5. ISR File

ISR files are the binary data files generated using safeguards data from the ISR or AMSR instruments. They are created by the ISR instrument support object. The file begins with one header record and continues with data records until the end of the day at which time a new file is created. The format is:

Record 1: Header
- 4 ASCII bytes - size of header that follows this field (69)
- 5 ASCII bytes - not used
- 3 ASCII bytes – MIC version number
- 3 ASCII bytes - Station id
- 3 ASCII bytes - year
- 3 ASCII bytes - month
- 3 ASCII bytes - day
- 47 ASCII bytes - spare for expansion (first four bytes contain ASCII year)

Record 2-n: 54 byte data records for each data acquisition
- 4 byte unsigned int - julian time, date of data acquisition
- 2 byte unsigned short int - status byte
- 8 byte double – Totals 1 Count
- 8 byte double – Totals 2 Count
- 8 byte double – Totals 3 Count
- 8 byte double – Reals + Accidentals Count
- 8 byte double – Accidentals Count
- 8 byte double – Elapsed Time in 1 second increments

10. MCA/1KADC

MIC support of the MCA type instrument is through the MCA instrument support object. The objective of this support object is to copy data placed in the MCA's battery backed up memory to the collect computer's hard drive. To this end it will display recently received information and will detect improper mode of operation of the instrument. If the instrument has been placed in any mode other than "monitor" then it will command the instrument into the correct mode. If the instrument stops responding to the support object then a reset sequence will be sent.

10.1. Configuration

To establish and configure an MCA instrument support object select the "Configuration" menu option (left click on the icon in MIC's main dialog title bar) and click on the "Add Instrument" button. Because the new instrument support object will need to connect to an existing communications object—if it hasn't been created do so using the "Add Comm" button prior to continuing. After clicking on the "Add Instrument" button the user will be prompted for the type and the name of the new instrument support object.

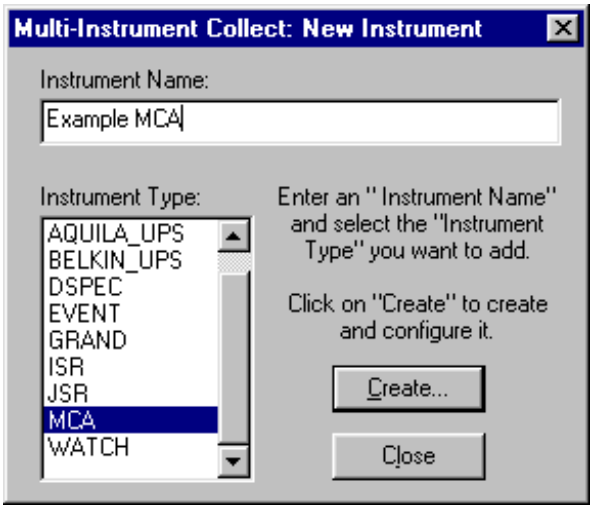


Figure 41 Add Instrument Dialog

To create an MCA instrument support object click on the "MCA" entry in the "Instrument Type" window and enter a name in the "Instrument Name" window—the "Create…" button will become active. Click on it to continue or select "Close" to exit without creating the support object. If "Create…" was selected then the MCA configuration dialog box will be presented.

There are two pages of configuration items for the MCA instrument support object. The first page is shown below. Each of the data items need to be set or at least verified. The "Extend Auto Close" button in the lower right corner indicates the time until this dialog box automatically aborts the creation process and closes. If more time is needed click on it as needed to extend the time by 5 minute intervals to a maximum of 120 minutes. In the "Communications" area set the "Port" to the desired communications support object and the "Node" to the appropriate node for the selected communications support object. When simple serial communications support objects are used the "Node" attribute is inconsequential.

Set the data items in the "File Output area to appropriate settings. Set the location which the MCA instrument support object should write the files for this instrument. The "Station ID" must be unique among all instruments! "Typically, "Do Dump File" should be set to not selected. The

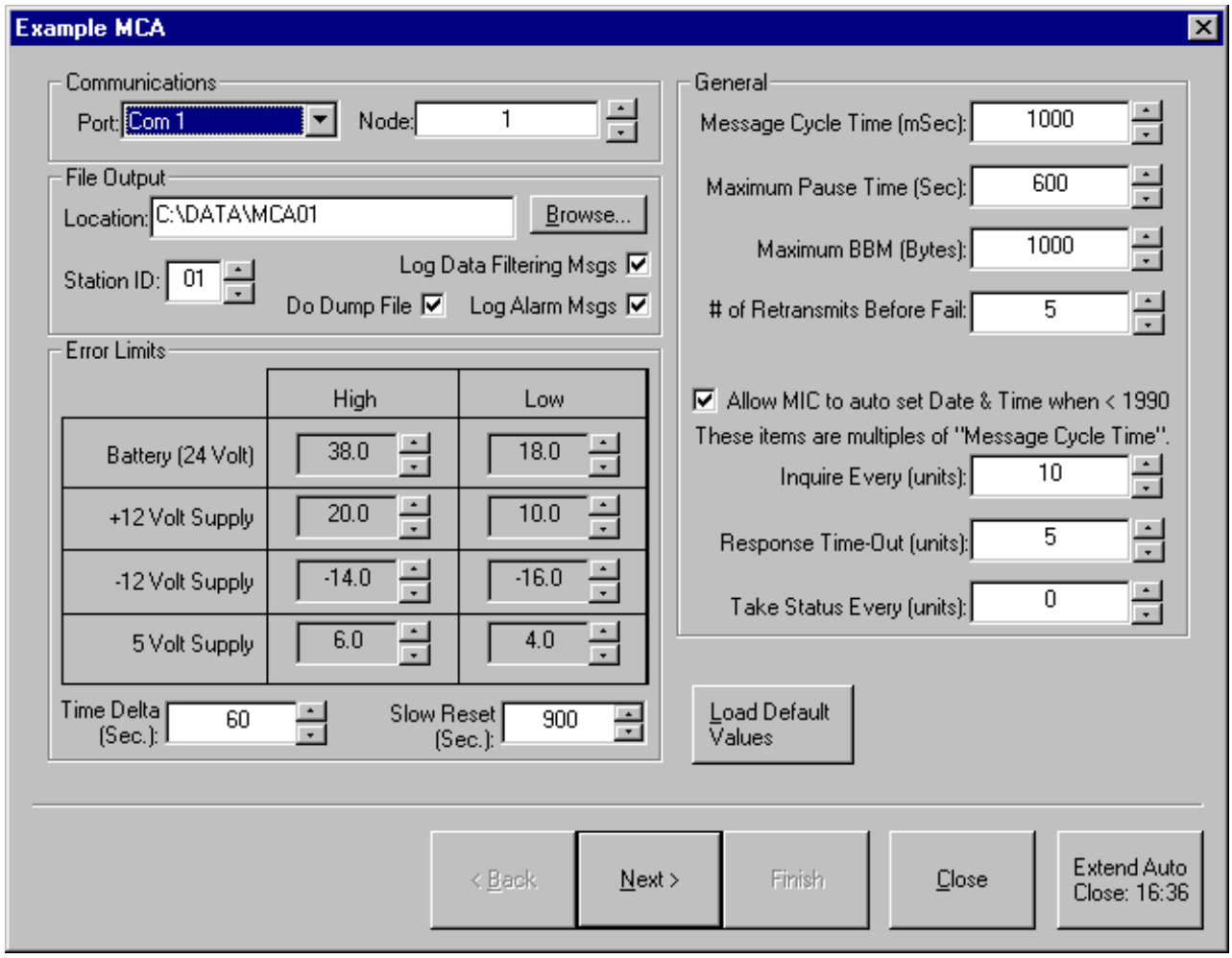


Figure 42 MCA Configuration Dialog's First Page

"Log Alarm Msgs" and the "Log Data Filtering Msgs" should be set as needed. A check mark in these items indicates they will be accomplished.

Adjust all of the data items in the "Error Limits" area as needed. The voltage high and low settings are used by MIC to flag an out-of-tolerance condition for the associated instrument. "Time Delta" sets the tolerance between the MIC computer's clock and the instrument's clock. When the MCA instrument support object detects the difference between the instrument's clock and the computer's clock is greater than the number of seconds set here then an error will be flagged in red and entered into the appropriate CEV and PFM file. When the difference transitions to less than the set value an entry in the CEV and PFM files will indicate the delta is now in tolerance.

In the General area the "Message Cycle Time" data item should be set to the number milliseconds between timing messages sent to the portion of the MCA instrument support object which controls the command sequence to the instrument. Generally, this should be left at 1000 (1 second). The "Maximum Pause Time" controls the maximum duration which the MCA instrument support object may be held in pause mode. When in pause mode the associated instrument will still be accumulating data but MIC will not ask the instrument for status. When the pause time runs out the instrument support object will automatically resume normal operations of asking for status and responding accordingly. The "Maximum BBM" data item is

the point at which the MCA instrument support object begins to dump the associated instrument's battery backed up memory to the .MCA file on the MIC computer. Once this trigger point is reached the dump sequence will continue until the associated instrument reports 0 bytes in BBM. This value should be set to a low number to allow maximum instrument autonomy. The "# of Retransmits Before Fail" is set to control how many repeats of a command the MCA instrument support object should attempt prior to assuming a communications failure.

The bottom three data items in this section are units of "Message Cycle Time" listed above. Consequently, if the "Message Cycle Time" is set to 1000 mSec. then these three values will be in seconds. The "Inquire Every (units)" data item controls how often to send INQUIRE2 messages to the associated instrument. The "Response Time-Out (units)" sets the duration the MCA instrument support object should wait for a response to a command such as INQUIRE2 or DUMPBBM. The "Take Status Every (units)" controls how often the MCA instrument support object should send a DUMPSTAT command to the associated instrument. Setting this value to

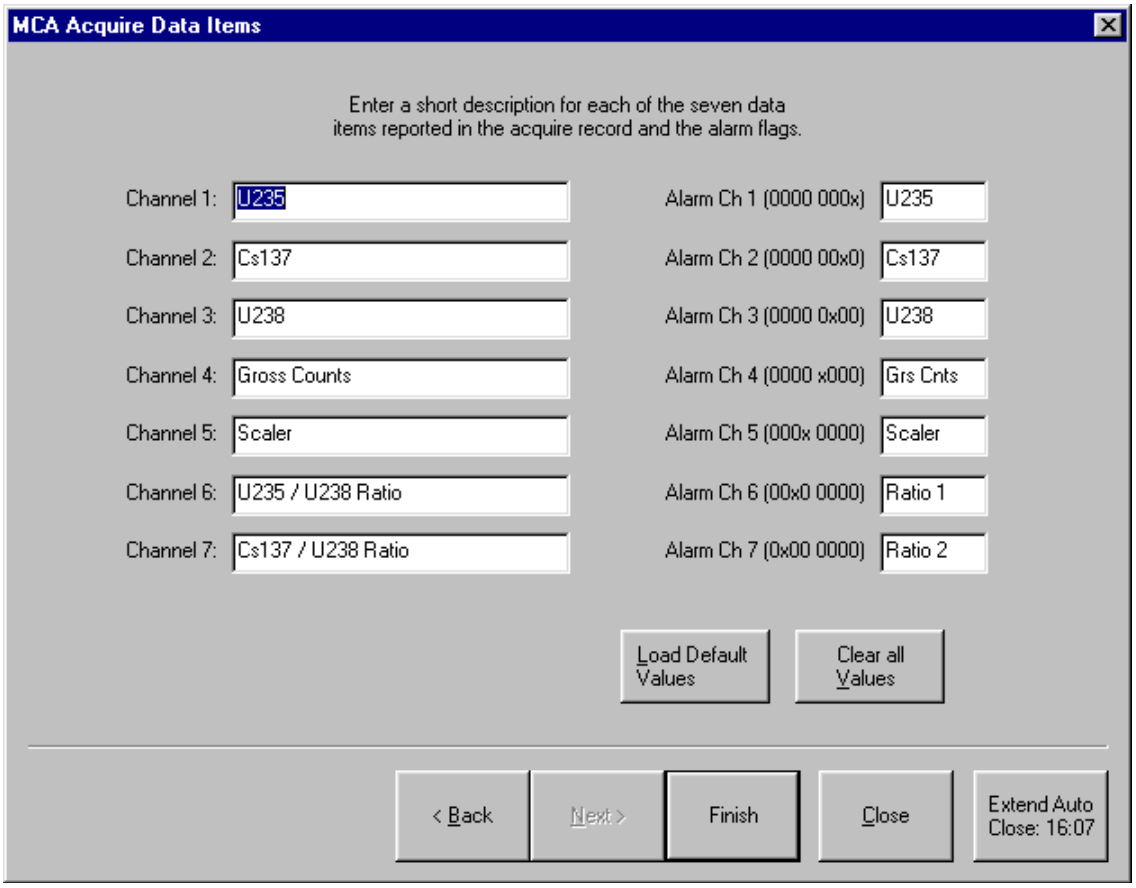


Figure 43 MCA Configuration Dialog's Second Page.

0 indicates a DUMPSTAT does not need to be repetitively sent.

The second page of the MCA configuration dialog contains 14 items which are used to label the seven channels of data and alarms. The entries on this page are informational only and are placed on the appropriate tab page of the instrument's tabbed dialog box.

After all values have been set or verified click on the "Finish" button. Prior to actually creating the new MCA/1KADC instrument support object the user will be prompted for a valid user name—password pair.

10.2. Use

A colored button on the MIC main dialog box will exist for each MCA instrument support object. One instrument support object should be created for each physical instrument being supported. The background color of the button on the MIC main dialog button indicates the current state of the instrument support object. Red signifies the instrument support object is having a problem communicating with the associated instrument. Green is the normal quiescent state and yellow indicates a command has been sent to the instrument but an acceptable response has not yet been received back. When the instrument support object is in the pause state the button will be gray. During physical instrument initialization the instrument may be too busy to talk to MIC in this case it will send a message which will tell MIC to temporarily not talk to the instrument. In this case the button will change to cyan for up to 90 seconds. New versions of the firmware in this instrument have minimized if not completely removed this problem. The title of the instrument support object is presented at the top of the button and the number of bytes in battery backed up memory (as reported by the instrument) is also displayed. In the lower portion of the button icons will be displayed to indicate various state of health information. Clicking on the button will cause a multi-page tabbed dialog box to be displayed. One of the tabs on this dialog provides a legend to the icons and the colors for the instrument's main dialog button.

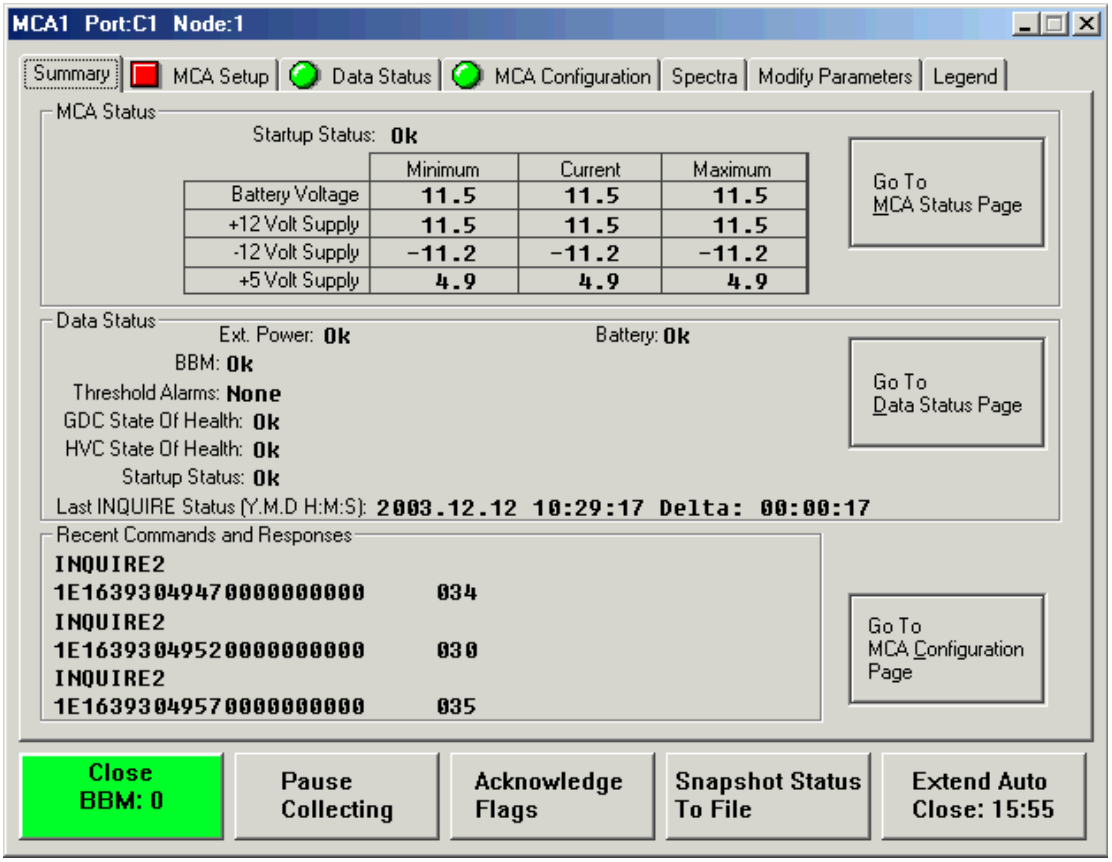


Figure 44 MCA Instrument Support Object Dialog Box

This dialog provides a "Summary", "MCA Status", "Data Status", "MCA Configuration", "Spectra", "Modify Parameters", and "Legend" tabs very similar to the GRAND and ISR instrument support object's dialog boxes. Each tab displays data items associated with various

classes of messages received from an instrument. On the Summary tab is a set of data items repeated from other tabs. These items are critical items which if out of tolerance safeguard information may be lost. Each item is associated with a tab page and will be displayed in white with red background if out of tolerance. If any of the items on a tab page are out of tolerance then the green round icon on the associated tab will change to a red rectangle. The user may to directly to that tab by clicking on it or by clicking on the button in the associated area. All flagged data items will stay red until canceled by clicking on the "Acknowledge Flags" button at the bottom of the dialog box. In the lower portion of the Summary tab is the "Recent Commands and Responses" area. This area scrolls up as commands are sent and responses are received—with the newest command or response displayed on the bottom. Clicking on one of the lines in this area will execute the MsgUtil.exe from the MicMgr.exe program's directory which in turn will display the components of the selected message.

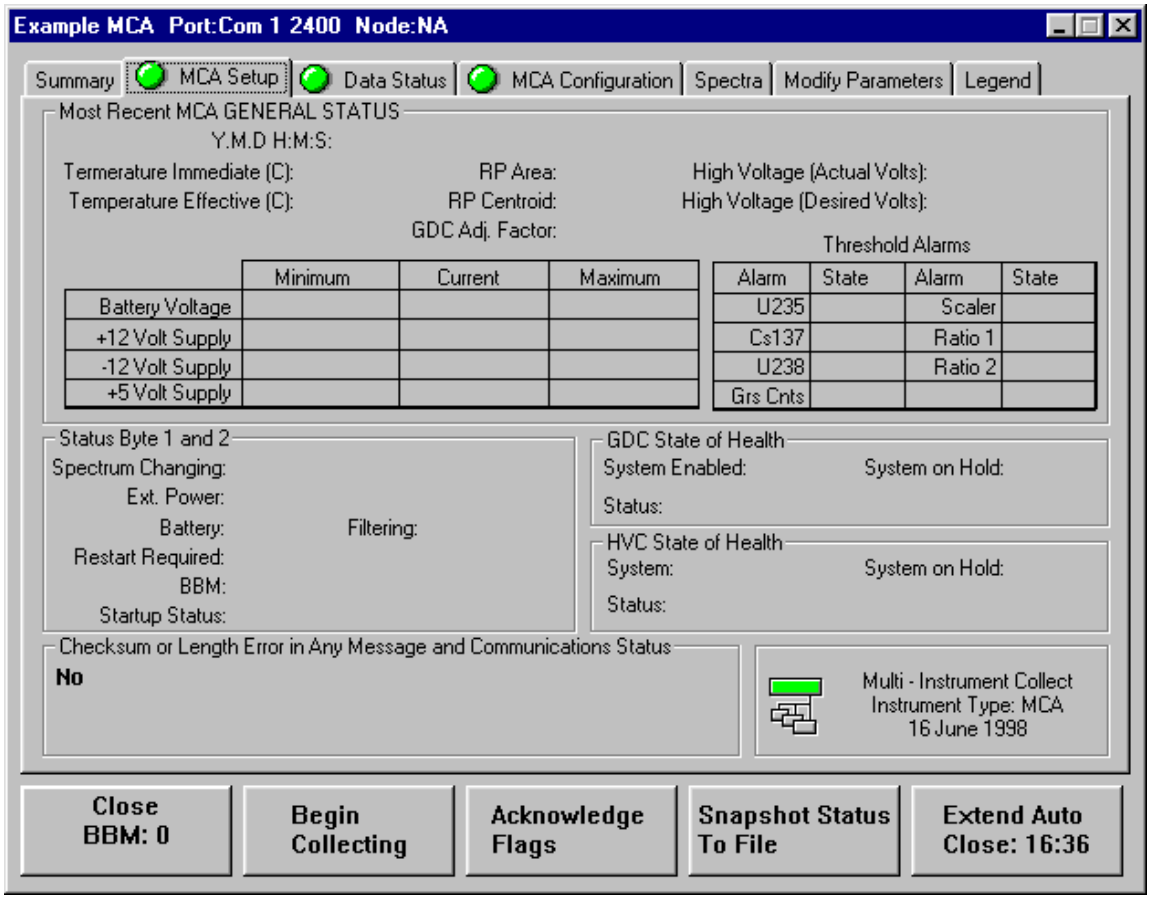


Figure 45 MCA Setup Tab.

To facilitate rapid evaluation of the information on this tab it is nearly identical with the GRAND and ISR summary tabs.

The second tab, "MCA Setup" provides information provided by the target MCA instrument's General Status Record. Also on this tab near the bottom is the "Checksum or Length Error in Any Message" area. In this area a time stamped copy of the most recent message with a checksum failure or message length error will be displayed. Items which have not yet been received will be blank.

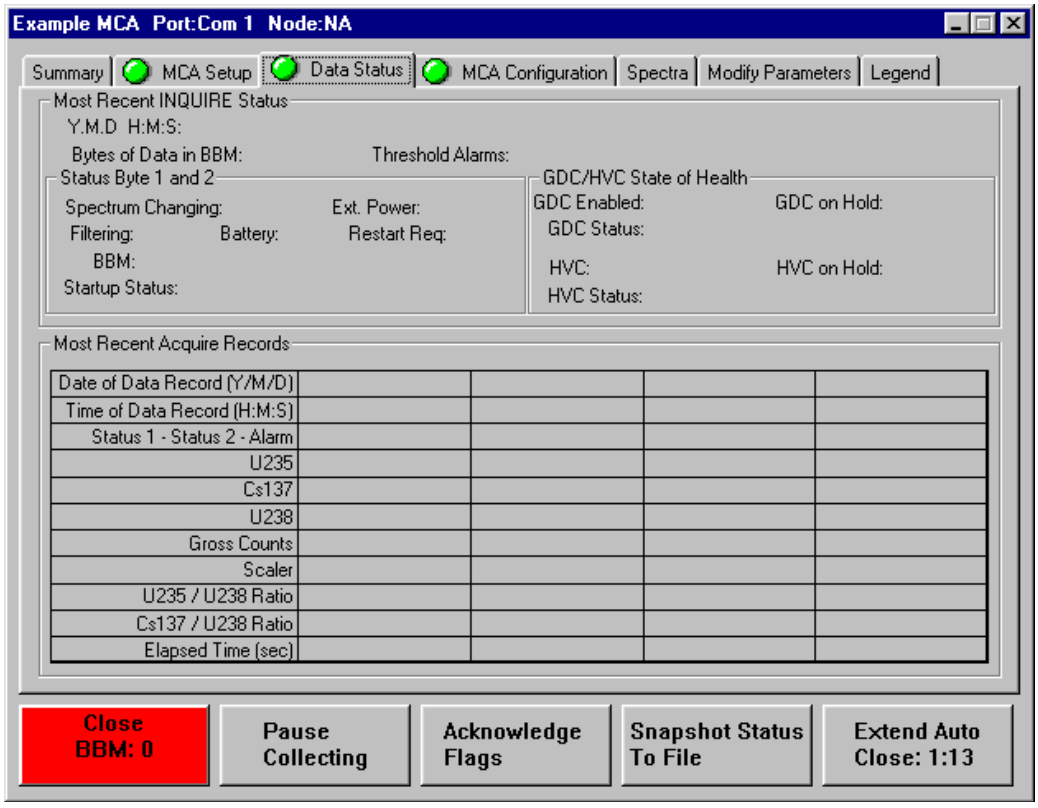


Figure 46 MCA Data Status Tab

The third tab, Data Status, contains information provided by the INQUIRE response and the four most recent ACQUIRE records. The difference between the time stamp of the most recent INQUIRE response and MIC computer's clock is presented as the "Delta" in the "Most Recent INQUIRE Status" area. If the communications object is receiving a lot of traffic and is backed up (NT will buffer the incoming data) this delta may be inaccurate.

Upon receipt of an ACQURE record each of the columns in the "Most Recent Acquire Records" area are shifted right to the next column and the new ACQUIRE record is placed in the left column. The date and time rows are converted from the Julian date of the record to the appropriate Gregorian date and time. For readability the status bytes and alarm byte are separated. All other fields are presented exactly as the were received in the ACQUIRE record.

The fourth tab "MCA Configuration" contains information from the latest of each of the five configuration records: types 10, 11, 12, 13, and 14. Each record is presented in the appropriate line in the upper half of the dialog. Upon selection of one of the configuration records, such as "Config 13" above, the information contained in the selected record will be divided into its data items and presented in the lower half of the screen. Receipt of a new record will cause a selected record to be unselected and the lower portion of the screen to erase its contents. This

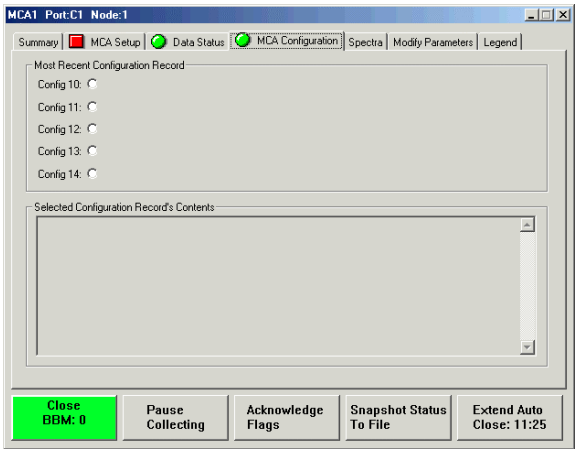


Figure 47 MCA Configuration Tab

tab page is becoming obsolete and will be replaced with a tab formatted similar to the Instrument Configuration tab of the MiniGRAND ISO.

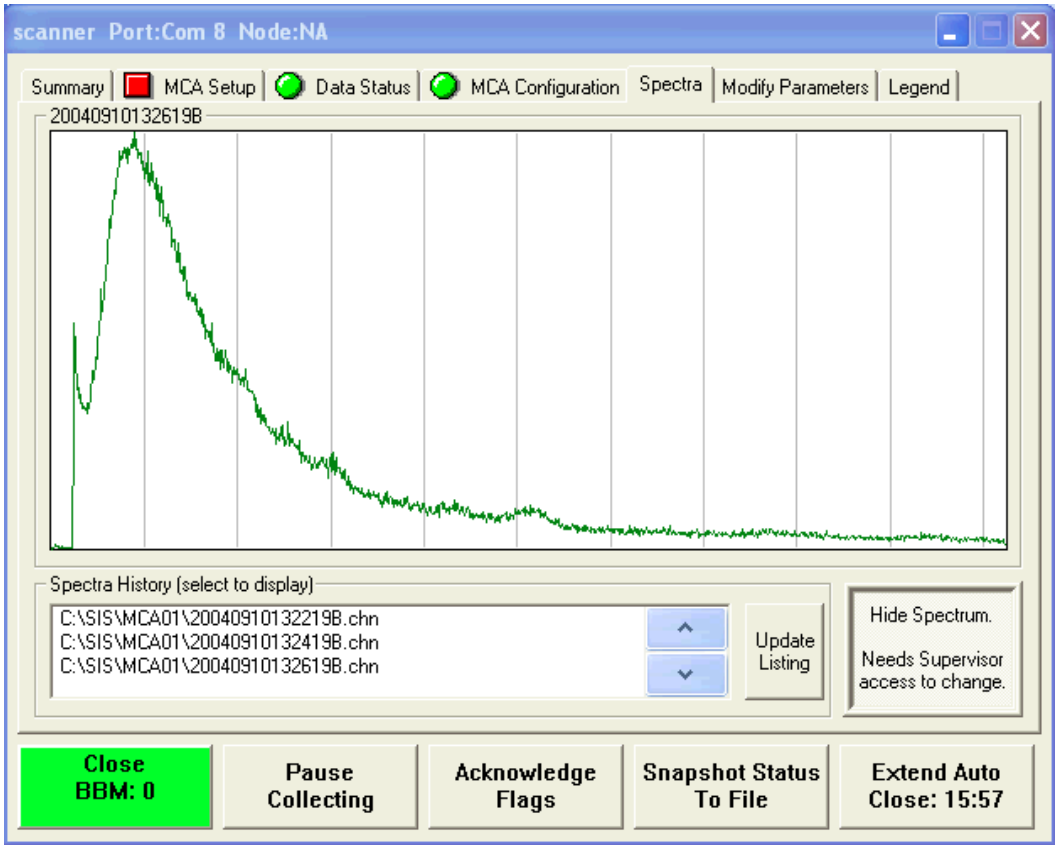


Figure 48 MCA Spectra Tab

The fifth tab, "Spectra" displays the most recently received spectra and provides a list of the most recent spectra. Using the mouse and left clicking on the spectra will cause the selected channel number to be displayed. The user may use the arrow keys to move left and right within the displayed spectra. Clicking on one of the spectra files listed in the "Spectra History" window will load it into the display window. Each time the MCA ISO receives a new spectra it is displayed and the Spectra History is updated. The user may click on "Update Listing" to force the MCA ISO to update what spectra files are available. There is a button near the lower right which turns on or off the ability to display spectra. A supervisor password must be used to change its state.

The sixth and seventh tabs, "Modify Parameters" and "Legend" are nearly identical to the GRAND's and ISR's similarly named tabs. The additional buttons provided on this page are discussed in the GRAND and ISR section. The "Modify Parameters" tab is also very similar to the first page of the MCA initial configuration dialog. To modify the setting in the second page of the initial configuration dialog box edit the MIC.INI file. The text displayed on the Legend page may be edited as described in the GRAND Instrument Support Object above.

10.3. Performance (PFM) File

Performance Files are text files containing date and time stamped performance information messages. One file is created each day using the configured file naming convention with a file extension of ".pfm".

All of the possible entries for MCA type instrument performance files are listed below. The format is the same for all entries: "YYYY.MM.DD hh.mm.dd X nnnnn msg<lf><cr>". Where "YYYY" is the four digit year, "MM" is the two digit month, "DD" is the two digit day of month, "hh" is the hour, "mm" is the minute, and "ss" is the second of date and time. The "X" indicates where the date and time originate; "C" designates the MIC computer and "M" designates the MCA instrument. "nnnnn" is a five digit identifier (ID) unique to that instrument and that specific message. (This ID is intended to support automated data analysis of the file.) The "msg" portion is the text message of the entry. All lines terminate with a line-feed character followed by a carriage return character.

The number in parenthesis at the end of some of the entries is the message type generated by the instrument that caused the performance file entry. The notation %s, %02x, and others in the message represent information received from the instrument. For example, %s is a text string, %02x is byte value represented as a hexadecimal number, and %f is a floating-point number.

If the maximum messages count for a specific message has been reached then the phrase "**(further occurrences not included)**" will be appended to the last message for that day. Only the messages indicated in the "Limited" column are restricted in this fashion. The message counts will all be returned to zero at the beginning of each day and anytime MIC is restarted.

In the table below, the CEV column indicates that the associated message will also be written to the CEV file (see following section).

Some of the entries below contain notes to the reader. These notes will NOT be included in the files.

Limited	CEV	ID	Message
	Yes	35250	"MCA Time %04d.%02d.%02d %02d:%02d:%02d Computer Time C - M = %.0f seconds"
	Yes	35260	"INVALID TIME %02d:%02d:%02d %04d.%02d.%02d %02d:%02d:%02d"
	Yes	35270	"MCA COLLECT Version %s started"
	Yes	35280	"MCA COLLECT Version %s started from abnormal shutdown"
	Yes	35290	"File %s deleted"
	Yes	35300	"Unknown TYPE %s"
	Yes	33560	"MCA Start new day"
Yes		33610	"MCA Timeout on receive DUMPLAST response"
Yes		33620	"MCA Timeout on receive DUMPLAST response (msg filter on)"
		33630	"Acquire Record from DUMPLAST written in MCA file (15)"
		33640	"Acquire Record Out Of Order (15)"
		33650	"Acquire Record from DUMPLAST in an EXCLUSION time (15)"
Yes		33680	"MCA Timeout on receive ANALYZE response"
Yes		33690	"MCA Timeout on receive ANALYZE response (msg filter on)"

Limited	CEV	ID	Message
Yes		33740	"MCA Timeout on INQUIRE2 command"
Yes		33750	"MCA Timeout on INQUIRE2 command (msg filter on)"
Yes		33760	"MCA Timeout on DUMPBBM command"
Yes		33770	"MCA Timeout on DUMPBBM command (msg filter on)"
		33780	"INSUFFICIENT NUMBER OF ACQUIRE RECORDS RECEIVED"
	Yes	33790	"HARD CHECKSUM ERROR"
		33810	"Acquire Record Out Of Order (15)"
		33820	"Acquire Record in an EXCLUSION time (15)"
Yes		33830	"MCA Timeout on DUMPOK command"
Yes		33840	"MCA Timeout on DUMPOK command (msg filter on)"
		33850	"Acquire Record Out Of Order (15)"
Yes		33860	"MCA Timeout on DUMPSTAT command"
Yes		33870	"MCA Timeout on DUMPSTAT command (msg filter on)"
Yes		33890	"MCA Timeout on receive ANALYZE response"
Yes		33900	"MCA Timeout on receive ANALYZE response (msg filter on)"
	Yes	33910	"Forcing Instrument to Computer Time"
		33950	"MCA Timeout on MCA initialization"
Yes	Yes	33960	"Local Break held off (start)"
Yes	Yes	33980	"Long Break sent (start)"
Yes	Yes	33970	"Local Break sent (start)"
Yes	Yes	33990	"Local Break held off (start) (msg filter on)"
Yes	Yes	34000	"Local Break sent (start) (msg filter on)"
Yes	Yes	34010	"Long Break sent (start) (msg filter on)"
Yes	Yes	34050	"Break sent (end)"
Yes	Yes	34060	"Break sent (end) (msg filter on)"
		34080	"MCA Sent BUSY (start wait)"
		34090	"MCA BUSY (end wait)"
	Yes	34100	"WRITE FAILURE on MCA file"
	Yes	34110	"Attempt restart from WRITE FAILURE on MCA file"
	Yes	34120	"MCA COLLECT take data stopped."
	Yes	34130	"MCA COLLECT take data started."
	Yes	34140	"MCA COLLECT stopped: Logon ID:%s MIC User ID:%s"
		34160	"%s" *NOTE: Any data received from the CSO and not from the instrument.*
	Yes	34190	"STATUS CHANGE - BATTERY OUT OF TOLERANCE (18)"
	Yes	34200	"STATUS CHANGE - BATTERY IN TOLERANCE (18)"
		34210	"%s" *NOTE: MCA record 18 inserted. See MCA documentation.*
		34220	"STATUS CHANGE - IN ALARM U235 (1b)"

Limited	CEV	ID	Message
		34230	"STATUS CHANGE - NOT IN ALARM U235 (1b)"
		34240	"STATUS CHANGE - IN ALARM U238 (1b)"
		34250	"STATUS CHANGE - NOT IN ALARM U238 (1b)"
		34260	"STATUS CHANGE - IN ALARM Cs137 (1b)"
		34270	"STATUS CHANGE - NOT IN ALARM Cs137 (1b)"
		34280	"STATUS CHANGE - IN ALARM Scaler (1b)"
		34290	"STATUS CHANGE - NOT IN ALARM Scaler (1b)"
		34300	"STATUS CHANGE - IN ALARM Gross Counts (1b)"
		34310	"STATUS CHANGE - NOT IN ALARM Gross Counts (1b)"
		34320	"STATUS CHANGE - IN ALARM Ratio 1 (1b)"
		34330	"STATUS CHANGE - NOT IN ALARM Ratio 1 (1b)"
		34340	"STATUS CHANGE - IN ALARM Ratio 2 (1b)"
		34350	"STATUS CHANGE - NOT IN ALARM Ratio 2 (1b)"
	Yes	34360	"STATUS CHANGE - BATTERY OUT OF TOLERANCE (1b)"
	Yes	34370	"STATUS CHANGE - BATTERY IN TOLERANCE (1b)"
	Yes	34380	"STATUS CHANGE - Plus 5 Volt Out Of Tolerance (1b)"
	Yes	34390	"STATUS CHANGE - Plus 5 Volt in Tolerance (1b)"
	Yes	34400	"STATUS CHANGE - Plus 15 Volt Out Of Tolerance (1b)"
	Yes	34410	"STATUS CHANGE - Plus 15 Volt In Tolerance (1b)"
	Yes	34420	"STATUS CHANGE - Minus 15 Volt Out Of Tolerance (1b)"
	Yes	34430	"STATUS CHANGE - Minus 15 Volt In Tolerance (1b)"
	Yes	34440	"%s" *NOTE: General stat record 1b inserted. See MCA documentation.*
	Yes	34450	"INVALID TIME Filter On"
	Yes	34460	"%s" *NOTE: id2 record if start of file. See MCA documentation.*
	Yes	34470	"STATUS CHANGE - Time Out of Tolerance (1e)"
	Yes	34480	"STATUS CHANGE - Time In Tolerance (1e)"
	Yes	34490	"STATUS CHANGE - Extenal POWER LOSS (1e)"
	Yes	34500	"STATUS CHANGE - External POWER OK (1e)"
	Yes	34510	"STATUS CHANGE - BATTERY LOW (1e)"
	Yes	34520	"STATUS CHANGE - BATTERY OK (1e)"
	Yes	34530	"STATUS CHANGE - FILTERING OFF (1e)"
	Yes	34540	"STATUS CHANGE - FILTERING ON (1e)"
	Yes	34550	"STATUS CHANGE - SPECTRUM CHANGING (1e)"
	Yes	34560	"STATUS CHANGE - SPECTRUM NOT CHANGING (1e)"
	Yes	34570	"STATUS CHANGE - RESTART REQUIRED (1e)"
	Yes	34580	"STATUS CHANGE - RESTART NOT REQUIRED (1e)"
	Yes	34590	"STATUS CHANGE - BBM Error: Bad Read"

Limited	CEV	ID	Message
	Yes	34591	"STATUS CHANGE - BBM Error: Bad Write"
	Yes	34592	"STATUS CHANGE - BBM Error: Empty"
	Yes	34593	"STATUS CHANGE - BBM Error: Full"
	Yes	34594	"STATUS CHANGE - BBM Error: Bad Buffer Size"
	Yes	34595	"STATUS CHANGE - BBM Error: Bad Opcode"
	Yes	34596	"STATUS CHANGE - BBM Error: Unknown"
	Yes	34600	"STATUS CHANGE - BBM No Error (1e)"
	Yes	34610	"STATUS CHANGE - MONITOR Error: Acq. Sys. Param. CS Failure (1e)"
	Yes	34620	"STATUS CHANGE - MONITOR Error: Mon. Param. CS Failure (1e)"
	Yes	34630	"STATUS CHANGE - MONITOR Error: HVC Sys. Setup Failure (1e)"
	Yes	34640	"STATUS CHANGE - MONITOR Error: GDC Sys. Setup Failure (1e)"
	Yes	34650	"STATUS CHANGE - MONITOR Error: Unknown error (1e)"
	Yes	34560	"STATUS CHANGE - MONITOR No Error (1e)"
	Yes	34570	"STATUS CHANGE - ALARM U235 Over Threshold (1e)"
	Yes	34580	"STATUS CHANGE - ALARM U235 Under Threshold (1e)"
	Yes	34590	"STATUS CHANGE - ALARM U238 Over Threshold (1e)"
	Yes	34600	"STATUS CHANGE - ALARM U238 Under Threshold (1e)"
	Yes	34610	"STATUS CHANGE - ALARM Cs137 Over Threshold (1e)"
	Yes	34620	"STATUS CHANGE - ALARM Cs137 Under Threshold (1e)"
	Yes	34630	"STATUS CHANGE - ALARM Scalar Over Threshold (1e)"
	Yes	34640	"STATUS CHANGE - ALARM Scalar Under Threshold (1e)"
	Yes	34650	"STATUS CHANGE - ALARM Gross Count Over Threshold (1e)"
	Yes	34660	"STATUS CHANGE - ALARM Gross Count Under Threshold (1e)"
	Yes	34670	"STATUS CHANGE - ALARM Ratio 1 Over Threshold (1e)"
	Yes	34680	"STATUS CHANGE - ALARM Ratio 1 Under Threshold (1e)"
	Yes	34690	"STATUS CHANGE - ALARM Ratio 2 Over Threshold (1e)"
	Yes	34700	"STATUS CHANGE - ALARM Ratio 2 Under Threshold (1e)"
	Yes	34710	"STATUS CHANGE - GDC System Enabled (1e)"
	Yes	34720	"STATUS CHANGE - GDC System Disabled (1e)"
	Yes	34730	"STATUS CHANGE - GDC System Enabled -- On Hold > 5 Minutes (1e)"
	Yes	34740	"STATUS CHANGE - GDC System On Hold (1e)"
	Yes	34750	"STATUS CHANGE - GDC System Not On Hold (1e)"
	Yes	34760	"STATUS CHANGE - GDC SOH Error: RP Area Too Small(1e)"
	Yes	34770	"STATUS CHANGE - GDC SOH Error: RP Area Crowded by U238(1e)"
	Yes	34780	"STATUS CHANGE - GDC SOH Error: RP Analysis Failure(1e)"
	Yes	34790	"STATUS CHANGE - GDC SOH Error: Peak Search Failure(1e)"
	Yes	34800	"STATUS CHANGE - GDC SOH Error: GDC Out of Range(1e)"
	Yes	34810	"STATUS CHANGE - GDC SOH Error: ROI Out of Limits(1e)"

Limited	CEV	ID	Message
	Yes	34820	"STATUS CHANGE - GDC SOH Error: RP Obscured by Higher Energies(1e)"
	Yes	34830	"STATUS CHANGE - GDC SOH Error: Unknown(1e)"
	Yes	34840	"STATUS CHANGE - GDC SOH No Error (1e)"
	Yes	34850	"STATUS CHANGE - HVC System Enabled, Auto (1e)"
	Yes	34860	"STATUS CHANGE - HVC System Enabled, Fixed (1e)"
	Yes	34870	"STATUS CHANGE - HVC System Enabled, Temp-Fixed (1e)"
	Yes	34880	"STATUS CHANGE - HVC System Enabled, Unknown (1e)"
	Yes	34890	"STATUS CHANGE - HVC System Disabled (1e)"
	Yes	34900	"STATUS CHANGE - HVC System Enabled -- On Hold > 5 Minutes (1e)"
	Yes	34910	"STATUS CHANGE - HVC System On Hold (1e)"
	Yes	34920	"STATUS CHANGE - HVC System Not On Hold (1e)"
	Yes	34930	"STATUS CHANGE - HVC SOH Error: T(eff) Out Of Range (1e)"
	Yes	34940	"STATUS CHANGE - HVC SOH Error: T(imm) is Drifting (1e)"
	Yes	34950	"STATUS CHANGE - HVC SOH Error: T(eff) is Drifting (1e)"
	Yes	34960	"STATUS CHANGE - HVC SOH Error: HV is Drifting (1e)"
	Yes	34970	"STATUS CHANGE - HVC SOH Error: HV target Not Reached (1e)"
	Yes	34980	"STATUS CHANGE - HVC SOH Error: T(imm) Out of Range (1e)"
	Yes	34990	"STATUS CHANGE - HVC SOH Error: HV Param Bad CS (1e)"
	Yes	35000	"STATUS CHANGE - HVC SOH Error: Unknown (1e)"
	Yes	35010	"STATUS CHANGE - HVC SOH No Error (1e)"
		35011	"%s" *NOTE: Status record inserted here. Produced on any change to status.*
		35020	"%s" *NOTE: All information records.*
	Yes	35040	"CONFIGURATION CHANGE - CONFIG 10 (10)"
	Yes	35041	"%s" *NOTE: All configuration 10 records.*
	Yes	35055	"CONFIGURATION CHANGE - CONFIG 11 (11)"
	Yes	35060	"%s" *NOTE: All config 11 records.*
	Yes	35080	"CONFIGURATION CHANGE - CONFIG 12 (12)"
	Yes	35090	"%s" *NOTE: All config 12 records.*
	Yes	35110	"CONFIGURATION CHANGE - CONFIG 13 (13)"
	Yes	35120	"%s" *NOTE: All config 13 records.*
	Yes	35140	"CONFIGURATION CHANGE - CONFIG 14 (14)"
	Yes	35150	"%s" *NOTE: All config 14 records.*
		35170	"CHECKSUM ERROR"
		35180	"%s" *NOTE: Any MCA response with a checksum error.*

Limited	CEV	ID	Message
		35190	"LENGTH ERROR"
		35200	"%s" *NOTE: Any MCA response with a length error.*
	Yes	35210	"Could not write to MCA file"
	Yes	35220	"Successful write to MCA file"
	Yes	35230	"Could not open MCA file"

10.4. Critical Events (CEV) File

Critical Events Files are text files containing date and time stamped performance information of a more critical nature or possible loss of data. One file is created each day using the configured file naming convention with a file extension of ".cev". All potential entries in a CEV file are indicated in the above table.

10.5. MCA File

MCA files are the binary data files generated using safeguards data from the MCA instruments. They are created by the MCA instrument support object. The file begins with one header record and continued with data records until the end of the day; at which time a new file is created. The format is:

Record 1: Header
- 4 ASCII bytes - size of header that follows this field (69)
- 5 ASCII bytes - not used
- 3 ASCII bytes – MIC version number
- 3 ASCII bytes - Station id
- 3 ASCII bytes - year
- 3 ASCII bytes - month
- 3 ASCII bytes - day
- 47 ASCII bytes - spare for expansion (first four bytes contain ASCII year)

Record 2-n: 39 byte data records for each data acquisition
- 4 byte unsigned long int – julian time seconds
- 1 byte unsigned BYTE – Status Byte 1
- 1 byte unsigned BYTE – Status Byte 2
- 1 byte unsigned BYTE – Alarm
- 4 byte single precision float – U235
- 4 byte single precision float – CS137
- 4 byte single precision float – U238
- 4 byte single precision float – Unknown
- 4 byte single precision float – Scaler
- 4 byte single precision float – U235 Ratio
- 4 byte single precision float – CS137 Ratio
- 4 byte int – Elapsed Time

10.6. Spectra File

Spectra files are the binary spectra files generated using safeguards data from the MCA instruments. They are created by the MCA instrument itself, transmitted to the MCA instrument support object, translated to one of three forms and subsequently written to disk. The three forms are comma delimited, text, and .CHN. The comma delimited form uses .CSV as the file type extension and is suitable for importing to Excel. The text form uses .TXT as the file type extension and is suitable for human consumption. The .CHN file is the ORTEC standard spectra file format as described in the *EG&G ORTEC Software File Structure Manual for DOS and Windows Systems*.. In all three cases the MCA provides 1024 spectra channels. The file name used to for the spectra file will be the same format as is used for the .CEV, .PFM, and .MCA files with two exceptions: first the hours, minutes, and seconds are not forced to zeros and second, the appropriate file extension is used.

11. DSPEC

MIC support of the ORTEC DSPEC-Plus digital spectrometer is through the DSPEC instrument support object. The objective of this support object is to copy spectra from the DSPEC-Plus buffer to the collect computer's hard drive. To this end it will display recently received information and will detect improper configuration of the instrument. If the instrument stops responding to the support object then a reset sequence will be initiated. It is important to keep in mind that the DSPEC-Plus has no battery backed up memory capability; consequently, MIC must be in constant communication with the DSPEC-Plus.

11.1. Configuration

To establish and configure a DSPEC instrument support object, select the "Configuration" menu option (left click on the icon in MIC's main dialog title bar) and click on the "Add Instrument" button. The new instrument support object must connect to an existing communications object of the type "ORTEC IPX Network". If it hasn't been created, do so using the "Add Comm" button prior to continuing. After clicking on the "Add Instrument" button, the user will be prompted for the type of instrument and the name of the instrument.

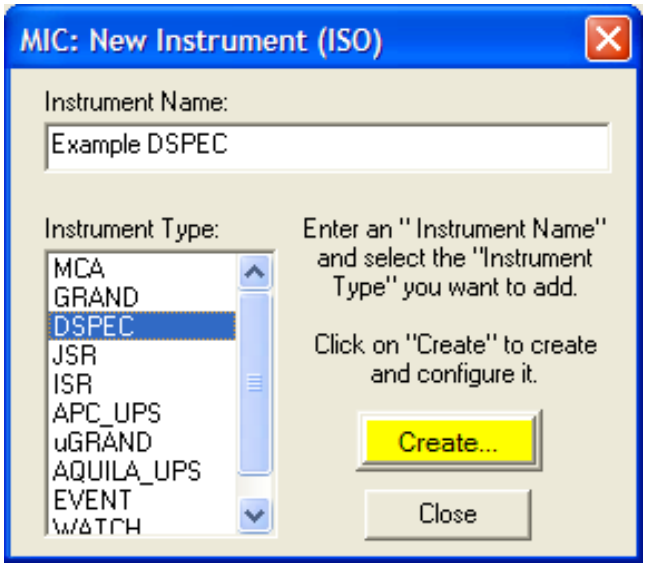


Figure 49 Add Instrument Dialog

To create a DSPEC instrument support object, click on the "DSPEC" entry in the "Instrument Type" window and enter a name in the "Instrument Name" window—the "Create" button will become active. Click on it to continue or select "Close" to exit without creating the support object. If "Create" was selected then the DSPEC configuration dialog box will be presented.

Each of the data items in the DSPEC configuration dialog needs to be set or at least verified. The "Extend Auto Close" button in the lower right corner indicates the time until this dialog box automatically aborts the creation process and closes. If more time is needed, click on it as needed to extend the time by 5 minutes to a maximum of 120 minutes. In the "Communications" area, set the "Port" to the desired communications. For the DSPEC, the communications setting will be an available IPX connection. Note that there is no "Node" attribute.

Set the data items in the "File Output" area to the appropriate settings. Set the location which the DSPEC instrument support object should write the files for this instrument. The "Station ID" must be unique among all instruments! Typically, "Do Dump File" and the "Quiet RealTime Data Text Displays" should be set to not selected.

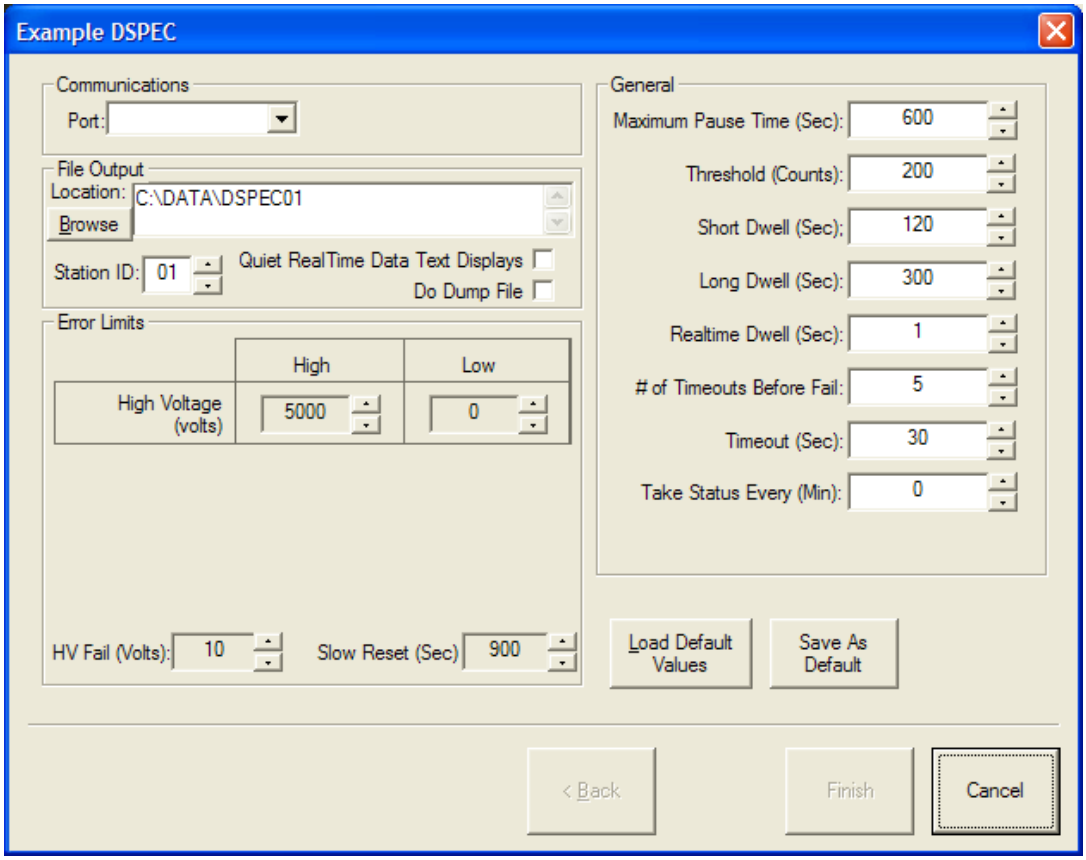


Figure 50 DSPEC Configuration Dialog.

Adjust all of the data items in the "Error Limits" area as needed.

In the "General" area, the "Maximum Pause Time" controls the maximum duration which the DSPEC instrument support object may be held in pause mode. When in pause mode, the associated instrument will still be accumulating data but MIC will not ask the instrument for status or data. When the pause time runs out, the instrument support object will automatically resume normal operations of asking for status and responding accordingly. The "Threshold (Counts)" data item is the number of counts that can occur in any channel of the spectrum that causes the data spectrum currently being collected to be classified as an event. When the counts in any channel exceed the threshold value, the count time is extended from the short dwell time to the long dwell time and the spectra file is saved to the MIC computer hard drive at the end of the long dwell time. If at the end of the short dwell count time none of the counts in any of the channels exceeds the threshold, the spectra is not saved and the DSPEC channels are cleared. The "Short Dwell (Sec)" data item is the short dwell time used to collect spectra to determine whether an item is in front of the detector. If the counts in any spectrum channel exceed the threshold when the short dwell time expires, then the collection time is extended to the "Long Dwell (Sec)" value. The spectra collected during the short dwell time continues to collect data until the elapsed time reaches the long dwell time. Upon completion of the long dwell time, the spectrum file is written to the MIC computer hard drive. MIC then starts the next

measurement by clearing the DSPEC channels and restarting with a short dwell time. The "Realtime Dwell (Sec)" data item is the rate at which the quick-look data displayed on the data status panel will be updated. The "# of Timeouts Before Fail" data item is the number of attempts that will be made to recover from an apparent failure (such as a communications failure, a high voltage failure, or a shutdown failure) when a failure is initially detected. The length of each of these timeout periods is set using the "Timeout (Sec)" data item. For example, if the number of timeouts is set to 6 and the timeout value is set to 10 seconds, then the support object will attempt to correct the problem with the DSPEC instrument every 10 seconds for 6 times (a total of 60 seconds) before a hard failure is declared. Thereafter, the instrument support object will attempt to recover from the failure at a periodic rate established by the value set into the "Slow Reset(Sec)" data item which is nominally 15 minutes (900 seconds). The "Take Status Every" value controls how often the support object queries the physical instrument for status. If this value is zero, MIC does not periodically query for status. The "HV Fail(Volts)" data item establishes the reported voltage level below which a catastrophic failure will be declared by MIC.

Pressing the "Load Default Values" button will restore the values in the Configuration dialog box to the values in the default section of the .ini file. The "Save As Default" button will write the current Configuration values to the default section of the .ini file. Use this "Save As Default" button judiciously; the system-established defaults will be overwritten for all DSPEC instruments, not just the one being setup currently.

After all values have been set or verified, click on the "Finish" button. Prior to actually creating the new DSPEC instrument support object, the user will be prompted for a valid user name—password pair. The creation of the DSPEC instrument support object will be accompanied by the addition of a colored button on the MIC main dialog. The initial state of the new instrument support object is paused; the colored button is gray.

With the exception of the port, the settings made for this initial configuration may be modified during normal operations using the Modify Parameters page.

11.2. Use

A colored button on the MIC main dialog will exist for each DSPEC instrument support object. One instrument support object should be created for each physical instrument being supported. The background color of the button on the MIC main dialog button indicates the current state of the instrument support object. Red signifies the instrument support object is not able to collect spectra from the associated instrument. Green is the normal quiescent state and yellow indicates a command has been sent to the instrument but an acceptable response has not yet been received back. When the instrument support object is in the pause state, the button will be gray.

CAUTION: Unlike other instruments which have a monitor mode supporting battery backup memory (BBM), the DSPEC does not. Consequently, the DSPEC may or may not be collecting safeguards data. MIC will not be talking to the instrument so it won't be able to switch between short or long dwell nor will MIC collect a spectra while paused.

The name of the instrument support object is presented at the top of the button. The center portion of the button contains text indicating the time to go (TTG) in the current dwell period. In the lower portion of the button, icons will be displayed to indicate various state of health information. Clicking on the button will cause a multi-page tabbed dialog box to be displayed. The Legend tab on this dialog box provides an explanation of the icons and the colors for the instrument's main dialog button.

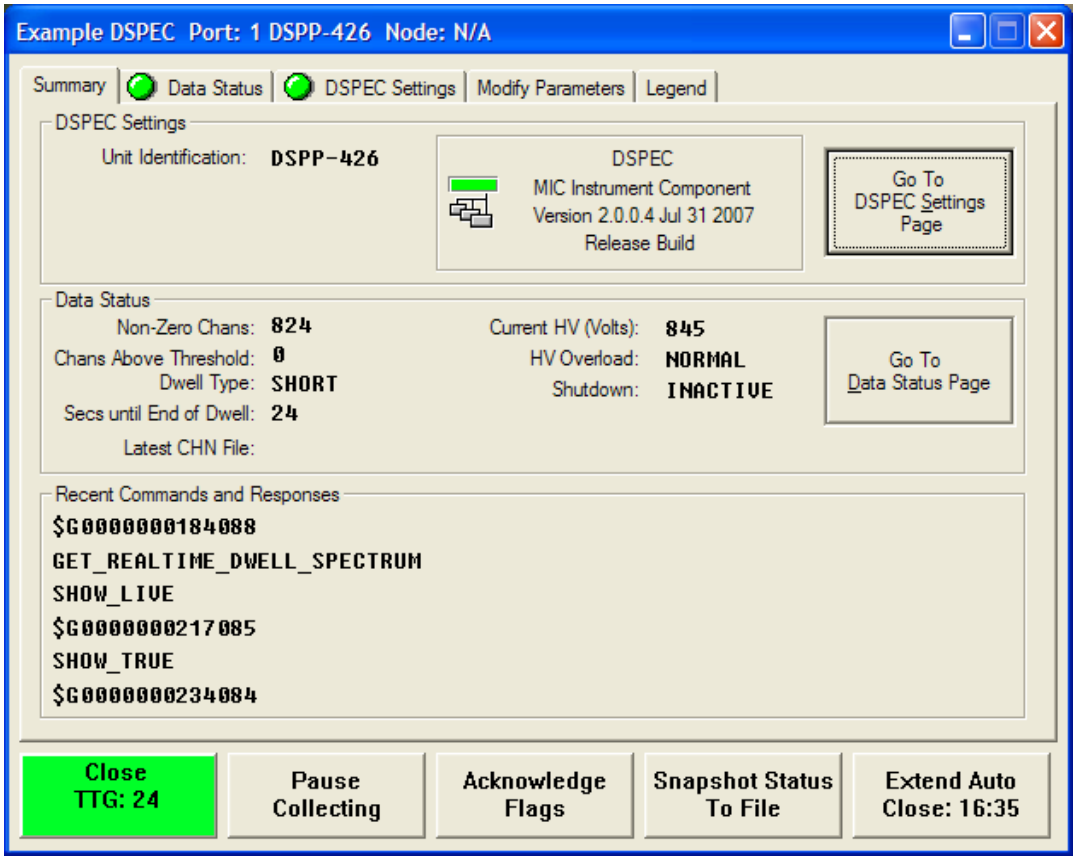


Figure 51 DSPEC Instrument Support Object Dialog Box

This dialog provides a "Summary", "Data Status", "DSPEC Settings", "Modify Parameters", and "Legend" tabs very similar to the GRAND instrument support object's dialog box. Each tab displays data items associated with various classes of messages received from the instrument.

The Summary tab has three panes: DSPEC Settings, Data Status, and Recent Commands and Responses. The DSPEC Settings pane displays the unit identification (serial number) of the specific DSPEC instrument that is controlled by this instrument support object. Pressing the button on the right side of the DSPEC Settings pane provides the user quick access to the DSPEC Settings page. On the Data Status pane is a set of data items repeated from the Data Status page. Some of these items are critical items which, if out of tolerance, may result in the loss of safeguards information. Each critical item will be displayed in white with red background if out of tolerance. The user may go directly to the Data Status page by clicking on the button on the right side of the Data Status pane. All flagged data items will stay red until canceled by clicking on the "Acknowledge Flags" button at the bottom of the dialog box. In the lower portion of the Summary tab is the "Recent Commands and Responses" pane. This area scrolls up as

commands are sent and responses are received—with the newest command or response displayed on the bottom.

The Data Status tab displays the spectrum currently being collected by the DSPEC. The "Real Time Raw Data" box displays a graphic of the actual spectrum counts. The "Dwell Type" field indicates whether the dwell time is a short or long dwell. The "Seconds Until End of Dwell" field is a count down on the number of seconds left in the dwell time. The "Non-Zero Channels" field indicates the number of channels that have counts greater than zero. The "Channels Above Threshold" field indicates the number of channels that have counts greater than or equal to the threshold value The threshold value is shown graphically as a horizontal cyan line on the Real

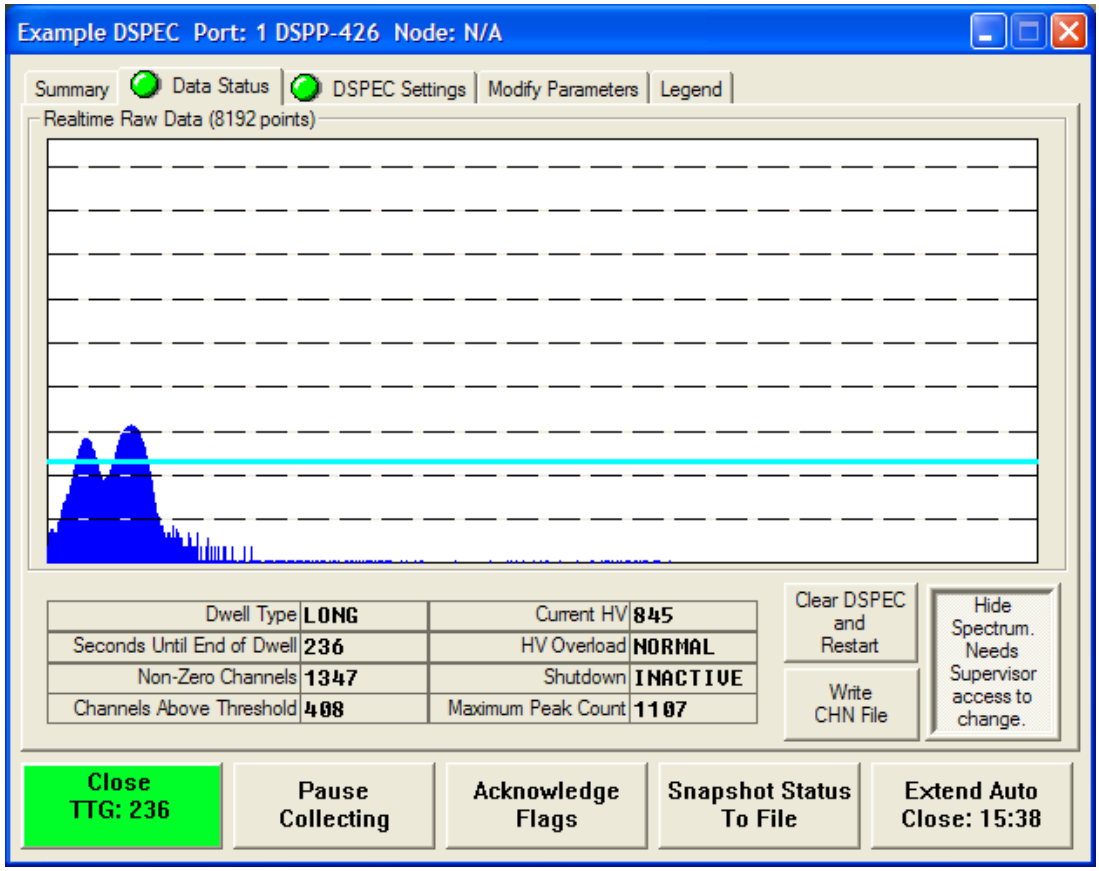


Figure 52 DSPEC Data Status Tab

Time Raw Data display box. MIC will continuously take measurements with a dwell time equal to the Short Dwell Duration until the number of counts in any channel of the gamma spectra is greater than or equal to the threshold value. When the short dwell time elapses and the threshold requirement is met, the Dwell Type is automatically changed to Long, the time is extended to the Long Dwell Duration value, and the gamma spectra file is stored to the MIC computer hard drive at the end of the long dwell time. The Current HV field indicates the latest reported value of the actual high voltage level. If the Current HV is below the HV Fail value, a catastrophic failure is declared because accurate safeguards data is not being collected unless the HV is at an appropriate level. The HV Overload field indicates the the latest reported HV Overload status. The Shutdown field indicates the latest reported status of the automatic HV shutdown. If the Shutdown status is active, a catastrophic failure is declared because the HV is shutdown and safeguards data is not valid.

Pressing "Clear DSPEC and Restart" button will manually clear the current spectrum from the DSPEC buffer and restart the measurement. Pressing the "Write CHN File" button causes the current spectrum from the DSPEC buffer to be written to the MIC computer hard drive with a tag of "M" for "manual" followed by a clearing the spectra data buffer. MIC normally writes the CHN file automatically at the end of a Long Dwell timeout with a tag of "N" for "normal"; the "Write CHN File" button provides the user with a manual capability to write the CHN file. Pressing the "Hide Spectrum. Needs Supervisor access to change" button toggles the display of the graphical indicator of the spectrum data.

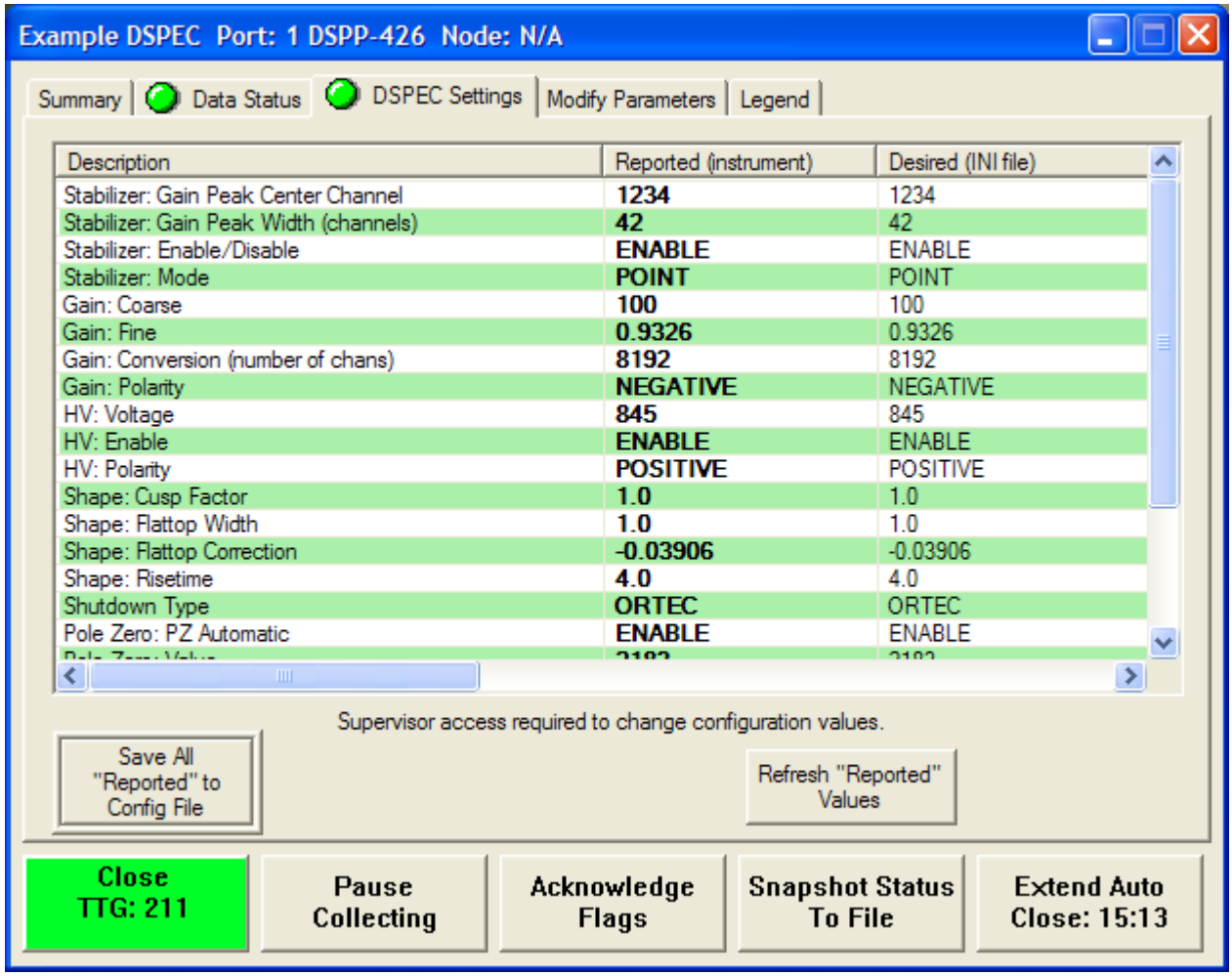


Figure 53 DSPEC Settings Tab

The DSPEC Settings tab displays status and settings information obtained from the DSPEC and provides a mechanism to capture those settings and save the values to the MIC.INI file. The ORTEC MAESTRO software should be installed on every data collection computer that supports DSPEC instruments. MAESTRO will be run concurrently with MIC during system installation. MAESTRO will be used to manually tune the DSPEC to those settings appropriate to the specific installation environment. The primary purpose of this Settings Tab is to capture the manually-established installation settings and save them in the MIC.INI file. In this way, should an unattended restart be required, MIC will be able to restore the predetermined settings into the DSPEC automatically, in accordance with UNARM philosophy.

Each parameter listed in the list control of the DSPEC Settings tab is an entry in the MIC.INI file. For an explanation of these settings with their allowed values, see the [DSPEC DEFAULT] subsection of Section 7.2 MIC.INI.

The DSPEC Settings tab displays the latest reported parameters with which the DSPEC-Plus is operating and compares them with the values last sent to the DSPEC by MIC (which are those listed in the MIC.INI file). The values in the "Reported" column are extracted from status messages received from the DSPEC-Plus. The values in the "Desired" column are those that are listed in the MIC.INI file. If the two values do not match, the "Reported" value is displayed in red. The "INI Name" lists the name of the parameter in the MIC.INI file. There is a fifth text-only column that lists the command that the DSPEC-Plus recognizes to reset the parameter. This column is useful when setting parameters via the command line prompt in an associated IPX Watch window.

Save All "Reported" to Config File button: To transfer all of the values in the "Reported" column to the MIC.INI file (and also to the "Desired" column), press the "'Save All 'Reported' to Config File" button. This function is designed to capture the settings established manually at system installation and to record them in the MIC.INI file for use when a subsequent system restart is required.

Refresh "Reported" Values button: When the "Refresh 'Reported' Values" button is pressed, the appropriate commands requesting the status of each parameter are sent to the DSPEC. The responses received are displayed in the "Reported" column immediately. The only times MIC automatically requests status of all of the parametric settings of interest from the DSPEC are when the DSPEC Settings tab is brought up and periodically when "Take Status" is enabled (see the Modify Parameters tab discussion). The values shown in the "Reported" column, therefore, are subject to being stale and can be "refreshed" using this button.

The "Modify Parameters" tab is nearly identical to the initial configuration dialog. At this point the user no longer has the option to change the "Communications" area information. The DSPEC default values for all data items may be reloaded by clicking on the "Load Default Values" or the user may click on the "Reset to Last Applied" forcing all data items to return to the currently

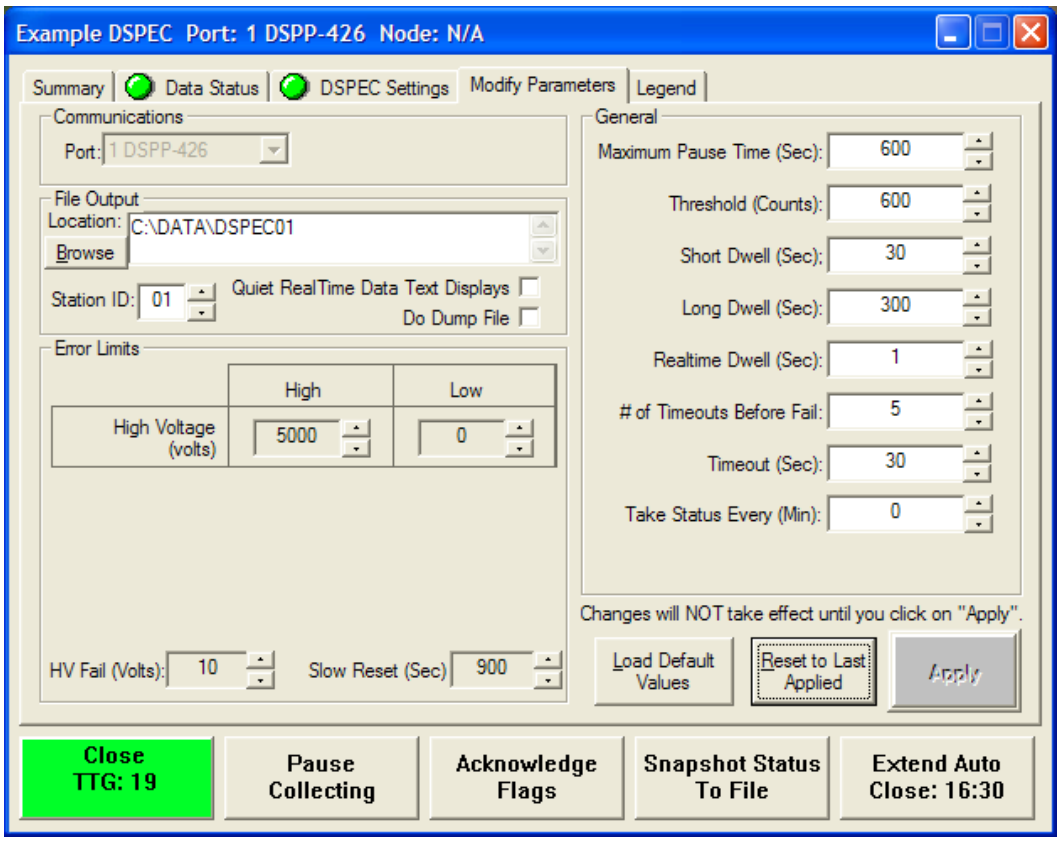


Figure 54 DSPEC Modify Parameters Tab

applied values (*i.e.*, the values in the MIC.INI file specific to this instrument). After adjusting any of the data items they must be applied by clicking on the "Apply" button. The border around the apply button indicates applying the changes is a password protected function.

11.3. Performance (PFM) File

Performance Files are text files containing date and time stamped performance information messages. One file is created each day using the configured file naming convention with a file extension of ".pfm".

All of the possible entries for DSPEC type instrument performance files are listed below. The format is the same for all entries: "YYYY.MM.DD hh.mm.dd X nnnnn msg<cr><lf>". Where "YYYY" is the four digit year, "MM" is the two digit month, "DD" is the two digit day of month, "hh" is the hour, "mm" is the minute, and "ss" is the second of date and time. The "X" indicates where the date and time originate; "C" designates the MIC computer and "G" designates the DSPEC instrument. "nnnnn" is a five digit identifier (ID) unique to that instrument and that specific message. (This ID is intended to support automated data analysis of the file.) The "msg" portion is the text message of the entry. All lines terminate with a carriage return character followed by a line-feed character.

In the table below, the CEV column indicates that the associated message will also be written to the CEV file (see following section).

Some of the entries below contain notes to the reader. These notes will NOT be included in the message written to the file.

CEV	ID	Message
Yes	61000	"Write CHN file: filename"
Yes	61100	"Write CHN file FAILED: filename"
	62000	"DSPEC Change State: INITIALIZING_1000"
	62010	"DSPEC Change State: WAITING_WITHIN_SHORT_DWELL_INTERVAL_2000" *NOTE: Deprecated—removed as of version 2.0.0.4*
	62020	"DSPEC Change State: EXPECTING_SHORT_DWELL_SPECTRUM_DATA_2010" *NOTE: Deprecated—removed as of version 2.0.0.4*
	62030	"DSPEC Change State: WAITING_WITHIN_LONG_DWELL_INTERVAL_3000"
	62040	"DSPEC Change State: EXPECTING_LONG_DWELL_SPECTRUM_DATA_3010"
	62050	"DSPEC Change State: EXPECTING_MANUAL_WRITE_SPECTRUM_DATA_4000"
	62060	"DSPEC Change State: SHORT_TERM_HARD_FAIL_9000"
	62070	"DSPEC Change State: LONG_TERM_HARD_FAIL_9500"
	62080	"DSPEC Change State: LOCKED_UP_9900"
Yes	62640	"STATUS CHANGE - HIGH VOLTAGE OUT OF DRIFT TOLERANCE"
Yes	62650	"STATUS CHANGE - HIGH VOLTAGE WITHIN DRIFT TOLERANCE"
Yes	62660	"STATUS CHANGE - FAILURE: HIGH VOLTAGE LEVEL TOO LOW"
Yes	62670	"STATUS CHANGE - RECOVERY: HIGH VOLTAGE LEVEL OK"
Yes	62680	"STATUS CHANGE - FAILURE: HV SHUTDOWN ACTIVE"
Yes	62690	"STATUS CHANGE - RECOVERY: HV SHUTDOWN INACTIVE"
Yes	63330	"DSPEC State Machine Failure"
Yes	63340	"DSPEC Sending INITIALIZE command"
Yes	63350	"DSPEC Attempting 60-sec reset"
Yes	63360	"DSPEC Recovered"
Yes	63370	"DSPEC Communications Failure"
Yes	63380	"DSPEC IPX MCB Error: command = xxxx"
Yes	65400	SEUP FAILURE - SET_GAIN_ADJUSTMENT
Yes	65410	"DSPEC SETUP FAILURE - SET_BLRE_AUTOMATIC_ENABLE"
Yes	65415	"DSPEC SETUP FAILURE - SET_CORRECTION_FLAT"
Yes	65420	"DSPEC SETUP FAILURE - SET_GAIN_CHANNEL"
Yes	65425	"DSPEC SETUP FAILURE - SET_GAIN_COARSE"
Yes	65430	"DSPEC SETUP FAILURE - SET_GAIN_CONVERSION"
Yes	65435	"DSPEC SETUP FAILURE - SET_GAIN_FINE"
Yes	65440	"DSPEC SETUP FAILURE - SET_GAIN_POLARITY"
Yes	65445	"DSPEC SETUP FAILURE - SET_GAIN_STABILIZATION_ENABLE"
Yes	65450	"DSPEC SETUP FAILURE - SET_GAIN_WIDTH"

CEV	ID	Message
Yes	65455	”DSPEC SETUP FAILURE - SET_GATE”
Yes	65460	”DSPEC SETUP FAILURE - SET_HV”
Yes	65465	”DSPEC SETUP FAILURE - SET_HV_ENABLE”
Yes	65470	”DSPEC SETUP FAILURE - SET_HV_POLARITY”
Yes	65475	“DSPEC SETUP FAILURE - SET_LLD“
Yes	65480	“DSPEC SETUP FAILURE - SET_MODE_STABILIZATION“
Yes	65485	“DSPEC SETUP FAILURE - SET_PZ“
Yes	65490	“DSPEC SETUP FAILURE - SET_PZ_AUTOMATIC_ENABLE“
Yes	65495	“DSPEC SETUP FAILURE - SET_SHAP_CUSP“
Yes	65500	“DSPEC SETUP FAILURE - SET_SHAP_FLAT“
Yes	65505	“DSPEC SETUP FAILURE - SET_SHAP_RISE“
Yes	65510	“DSPEC SETUP FAILURE - SET_SHUTDOWN”
Yes	65515	“DSPEC SETUP FAILURE - SET_ULD”
Yes	65520	“DSPEC SETUP FAILURE - SET_ZDT_ENABLE”
Yes	67270	“DSPEC Start new day”
Yes	68060	“DSPEC Periodic Status Request”
Yes	68070	“DSPEC COLLECT take data stopped.”
Yes	68080	“DSPEC COLLECT take data started.”
Yes	68090	“DSPEC COLLECT stopped: Logon ID:xxxx MIC User ID:xxxx”

11.4. Critical Events (CEV) File

Critical Events Files are text files containing date and time stamped performance information of a more critical nature or possible loss of data. One file is created each day using the configured file naming convention with a file extension of ".cev". All potential entries in a CEV file are indicated in the above table.

11.5. CHN File

The gamma spectra collected with MIC are stored in CHN files. The format of the CHN files is described in the *EG&G ORTEC Software File Structure Manual for DOS and Windows Systems*.

12. JSR-12

MIC support of the JSR-12 type instrument is through the JSR instrument support object. The objective of this support object is to control one JSR-12 instrument and continuously collect data and save that data on the computer's hard drive. To this end it will display recently received information and will detect improper configuration of the instrument. If the instrument stops responding to the support object then a reset sequence will be initiated. Battery Backed Up Memory or BBM is NOT employed here, consequently, any loss of communications between MIC and the instrument may cause loss of data.

12.1. Configuration

To establish and configure a JSR-12 instrument support object select the "Configuration" menu option (left click on the icon in MIC's main dialog title bar) and click on the "Add Instrument" button. Because the new instrument support object will need to connect to an existing communications object—if it hasn't been created, do so using the "Add Comm" button prior to continuing. After clicking on the "Add Instrument" button the user will be prompted for the type and the name of the new instrument support object.

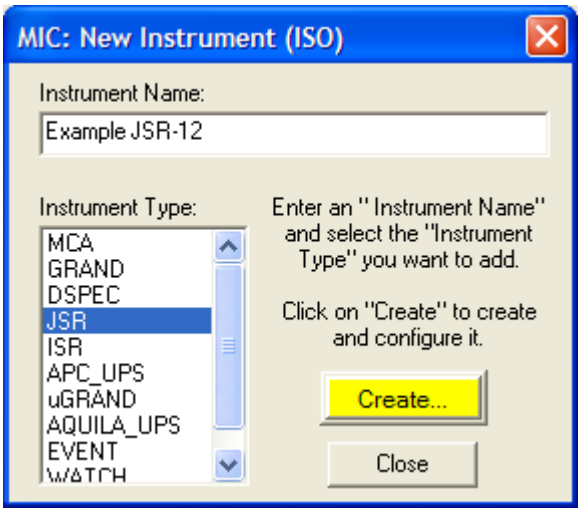


Figure 55 Add Instrument Dialog

To create a JSR-12 instrument support object click on the "JSR" entry in the "Instrument Type" window and enter a name in the "Instrument Name" window—the "Create" button will become active. Click on it to continue or select "Close" to exit without creating the support object. If "Create" is selected then the JSR Configuration dialog box will be presented.

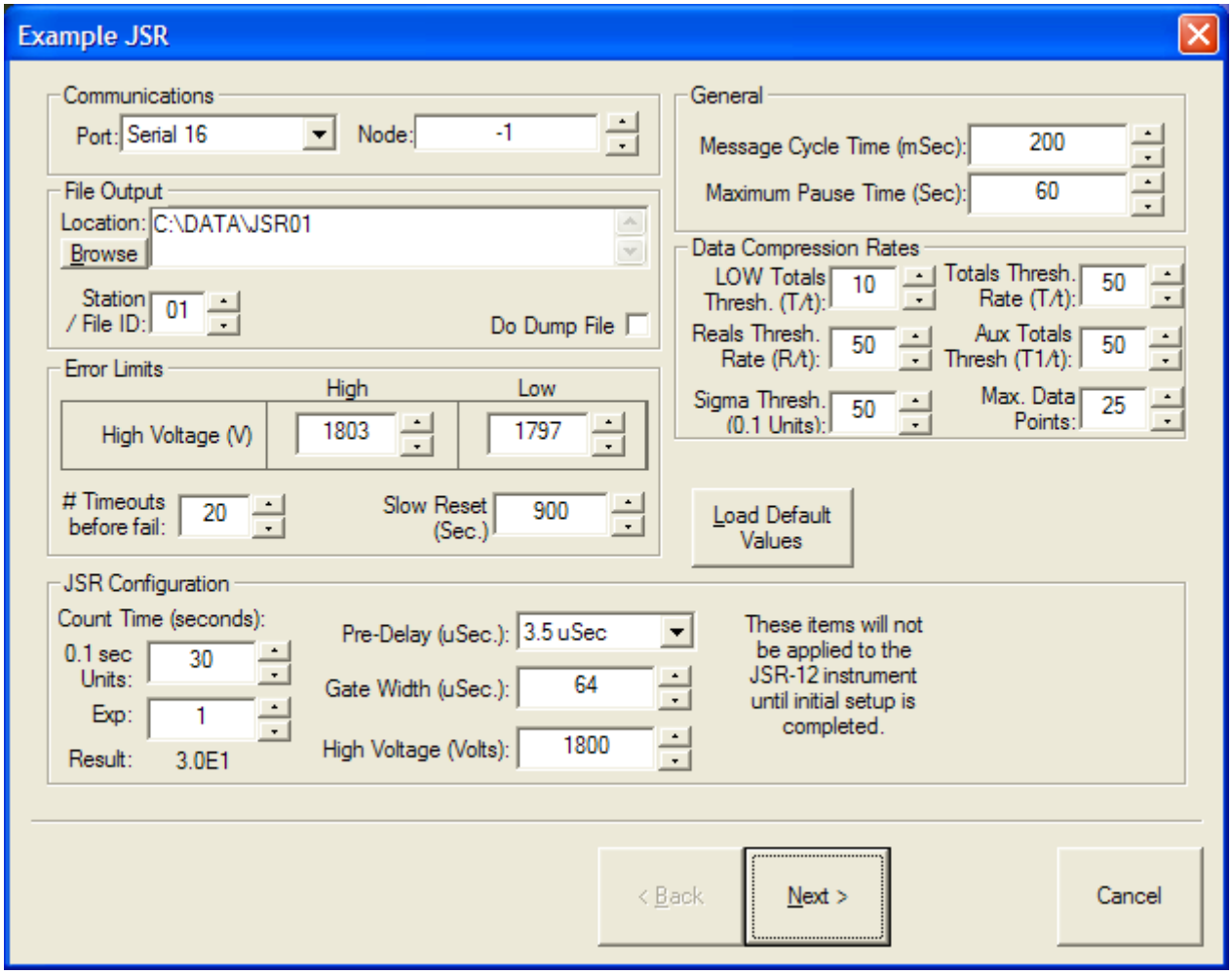


Figure 56 JSR-12 Configuration Dialog, Pane 1.

There are two panes to the JSR-12 Configuration Dialog. The data in each of the data items in both panes need to be set or at least verified. Use the "< Back" and "Next >" buttons to switch between the two panes. The "Extend Auto Close" button in the lower right corner indicates the time until this dialog box automatically aborts the creation process and closes. If more time is needed, click on it as needed to extend the time by 5 minutes with each click to a maximum of 120 minutes. In the "Communications" area set the "Port" to the desired communications support object and the "Node" to the appropriate node for the selected communications support object. When simple serial communications support objects are used the "Node" attribute is inconsequential.

Set the data items in the "File Output" area to appropriate settings. Set the location which the JSR-12 instrument support object should write the files for this instrument. The "Station ID" must be unique among all instruments! Typically, "Do Dump File" should be set to not selected.

Adjust all of the data items in the "Error Limits" area as needed. The voltage high and low settings are used by MIC to flag an out-of-tolerance condition for the associated instrument. The "Slow Reset" is the number of seconds between attempted restarts if the JSR-12 instrument is not responding to commands from MIC.

For data collection with the JSR-12, data compression is performed in the same manner as it was done in the original Shift Register(SR) Collect software. Only background data is

compressed. The data for consecutive background records are accumulated as if there were one long background record rather than several records. The start time is the start time of the first record in the set of consecutive background records, and the duration is the sum of the records' durations. The totals counts, reals plus accidentals counts, and accidentals counts are likewise the sums of the records' counts. A maximum of "Max. Data Points" are combined together into a single record. Once the maximum is reached, the data are written to the MIC data file.

The items in the "Data Compression" area are used to control the accumulation of records in the binary .jsr file and to set trigger levels for the camera output. The four threshold values are each compared to the data being received from the instrument. Reals Threshold Rate, Low Totals Threshold Rate, Totals Threshold Rate, and Aux Totals Threshold Rate are compared to the associated raw data divided by time. If the comparison shows the received values are greater (lower or equal to in the case of Low Totals Threshold Rate) than or equal to the threshold values then the new values will be written as a new record in the binary file (*i.e.*, data compression has stopped). Also, a camera trigger will be generated if the triggering threshold has been selected to trigger a camera (see the following dialog box).

The Sigma Threshold is computed differently than the other thresholds. It is:

TRate = totals rate
TRateSigma = SQRT(totals)/time
SumTRate = accumulated totals rate
SumTRateSigma = SQRT(accumulated totals)/time
Sigmas = ABS(TRate – SumTRate) / SQRT(TRateSigma * TrateSigma +
SumTRateSigma * SumTRateSigma)

If Sigmas is greater than or equal to Sigma Threshold then sigma test is true and data compression stops.

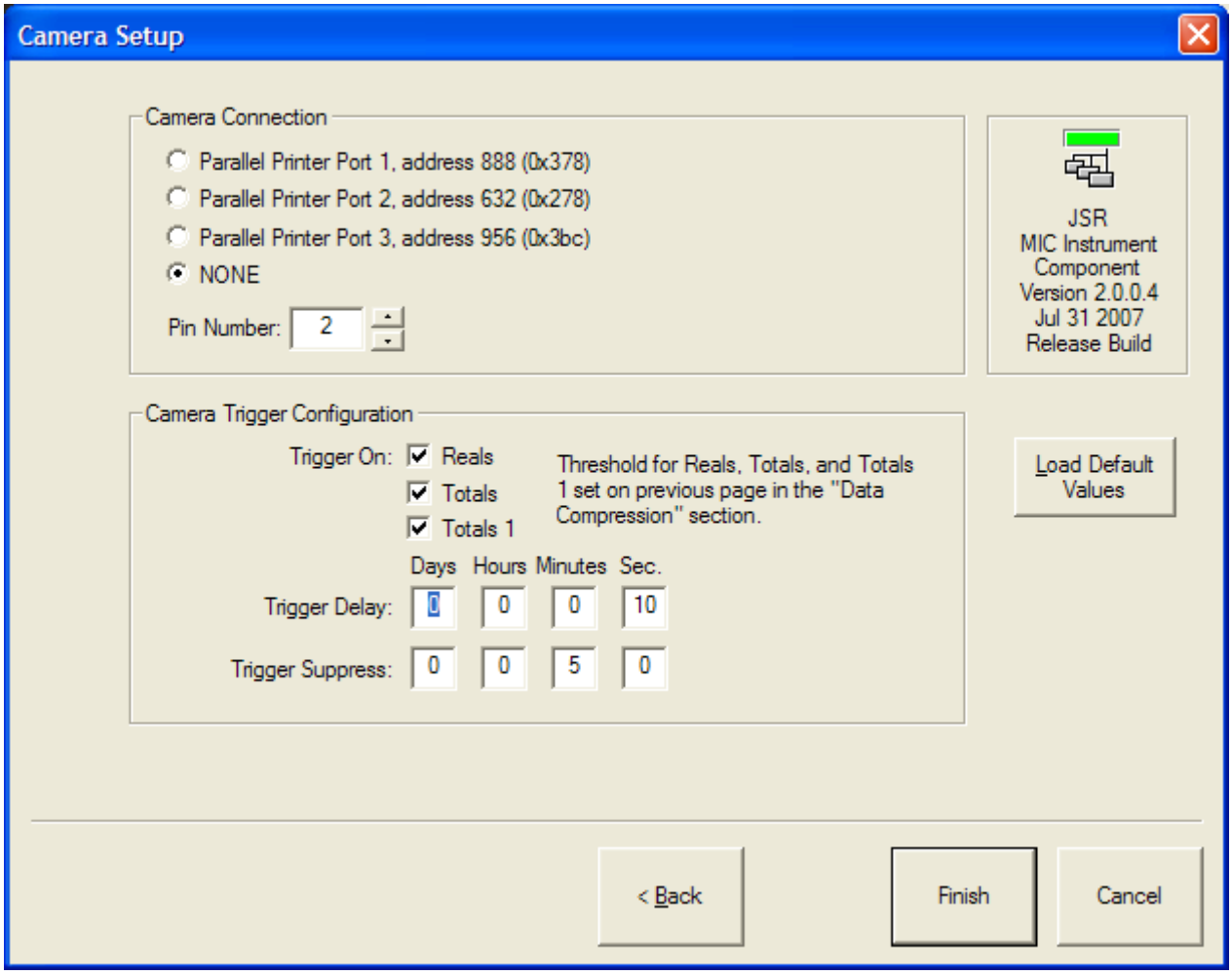


Figure 57 JSR-12 Configuration Dialog, Pane 2.

On the second JSR-12 Configuration Pane set the Camera Connection to the appropriate printer port and set the pin number on that port to its correct value. In the Camera Trigger Configuration area select whether the camera should trigger on Totals, Reals, and/or Totals 1. The three trigger threshold rates at which the trigger occurs are set in pane 1 and may be changed while MIC is running. Each of the trigger threshold rates will be compared to the associated values received from the JSR-12 to decide if a camera trigger should be sent out the parallel port. Setting the "Days", "Hours", "Minutes", and "Sec." of the "Trigger Delay" controls the time between when a trigger condition is noted and when the trigger pulse is started. The pulse will be approximately 600 milliseconds in length. By setting values in the "Trigger Suppress" "Days", "Hours", "Minutes", and "Sec." fields the minimum period from the detection of one camera trigger until the start of the delay for another camera trigger may be set. If a second camera trigger occurs within the "Trigger Suppress" time from the first trigger then the second trigger will be suppressed. If no delay or suppression is required then set all four values to zero.

12.2. Use

A colored button on the MIC main dialog box will exist for the JSR-12 instrument support object. The pseudo-instrument Watcher windows may be created to examine the data stream between the JSR-12 instrument and MIC. The background color of the button on the MIC main dialog

button indicates the current state of the instrument support object. Red signifies the instrument support object is having a problem communicating with the associated instrument. Green is the normal quiescent state and yellow indicates a command has been sent to the instrument but an acceptable response has not yet been received back. When the instrument support object is in the pause state the button will be gray.

CAUTION: Unlike other instruments which have a monitor mode supporting Battery Backup Memory (BBM) the JSR-12 does not. Consequently, when the MIC JSR-12 support object is paused safeguards data will not be collected.

The title of the instrument support object is presented at the top of the button. In the lower portion of the button icons will be displayed to indicate various state of health information. Clicking on the button will cause a multi-page tabbed dialog box to be displayed. One of the tabs on this dialog provides a legend to the icons and the colors for the instrument's main dialog button.

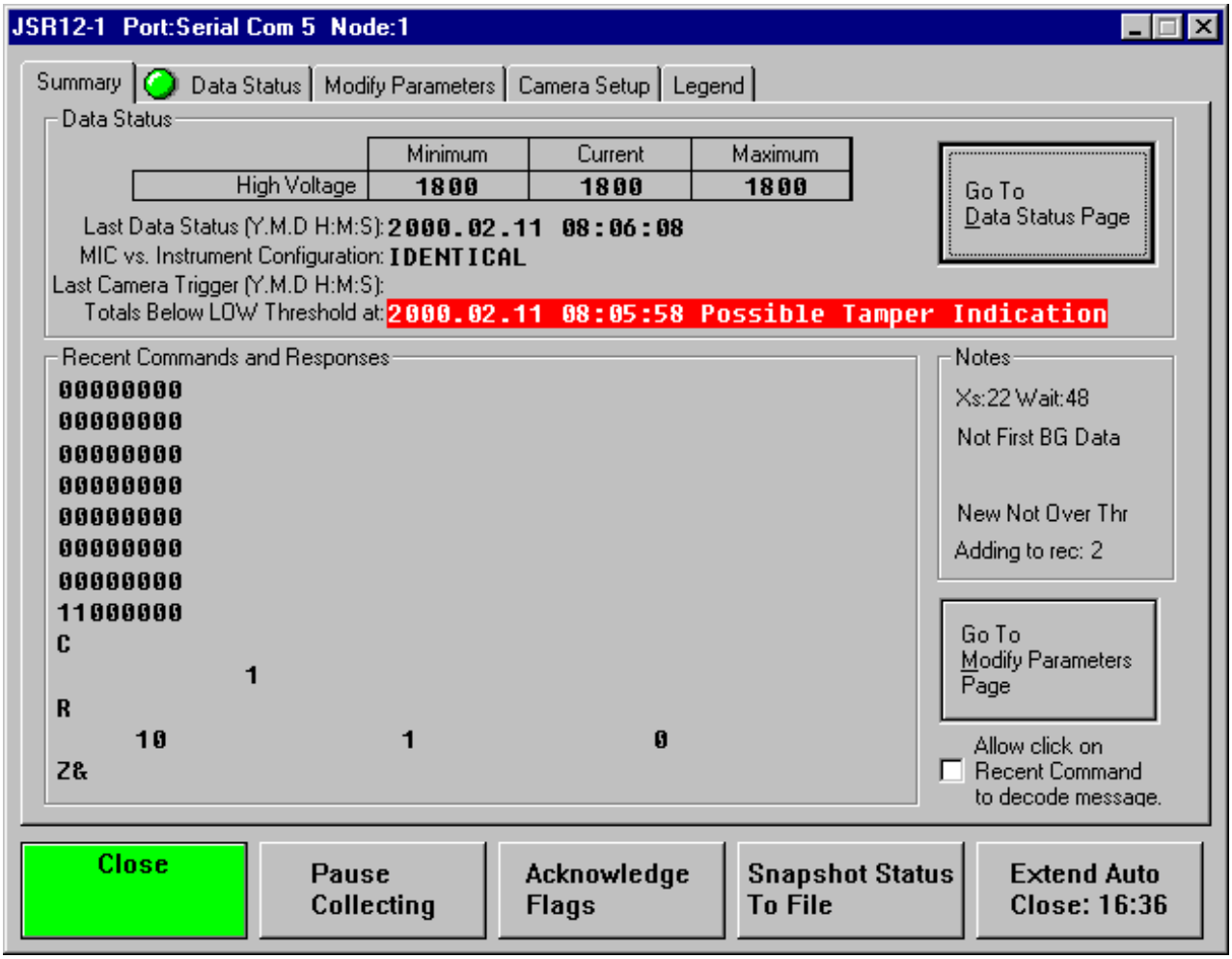


Figure 58 JSR-12 Instrument Support Object Dialog Box

This dialog provides a "Summary", "Data Status", "Modify Parameters", "Camera Setup" and "Legend" tabs very similar to the GRAND, MCA, and ISR instrument support objects' dialog boxes. On the Summary tab is a set of data items repeated from other tabs. These items are critical items which if out of tolerance safeguard information may be lost. These items will normally be displayed in black text. If out of tolerance then the background for the text will be changed to red and the text will be presented in white. If an item goes back into tolerance then

the text will be updated to show the correct value but the red and white color will remain until the user clicks on the "Acknowledge Flags" button. If MIC detects that the instrument is not configured the same as the JSR-12 instrument support object then the green marble on the Data Status tab will change to a red rectangle. In this case user should click on the Data Status tab. The errant data on the Data Status tab will also be displayed with a red background and white lettering.

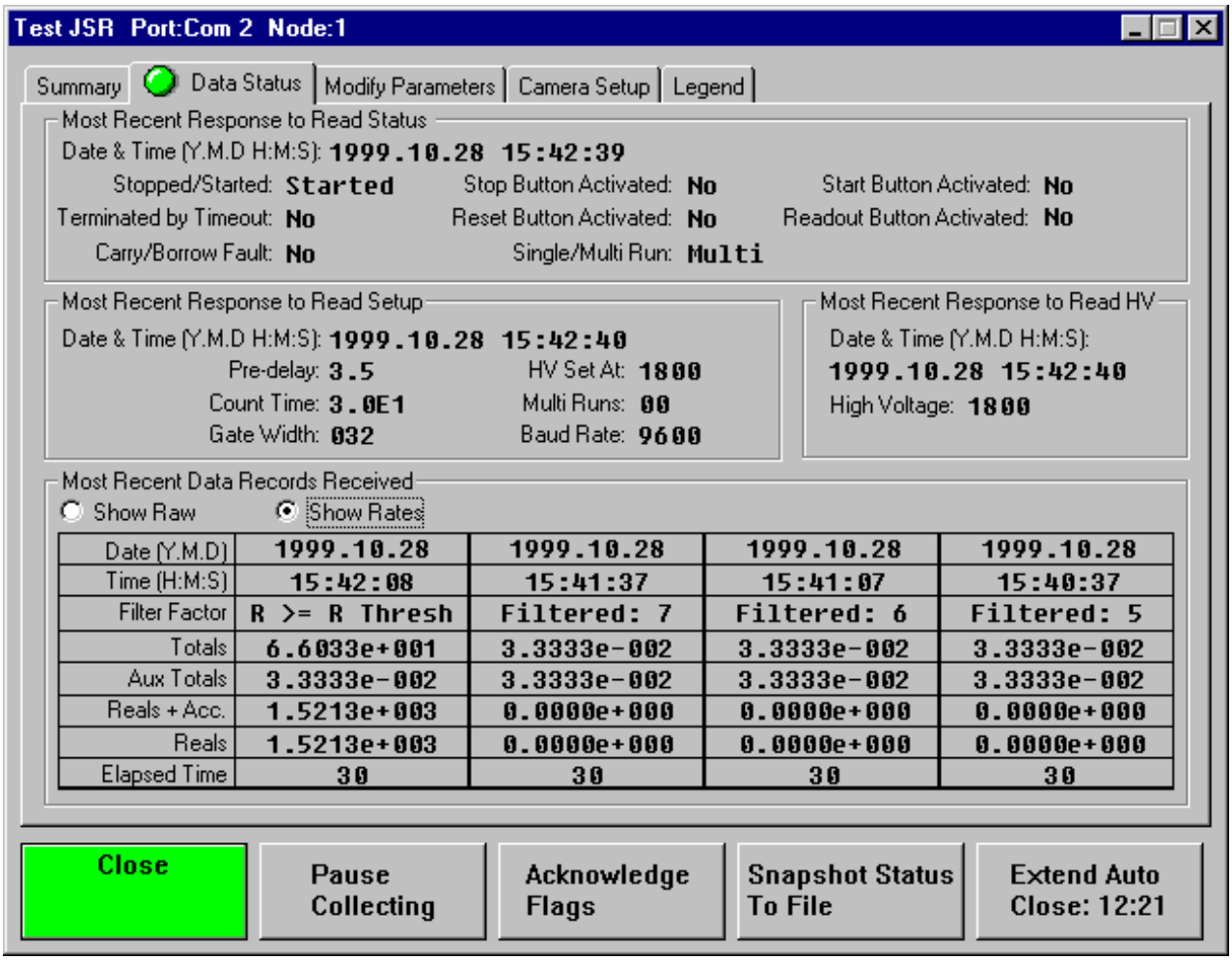


Figure 59 JSR-12 Data Status Tab

The Data Status tab presents the most recent information received from the JSR-12. The date and the time that the response was received as well as all the information is displayed. The "Most Recent Data Records Received" section contains information from the last four data records. The newest is on the left and the oldest of the four is on the right. The data items may be displayed as the raw data, as received, or as rates (in which case each of the values will be divided by the elapsed time). If MIC has detected a difference between the instrument's configuration and the JSR-12 instrument support object then the errant datum will be displayed with a red background and white lettering in the Most Recent Response to Read Setup area. The JSR-12 instrument support object as well as the JSR-12 instrument's configuration may be changed via the Modify Parameters tab.

The "Filter Factor" in the Most Recent Data Records Received area depicts how the JSR-12 instrument support object will treat the record. "Filtered: n" means the record was added to a

previous record in the binary file. "Max Compr Met" means that the maximum number of records which may be added together has been reached and a new record was written. "New Record" means a new record was written. This can be triggered by the end of day, pausing data collection, on startup, or the first record after any over threshold record in which itself is not over threshold. Other possibilities are "R >= R thresh", "T >= T thresh", "T1 >= T1 thresh", or "Over Sigma"

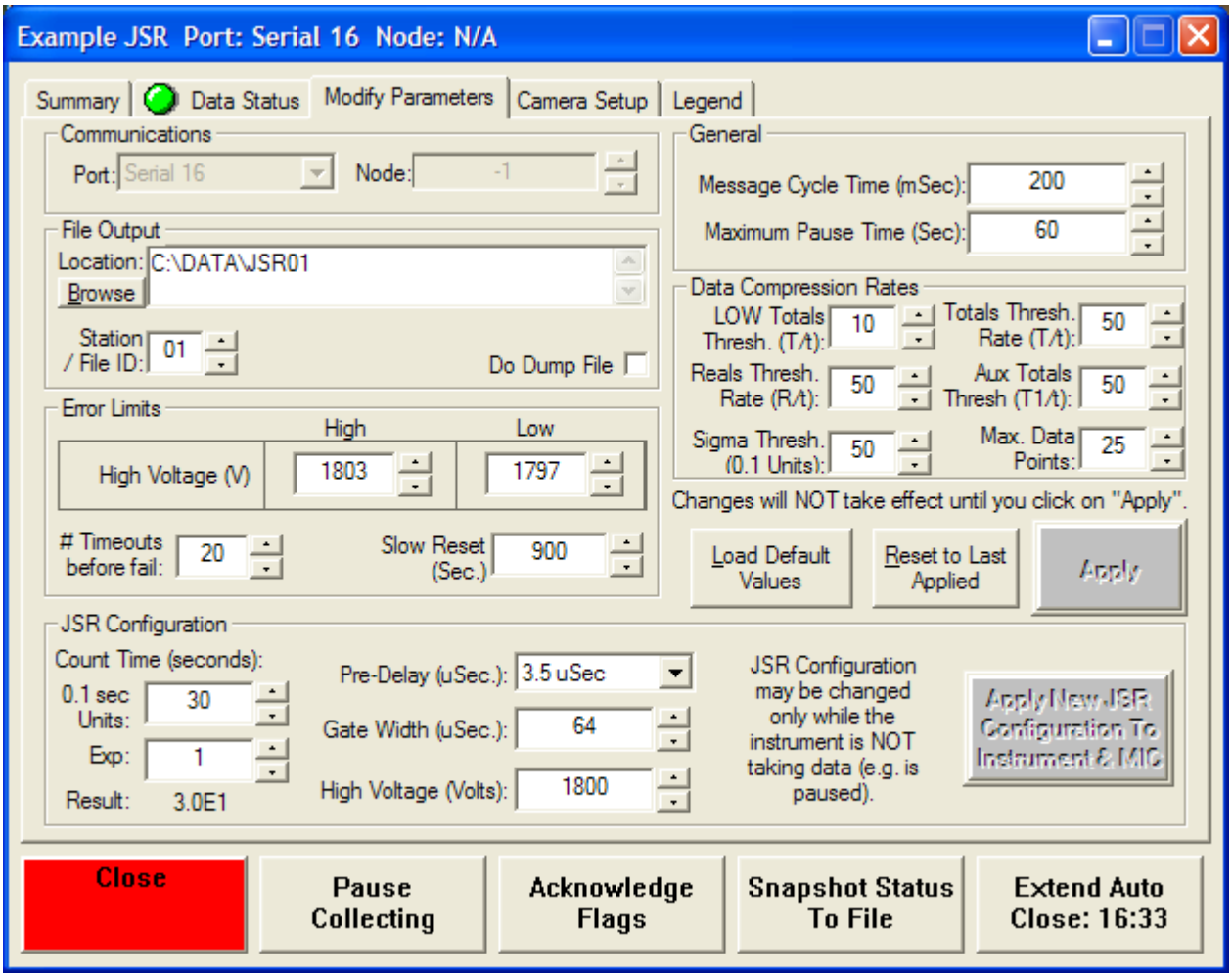


Figure 60 JSR-12 Modify Parameters Tab

The JSR Modify Parameters page contains a large number of configuration items. Some of these items only effect MIC and some effect both MIC and the JSR-12 instrument. The items in the JSR Configuration will be stored in the MIC configuration when the "Apply all to MIC only" button as will be all of the other items on the dialog. By clicking on the "Apply New JSR Configuration To Instrument" the data items in this area will be used to reconfigure the associated JSR-12 instrument.

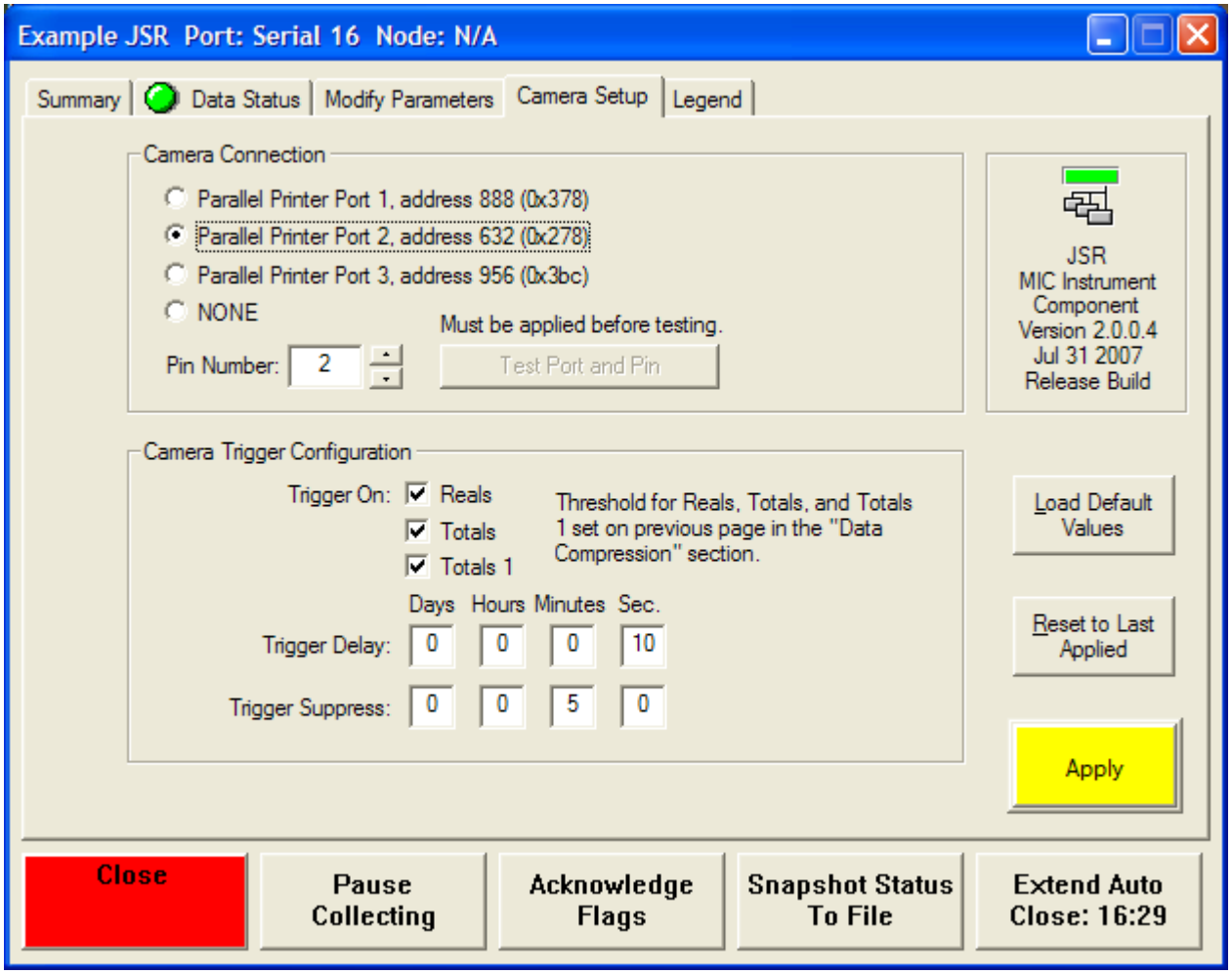


Figure 61 JSR-12 Camera Setup Tab

The JSR-12 Camera Setup Tab is used to configure how a camera is connected to the MIC computer as well as when to trigger the camera. The "Camera Connection" area controls set how a camera is connected. The "Camera Trigger Configuration" area controls set what values to trigger on and when MIC should and should not send the trigger signal to the camera.

12.3. Performance (PFM) File

Performance Files are text files containing date and time stamped performance information messages. One file is created each day using the configured file naming convention with a file extension of ".pfm".

All of the possible entries for JSR-12 type instrument performance files are listed below. The format is the same for all entries: "YYYY.MM.DD hh.mm.dd X nnnnn msg<cr><lf>". Where "YYYY" is the four digit year, "MM" is the two digit month, "DD" is the two digit day of month, "hh" is the hour, "mm" is the minute, and "ss" is the second of date and time. The "X" indicates where the date and time originate; "C" designates the MIC computer and "J" designates the JSR-12 instrument. "nnnnn" is a five digit identifier (ID) unique to that instrument and that specific message. (This ID is intended to support automated data analysis of the file.) The "msg" portion is the text message of the entry. All lines terminate with a carriage return character followed by a line-feed character.

The number in parenthesis at the end of some of the entries is the message type generated by the instrument that caused the performance file entry. The notation %s, %02x, and others in the message represent information received from the instrument. For example, %s is a text string, %02x is byte value represented as a hexadecimal number, and %f is a floating-point number.

In the table below, the CEV column indicates that the associated message will also be written to the CEV file (see following section).

Some of the entries below contain notes to the reader. These notes will NOT be included in the message written to the file.

CEV	ID	Message
Yes	53030	"Camera Triggered"
Yes	53035	"Camera Trigger Test"
	53040	"JSR Parameters reset: %s" *NOTE: Reset string UxxExPxGxxxVxxxxJ commands. See JSR documentation.*
	53100	"JSR Timeout on receive SETUP response"
	53120	"JSR Timeout on receive actual HV response"
	53150	"JSR Timeout on receive initial status response"
Yes	53160	"Late Response (2100)"
	53180	"JSR Timeout on receive AUX data response"
	53200	"JSR Timeout on receive DATA response"
	53230	"JSR Timeout on receive status response"
	53240	"JSR Too many bad status response"
	53250	"JSR Too much time to restart"
	53290	"JSR Timeout on receive SETUP response"
	53310	"JSR Timeout on receive HV response (3610)"
Yes	53320	"WRITE FAILURE on JSR file"
Yes	53330	"State Machine Failure"
Yes	53340	"JSR COLLECT take data stopped."
Yes	53350	"JSR COLLECT take data started."
Yes	53360	"JSR COLLECT stopped: Logon ID:%s MIC User ID:%s"
	53370	"JSR COLLECT CONFIG CHANGE - %s = %s"
	53380	"Bad LParam Address Received (1002)"
	53400	"Unknown Message Received from JSR"
	53410	"%s" *NOTE: Will contain any message from JSR that MIC doesn't recognize.*
Yes	53420	"STATUS CHANGE - RECEIVING TOTALS COUNT < LOW THRESHOLD"
Yes	53430	"STATUS CHANGE - RECEIVING TOTALS COUNT >= LOW THRESHOLD"
Yes	53440	"STATUS CHANGE - HIGH VOLTAGE OUT OF TOLERANCE (21)"
Yes	53450	"STATUS CHANGE - HIGH VOLTAGE IN TOLERANCE (21)"
Yes	53460	"%s = Setup, New Day" *NOTE: The JSR setup record response record is inserted here. See the JSR*

CEV	ID	Message
		documentation.
Yes	53470	"Could not write to JSR file"
Yes	53480	"Could not write to JSR file"
Yes	53490	"Could not open JSR file"
Yes	53500	"JSR Time %04d.%02d.%02d %02d:%02d:%02d Computer Time C - I = %.0f seconds");
Yes	53510	"INVALID TIME %04d.%02d.%02d %02d:%02d:%02d"
Yes	53520	"JSR COLLECT Version %s started"
Yes	53530	"JSR COLLECT Version %s started from abnormal shutdown"
	53540	"File %s deleted"
	53550	"Unknown TYPE %s" *NOTE: MIC internal error.*

12.4. Critical Events (CEV) File

Critical Events Files are text files containing date and time stamped performance information of a more critical nature or possible loss of data. One file is created each day using the configured file naming convention with a file extension of ".cev". All potential entries in a CEV file are indicated in the above table.

12.5. JSR File

JSR files are the binary data files generated using safeguards data from the JSR-12 instrument. They are created by the JSR instrument support object and are identical in form to the ISR files. The status bytes are always zero as is the Totals 3 count. The file begins with one header record and continues with data records until the end of the day at which time a new file is created. The format is:

Record 1: Header
- 4 ASCII bytes - size of header that follows this field (69)
- 5 ASCII bytes - not used
- 3 ASCII bytes – MIC version number
- 3 ASCII bytes - Station id
- 3 ASCII bytes - year
- 3 ASCII bytes - month
- 3 ASCII bytes - day
- 47 ASCII bytes - spare for expansion (first four bytes contain ASCII year)

Record 2-n: 54 byte data records for each data acquisition
- 4 byte unsigned int - julian time, date of data acquisition
- 2 byte unsigned short int - status byte (currently set to 0)
- 8 byte double – Totals Count
- 8 byte double – Aux Totals Count
- 8 byte double – Totals 3 Count (currently set to 0)
- 8 byte double – Reals + Accidentals Count
- 8 byte double – Accidentals Count
- 8 byte double – Elapsed Time in 1/10 (or 1 second) sec increments

13. EOSS

The Multi-Instrument Collect support of the Dr. Neumann/Canberra Electronic Optical Sealing System relies on the proper installation of the Dr. Neumann/Canberra EOSS Reader software. MIC uses the crypto dongle and the associated services provided by the EOSS Reader software to decrypt the communications coming from the seals. Before configuring MIC to gather data from EOSS seals, the Dr. Neumann/Canberra EOSS Reader software (provided with EOSS seals) must be installed and verified as functional. MIC cannot operate EOSS seal data collection without the Dr. Neumann/Canberra EOSS Reader software installed and verifiably operable.

There are three LANL-provided software components associated with the MIC EOSS support: MIC_EOSSReader.exe, CoEOSSCSO.dll, and CoEOSSISO.dll. MIC_EOSSReader.exe does the actual reading from the optical seals. MIC schedules MIC_EOSSReader.exe to run using SCHTASKS.exe (a built-in tool provided by the Windows operating system). MIC_EOSSReader.exe can be scheduled to run monthly, weekly, daily or hourly. Under normal circumstances, running once per week or once per day should be adequate. The ISO CoEOSSISO.dll, and CSO CoEOSSCSO.dll, are MIC components compatible with MIC version 2.0.0.4 and above.

The CSO is simple communications support object. It reserves a serial communications port, so that MIC cannot use that port for any other CSO. It also provides a point of connection for the ISO, following the standard "MIC ISO connecting to a CSO" approach.

The ISO schedules running the MIC_EOSSReader.exe using commands to the Windows operating system. The ISO periodically verifies the scheduling and reschedules if necessary. It also monitors the running of MIC_EOSSReader.exe. MIC_EOSSReader.exe saves all the data it collects in a binary day file with an extension of ".ess". It also saves this data in the registry. When the MIC ISO detects MIC_EOSSReader.exe has completed the seal reading process, the ISO then reads the registry and makes appropriate entries in the .PFM and .CEV files as well as to the dialog boxes.

Figure 62 MIC with EOSS Instrument Support Object.

13.1. Configuration

Pre-MIC: The operating system utility SCHTASKS is used to automatically schedule running of the MIC_EOSSReader.exe program. This is accomplished by the MIC EOSS ISO in background under the control of a user account established for this purpose. This user account MUST have administrator privileges. After installing the Dr. Neumann/Canberra EOSS Reader software create the new account with administrator privileges, log out of the current account, and then log into the new account. While logged on to the new account, run the EOSS Reader

software to verify the account can access the seals. You may need to re-install the EOSS Reader software while logged into the new account. Once you've verified the new account can access the seals you may log out and log back in to the account normally used.

MIC Configuration: The communications support object must be configured first. Select "Configuration" from the MIC dropdown menu and then in the "Multi-Instrument Collect: Configure" dialog box select "Add Comm…". In the subsequent dialog enter a Comm Name and select the EOSS entry. If EOSS doesn't appear here then the CoEOSSCSO.dll has not been been fully installed on your system. In this case open a command prompt window, change directory to where the CoEOSSCSO.dll is and do this command: "`regsvr32 CoEOSSCSO.dll`". You may now return to MIC, close the MIC: New Communications (CSO) dialog and click on "Add Comm…" again. You'll next be asked to select a serial communications port. This is the serial port the EOSS Serial adapter is plugged into. The next task is to establish the MIC instrument support object. From the Multi-Instrument Collect: Configure" dialog select "Add Instrument". In the subsequent dialog box you'll be asked to provide the instrument name and the instrument type. Select EOSS. If EOSS doesn't appear in the dialog box follow the steps above replacing CoEOSSCSO with CoEOSSISO.

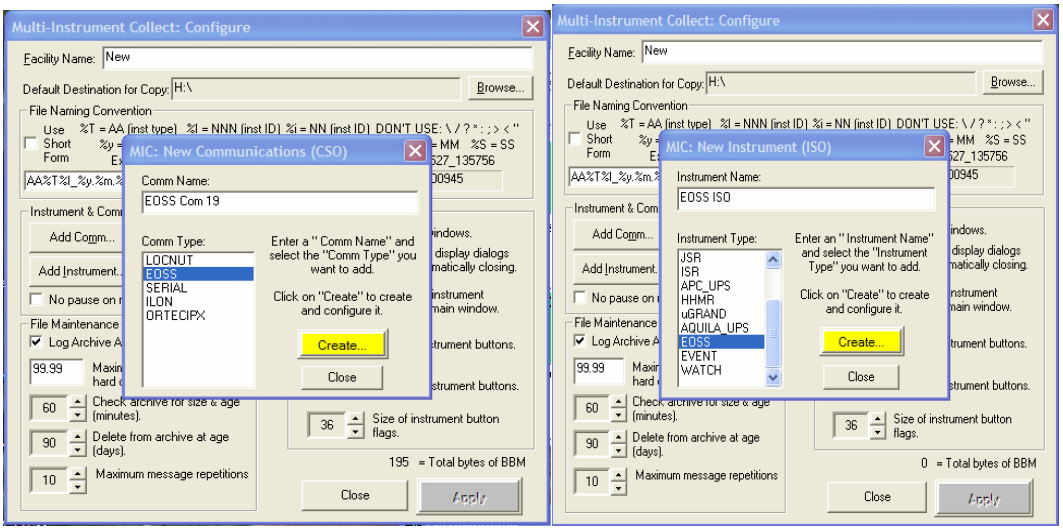


Figure 63 Creating an EOSS CSO and ISO.

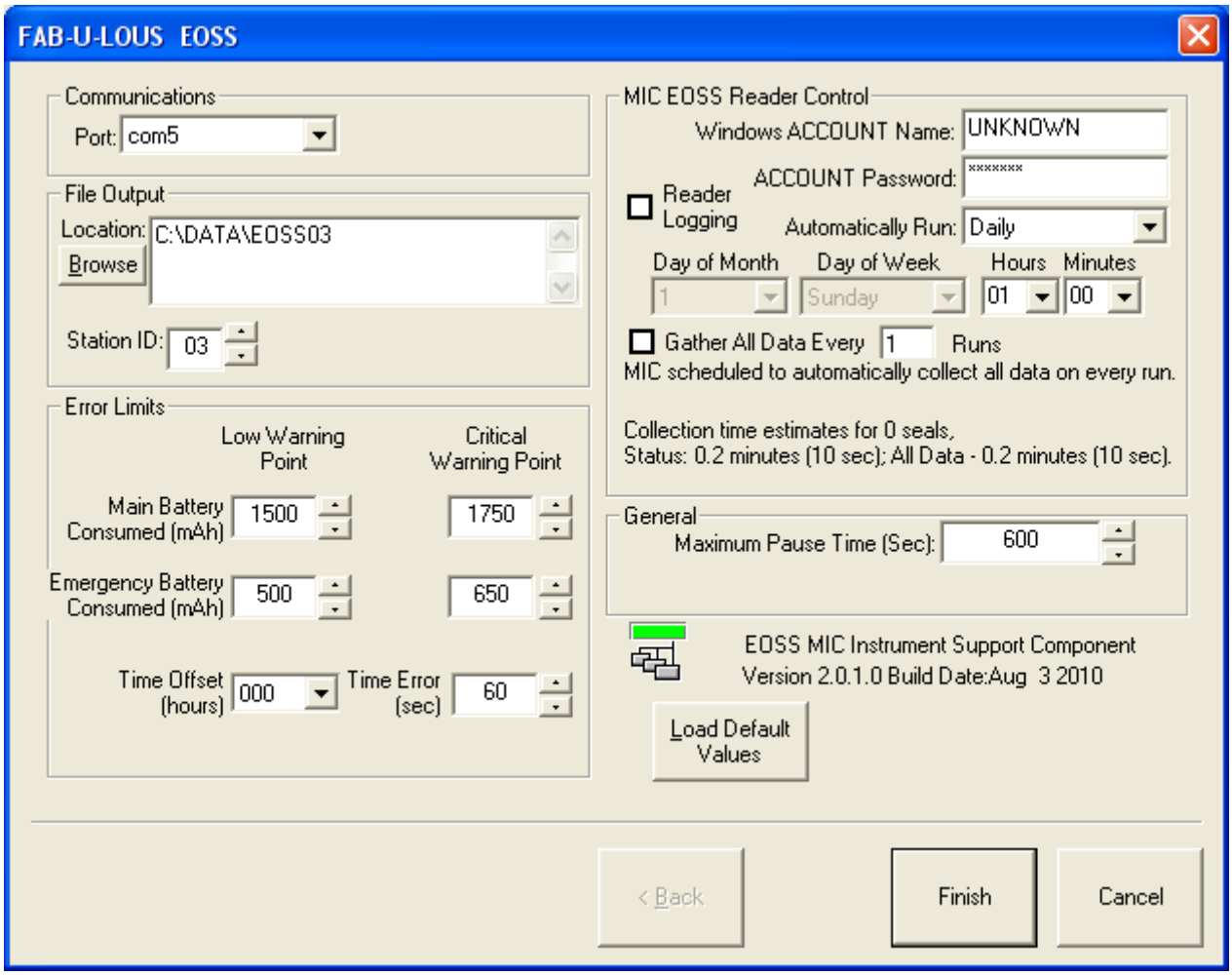


Figure 64 Initially Configuring an EOSS ISO.

Configuration of the "Communications", "File Output", "Error Limits", and "MIC EOSS Reader Control" are all critical. The "Port", "Location", and "Station ID" are set in the same fashion as all of the other MIC Instrument Support Objects. The "Error Limits" section contains controls for setting points at which the ISO will flag potential problems such as low battery.

Finish the configuration on this page and proceed to start the EOSS display from the EOSS. In this next step, you will enter the EOSS Seal IDs for each seal into MIC. MIC probes for the declared EOSS seals by ID. No seal ID discovery occurs. Instead, you will use the EDIT feature found on the Summary EOSS page to enter the seal IDs.

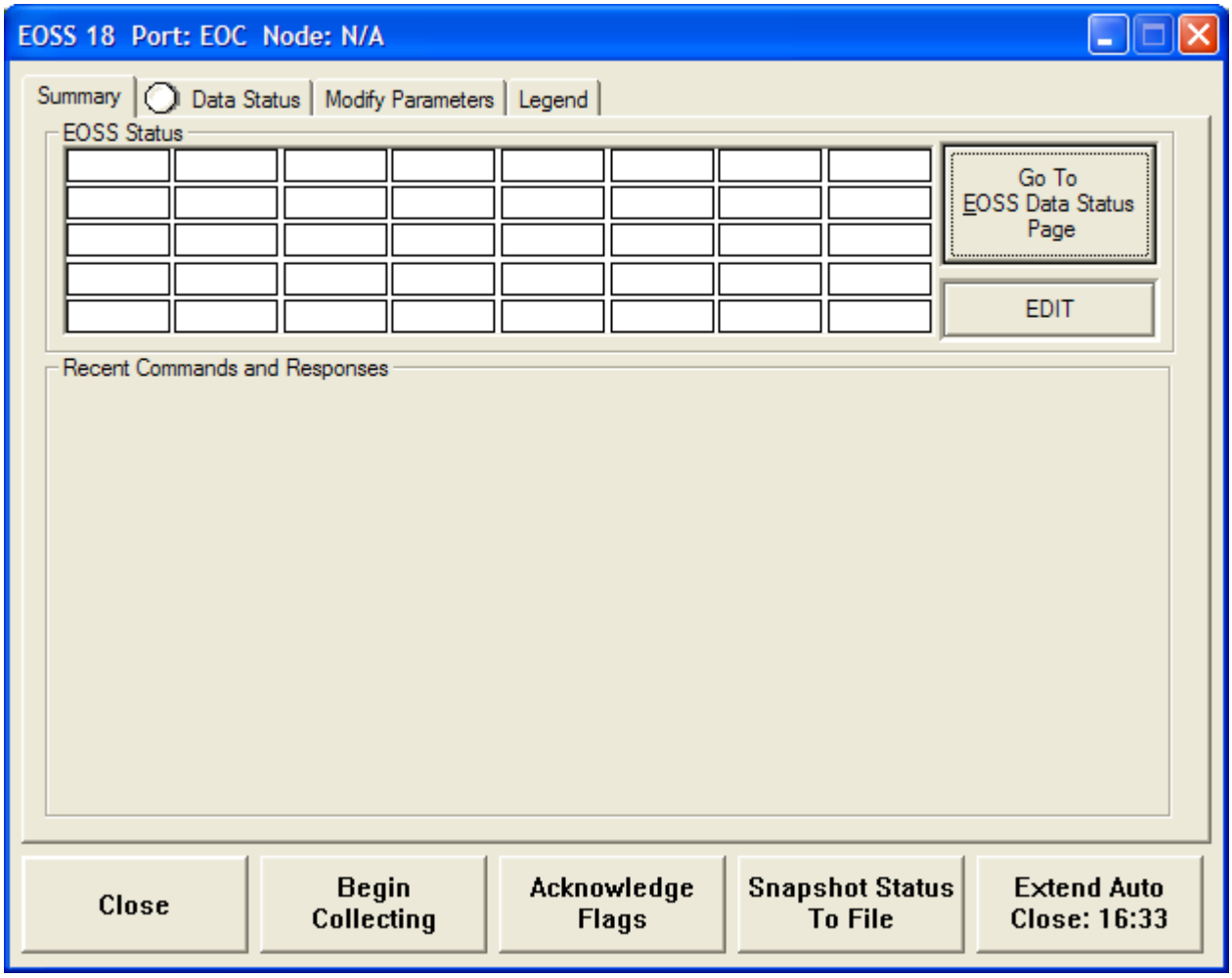


Figure 65 Configuring the EOSS Seal List.

To start, select the EDIT button (see Figure 65 above). MIC presents a request for the administrator login name and password. Following your successful password entry presents a single column seal ID entry dialog. (See Figure 66).

Using the Add button, enter each Seal ID into the dialog. Adjust the order using the Move buttons. Save the results by selecting the OK button. The seal IDs now appear in the EOSS status grid. (See Figure 67 below).

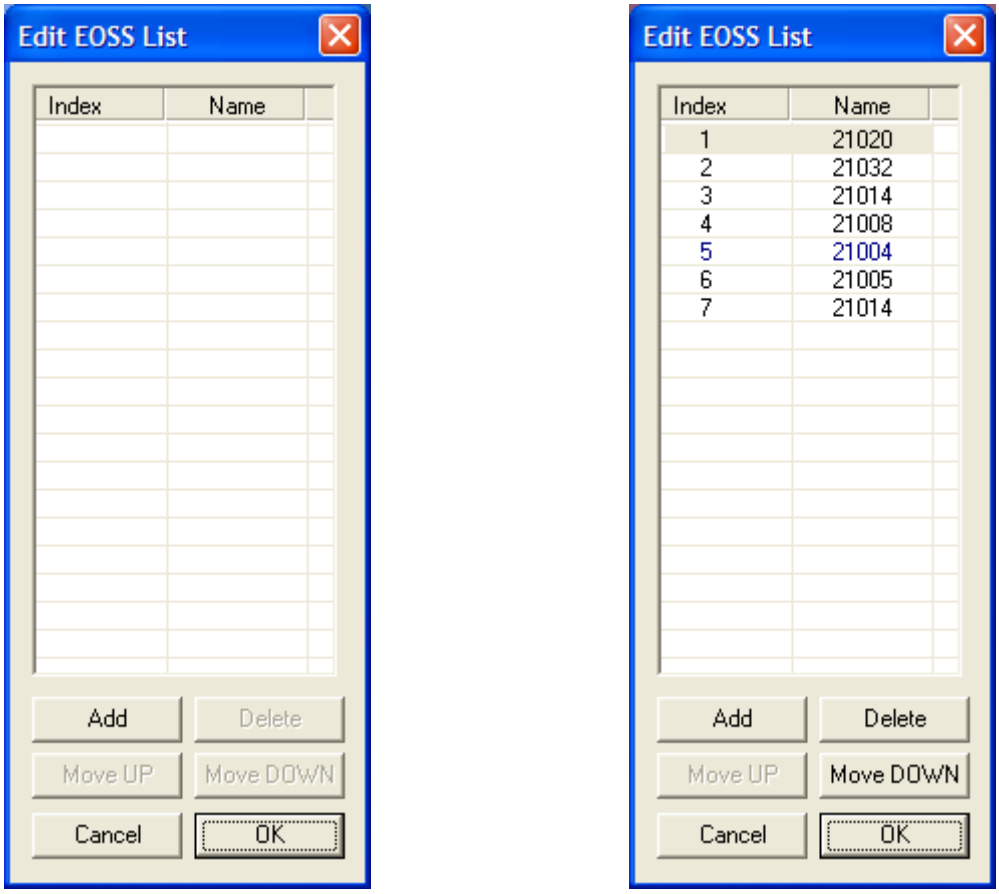


Figure 66 The EOSS Seal List.

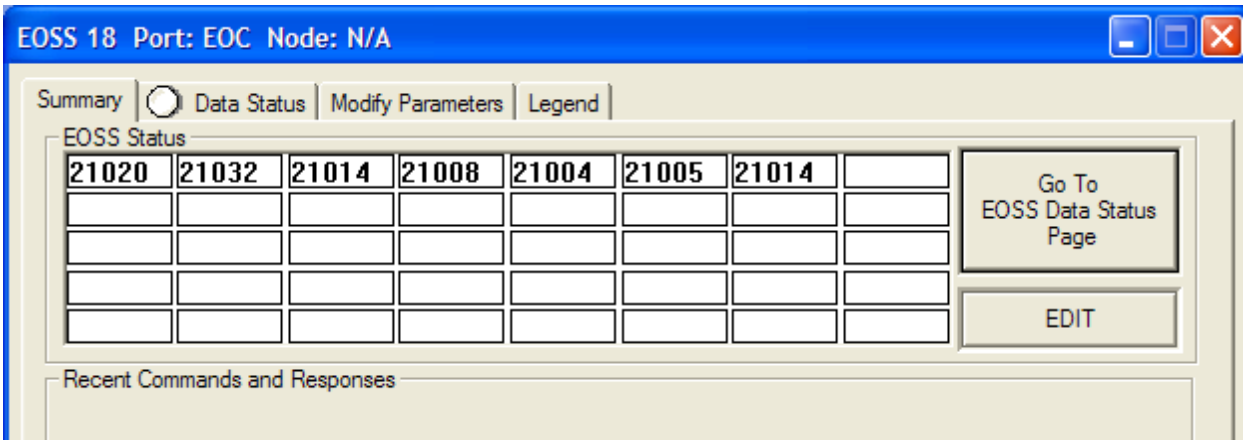


Figure 67 The EOSS Seal Status display.

To test MIC EOSS, select the "Check EOSS Seal Status Only" or "Gather ALL Data from EOSSes" button on the Data Status tab. A DOS command shell should soon appear, showing seal-by-seal MIC interrogation progress. If "Reader Logging" is enabled on the Parameters page, these progress messages are written to the log file, and not presented in the DOS shell. Upon completion of the interrogation processing, the MIC EOSS Data Status page is updated with the latest seal status and content.

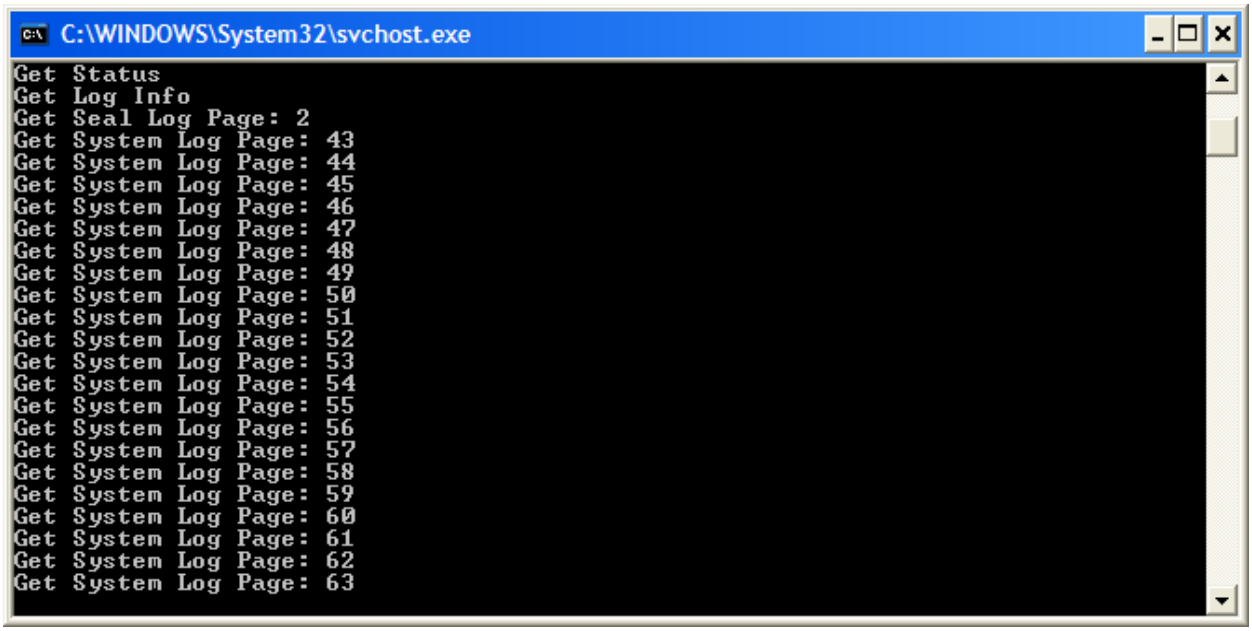


Figure 68 The EOSS Seal Query progress display.

13.2. Use

The colored button associated with the EOSS ISO on the MIC main dialog will normally be green. It will change to yellow while the seals are being read. While yellow other EOSS readers such as the R. Neumann Consultants EOSS Reader should not be used. When the button is clicked on the EOSS ISO presents a tabbed dialog box. The first and default tab is the "Summary". It displays a list of the EOSS devices found and a list of recent commands and responses. In the example shown in Figure 69 there are seven EOSSes detected and because the color is green there are no serious problems with them.

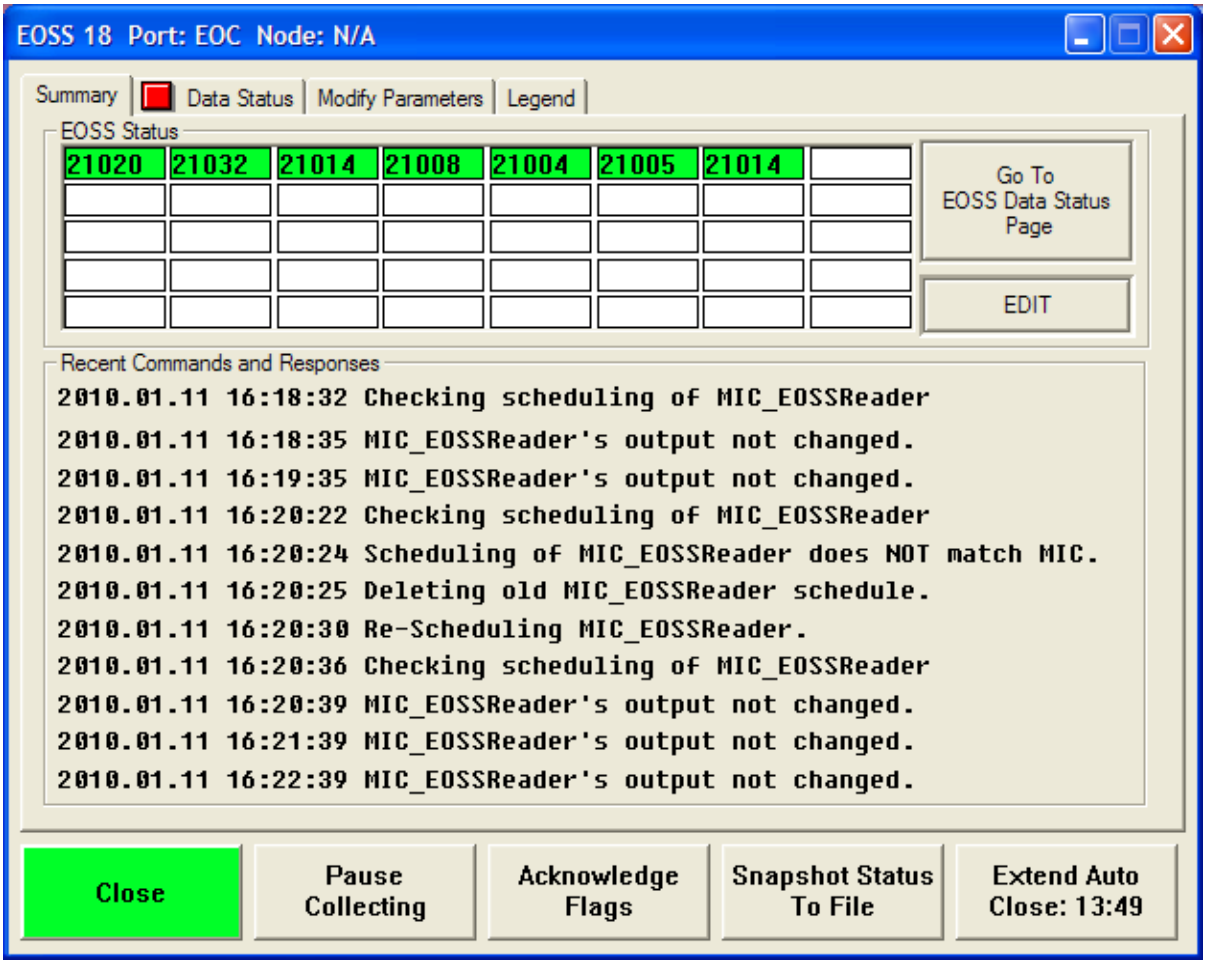


Figure 69 EOSS Summary Tab

The "Data Status" tab displays all of the collected data. The round green icons further indicate the health of the specific instruments as well as some general information. If there is a problem they will change to a red rectangle or a yellow triangle depending on the severity of the problem. The data is accessed by selecting and expanding one of the items and then selecting one of the sub-items. The collected data associated with selected item will be displayed in the right part of the Data Status dialog.

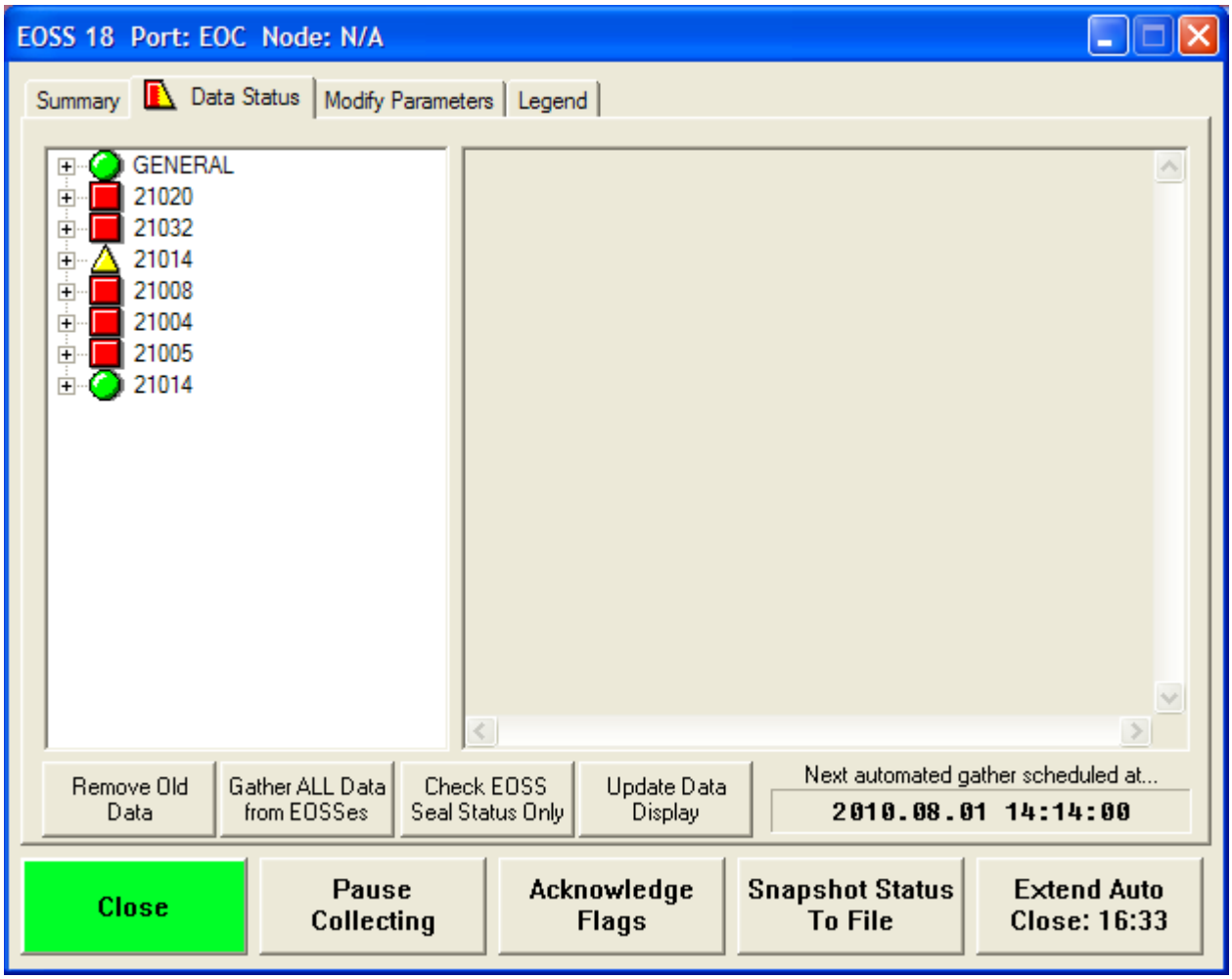


Figure 70 EOSS Data Status Tab

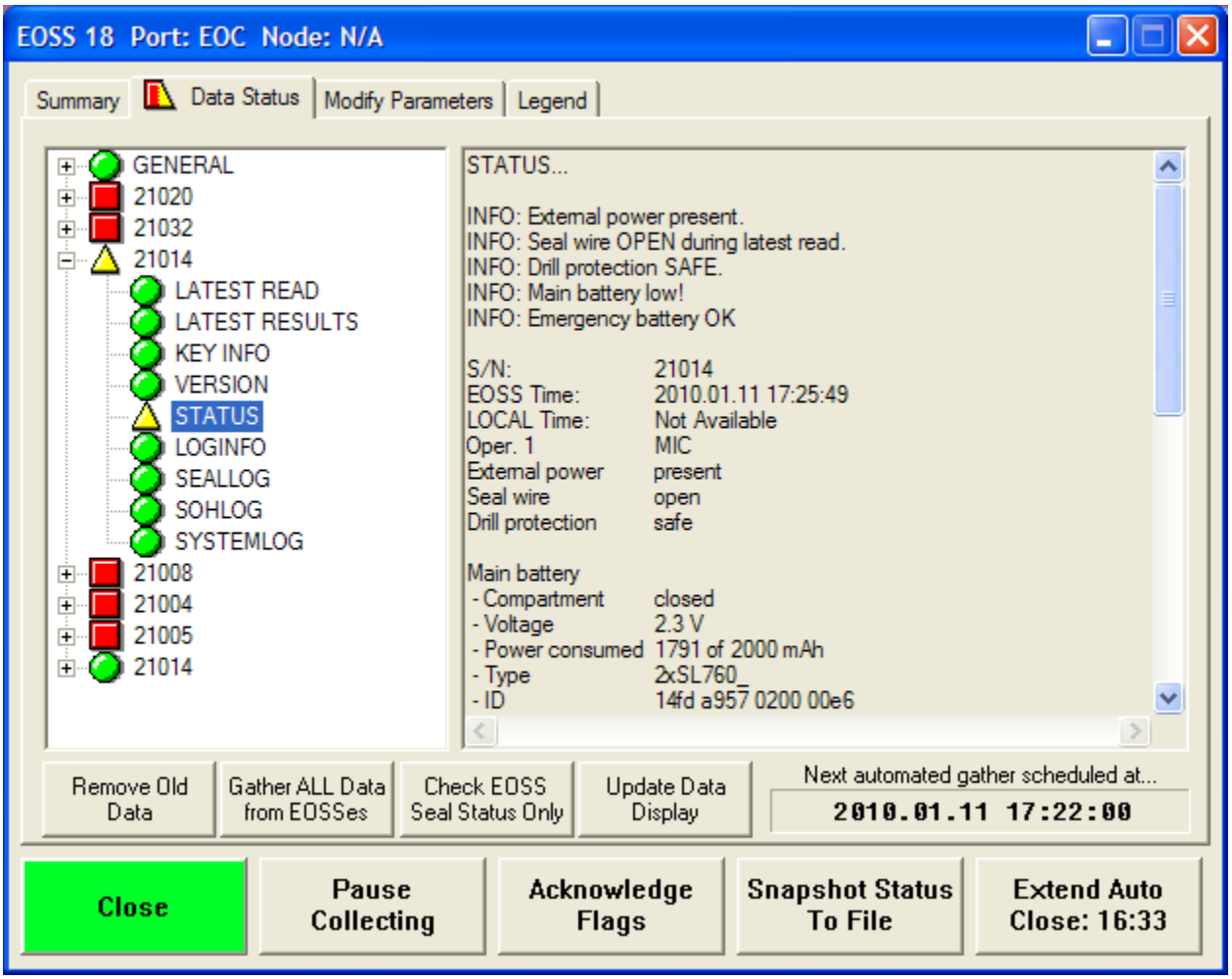


Figure 71 EOSS Data Status Tab with item selected

Near the bottom of the Data Status Tab are four buttons. "Remove Old Data" should be used when a seal has been replaced. The EOSS ISO will continue to report the old EOSS seal and will eventually mark it with an overdue update status, until this button removes the information from the registry. "Gather ALL Data from EOSSes" and "Check EOSS Seal Status Only" may be used to trigger a nearly immediate full or status read of the associated EOSS seals. This immediate seal collection feature may be used at any time, provided that an automatic read is not in progress (yellow) and no other software is attempting to read the EOSS seals.

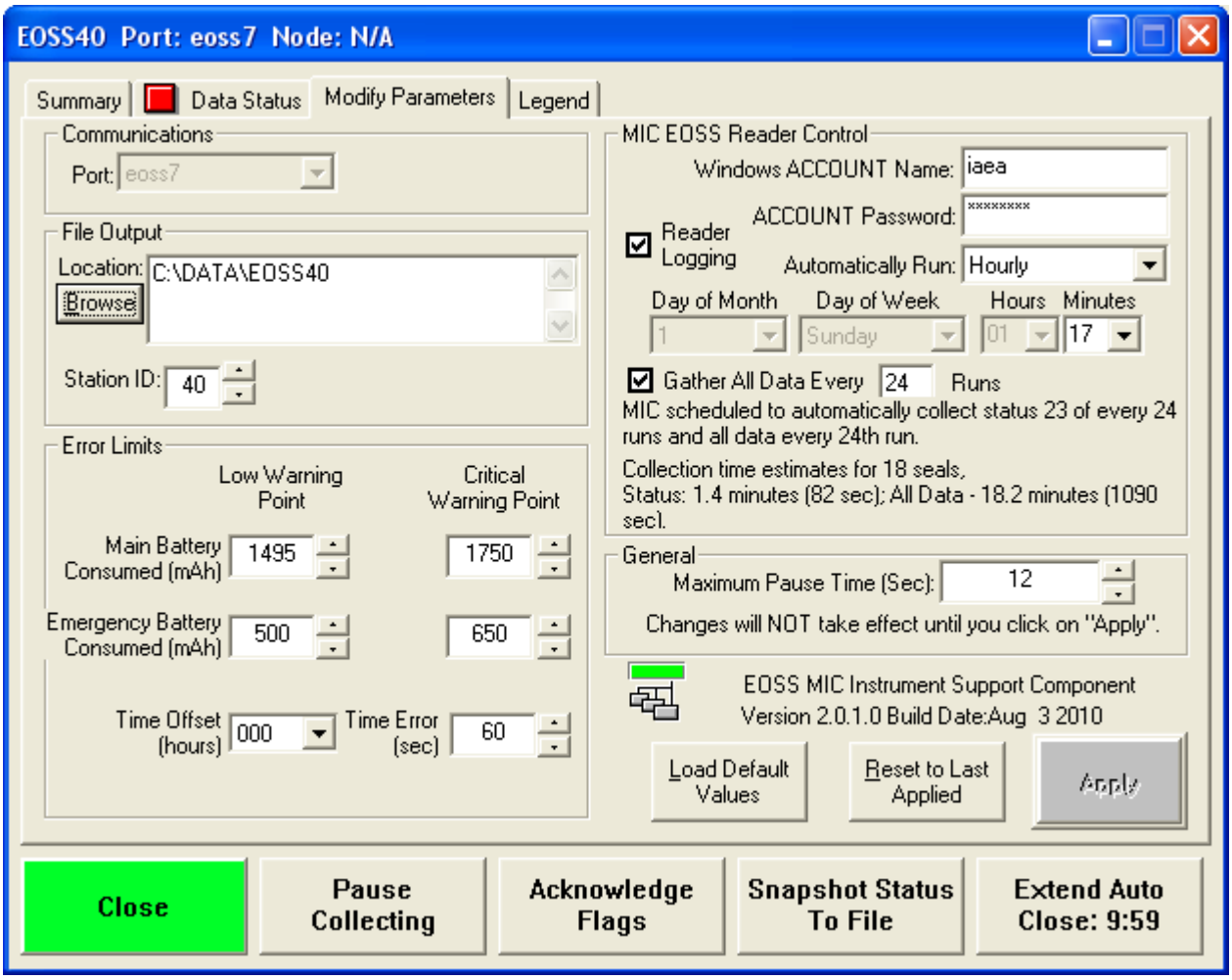


Figure 72 EOSS Modify Parameters Tab

The Modify Parameters tab provides for user configuration of various operating parameters. It is organized similar to other MIC ISOs and is used similarly.

The **MIC EOSS Reader Control** section manages scheduling the frequency of seal collection by scheduling automatic runs of the MIC_EOSSReader.exe application**.**

Collection Scheduling

Scheduling is available for monthly, weekly, daily and hourly. The "Day of Month", "Day of Week", "Hours", and "Minutes" will activate as appropriate for the "Automatically Run" selection. The MIC EOSS Reader runs under the credentials of the Windows account name and password entered here. Appropriate credentials are required because the MIC EOSS Reader interacts directly with the Dr. Neumann EOSS Crypto Token process. Enter the appropriate values based on your EOSS installation and Windows system.

Balancing Collection Times

Short and full data collection runs may be scheduled to reduce the overall time required for a collection cycle. Use the 'Gather All Data' check box to enable status-only and full data collection intervals. Under this scheme, a lengthy full collection occurs only on the *nth* automatic

run. Fig. 72 shows an example hourly collection schedule, a full collection occurs only on 1 run out of 24, or every 24th run.

Reader Logging

The "Reader Logging" check box enables the collection process, the MIC EOSS Reader, to log progress, status and error messages to a text file. Enabling this feature supports diagnostic, maintenance and system configuration tasks. The log file is named, created and handled according to the same rules as PFM, CEV, DMP and ESS files. A day file, the log file is found in the same location as the other files, with the suffix ".rlog".

The final tab "Legend" defaults to built-in text but may be changed by the installer. It uses a Rich Text File format. If a file with the same name as this instantiation of the EOSS ISO exists (*e.g.* EOSS SEAL 18.rtf) then that file will be loaded instead of the default text. If that file doesn't exist the EOSS ISO will look for a file with the name "EOSS.rtf" and load it if found. If that file isn't found then the default text will be displayed as shown. Use any editor that can save the file as a Rich Text file (.rtf) to edit or create a custom display.

13.3. Performance (PFM) File

Performance Files are text files containing date and time stamped performance information messages. One file is created each day using the configured file naming convention with a file extension of ".pfm".

All of the possible entries for EOSS type instrument performance files are listed below. The format is the same for all entries: "YYYY.MM.DD hh.mm.dd X nnnnn msg<cr><lf>". Where "YYYY" is the four digit year, "MM" is the two digit month, "DD" is the two digit day of month, "hh" is the hour, "mm" is the minute, and "ss" is the second of date and time. The "X" indicates where the date and time originate; "C" designates the MIC computer and "E" designates the EOSS instrument. "nnnnn" is a five digit identifier (ID) unique to that instrument and that specific message. This ID is intended to support automated data analysis of the file. The "msg" portion is the text message of the entry. All lines terminate with a carriage return character followed by a line-feed character.

The notation %s, %d, and others in the message represent information received from the instrument. For example, %s is a text string, %d is a decimal number, and %f is a floating-point number.

In the table below, the CEV column indicates that the associated message will also be written to the CEV file (see following section).

CEV	ID	Message
	47100	EOSS State machine fault
Yes	47103	EOSS Cannot create EOSS task deletion script at %.256s; (%.64s)
Yes	47104	EOSS Cannot create EOSS task reader script at %.256s; (%.64s)
Yes	47105	EOSS Cannot create EOSS compare task script at %.256s; (%.64s)
Yes	47106	EOSS Cannot create EOSS task schedule deletion script at %.256s…
Yes	47107	EOSS Cannot create EOSS reschedule task script at %.256s; (%.64s)
Yes	47108	EOSS Cannot create EOSS reader task script at %.256s; (%.64s)

CEV	ID	Message
	47110	EOSS Bad LParam Address Received (Start of msg block)
	47111	EOSS Bad LParam Address Received (End of msg block)
	47200	EOSS Cannot read KEY NUMBER from registry!
	47201	EOSS Cannot read KEY TIME from registry!
	47202	EOSS Cannot read LATEST READ from registry
Yes	47203	EOSS Cannot read LATEST RESULTS from registry!
	47204	EOSS Cannot read VERSION from registry!
	47205	EOSS COLLECT Power Fail
	47206	EOSS ERROR: Cannot access %s status in registry!
	47207	EOSS ERROR: Cannot read %s from registry!
	47208	EOSS Read from seal is overdue!
	47300	EOSS Date of LATEST READ in registry corrupted
	47301	EOSS WARNING on %d, Time out of tolerance (%.0f sec)!
Yes	47302	EOSS Errors occurred during LATEST READ from seal
Yes	47303	EOSS Scheduling of MIC_EOSSReader does NOT match MIC.
Yes	47304	EOSS WARNING: No external power!
Yes	47305	EOSS WARNING: Cannot read LOGINFO from registry!
Yes	47306	EOSS WARNING: Cannot read STATUS from registry!
Yes	47307	EOSS WARNING: Drill protection SHORTED!
Yes	47308	EOSS WARNING: Emergency battery CRITICALLY low!
	47309	EOSS INFO: Emergency battery low!
Yes	47310	EOSS WARNING: FAILED seal log page linking!
Yes	47311	EOSS WARNING: FAILED seal log page not available in registry!
Yes	47312	EOSS WARNING: FAILED seal log page read!
Yes	47313	EOSS WARNING: FAILED SoH log page linking!
Yes	47314	EOSS WARNING: FAILED SoH log page not available in registry!
Yes	47316	EOSS WARNING: FAILED system log page linking!
Yes	47317	EOSS WARNING: FAILED system log page not available in registry!
Yes	47318	EOSS WARNING: FAILED system log page read!
	47319	EOSS WARNING: Flash memory warnings!
	47320	EOSS WARNING: Flash memory errors!
Yes	47321	EOSS WARNING: Majority vote memory errors!
Yes	47322	EOSS WARNING: Seal wire FAILURE!
	47323	EOSS INFO: Flash memory warnings!
	47324	EOSS INFO: Main battery low!
	47325	EOSS INFO: Majority vote memory warnings!
	47326	E 47326 EOSS Time Computer Time C - E = %.0f seconds
	47327	I 47327 EOSS INVALID TIME

CEV	ID	Message
	47328	C 47328 EOSS Unknown TYPE %s
	47330	EOSS MIC_EOSSReader cannot detect any EOSS seals, check hardware connections and MIC configuration
	47400	EOSS Attempted to close \"EOSS Crypto Token\"
	47401	EOSS Checking scheduling of MIC_EOSSReader
Yes	47402	EOSS COLLECT Start new day
Yes	47403	EOSS COLLECT stopped: Logon ID: XXXXXXXX MIC User ID: XXXX
Yes	47404	EOSS COLLECT pausing registry data examination for at most %d seconds
Yes	47405	EOSS COLLECT registry data examination starting
	47406	EOSS Manually running MIC_EOSSReader
	47407	EOSS Read Registry Entries
	47408	EOSS Registry Entries Changed
	47409	EOSS Removed %s from registry!
	47410	EOSS Rescheduling MIC_EOSSReader
Yes	47411	<Time> C 47411 EOSS COLLECT Version %s started
Yes	47412	<Time> C 47412 EOSS COLLECT Version %s started from abnormal shutdown
	47413	<Time> C 47413 EOSS File %s deleted

13.4. Critical Events (CEV) File

Critical Events Files are text files containing date and time stamped performance information of a more critical nature or possible loss of data. One file is created each day using the configured file naming convention with a file extension of ".cev". All potential entries in a CEV file are indicated in the above table.

13.5. ESS File

The ESS files are day files containing binary data read from the EOSSes. They always consist of a header and one or more records from the seals. One file will be created per day and will contain all of the data acquired from all of the seals on the serial port associated with the EOSS ISO. MICDump versions from 1.0.0.3 onward convert these binary files into human-readable text files.

13.6. EOSS Reader Log (RLOG) File

EOSS seal data collection uses a separate task to negotiate and collect data from installed EOSS seals. This EOSS reader task has a logging feature helpful for diagnostic analysis during system configuration and maintenance. Reader logging is enabled using the "Reader Logging" checkbox on the Parameters page of the primary EOSS (See Fig. 72 and).

The log file is created and archived according to the same rules used for PFM, CEV, DMP and ESS files. Reader log files have the ".rlog" suffix. The log file is a text file.

The message format is similar to PFM and CEV log message formats. The ID numbers and messages are shown here:

ID	Message
47700	Failed to open registry at %s
47701	MIC_EOSSReader starting
47702	MIC_EOSSReader exiting
47710	PARAMETERS: %s
47711	COMPORT: %d
47712	PATH: %s
47713	INST ID: %s
47714	Query depth: %s
47715	Query depth override
47716	Interval use is %d; Interval is %d; Count %d
47717	Not using interval depth collection (Interval is %d; Count %d)
47718	LOG FILE: %s
47719	ID list: %.256s
47720	Failed due to invalid com port number (less than 1)
47721	Exception in seal query preparation
47722	No seal IDs found in the registry nor the Mic ini file
47723	Unable to open data file: %s %s
47724	Set Current Address[%d]: %d
47725	Get Challenge
47726	Failed Challenge: [%d]:%d %S
47727	Log on
47728	Failed 1st LOGON: %d %S
47729	Failed 2nd LOGON: %d %S
47730	Failed 3rd LOGON: %d %S
47731	Failed LOGON: %d
47732	Get Status
47733	Failed STATUS read [%d]: %d
47734	Get Log Info
47735	Failed LOGINFO read [%d]: %d
47736	Get Seal Log Page: %d
47737	Failed LOGPAGE read [%d]: %d Page:%d
47738	Get System Log Page: %d
47739	Failed SYSTEMLOGPAGE read [%d]: %d Page:%d
47740	Get SOH Log Page: %d
47741	Failed SOHLOGPAGE read [%d]: %d Page:%d
47742	Log off
47743	Interval reader count incremented %d
47744	Error: Serial Port %d -> %d during seal processing

ID	Message
47745	Error: Exception %s during seal processing
47746	Error: Exception during seal processing
47747	Failed to clear reg: %s %s %x
47748	Failed to open reg: %s %s %x

14. Event

Event instrument (ILON configured to collect events) support is through the EVENT instrument support object. The objective of this support object is to copy data placed in the EVENT memory onto the collect computer's hard drive. To this end it will display recently received information. The EVENT instrument and instrument support object is designed to collect binary event data, GPS data, and VACOSS data.

14.1. Configuration

To establish and configure an EVENT instrument support object select the "Configuration" menu option (left click on the icon in MIC's main dialog title bar) and click on the "Add Instrument" button. Because the new instrument support object will need to connect to an existing communication object--if it hasn't been created do so using the "Add Comm" button prior to continuing. Because the EVENT instrument is an adaptation of an ILON the EVENT instrument may attach only to an ILON communications support object--serial direct or IPX communications support objects are not appropriate for the EVENT instrument and will NOT work.

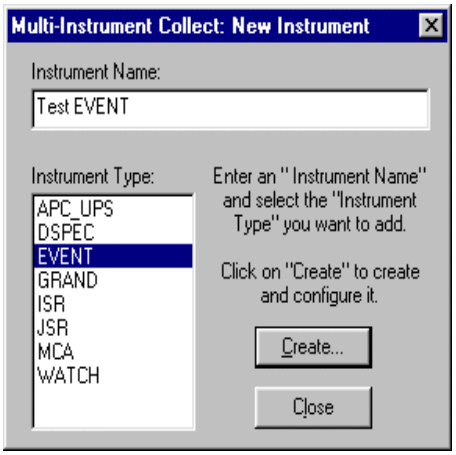


Figure 73 Add Instrument Dialog

To create an EVENT instrument support object click on the "EVENT" entry in the "Instrument Type" window and enter a name in the "Instrument Name" window--the "Create" button will become active. Click on it to continue or select "Close" to exit without creating the support object. If "Create" was selected then the EVENT configuration dialog box will be presented.

Each of the data items in the EVENT configuration dialog box need to be set or at least verified. The "Extend Auto Close" button in the lower right corner indicates the time until this dialog box automatically aborts the creation process and closes. If more time is needed click on it as needed to extend the time by 5 minutes each click to a maximum of 120 minutes. In the "Communications" area set the "Port" to the desired communications support object and then "Node" to the appropriate node for the selected communications support object. The "Node" number is the node address of the EVENT instrument (ILON). Note: When configuring a GPS

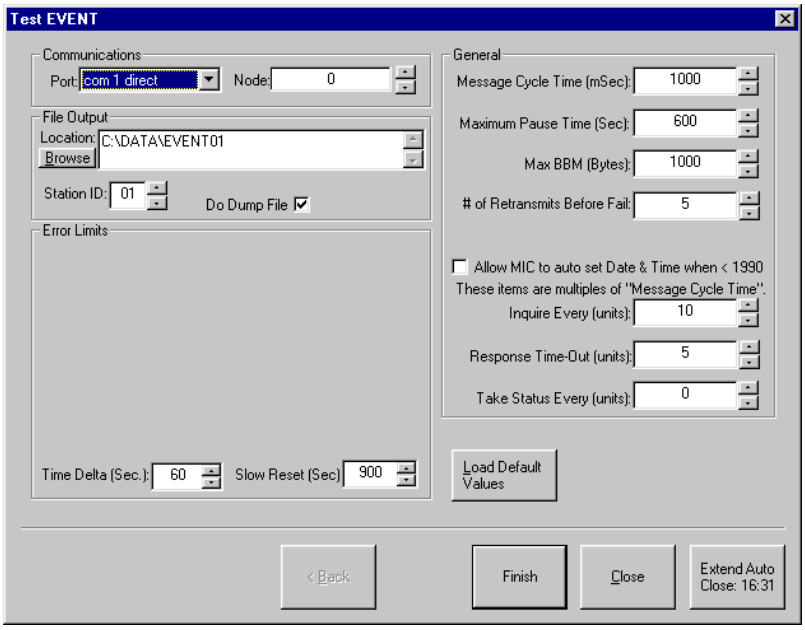


Figure 74 EVENT Configuration Dialog

EVENT ILON node, the ILON Node number must be used, not that of the GPS instrument.

Set the data items in the "File Output" area to appropriate settings. Set the location which the EVENT instrument support object should write the files for this instrument. The "Station ID" must be unique among all instruments! Typically, "Do Dump File" should be set to not selected.

Adjust all of the data items in the "Error Limits" area as needed. The "Time Delta (Sec.)" sets the acceptable tolerance between the MIC computer's clock and the instrument's clock. When the EVENT instrument support object detects the difference between the instrument's clock and the computer's clock is greater than the number of seconds set here, then an error will be flagged in red and entered into the appropriate CEV and PFM files. When the difference transitions to less than the set value an entry is again placed into the CEV and PFM files indicating the delta is now in tolerance. The out of tolerance condition will cause a "clock" icon to be placed on the instrument support object's colored button on the MIC main dialog. This icon will not go away until the user clicks on the "Acknowledge Flags" button.

In the General area the "Message Cycle Time" data item should be set to the number of milliseconds between timing messages sent to the portion of the EVENT instrument support object which controls the command sequence to the instrument. Generally, this should be left at 1000 (1 second). The "Maximum Pause Time" controls the maximum duration which the EVENT instrument support object may be held in pause mode--this does not affect data collection on the instrument. When in pause mode the associated instrument will still be accumulating data but MIC will not ask the instrument for status or data. When the pause time runs out the instrument support object will automatically resume normal operations of asking for status and responding accordingly. The "Maximum BBM" data item is the point at which the EVENT instrument support object begins to dump the associated instrument's battery backed up memory to the binary files on the MIC computer. Once this trigger point is reached the dump sequence will continue until the associated instrument reports 0 bytes in BBM. This value should be set to a low number to allow maximum instrument autonomy. The "# of Retransmits Before Fail" is set to control how many repeats of a command the EVENT instrument support object should attempt prior to assuming a communications failure.

The next item down is "Allow MIC to auto set Date and Time when < 1990". When the internal battery fails in the EVENT instrument and the instrument has subsequently been reset (*e.g.* experienced a power loss) the internal clock may have been reset to January 1, 1982. The EVENT instrument support object can detect this and force the instrument's clock to match the collect computer's time. Set this item to checked to allow this feature.

The bottom three data items in this section are units of "Message Cycle Time" listed above. Consequently, if the "Message Cycle Time" is set to 1000 mSec. then these three values will be in seconds. The "Inquire Every (units)" data item controls how often to send INQUIRE2 messages to the associated instrument. The "Response Time-Out (units)" sets the duration the EVENT instrument support object should wait for a response to a command such as INQUIRE2 or DUMPBBM. The "Take Status Every (units)" controls how often the EVENT instrument support object should send a DUMPSTAT command to the associated instrument. Setting this value to 0 indicates a DUMPSTAT does not need to be repetitively sent.

After all values have been set or verified click on the "Finish" button. Prior to actually creating the new EVENT instrument support object the user will be prompted for a valid user name—password pair.

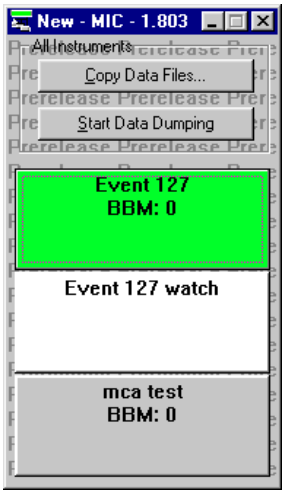


Figure 75 Event Colored Button from MIC Main Dialog (with others also).

The creation of the EVENT instrument support object will be accompanied by the addition of a colored button on the MIC main dialog.

14.2. Use

A colored button on the MIC main dialog will exist for each EVENT instrument support object instrument (see figure 75) and one support object should be created for each actual instrument being supported. The background color of the button on the MIC main dialog indicates the current state of the instrument support object. Red signifies the instrument support object is having a problem communicating with the associated instrument. Green is the normal quiescent state and yellow indicates a command has been sent to the instrument but an acceptable response has not yet been received back. The title of the instrument support object is presented at the top of the button and the number of bytes in battery backed up memory (as reported by the instrument) is also displayed. In the lower portion of the button icons will be displayed to indicate various state of health information. Clicking on a button will cause a multi-page tabbed dialog box to be displayed.

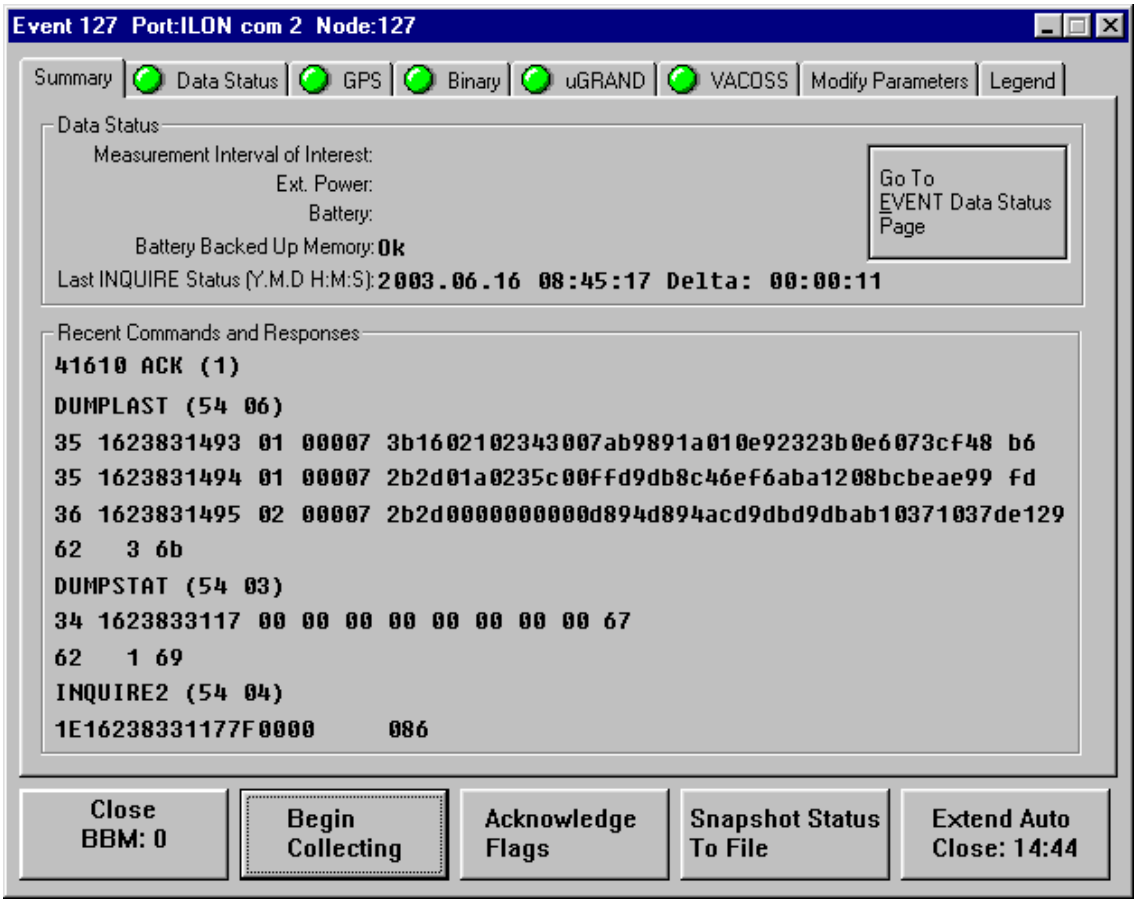


Figure 76 EVENT Instrument Support Object Dialog Box

This is a test The multi-page tabbed dialog provides "Summary", "Data Status", "GPS", "Binary", "VACOSS", "Modify Parameters", and "Legend" tabs. The first two and last two contain data and controls associated with the Event ISO and MIC's control of it. Whereas, the other tabs present recent data from each of the types of instruments the Event Instrument gathers data from. For example, the Event Instrument may be collecting information from five VACOSS

seals, but only one VACOSS tab will be shown. On that tab will be the last four VACOSS messages received by the Event ISO from the Event Instrument. In Figure 76 the "Summary" tab has been selected. On the lower half of this page is displayed is a window showing recent commands sent to and received from the Event Instrument. As new messages are sent and received data displayed in this window will scroll up. The objective of this window is to provide the user with a quick indication that communications between the EVENT ISO and the EVENT Instrument is ok. In the upper portion of the page selected parameters are displayed. If a parameter is out of tolerance it will be displayed with a red background.

The second tab, "Data Status" presents information provided in the most recent INQUIRE2

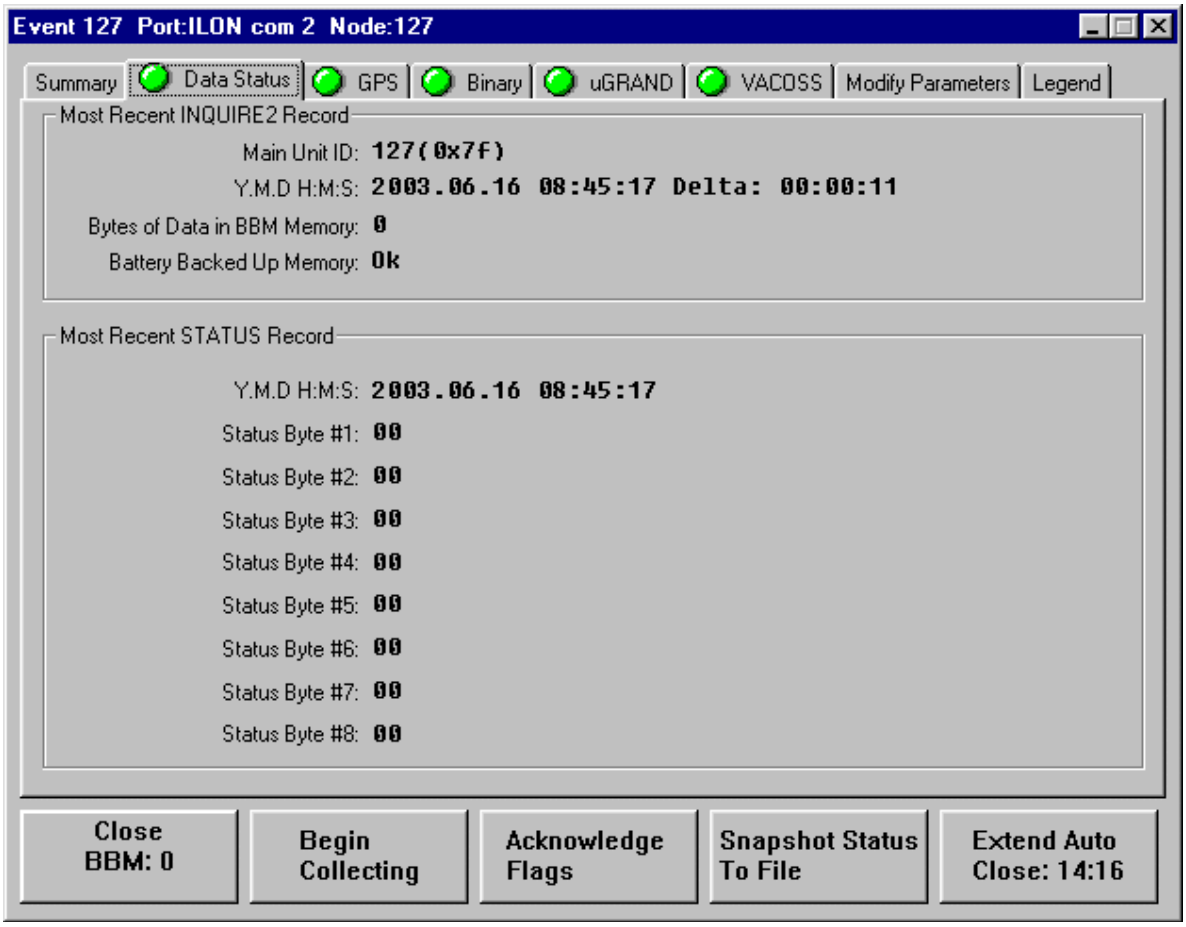
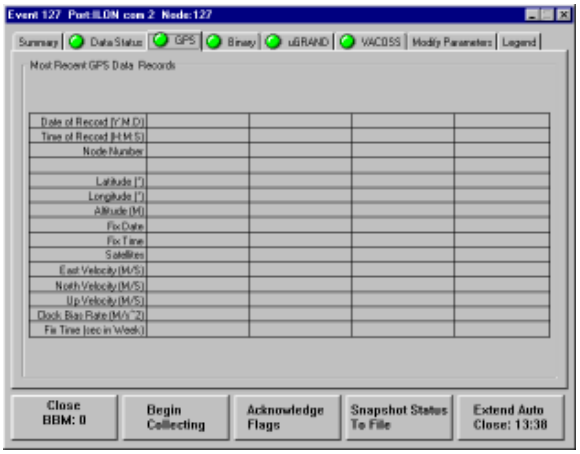


Figure 77 Data Status tab of the EVENT Instrument Support Object Dialog Box

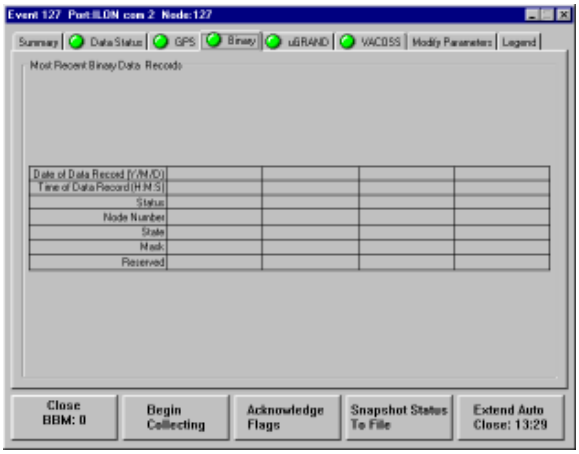
response along with the difference between the MIC computer's time and the apparent EVENT Instrument's time. It also presents the information from the data status record received from the EVENT instrument.

After the "Data Status" tab the next four tabs present recent data from each of the types of data the EVENT instrument supports. The "GPS" tab displays recent records from the all Global Positioning Systems this Event instrument supports. The most recent binary events (*e.g.* mechanical switch changes, trigger events, etc.) collected and subsequently reported to the EVENT instrument are displayed on the "Binary" tab. The uGRAND tab shown above has been removed. The EVENT Instrument Support Object will not support the uGRAND instrument. On the "VACOSS" tab event data, error, and information records recently received are displayed.

The GPS, Binary, and VACOSS tabbed pages provide the latest few data elements to be received.

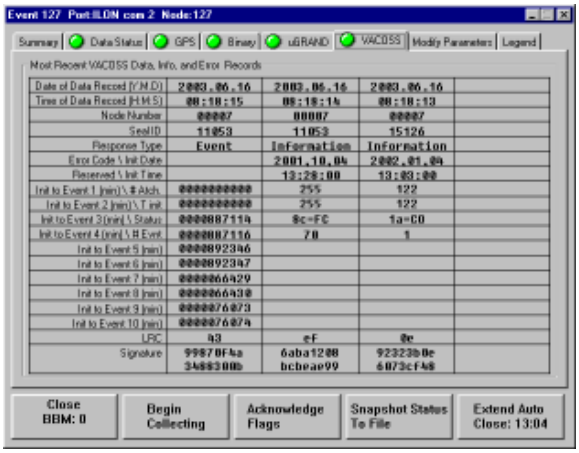


GPS data tab



Binary data tab

Note: Other instruments may be added to this set. Each will have an associated tab page to display recent data.



VACOSS data tab

Figure 78 Data tabs of the EVENT Instrument Support Object Dialog Box

14.3. Performance (PFM) File

Performance Files are text files containing date and time stamped performance information messages. One file is created each day using the configured file naming convention with a file extension of ".pfm".

All of the possible entries for EVENT type instrument performance files are listed below. The format is the same for all entries: "YYYY.MM.DD hh.mm.dd X nnnnn msg<cr><lf>". Where "YYYY" is the four digit year, "MM" is the two digit month, "DD" is the two digit day of month, "hh" is the hour, "mm" is the minute, and "ss" is the second of date and time. The "X" indicates where the date and time originate; "C" designates the MIC computer and "E" designates the EVENT instrument. "nnnnn" is a five digit identifier (ID) unique to that instrument and that specific message. (This ID is intended to support automated data analysis of the file.) The "msg" portion is the text message of the entry. All lines terminate with a carriage return character followed by a line-feed character.

The number in parenthesis at the end of some of the entries is the message type generated by the instrument that caused the performance file entry. The notation %s, %02x, and others in the message represent information received from the instrument. For example, %s is a text string, %02x is byte value represented as a hexadecimal number, and %f is a floating-point number.

If the maximum messages count for a specific message has been reached then the phrase "**(further occurrences not included)**" will be appended to the last message for that day. Only the messages indicated in the "Limited" column are restricted in this fashion. The message counts will all be returned to zero at the beginning of each day and anytime MIC is restarted.

In the table below the CEV column indicates that the associated message will also be written to the CEV file (see next section).

Some of the entries below contain notes to the reader. These notes will NOT be included in the performance file.

Limited	CEV	ID	Message
	Yes	40000	"EVENT COLLECT Version %s started"
	Yes	40010	"EVENT COLLECT Version %s started from abnormal shutdown
	Yes	40013	"EVENT Start new day"
Yes		40040	"EVENT Timeout on receive DUMPLAST response"
Yes		40050	"EVENT Timeout on receive DUMPLAST response (msg filter on)"
Yes		40110	"EVENT Timeout on INQUIRE2 command"
Yes		40120	"EVENT Timeout on INQUIRE2 command (msg filter on)"
Yes		41140	"EVENT Timeout on DUMPBBBM command"
Yes		41150	"EVENT Timeout on DUMPBBM command"
Yes		41160	"EVENT Timeout on DUMPBBBM command (msg filter on)"
Yes		41170	"EVENT Timeout on DUMPBBM command (msg filter on)"
		41200	"EVENT INSUFFICIENT NUMBER OF ACQUIRE RECORDS RECEIVED"
	Yes	41220	"EVENT HARD CHECKSUM ERROR"
	Yes	41240	"EVENT Multiple Timeout on DUMPOK -- assuming ok"
Yes		41260	"EVENT Timeout on DUMPOK command"
Yes		41270	"EVENT Timeout on DUMPOK command (msg filter on)"
	Yes	41290	"EVENT HARD CHECKSUM ERROR ON DUMPBBMOK"
Yes		41310	"EVENT Timeout on DUMPSTAT command"
Yes		41320	"EVENT Timeout on DUMPSTAT command (msg filter on)"
Yes		41350	"EVENT Timeout on receive ACK or NAK response"
Yes		41360	"EVENT Timeout on receive ACK or NAK response (msg filter on)"
		41380	"EVENT Timeout on EVENT initialization"
		41390	"EVENT Timeout on EVENT initialization (msg filter on)"
Yes	Yes	41410	"Local Break held off (start)"
Yes	Yes	41420	"Local Break sent (start)"
Yes	Yes	41430	"Break sent (start)"

Limited	CEV	ID	Message
Yes	Yes	41440	"Local Break held off (start) (msg filter on)"
Yes	Yes	41450	"Local Break sent (start) (msg filter on)"
Yes	Yes	41460	"Break sent (start) (msg filter on)"
Yes	Yes	41500	"Break sent (end)"
Yes	Yes	41510	"Break sent (end) (msg filter on)"
	Yes	41530	"WRITE FAILURE on BID file, SUPPORT TERMINATED"
	Yes	41540	"Attempt restart from WRITE FAILURE on BID file"
		41545	"EVENT COLLECT Power Fail Drive BBM to Zero."
		41550	"EVENT COLLECT take data stopped."
	Yes	41560	"EVENT COLLECT take data started."
	Yes	41570	"EVENT COLLECT stopped: Logon ID: xxx MIC User ID: xxx"
		41580	"Bad LParam Address Received (OOB)"
		41581	"xxx" *NOTE: xxx = content from OOB msg 41580.*
		41620	"%c%c %10u %02x %04x %02x %02x %02x %02x"
	Yes	41640	"Year < 1990"
	Yes	41650	"STATUS CHANGE - BATTERY BACKED UP MEMORY ERROR (1E)"
	Yes	41660	"Full"
	Yes	41661	"Bad Record Size"
	Yes	41662	"Write Failure"
	Yes	41663	"Bad Opcode Fetched"
	Yes	41664	"Unknown Error"
	Yes	41670	"STATUS CHANGE - NO BATTERY BACKED UP MEMORY ERROR (1E)"
		41690	"%c%c %10u %02x %02x %02x %02x %02x %02x %02x %02x %02x"
	Yes	41710	"%c%c UNKNOWN RECORD TYPE"
		41720	"%c%c %10u %02x %5u %5u %5u %5u %5u"
	Yes	41730	"%c%c %10u %02x %05u %04x %02x%02x%02x%02x %02x"
		41740	"%c%c %10u %02x %05u %02x%02x%02x%02x%02x%02x%02x%02x%02x%02x%02x%02x%02x %02x%02x%02x%02x%02x%02x%02x%02x%02x%02x%02x%02x %02x%02x%02x%02x%02x%02x%02x%02x%02x%02x%02x%02x %02x%02x%02x%02x%02x%02x%02x%02x%02x%02x%02x%02x %02x" *NOTE: Contains VACOSS event record.*
		41750	"%c%c %10u %02x %05u %02x%02x%02x%02x%02x%02x%02x%02x%02x%02x%02x%02x %02x%02x%02x%02x%02x%02x%02x%02x%02x %02x" *NOTE: Contains VACOSS information record.*
		41770	"CHECKSUM ERROR"
		41780	"LENGTH ERROR"
		41790	"xxx" *NOTE: message with checksum or length error.*

Limited	CEV	ID	Message
	Yes	41800	"Could not write to binary file"
	Yes	41810	"Successful write to binary file"
	Yes	41820	"Could not open binary file"

14.4. Critical Events (CEV) File

Critical Events Files are text files containing date and time stamped performance information of a more critical nature or possible loss of data. One file is created each day using the configured file naming convention with a file extension of ".cev". All potential entries in a CEV file are indicated in the above table.

14.5. EVENT Data Files

A unique data file is created for each of the supported object types (*e.g.* GPS, Binary, and VACOSS). Records are entered into these files soon after a block of data has been received from the EVENT instrument and the block has been verified. All multi-byte binary fields are in little-endian form.

14.5.1. GPS Data Files

Record 1: Header
- 4 ASCII bytes - size of header that follows this field ("0069")
- 5 ASCII bytes - not used
- 5 ASCII bytes – MIC version number
- 3 ASCII bytes - Station id
- 3 ASCII bytes - year
- 3 ASCII bytes - month
- 3 ASCII bytes - day
- 4 ASCII bytes - Year with century
- 43 ASCII bytes - spare for expansion

Record 2-n: 67 byte data records for each data acquisition
- 4 byte unsigned int - julian time, date of data acquisition
- 2 byte unsigned short int - record length
- 1 byte unsigned char - Record Type A
- 1 byte unsigned char - Record Type B
- 4 byte unsigned int - julian time
- 2 byte unsigned short int - node number
- 8 byte double - Latitude
- 8 byte double - Longitude
- 8 byte double - Altitude
- 1 byte unsigned int - Hour
- 1 byte unsigned int - Minute
- 1 byte unsigned int - Second
- 1 byte unsigned int - Day
- 1 byte unsigned int - Month
- 2 byte unsigned short int - Year
- 1 byte unsigned int - Satellite count
- 4 byte float - Fix Time A
- 4 byte float - East Velocity
- 4 byte float - North Velocity

4 byte float - Up Velocity
4 byte float - Clock Bias Rate
4 byte float - Fix Time B
1 byte unsigned int - Checksum

14.5.2. Binary Data Files

Record 1: Header
4 ASCII bytes - size of header that follows this field ("0069")
5 ASCII bytes - not used
5 ASCII bytes – MIC version number
3 ASCII bytes - Station id
3 ASCII bytes - year
3 ASCII bytes - month
3 ASCII bytes - day
4 ASCII bytes - Year with century
43 ASCII bytes - spare for expansion

Record 2-n: 15 byte data records for each data acquisition
2 byte unsigned short int - record length
1 byte unsigned char Record Type A
1 byte unsigned char Record Type B
4 byte unsigned int - julian time
1 byte - Status bits
2 byte unsigned short - node number
1 byte - State
1 byte - Mask
1 byte - Reserved
1 byte unsigned int - Checksum

14.5.3. VACOSS Data Files

Support for VACOSS seals is still under development. These file formats may change.

Record 1: Header
4 ASCII bytes - size of header that follows this field ("0069")
5 ASCII bytes - not used
5 ASCII bytes – MIC version number
3 ASCII bytes - Station id
3 ASCII bytes - year
3 ASCII bytes - month
3 ASCII bytes - day
4 ASCII bytes - Year with century
43 ASCII bytes - spare for expansion

Record 2-n: There are three types of messages which may be included: Error, Event, and Info.

Vacoss Error Record
4 byte unsigned int - julian time, date of data acquisition
2 byte unsigned short int - record length
1 byte unsigned char - Record Type A
1 byte unsigned char - Record Type B
4 byte unsigned int - Julian Time
1 byte unsigned int - ResponseType
2 byte unsigned short int - Node Number

2 byte unsigned short int - Error Code
4 byte Reserved
1 byte unsigned int - Checksum

Vacoss Event Record
4 byte unsigned int - julian time, date of data acquisition
2 byte unsigned short int - record length
1 byte unsigned char - Record Type A
1 byte unsigned char - Record Type B
4 byte unsigned int - Julian Time
1 byte unsigned int - ResponseType
2 byte unsigned short int - Node Number
36 byte - Seal Data
1 byte unsigned int - Checksum;

Vacoss Info Record
4 byte unsigned int - julian time, date of data acquisition
2 byte unsigned short int - record length
1 byte unsigned char - Record Type A
1 byte unsigned char - Record Type B
4 byte unsigned int - Julian Time
1 byte unsigned int - ResponseType
2 byte unsigned short int - Node Number
21 byte - Seal Data
1 byte unsigned int - Checksum;

15. APC UPS

The American Power Conversion Un-Interruptible Power System support object is used to extend the data collection time during an external power loss. The physical APC instrument will notify the APC support object when a power fail occurs. The support object will then move all of the data accumulated in the battery backed up memory of all instruments to the collect computer's hard disk, shutdown selected programs or services, and then safely power down the collect computer. During the power down sequence the APC support object will command the APC UPS to bring the system back up after a user selected period—typically 4 to 6 hours later. At which time, it the power loss persists, the support object will command all of the instruments to copy all of the battery backed up data to the hard drive again and again shutdown. This type of cycling can extend the non-loss of data operational period from one or two hours up to 18 or 20 hours or longer depending on the size of UPS and the state of the UPS batteries.

Recent versions of the APC UPS will not allow the unit after a power shutdown to return to supplying power if mains power has not returned. This is a significant change from previous versions of the APC UPS and effectively breaks the "power extend" capability of this instrument support object. Either way, this instrument support object is still useful in monitoring APC battery state.

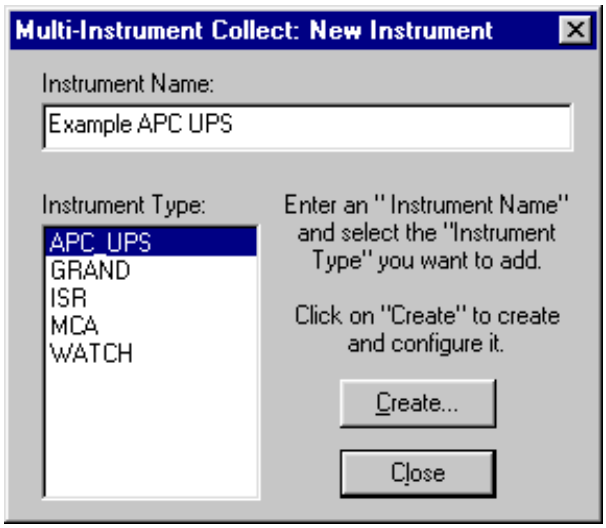


Figure 79 Add Instrument Dialog.

The APC UPS instrument support object has been expanded to support a unique UPS system built by Aquila. New Different from the APC UPS, which provides many status items, the Aquila UPS system only provides battery voltage. The APC UPS instrument support object automatically detects the existence of the Aquila UPS. Although the APC UPS still contains support for the Aquila UPS, support has been split out as a separate Instrument Support Object called Aquila UPS and should be used instead of the APC UPS. The dialogs displayed in the Aquila UPS Instrument Support Object are very similar to the APC UPS dialogs shown here.

The capability to run programs during shutdown was added with version 1.805 build 26. This capability may be used to stop services (*e.g.* MPSS, MicXfer, GemCommServer, DCMPoll, etc), stop applications (*e.g.* DelFi or any third party applications), or to run any site specific shutdown application. See the section on MIC.INI for specific instructions on how to configure this capability.

15.1. Configuration

To establish and configure an American Power Conversion Un-Interruptible Power System support object select the "Configuration" menu option (left click on the icon in MIC's main dialog title bar) and select the "Add Instrument" button. Because this instrument support object will need to connect to an existing communications object—if it hasn't been instantiated do so now by clicking on the "Add Comm…" button before proceeding. After selecting "Add Instrument" the user will be prompted for the type of instrument and the name of the instrument.

To instantiate an APC UPS support object click on the "APC_UPS" entry in the "Instrument Type" window and enter a name in the "Instrument Name" window—the "Create…" button will become active. Click on it to continue or select "Close" to exit without creating the support object. If "Create…" was selected then the APC UPS configuration dialog box will be presented.

To configure the APC UPS instrument support object select the "Communications Device" to which the APC UPS instrument is connected. This connection is NOT a standard serial line. The UPS serial cable supplied with the APC UPS (usually black) must be used! The communications object must be configured for 2400, None, 8, and 1. If the APC UPS is connected via an ILON network then the appropriate "Node" must be set and the node's baud

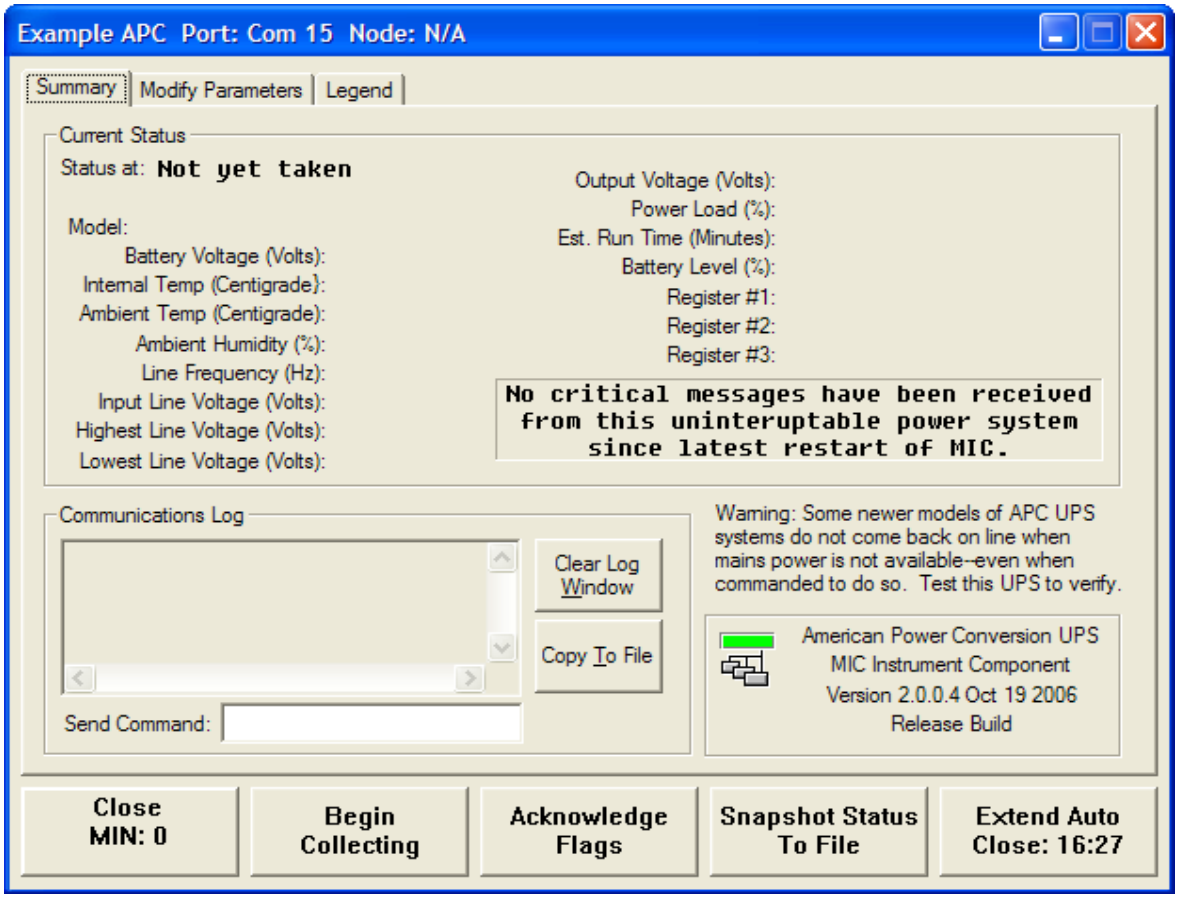


Figure 80 APC UPS Dialog.

rate must be set appropriately. The "Take Status Every" value controls how often the support object queries the physical instrument for status. "Restart Interval During Power Fail" controls the number of 6 minute intervals to tell the UPS system to wait before powering up the collect computer during an external power loss. "Delay Start Dumping" sets the time the support object should wait after detecting an external power loss before it starts dumping the battery backed up memory of all of the instruments to the hard drive. Like the other instrument support objects the APC UPS support object may be placed in a "pause" mode. When in this mode the support object will not take status from the physical instrument but WILL respond to loss of external power. If a loss of external power occurs while the support object is paused then it will immediately come out of paused mode, take status from the instrument, and continue through its normal power failure sequence. The "Station ID" must be set to a facility unique number and the "Location" for this instrument support object to write the PFM file to must be set. In the

"External programs to run during shutdown" section of the dialog the user must configure instructions for each of programs that should be shutdown or run during the power down sequence. During initial configuration this section is automatically loaded with typical commands in an appropriate order. It is up to the installer to add to or delete from this list.

WARNING!!! Some newer models of the APC UPS will not return power to the computer when mains power is not available. This change in the APC UPS effectively prevents MIC from power cycling to download instruments' BBM periodically during an extended power outage. Generally, the newer black boxed DO NOT but the older beige models DO. Any new model must be tested by setting up the APC UPS instrument support object to power cycle the computer and then remove mains power from the APC!

15.2. Use

When the user clicks on an APC UPS colored button in MIC's main dialog box a dialog box will be displayed. This dialog box presents the current configuration (which may be changed) and the current status of the APC UPS instrument.

Through the Modify Parameters tab of the APC UPS instrument dialog the user may modify the current configuration of the APC UPS instrument support object. The Summary Tab of the dialog is nearly identical to the Configuration Dialog shown earlier. The Communications Log area shows the support object's communications to and responses from the APC UPS physical instrument. In this section is a small edit input area. Enter an appropriate command and press the enter key to transmit it. All the available commands may be seen by clicking in the scrollable area of the communications log. The Current Status section displays the current status and the time at which that status was taken.

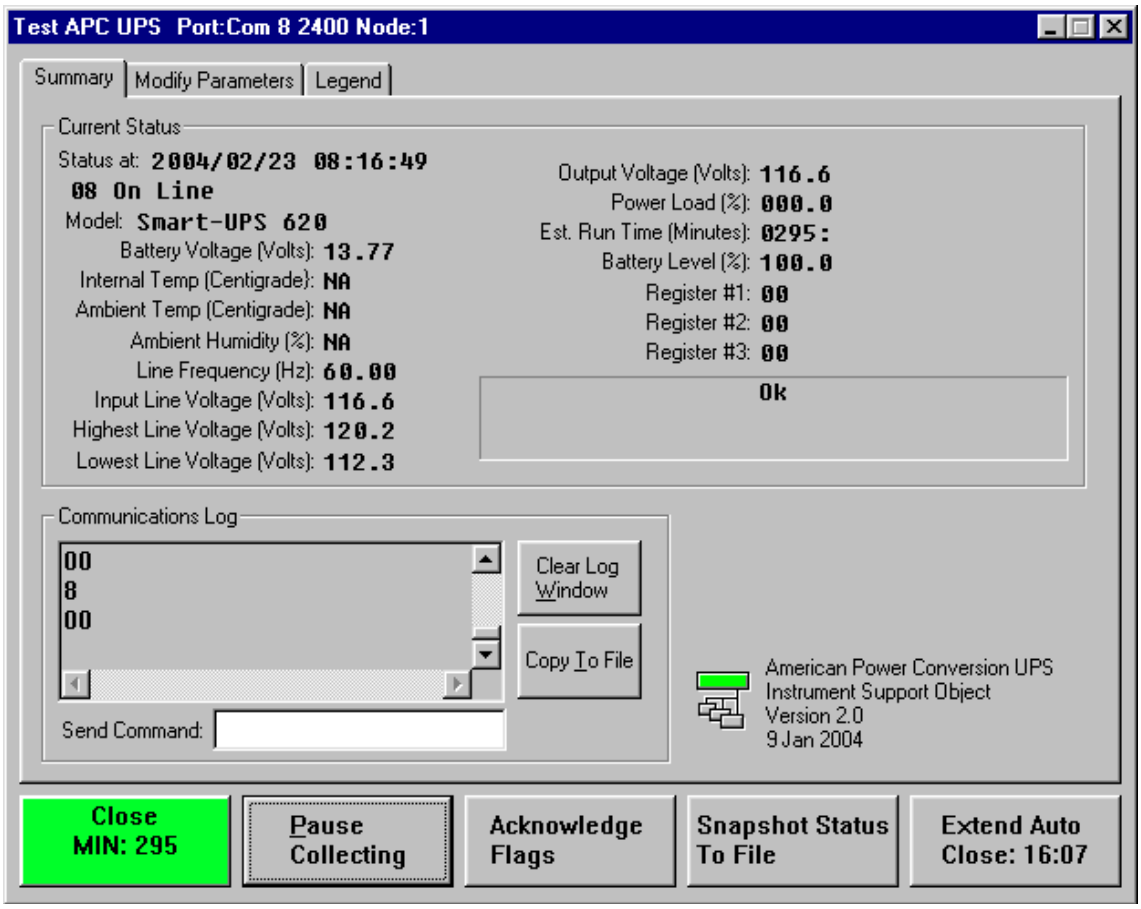


Figure 81 APC UPS Instrument Dialog.

The Modify Parameters tab is where any configuration changes may be made. Changes must be applied by clicking on the "Apply" button. The user must modify the entries in the "External programs to run during shutdown" as needed for each installation. The "Restart During Power Failure (6 Minute Intervals)" will not work on some newer models of APC UPS. See the warning above.

As part of the installation the user should verify the shutdown grace period is set to at least 30 seconds. The procedure is to go to the Summary tab and send the following commands:

1. Y (this will ensure the APC UPS is in smart mode
2. p (this will read the current shutdown grace delay in seconds
3. + (this will set the next higher shutdown grace delay and echo it back to the user
4. repeat p and then + until you've cycled through all of the possible settings and the value has returned to the lowest value above 30 seconds. Typical valid values are 000, 090, 180, 270, 360, 450, 540, and 630 but will be different for various models of APC UPS.

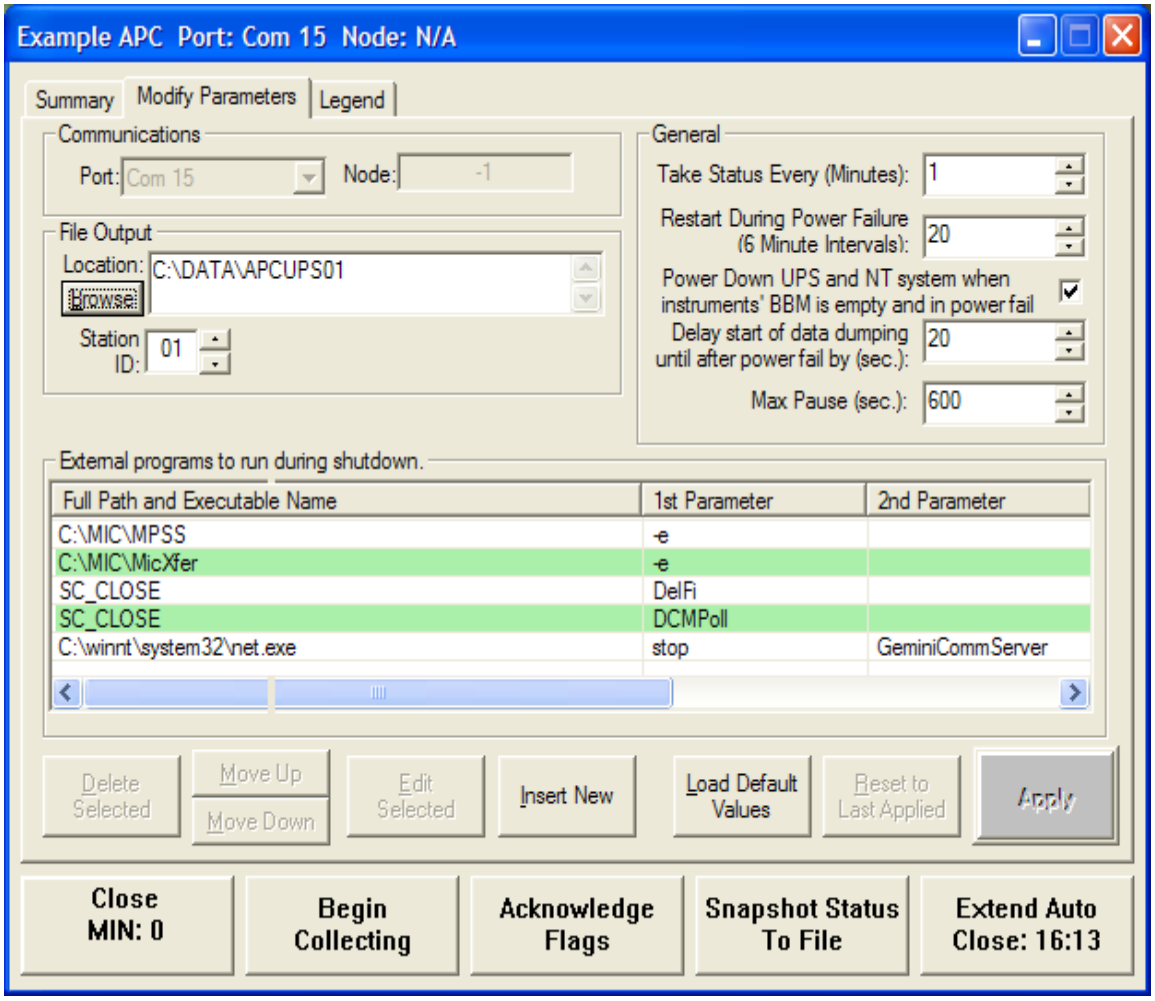


Figure 82 APC UPS Modify Parameters Dialog.

15.3. Performance (PFM) File

Performance Files are text files containing date and time stamped performance information messages. One file is created each day using the configured file naming convention with a file extension of ".pfm".

All of the possible entries for APC UPS type instrument performance files are listed below. The format is the same for all entries: "YYYY.MM.DD hh.mm.dd X nnnnn msg<cr><lf>". Where "YYYY" is the four digit year, "MM" is the two digit month, "DD" is the two digit day of month, "hh" is the hour, "mm" is the minute, and "ss" is the second of date and time. The "X" indicates where the date and time originate; "C" designates the MIC computer and "G" designates the APC UPS instrument. "nnnnn" is a five digit identifier (ID) unique to that instrument and that specific message. (This ID is intended to support automated data analysis of the file.) The "msg" portion is the text message of the entry. All lines terminate with a carriage return character followed by a line-feed character.

The notation %s, %02x, and others in the message represent information received from the instrument. For example, %s is a text string, %02x is byte value represented as a hexadecimal number, and %f is a floating-point number.

ID	Message
00000	"Computer System Time Changed"
00000	"Computer System Time Changed by MIC"
17290	"APC UPS ISO Version %s of %s started"
17300	"APC UPS ISO Version %s dated %s started from abnormal shutdown"
30005	"Critical Message: Power Failure Detected. Starting power failure sequence."
30005	"Critical Message: Power Failure Detected. Power down sequence turned off."
30006	"Critical Message: Power returned. Aborting power failure sequence."
30007	"Critical Message: Low Battery"
30008	"Critical Message: Replace Battery"
30010	"APC Model: %s"
30011	"Status : %d %s"
30014	"Battery Voltage: %f"
30015	"Internal Temp: %f"
30016	"Ambient Temp: %f"
30017	"Ambient Humidity: %f"
30018	"Line Frequency: %f"
30019	"Line Voltage: %f"
30020	"Highest Line Voltage: %f"
30021	"Lowest Line Voltage: %f"
30022	"Output Voltage: %f"
30023	"Power Load (%): %f"
30024	"Est. Run Time (min): %f"
30025	"Battery Level (%): %f"
30026	"Register #1: %d"

ID	Message
30027	"Register #2: %d"
30028	"Register #3: %d"
30029	"Critical Message: Ok"
30030	"Critical Message: Driving BBM to 0 (3000)"
30031	"Critical Message: Powering down UPS (3100)"
30032	"Critical Message: Power Down UPS Blocked (3100)"
30033	"Critical Message: Received %s"
30034	"Critical Message: Powering down NT (3200)"
30035	"Critical Message: Open Process Token Failed (3200)"
30036	"Critical Message: Adjust Token Failed (3200)"
30037	"Critical Message: Exit Windows Failed (3200)"
30038	"Critical Message: Power Down Blocked (3200)"
30040	"Critical Message: Communications Failure (9000)"
30041	"SHUT DOWN PROGRAM: %s %s Not Found"
30041	"SHUT DOWN PROGRAM: %s %s Ok"
30041	"SHUT DOWN PROGRAM: %s %d"
30099	"Get Status: YYYY/MM/DD HH:MM:SS"
30099	"APC COLLECT stopped: Logon ID: xxx MIC User ID: xxx"

15.4. Critical Events (CEV) File

The APC UPS Instrument Support Object does not create a CEV file.

15.5. Data File

The APC UPS Instrument Support Object does not create any data files.

16. AQUILA UPS

The Aquila Un-Interruptible Power System support object is used to extend the data collection time during an external power loss. The Aquila UPS instrument support is included in MIC 2.0.0.0 forward for completeness. The Summary tab is similar to the APC UPS instrument support object as shown below. The Modify Parameters tab is identical to the APC UPS's.

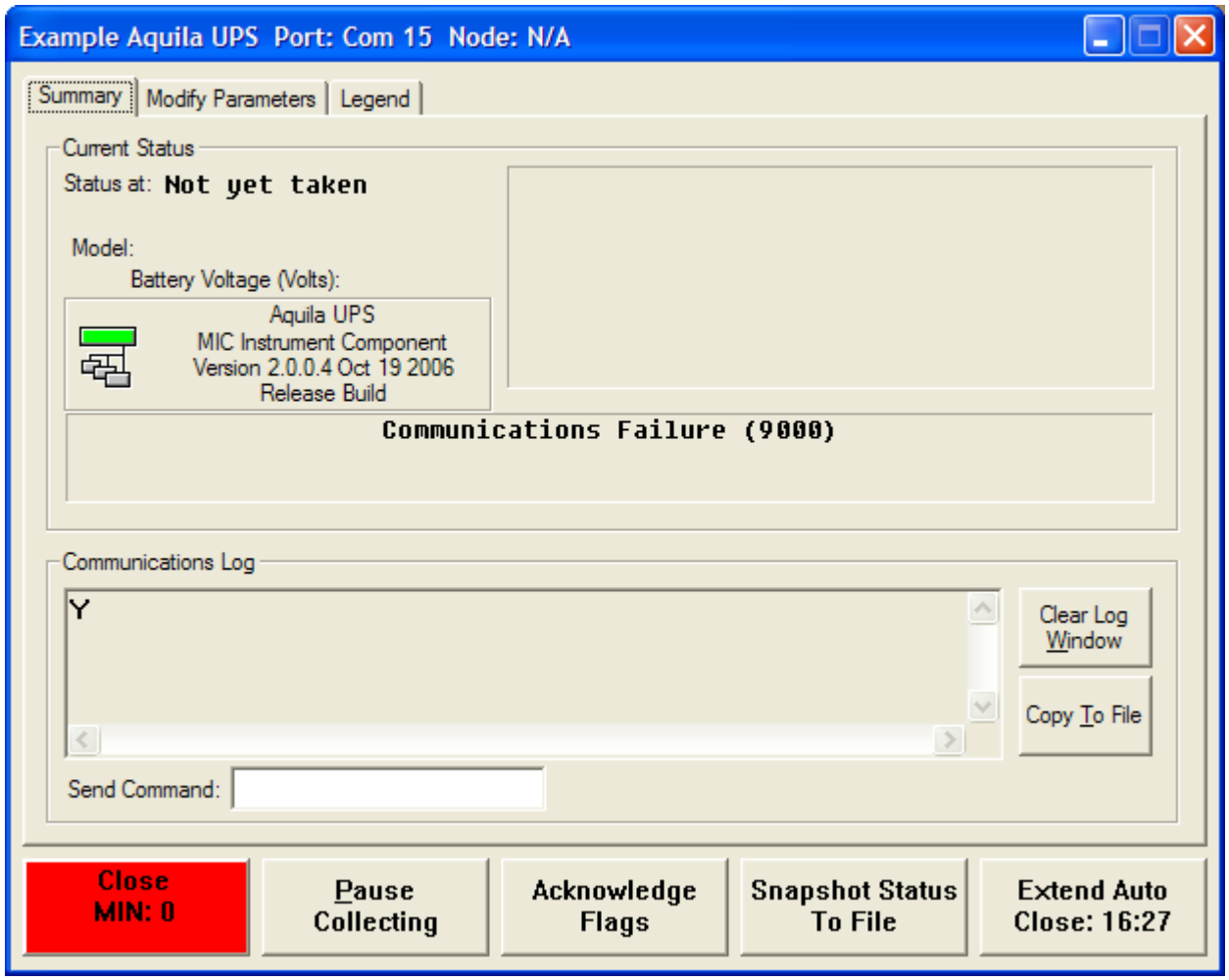


Figure 83 Aquila UPS Summary Tab.

17. WATCHER

The Watch type instrument provides communications monitoring to all of the other instruments. It also provides the ability to manually send commands to the watched instrument and to send files of commands to the instrument. When connecting to an ILON network a Watcher window can monitor communications to and from an individual instrument or by selecting node 0 it may watch all communications to and from the ILON network.

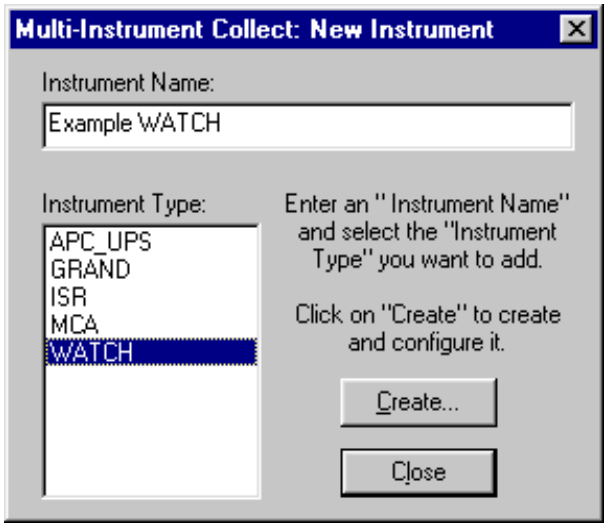


Figure 84 Add Instrument Dialog.

17.1. Configuration

To establish and configure a Watcher type support object select the "Configuration" menu option (left click on the icon in MIC's main dialog title bar) and select the "Add Instrument button". Because this support object will need to connect to an existing communications object—if it hasn't been instantiated do so now by clicking on the "Add Comm…" button. After selecting "Add Instrument" the user will be prompted for the type of instrument and the name of the instrument.

Click on the "Create…" button to continue creating the Watcher support object. The Watcher configuration dialog box will be displayed.

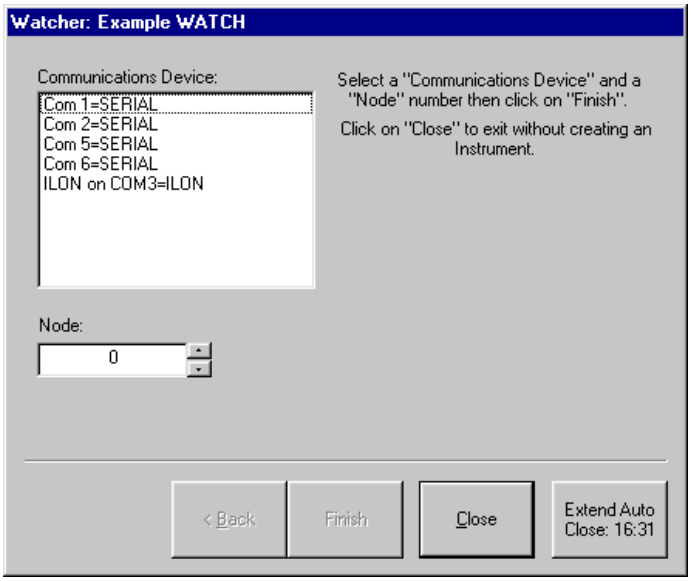


Figure 85 Watcher Configuration Dialog.

There are only two items which must be selected to configure the new Watcher support object. First, the communications object which the Watcher will monitor must be selected. To do so click on the appropriate entry in the Communications Device area. Second, the Node must be selected. If the selected communications support object is of type "SERIAL" as depicted in the first four items in the figure then the "Node" entry will be ignored. If an "ILON" type is selected then the Node value may be one of two values. If it is set to "0" then the watcher will display all communications, both directions, to the selected ILON network—including the ILON packet information. If a Node number other than 0 is selected then only communications traffic involving the selected node will be displayed.

17.2. Use

The Watcher support objects have a colored button on the MIC main dialog similar to the other instrument support objects. Because the Watcher doesn't actually control an instrument like the GRAND, ISR, MCA, DSPEC, JSR, BELKIN_UPS, and APC_UPS support objects do, its colored button is white. When this button is clicked a special Watcher dialog box is displayed.

Figure 86 Watcher's Colored Button.

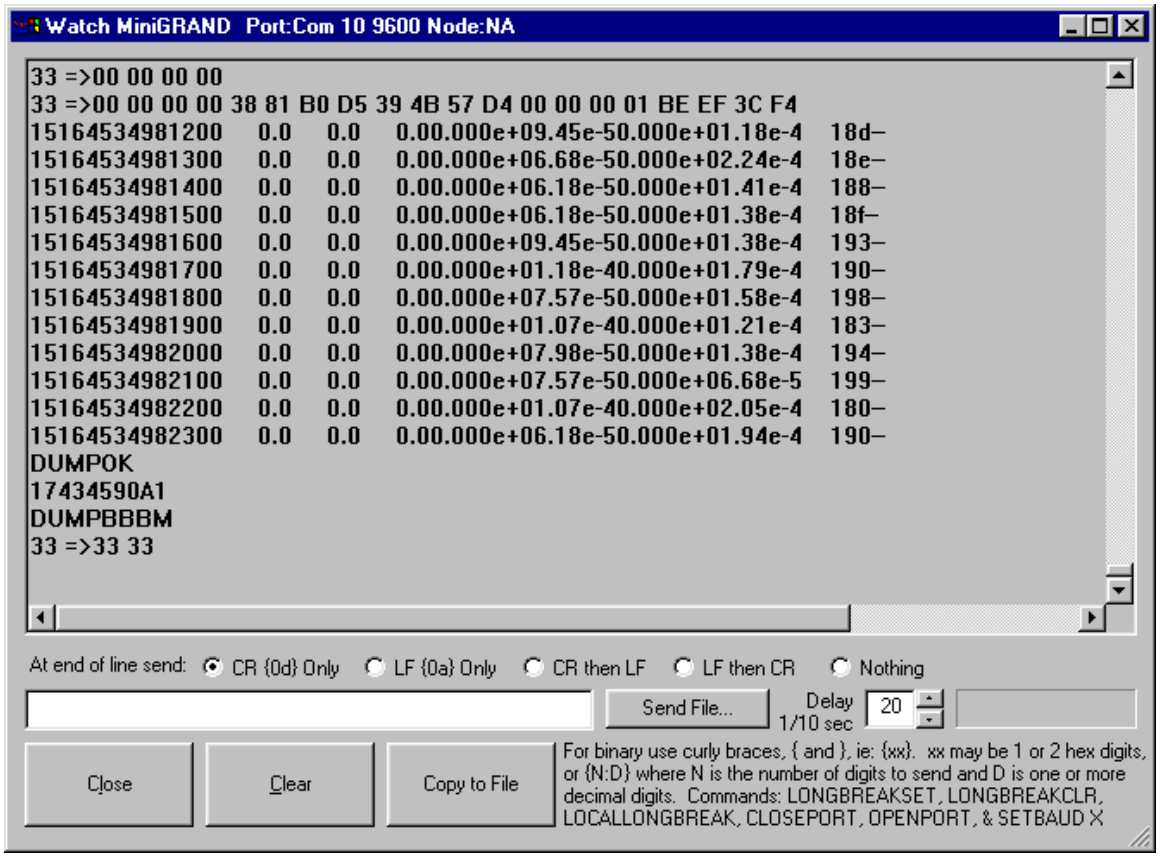


Figure 87 Watcher Dialog Box.

The top portion of the Watcher dialog box is a scrolling list of the most recent commands sent to the instrument and the responses received from the instrument. Close to the bottom of the dialog, above the three large buttons, is an input area which can be used to send commands to the watched instrument and above that are radio buttons which set what to send at the end an input line. A file containing commands may also be sent to the instrument by clicking on the "Send File…" button. While sending a file the value in the "Delay 1/10 sec" may be adjusted to increase or decrease a delay between each line transmitted. When a file is sent the end of line treatment will be as set in the radio buttons. A long break may be sent to the watched instrument by entering "LONGBREAKSET" in the input window and pressing the enter key. The long break must be cleared by sending "LONGBREAKCLR" using the same technique. A local

long break may be sent to the local ILON by entering “LOCALLONGBREAK”. It also requires a “LONGBREAKCLR” follow-up command. So that other programs may use the serial port, for example Iconfig, the port may be closed and subsequently reopened using the "CLOSEPORT" and "OPENPORT" commands. The "SETBAUD X" command may be used to force the port's baud rate to another value. For example "SETBAUD 2400". This DOES NOT change the MIC configuration and should only be used by knowledgeable users. Further, it only modifies the local serial port.

18. MPSS and MPSU

Multi-Program Startup Service (MPSS) and Multi-Program Startup User (MPSU) are identical NT service type applications designed to ensure one or more applications are always running on the system. They are controlled via INI files and can be set to ensure an unlimited number programs are running. They periodically check to see if a given window title exists on the system. Some programs use a technique employing a string of characters that uniquely identify that program; MPSS and MPSU can use that unique string also. In the case of MIC it is "MultiInstCollect" and as of version 2.0.0.4 "multiinstcollect" is also used. For software developers who wish to use this capability the unique string is the name of a windows global named mutex. There is no external technique to see what mutex a program has created other than to try to create it again and note the failure. Each of the MIC utilities also registers a unique class name with the operating system. If MPSS or MPSU does not find the window title, the uniquely identified program mutex, or the unique class name then the associated application is started with the default directory the same as the directory the in which is the executable. MPSS is intended to run in the "system" account and consequently all of the programs it starts do also. Whereas MPSU is intended to run in a valid user account and consequently all of the programs it starts run in the same user account.

Some of the unique identifiers are:

Name	Mutex	Class Name	Title
MicMgr	MultiInstrumentCollect multiinstrumentcollect	MICClass	User configurable
MsgUtil		MsgUtilClass	User configurable
DelFi		DelFiClass	DelFi
EZ-Copy		EZCopyClass	EZ-Copy – v.v.v.v
EZ-Move		EZMoveClass	EZ-Copy – v.v.v.v
Tracker	See § 22.4 for details	TrackerClass	Tracker < User configurable> v.v.v.v

18.1. Installation

After copying the MPSS.EXE (MPSU.EXE) and the MPSS.INI (MPSU.INI) files to a target directory the INI file must be edited to provide the correct configuration—see the following section. There are a few command line parameters which MPSS.EXE (MPSU.EXE) will respond to:

mpss –i
mpsu –i
Installs the services. The installation may be verified by opening the NT control panel and double clicking on the "Services" entry. See the figure below.

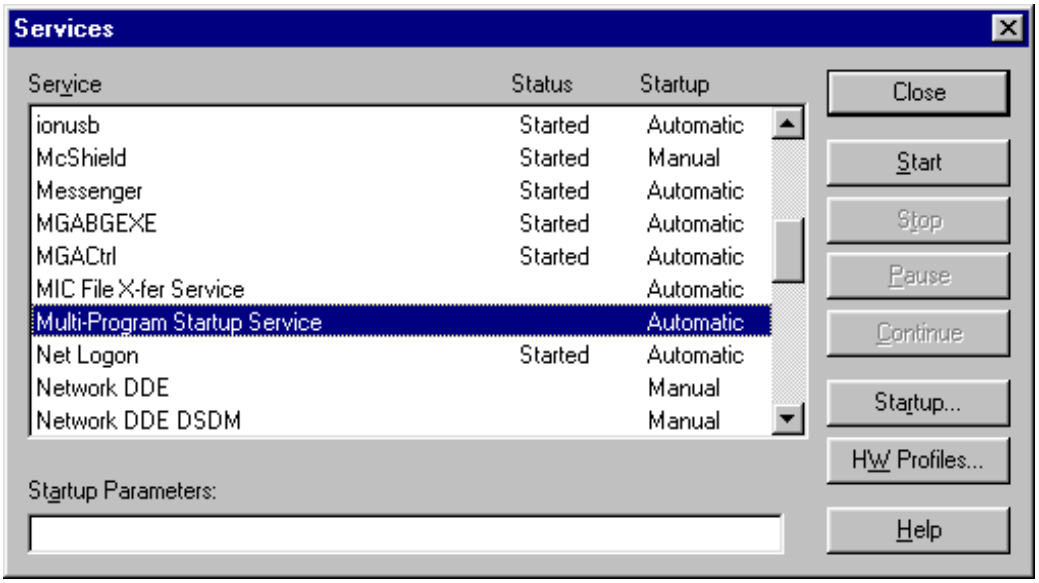


Figure 88 NT 4.0 Services Dialog With MPSS Installed.

mpss –u
mpsu –u
Un-installs the Multi-Program Startup Service or the Multi-Program Startup User.

mpss –e
mpsu –e
Stops the Multi-Program Startup Service or the Multi-Program Startup User. This is a useful command if you are attempting to update mpsu or mpss as it doesn't change the login configuration of the service.

mpss –s
mpsu –s
Starts the Multi-Program Startup Service or the Multi-Program Startup User.

The Multi-Program Startup Service should be run in the system account. This is the default and may be set or verified by clicking on the "Startup…" button in the Services dialog box shown above. Typically, MPSS should be set to run automatically as shown below.

Figure 89 The MPSS Services Dialog.

The MPSU should be started in a user account. Instead of the "System Account" being checked the "This Account:" should be and the account name and passwords should be filled in. **Processes that are started on an account other than the "System Account" cannot be displayed on the desktop of the computer—even if the user is logged into that account!**

If either of these services are running when the "Log On As" values are changed then the service must be stopped and restarted.

18.2. Configuration

MPSS and MPSU are configured via its INI file, MPSS.INI and MPSU.INI. These file should be in the same directory as the mpss.exe and mpsu.exe file. They contain only one section called "CONTROL". The "CYCLE" control tells MPSS (MPSU) how often in seconds to check if the programs are running. In the example below MPSS (MPSU) will check every 30 seconds from the time it was started. Each time MPSS (MPSU) begins a check sequence it looks at the INI file's archive flag. If the flag is set MPSS (MPSU) will reread the INI file and clear the flag. Therefore, if a configuration change is required the user need only edit the INI file and save it (this will set the archive flag). When MPSS (MPSU) rereads the INI file it will also clear the flag. The user may verify MPSS (MPSU) has read the INI file by watching the archive bit with NT Explorer. The VERSION entry is added automatically when MPSS or MPSU start up. It is the version of the currently running MPSS or MPSU. INITIALPAUSE_SEC is the amount of time in seconds after initial start up that MPSS or MPSU will wait before starting any of the target programs. It is useful to control the startup of a program when there are dependencies on other parts of the operating system. For example, in NT4.0 a PCMCIA card services utility may need to be running before MIC starts up.

Example MPSS.INI or MPSU.INI file.

```
[CONTROL]
;cycle time in seconds
CYCLE=30
VERSION= 1.7.1.0
INITIALPAUSE_SEC=20
;n=Mutex name or dialog title, full path to executable
1=MultiInstCollect, D:\MIC\MicMgr.EXE
2=MIC - Royal Crest Space 13, D:\MIC\Tracker.exe
3=MIC - West Reactor Pit, D:\MIC\Tracker.exe  WestPit
```

The numbered entries in the INI file are the programs and their associated unique identifier or main dialog title. On each cycle MPSS (MPSU) will step down this list until there are no more entries. On each entry MPSS (MPSU) will first look for the unique identifier as in 1 which is "MultiInstCollect" and "multiinstcollect". MIC creates these unique identifiers when it is started by creating what is called a named global mutex. If MIC is not running MPSS (MPSU) will not find either of the unique identifiers ("MultiInstCollect" nor "multiinstcollect") so it will look for an application with "MultiInstCollect" as its class name. If none can be found then MPSS (MPSU) will look for a main dialog box title of "MultiInstCollect". If none can be found MPSS (MPSU) will change the default directory to "D:\MIC" and execute "MicMgr.exe". The same is true for each of the entries. The first part of the entry must match the unique identifier, class name, or the application's main dialog box title. In the case of MIC "MultiInstCollect" or "multiinstcollect" must match exactly. In all other situations the test is not case sensitive (*e.g.* MULTI is the same as multi). The second part, after the comma, must be the full path to the application. If an entry's name will include a comma then enclose the string in quotes (*e.g.* 3="MIC – West Reactor Pit, #1", D:\MIC\Tracker.exe WestPit). If an entry's path includes a space then enclose it in quotes. Command line arguments may be placed after the path to the executable as shown in entry 3 above.

18.3. Use

There are no dialog boxes created by the MPSS or the MPSU service application. The user should verify the service is running via the Control Panel's Service applet and that it is set to automatically startup. Proper function can be verified by adding a program to the numbered list and waiting up to the cycle time to verify MPSS (MPSU) starts it up. Proper functioning may also be verified by terminating a program which is on the list such as MIC and subsequently waiting up to the cycle time to see if MPSS (MPSU) starts it back up. Note that programs started by MPSS have access to the desktop and consequently will be displayed. Programs started by MPSU do **NOT** have access to the desktop and consequently cannot be displayed.

19. MicXfer

MicXfer is an NT service application designed to copy files from multiple source locations to multiple destination locations. It uses a file's archive flag to detect if the file has been previously copied. After successful copy of the file the archive flag is cleared. A subsequent write operation by an application to the file will turn the archive flag back on and cause MicXfer to copy the file again. Any application creating a file in one of the source directories will cause MicXfer to copy the file and clear its archive flag. If MicXfer is configured to move the file into a ZIP file then in that case only, it may be configured to ignore the state of the archive flag and zip the file—in all other cases MicXfer will NOT move the file if the archive bit is off and will if it is on. MicXfer may copy files to different locations within a machine or between machines. If it is configured to copy to one or more other systems it must be installed to run under a user account which has write privileges on the MicXfer system as well as each system to which it will be copying the files. Both the account name and the password must be identical for the account on all target systems. The account need not be logged on any of the systems, MicXfer will be running as a user under that account. When running on Windows XP the account it is running under should have Administrator privileges.

MicXfer also has the ability to maintain both an extensive log file or an abbreviated log file. It also can be configured to post UDP packets to multiple systems, including the same system, containing logging information. There are two levels of logging, verbose and not verbose. When configured to be not verbose only successful file copies are logged.

19.1. Installation

After copying the MicXfer.EXE and the MicXfer.INI files to the install directory the INI file must be edited to provide the correct configuration-—see the following section. It then must be installed as an NT service. There are a few command line parameters which MicXfer.EXE will respond to:

MicXfer -i
Installs the service. The installation may be verified by opening the NT Control Panel and double clicking on the "Services" entry. See the figure below.

MicXfer -u
Un-installs the MicXfer service.

MicXfer -s
Starts the MicXfer service.

MicXfer -e
Ends the MicXfer service.

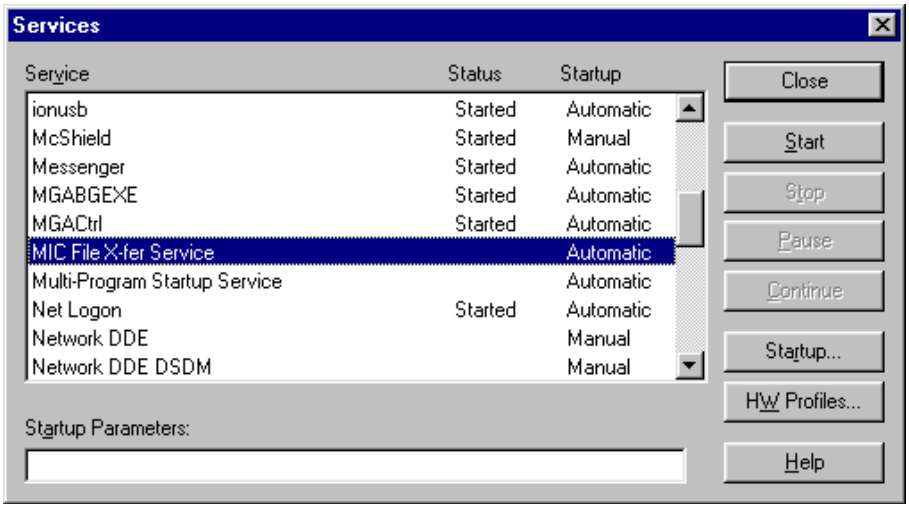


Figure 90 NT 4.0 Services Dialog With MicXfer Installed.

The MicXfer service should be run in a user account which has write privileges on all target systems. This is NOT the default installation and must be set manually by double clicking on the MIC File X-fer Service entry in the Services dialog box above. The subsequent dialog box will allow setting an appropriate user account and password. MicXfer will not be able to function if the account and password are not identical on the MicXfer computer and each of the target computers. If MicXfer will be configured to copy files only on the same system it is running on then it may be configured to run in the "System Account". **If MicXfer is being configured on a Windows XP system then the account MUST have administrator privileges.**

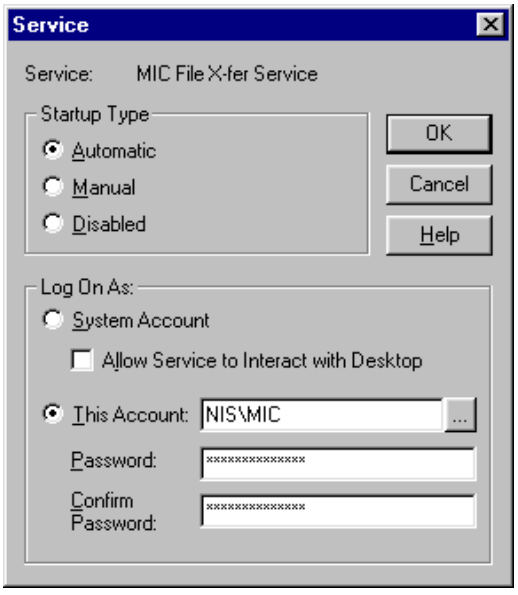


Figure 91 MicXfer NT Service Dialog

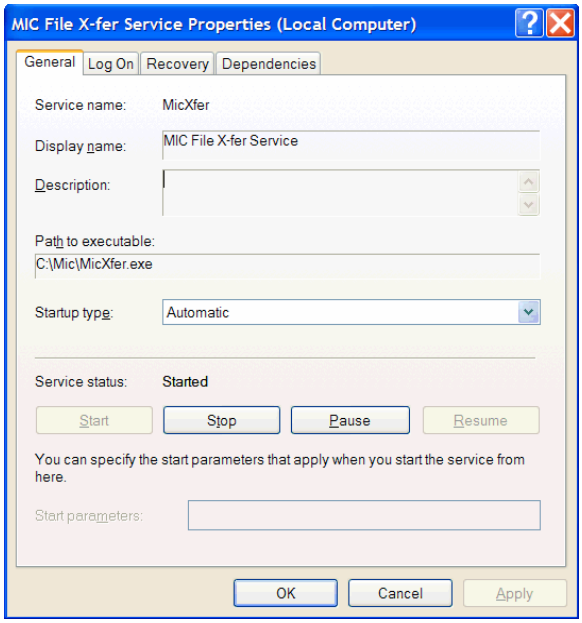


Figure 92 MicXfer XP Service Dialog.

19.2. Configuration

MicXfer is configured via an INI file, MicXfer.INI. This file should be in the same directory as the MicXfer.exe file. It may be manually edited to configure MicXfer although using MicXferC to modify the INI file is a much better choice.

The first section in the INI file is the "CONFIGURATION" section. The CYCLE entry is how often in seconds MicXfer will check to see if it needs to copy files. If none of the files are more often than once per day a reasonable entry might be 3600 seconds or once per hour. MicXfer can create a log entry for each attempted file copy. To turn on logging set DOLOG to 1 or Yes as shown below. To turn off logging set it to 0 or No. MAXLOG is the maximum length of the log file in bytes. When MicXfer detects it has exceeded that limit the file is deleted and a new one is begun. VERBOSE controls the messages which are placed into the log and UDP transmission. When VERBOSE is set to no some messages are not logged or transmitted. MicXfer has the ability to receive new configuration information while it is running. This new information is in the form of an INI file with a digital signature added for security. The VALIDATEPATH entry contains a path to a program which will be used to certify the digital signature is valid. ZIPPATH is the location of pkzip.exe. It is used to create the ZIP files when needed. USERNAME, DOMAINNAME, and VERSION are automatically added to the INI file each time MicXfer is run. If DO_UDP is set to "Yes" then PORT is the port the UDP packets will be sent on. When DO_UDP is not set to "Yes" the setting of PORT is not significant. The CALENDAR section controls when and how often MicXfer will look for the new configuration information. Typically, this option is not used. INITIALPAUSE_SEC is the number of seconds after initial startup to wait before attempting to do any file copies. When MAXLOG is set to 0 no limits are imposed on the length of the log file. The log file may contain automatically substituted variables for: four char year (%Y), two char year(%y), numeric month (%m), text month (%B), abbreviated text month (%b), numeric day of month (%d), text day (%A), abbreviated text day (%a), hours in the day (%H), and minutes in the hour (%M) in any combination. Note that setting a name containing the year, month, and day will cause a unique file name to be generated for each day where as if only year and month are used then a unique file will be generated for each month. If DO_UDP is set to Yes then UDP packets will be sent on the port number in PORT to the IP addresses listed in 1, 2, etc.

[CONFIGURATION]
CYCLE=30
DOLOG=No
MAXLOG=200000
VERBOSE=NO
VERBOSEUDP=No
LOGPATHNAME=C:\data\LOG%Y%b%d.txt
VALIDATEPATH=c:\mic\GemAuth.exe
ZIPPATH=c:\mic\pkzip.exe
USERNAME=SYSTEM
DOMAINNAME=NT AUTHORITY
PORT=2323
DO_UDP=Yes
INITIALPAUSE_SEC=1
VERSION=1.8.3.1
1=192.168.1.1
2=192.168.1.3

The following sections contain the INI file information MicXfer uses to select how often to copy files, the source directories, and the destination directories. There are five sections: CALENDAR, ACQUIRE, CEV, PFM, and OTHER. The CALENDAR section controls when and where MicXfer will look for new configuration information. Updating the configuration works slightly different than the other four sections; only the first source and destination directories are

significant. When a new CALENDAR.CAL file is detected and authenticated its contents are read and the MicXfer.INI file is immediately updated. In the other four sections all of the source – destination pairs are significant. The following section from the INI file describes the meaning of the timing entries in all five sections. By setting the CONTROL entry appropriately MicXfer can be set to: never transfer, transfer every n seconds, transfer every n minutes, transfer every n minutes, transfer daily at a particular time of day, transfer weekly at a particular day and time of day, transfer monthly at a particular day of month and time of day, or to transfer one time at a specified date and time.

;CONTROL=<NEVER,SECOND,MINUTE,HOURLY,DAILY,WEEKLY,MONTHLY,PROGRAM>
;NEVER reads nothing
;SECOND reads only TIMESECOND and repeats that often
;MINUTE reads only TIMEMINUTE and repeats that often
;HOURLY reads only TIMEMINUTE and repeats on TIMEMINUTES after hour
;DAILY reads only TIMEHOURS, TIMEMINUTES and repeats on TIME each day
;WEEKLY reads DAYOFWEEK and TIME and repeats each occurrence
;MONTHLY reads DATEDAY and TIME and repeats each occurrence
;SOURCEDIRn directory to get files from
;DESTINDIRn directory to send files to
;DESTINDIRna second directory to send files to
;DESTINDIRnb third directory to send files to
;DOZIP=Y
;DOSUB=Y

The DOZIP option tells MicXfer to zip each day's files into a single file with an extension of ".ZIP". The file will be named: YYYY_MM_DD.ZIP where "YYYY" is the four digit year, "MM" is the two digit month, and "DD" is the two digit day of the month. This capability is extremely useful if a large number of files are being created in the directory (as is the case for JPG files). There is very little advantage to turning on the ZIP capability on in directories which will contain only one file per day—such as the CEV and PFM directories. If MicXfer has difficulty appending to an existing ZIP file then it assumes the file has been corrupted and appends "BAD" to the name and starts a new ZIP file. DOZIP may have "YI" standing for Yes and Ignore. The Ignore flag tells MicXfer that if it is moving the target file into a ZIP file then it doesn't care if the archive bit is on or not—go ahead and move the file.

The DOSUB option tells MicXfer to go into all sub-directories of the section's source directories and repeat the commanded action. If MicXfer goes into a sub-directory and finds a file which needs to be moved then the that subdirectory will be created under each of the destination directories and then the file will be copied into it.

The following section is a typical CALENDAR section indicating that MicXfer should look for a new configuration file called "CALENDAR.CAL" on the NIS5 computer in the "\host3\pelowitz" subdirectory. It should look daily at 6:30 every morning and the next time to look is on May 7, 1999. If it finds a new CALENDAR.CAL file then MicXfer will authenticate it using the program referenced in the CONTROL section and if ok update the MicXfer.INI file as directed by it. The file will be copied to the directory named in the DESTINDIR1 entry. Note that the source directory may use the Universal Naming Convention. See the examples below for various options such as using a dotted IP address.

[CALENDAR]
CONTROL=DAILY
DATEDAY=1
DATEMONTH=1
DATEYEAR=1999

TIMEHOURS=6
TIMEMINUTES=30
DAYOFWEEK=0
FILESPEC=CALENDAR.CAL
PREVIOUS=06 May 1999 06:30:00
NEXT=07 May 1999 06:30:00
SOURCEDIR1=\\NIS5\host3\pelowitz
DESTINDIR1=d:\MIC

Each of the four remaining sections work similar to the CALENDAR section. The major difference is that there is no file content validation nor is there an associated modification to the MicXfer configuration—MicXfer simply copies the files from the set of source directories to the set of destination directories at the time indicated. They each may contain one or more source directory – destination directory pairs, to a maximum of 50 pairs. Multiple destination directories may be used. After each individual file is successfully copied to each destination its archive bit is cleared. Consequently, if two sections reference the same source directory then only the first copy will occur—when the second looks at the same directory all of the files will have their archive bits off indicating the files have been copied.

The five remaining sections are named to assist in grouping the class of files to be transferred. For example, the ACQUIRE section is intended to be used to transfer binary acquire record files. Because the file extensions are included in the FILESPEC entry, the section may be used to copy any file type—not just binary acquire records. In this example only acquire records from GRAND, ISR, and MCA instrument support objects will be copied. The copy will occur once per hour at 15 minutes past the hour. The PREVIOUS and NEXT will automatically be updated when the copy occurs. All of the files in each of the source directories matching the wildcards in the FILESPEC entry which have their archive bit on will be copied to the associated destination directory(s).

[ACQUIRE]
CONTROL=HOURLY
DATEDAY=0
DATEMONTH=0
DATEYEAR=0
TIMEHOURS=0
TIMEMINUTES=15
DAYOFWEEK=0
FILESPEC=*.BID,*.ISR,*.MCA,*.JSR
PREVIOUS=06 May 1999 12:15:00
NEXT=06 May 1999 13:15:00
DOZIP=Y
DOSUB=Y
SOURCEDIR1=c:\data\isr01
DESTINDIR1=\\NIS5\host3\pelowitz\isr01
DESTINDIR1a=\\MyMachine\test\isr01
SOURCEDIR2=c:\data\grand11
DESTINDIR2=\\NIS5\host3\pelowitz\grand11
DESTINDIR2a=\\MyMachine\test\grand11
DESTINDIR2b=\\AnotherMachine\GoodData\grand11

The CEV and PFM sections are intended to provide a configuration for copy of critical event files and for performance files. Like the ACQUIRE section above any file type may be transferred by modifying the FILESPEC to the desired wild card or even to a specific file name.

[CEV]
CONTROL=HOURLY
DATEDAY=0
DATEMONTH=0
DATEYEAR=0
TIMEHOURS=0
TIMEMINUTES=15
DAYOFWEEK=0
DOZIP=N
DOSUB=N
FILESPEC=*.CEV
PREVIOUS=06 May 1999 12:15:00
NEXT=06 May 1999 13:15:00
;source - destination pairs
SOURCEDIR1=c:\data\isr01
DESTINDIR1=\\NIS5\host3\pelowitz\isr01
SOURCEDIR2=c:\data\grand11
DESTINDIR2=\\NIS5\host3\pelowitz\grand11

[PFM]
CONTROL=HOURLY
DATEDAY=0
DATEMONTH=0
DATEYEAR=0
TIMEHOURS=12
TIMEMINUTES=30
DAYOFWEEK=15
DOZIP=N
DOSUB=N
FILESPEC=*.PFM
PREVIOUS=06 May 1999 12:30:00
NEXT=06 May 1999 13:30:00
SOURCEDIR1=c:\data\isr01
DESTINDIR1=\\NIS5\host3\pelowitz\isr01
SOURCEDIR2=c:\data\grand11
DESTINDIR2=\\NIS5\host3\pelowitz\grand11

The OTHER section is intended as a catch all section for files which don't fit in the categories used above. In this example every 10 seconds all files matching *.HTML which have the archive flag set will be copied from the D:\MIC directory to a system IP addressed as 204.121.16.3 into a subdirectory of NIS5software.

[OTHER]
CONTROL=SECOND
DATEDAY=31
DATEMONTH=12
DATEYEAR=1999
TIMESECONDS=10
TIMEHOURS=17
TIMEMINUTES=1
DAYOFWEEK=1
DOZIP=NI
DOSUB=N
FILESPEC=*.HTML

PREVIOUS=06 May 1999 12:40:20
NEXT=06 May 1999 12:40:40
;source - destination sets
SOURCEDIR1=D:\MIC
DESTINDIR1=\\204.121.16.3\NIS5software
DESTINDIR1a=
DESTINDIR1b=
DESTINDIR1c=
DESTINDIR1d=

A section called "[JPG]" also exists.

The Universal Naming Convention, UNC, used in the source and destination directories above follow the following requirements: \\System\dirsharename\path. System may be a system name on the network or a dotted IP address as shown above. If the target drive is not the default drive then the hidden share name such as "D$" may be used (*e.g.*"****204.121.16.3 \D$ \NIS5software \archive" will target drive "D:", subdirectory "NIS5software\archive" on the system addressed by "204.121.16.3", spaces have been added for readability and should not be included where not meaningful). In the above example if drive D had a share name then that name should replace the "D$" in the example. A normal fully qualified path such as "D:\test\archive\camera1" may be used in either the source or destination directory entries.

19.3. Use

There are no dialog boxes created by the MicXfer service application. The user should verify the service is running via the Control Panel's Service applet, that it is set to automatically startup, and an appropriate account and password are set. Proper function can be verified by setting the DOLOG in the CONFIGURATION section to 1 and checking the entries in the log. The log entries include date, time, fully qualified source file name, fully qualified destination file name, and OK or FAILED. If MicXfer has been configured to DO_UDP then the UDP messages may be received, displayed, and logged with the WatchMicXfer.exe utility which may be run on any or all machines to which MicXfer is sending UDP packets. The APC-UPS when supporting an Aquila UPS system catches the UDP packets being sent by MicXfer. Therefore, WatchMicXfer may not be used on the collect system in this circumstance, because only one application on a system will receive UDP packets on a port.

There is no explicit test for the existence of a network connection. Any failure simply marks that transfer as a failure and re-attempts it on the next cycle. If a transfer fails because the destination is not reachable (*e.g.* network is not available) MicXfer will not attempt any more transfers to that destination until the next cycle.

A program to assist in the configuration of MicXfer has been created called MicXferC. It automates the creation and editing of the MicXfer.INI file. It also has an icon showing when MicXfer has read the associated INI file.

20. MicXferC

MicXferC is a Windows program designed to simplify modifications to the MicXfer.INI file used by the MicXfer.exe NT service application.

20.1. Installation

MicXferC.exe is installed automatically during a normal MIC install into the targeted install directory. It may be installed manually by copying it into the same directory as the MicXfer.exe and MicXfer.INI files.

20.2. Configuration

There is no configuration necessary for the MicXferC program.

20.3. Use

Simply execute the MicXferC application. Each of the modifiable data items in the MicXfer.INI file will be displayed in a "tree" type display. To modify an item click on the "+" left of the item category to expand the tree; select the item you wish to modify; and finally click on the "Edit Selected Item" button. Once all of the desired changes have been made click on the "Apply ALL to INI File". The icon in the lower right of MicXferC will change to an hour glass and when MicXfer has read the new INI file it will change to a check mark. MicXfer checks for a changed INI file at the beginning of each major cycle. Consequently, if the current cycle has a lot of work to do it may take a few minutes before MicXfer will detect the change and update itself. In this circumstance you may force MicXfer to update as quickly as possible by pausing the MicXfer service and then continuing it.

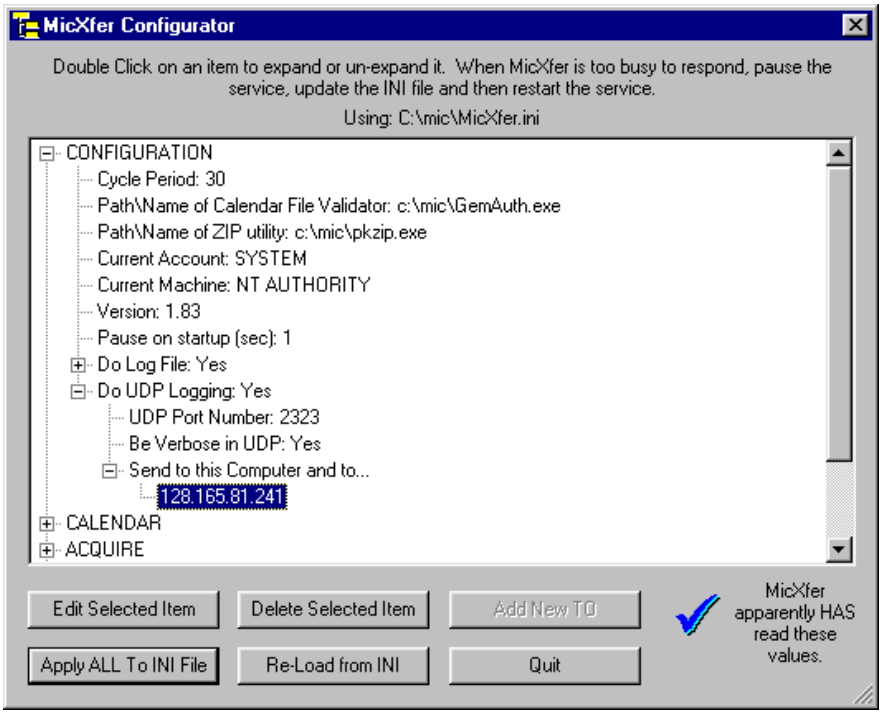


Figure 93 Typical MicXferC Dialog.

21. WatchMicXfer

WatchMicXfer is a Windows program designed to monitor MicXfer actions. It receives UDP packets generated by MicXfer and displays them. It may run on any system as long as the network between the system running MicXfer and WatchMicXfer can deliver UDP packets. It may also be run on the same system as MicXfer.

21.1. Installation

WatchMicXfer.exe is installed automatically during a normal MIC install into the targeted install directory. It may be installed manually by copying it into an appropriate directory on a target computer.

21.2. Configuration

Coordinated configuration is required for WatchMicXfer to receive MicXfer messages; MicXfer must know where to send the UDP packets and what port to use and WatchMicXfer must know which port MicXfer is using. Using MicXferC one must set MicXfer's "Do UDP logging" to YES. If set to YES, then MicXfer will send to the local computer. If other computers' IP addresses are added to the list as shown, then MicXfer will send to them also. In the example shown port 2020 will be used.

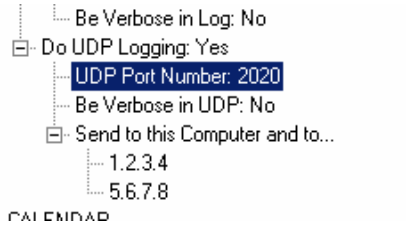


Figure 94 UDP Configuration in MicXferC Dialog.

WatchMicXfer must be configured to use the same port as MicXfer is sending on. Click on the icon in the WatchMicXfer title bar and select "Configure…". Note that you can ask WatchMicXfer to maintain a log file.

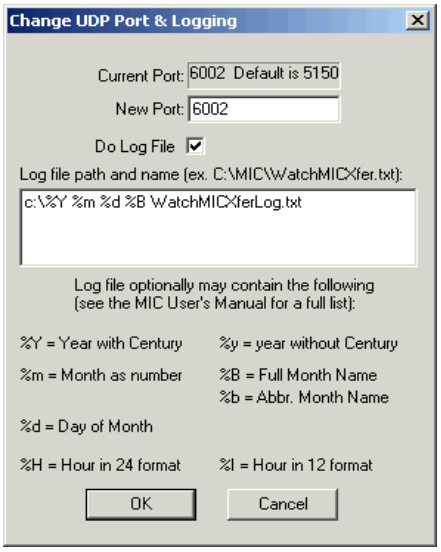


Figure 95 UDP Port and Logging Configuration in WatchMicXferC.

WatchMICXfer's logging file defaults to "**c:\WatchMICXferLog.txt**" but may be changed as needed. The disk drive, path, and name may be set through the configuration dialog. The file name may contain special codes. They will be replaced as indicated below. Generally only %Y, %m, %d should be used; for example if you use something like "**c:\mic\%Y %m %d %H%M%S Watch Log.txt**" then a new log file would be generated for each second of the day that a message was received in—generating thousands of files. The recommendation is to use only year, month, and day as in "c:\mic\%Y %m %d Watch Log.txt" which will generate something like "c:\mic\2005 06 16 Watch Log.txt". The full path to the file should exist. Normal file naming conventions should be used and consequently special characters such as *, ?, :, and $ should not be used. The % is a flag that tells WatchMICXfer that the following code is to be replaced; the % symbol will not be included in the name.

%a	Abbreviated weekday name
%A	Full weekday name
%b	Abbreviated month name
%B	Full month name
%c	Date and time representation appropriate for locale
%d	Day of month as decimal number (01 – 31)
%H	Hour in 24-hour format (00 – 23)
%I	Hour in 12-hour format (01 – 12)
%j	Day of year as decimal number (001 – 366)
%m	Month as decimal number (01 – 12)
%M	Minute as decimal number (00 – 59)
%p	Current locale's A.M./P.M. indicator for 12-hour clock
%S	Second as decimal number (00 – 59)
%U	Week of year as decimal number, with Sunday as first day of week (00 – 53)
%w	Weekday as decimal number (0 – 6; Sunday is 0)
%W	Week of year as decimal number, with Monday as first day of week (00 – 53)
%y	Year without century, as decimal number (00 – 99)
%Y	Year with century, as decimal number
%z, %Z	Time-zone name or abbreviation; no characters if time zone is unknown.

21.3. Use

Once configured you may execute WatchMicXfer on any of the systems MicXfer is sending messages to. Using this simple tool will help you trouble shoot problems associated with MicXfer file transfers. Eventhough MicXfer is sending UDP packets to a system, it is not mandatory that WatchMicXfer be active to receive them. In this case the messages will be deleted by the target computer.

22. Tracker

Tracker is a 32-bit multi-tasking application that mimics the display of the MIC main dialog box. Only the GRAND, ISR, MCA, JSR, APC UPS and EOSS instrument support objects send state of health information—instantiated Watchers will not. It may be run on a Windows 9x, Windows NT, W2K or XP system. It will likely run on Windows Server OS's, Vista and 7. To operate, a MIC application must be sending UDP packets to the dotted IP address of the system the Tracker is running on using a selected UDP port number. Configure MIC's Tracker UDP details by manually editing the NETWORK section of the MIC.INI file. MIC's UDP messaging to Tracker may be turned on or off from the MIC.INI file. To send and receive UDP packets, TCP/IP must be installed on both systems. Any intervening network must pass through UDP packets with the selected port number. Firewalls usually must be modified to accommodate UDP packets. This technique will work across TCP/IP networks as well as

NetBEUI networks. The only data sent via UDP from MIC is state of health information displayed in the MIC main dialog box's colored buttons. No communications are ever sent back into the MIC computer. MIC blindly transmits the UDP packets and does not care if there is anything to receive them. On the Tracker end, if Tracker is not running the operating system will throw away the UDP packets until Tracker is running.

Tracker can be set to periodically snapshot the data and create an HTML file. Consequently, MIC running on a collect computer can send state of health information to Tracker on another machine; which in turn can create an HTML file; which then may be copied via the MicXfer service to a Web server. If configured properly this would allow someone anywhere in the world with access only to the Web server to view the state of health of MIC and its associated instruments. Tracker may also be configured to forward all state of health information received from MIC to yet another tracker. Tracker will act as a state of health server. Turning on this capability allows a Tracker program running on any other computer to request state of health information from the Tracker server in real-time.

22.1. Installation

The Tracker.exe and Tracker.ini file should be copied from the distribution disk to an appropriate directory such as \MIC. The Tracker.ini file must be manually edited to configure Tracker or through the "Configure" menu item on the system menu. See the following section.

22.2. Configuration

Tracker is configured via the Tracker.ini file which may be manually edited or setup via the "Configure" system menu option. Left click on the icon on the Tracker title bar to access the system menu. Multiple trackers may be run with unique configurations by placing the INI file name on the command line. For example: "Tracker.exe" will run Tracker using Tracker.ini, but "Tracker.exe WestPit" will run Tracker using WestPit.ini. There is only one section in the INI file, CONFIGURATION. The following is an explanation of each of the possible entries in that section. All of these items with the exception of BUTTON entries may be modified via the Configure system menu option.

[CONFIGURATION]

NAME=West Reactor Pit

This is the name which will be appended to "MIC – " to form the dialog box title. If MPSS is used to force this tracker to always run and it was installed in the C:\MIC directory, and the desired INI file's name is WestPit.INI, then the entry in the MPSS.INI file might look like: 3=MIC – West Reactor Pit, C:\MIC\Tracker.exe WestPit.

DOMAILSLOT=1

MIC 2.0.0.0 will not talk to Tracker using mailslot. This item has no function.

MAILSLOT=name

MIC 2.0.0.0 will not talk to Tracker using mailslot. This item has no function.

MAILUPDATE=1000

MIC 2.0.0.0 will not talk to Tracker using mailslot. This item has no function.

ADDRESS=128.165.81.56
This is the IP address of the system which MIC is running on. Any UDP messages from any system other than the address in the INI file will be discarded.

PORT=1028
This is the UDP port number. It must match the UDP port number in the MIC.INI file of the sending MIC system. Any UDP message to any other port other than the port in the INI file will be discarded.

DOHTML=0
Flag to control snapshot of information to .html file. If set to "1" a new html file will be generated at the interval controlled by the HTMLUPDATE parameter.

HTMLNAME=d:\mic\WESTPIT.html
File name of output html file.

HTMLUPDATE=10
Seconds to wait between updates of html file.

BUTTONSWIDE=1
Number of columns in which to display the instrument's state of health colored buttons.

BUTTONWIDTH=175
Width in pixels of the instrument's state of health colored buttons.

BUTTONFLAGSIZE=36
Height in points of the instrument state of health icons.

BUTTONHEIGHT=70
Height in pixels of the instrument's state of health colored buttons.

LAST_X=466
Horizontal position of the upper left corner of the dialog box. Automatically saved by Tracker.exe when the dialog box is moved.

LAST_Y=1
Vertical position of the upper left corner of the dialog box. Automatically saved by Tracker.exe when the dialog box is moved.

BADADDRESS=128.165.81.64
If Tracker receives a message from an address other than the one set in the "ADDRESS" entry above then that address will be placed in this parameter.

ALLOWFORWARDING=Y
If set to "Y" then up to 50 Tracker applications may request state-of-health information be forwarded in real-time as received from MIC or another Tracker application. When set to "N" this feature is deactivated.

TO_MIC=N
Tracker may be configured to request state-of-health information from another Tracker or to expect data to automatically be sent to it from MIC. When TO_MIC is set to "Y" then Tracker expects to be receiving data automatically from MIC. When set to "N" Tracker expects to have to request data (every 5 minutes) from another Tracker.

22.3. Use

A dialog box similar to the MIC main dialog box consisting only of the instrument support object's colored buttons, excluding Watcher buttons, is displayed. Clicking on any of the buttons will produce a dialog box presenting a default legend for each color and each of the icons.

After starting, Tracker presents a grey message box "Waiting for UDP message from MIC on port nnnn", where nnnn is the port number specified during configuration. After the first state of health information arrives from an instrument managed by the MIC installation, a button

reflecting the instrument status is displayed. If no new status for an instrument is sent from MIC within 5 minutes of the previous message, the instrument button will begin flashing. The flashing button alerts the viewer that there may be an instrumentation or computer fault on the collect computer, or that perhaps a networking problem is actively preventing Tracker from receiving additional information. Investigation is suggested. For instruments with a slow state of health status variance, a MIC heartbeat control interval can be enabled to suppress the 5 minute flashing feature. See the `BEAT` entry under the `[NETWORK]`configuration section of MIC.ini, § 7.2.

MIC must be configured to send UDP packets to the computer system Tracker is running on (set to use TCP/IP) and the intervening network must be set to allow UDP packets. MIC's configuration requires both a dotted IP address and a UDP node number. Tracker must be set to watch on the port MIC is sending on and for the dotted IP address sending the packet. Most firewall systems must be configured to allow UDP packets of the node being set.

22.4. Troubleshooting with MPSS

When using the MPSS service to start and re-start Tracker instances, take particular care to specify the appropriate class name or dialog window titles for proper identification of a running Tracker process.

The unique class name for a running Tracker is **TrackerClass**. Use this class name for the MPSS.ini entry for "Mutex name or dialog title" if only one Tracker instance is needed on a computer. *E.g.* `2=TrackerClass,"C:\mic\tracker.exe"`

When monitoring multiple MIC installations with multiple Trackers, use the Tracker dialog title as the entry for MPSS. The dialog title for a running Tracker is composed of the word "Tracker", followed by the Tracker's .ini NAME configuration entry, and the Tracker application version number, with spaces as the separator, (Tracker <User configurable> v.v.v.v). *E.g.*, if the Tracker's .ini NAME entry `is NAME=S. Goodman`, and Tracker's version is `1.9.0.0`, then the Tracker window title becomes "Tracker S. Goodman 1.9.0.0", and an correct example of MPSS.ini entry would be `2=Tracker S. Goodman 1.9.0.0,"C:\mic\tracker.exe"`

Use of an incorrect title as an MPSS entry results in MPSS starting a new tracker instance each time the MPSS control cycle interval occurs; MPSS uses the incorrect title in MPSS.ini to find a running process, does not find the process, and starts a new Tracker. If an earlier Tracker is running using the same Tracker .ini, that Tracker instance likely successfully opened the port specified as the MIC source port , any other attempt to start a Tracker and listen on the name port will give an error on the port #. See the figure below for an example. The overall result is a cascade of failed Tracker processes confounding the desktop and taking up system resources. If this problem occurs, stop MPSS (MPSS –e), edit MPSS.ini to use the correct dialog tile, close all the spurious Tracker instances, and re-start MPSS (MPSS –s).

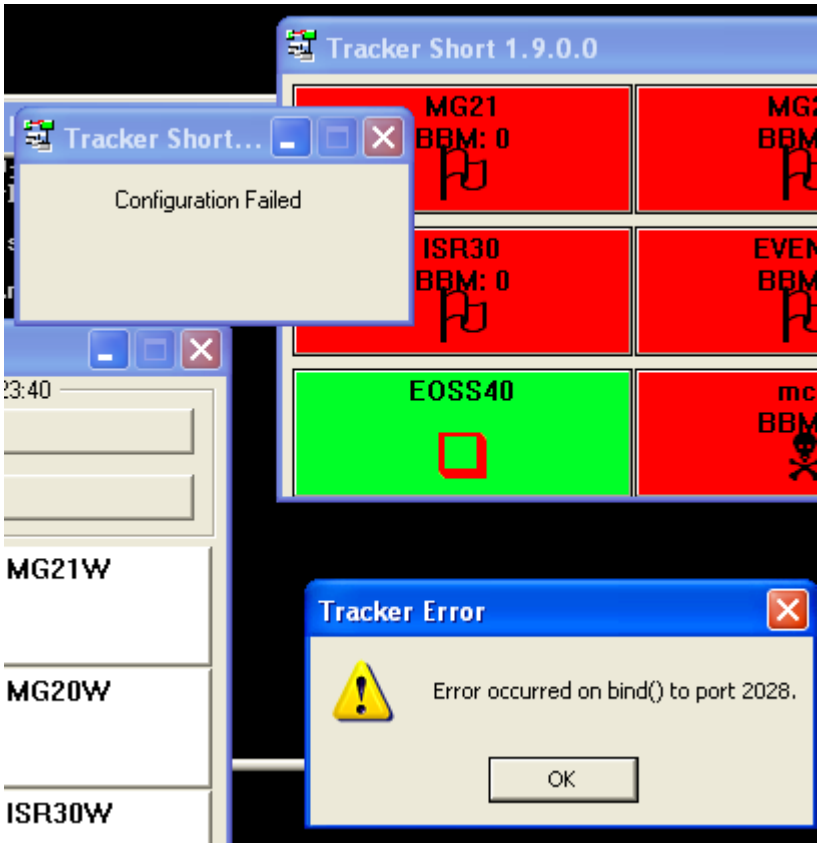


Figure 96 Tracker Error Conditions

23. Dump

Dump is a utility used to convert any of the binary data files (including spectra files) created by the GRAND, ISR, JSR, EVENT, or MCA instrument support objects to a readable text file. It is used for debugging purposes and can spot data gaps and data out of order. It is being replaced with the easier to use MICDump application.

23.1. Configuration

No configuration is required.

23.2. Use

The Dump.exe utility is run from a DOS command prompt window. The syntax is:

Dump.exe filename n

Filename is the file which dump is to convert and may include wild cards. The n parameter is the number of seconds of difference between expected times on data records to accept as ok and defaults to two. For example the following are all valid executions of DUMP: "Dump *.isr 3", "dump 12345a00.bid", and "dump 123??a00.mca".

24. MICDump

MICDump is a utility used to convert any of the binary data files (including spectra files) created by the DragonBall MiniGRAND, traditional MiniGRAND, GRAND, ISR, JSR, EVENT, MCA, or EOSS instrument support objects to a readable text file. It is used for debugging purposes and in some cases can spot data gaps and data out of order. It replaces the old Dump application.

24.1. Configuration and Settings

No configuration is required. Selecting the "Associate File Extensions" menu item assigns a cute hammer and screwdriver icon to file extensions CHN, BID, BI0, MCS, ISR, JSR, PSR, VCS, GPS, BNY, MGD, ESS, RAD, HMR, RFI and SOH, and enables Windows to run MICDump on a double-clicked file, automatically opening the resulting text file in your text editor.

MICDump BI0 data file processing has two options. By selecting the "BI0 Conversion Settings" menu item, MICDump may be set to a corresponding BID data file, with an additional option to trim or pare the first five potential sub-second records.

The Gap Analysis checkbox enables time gap warnings and record count summaries added to the output file. The default gap value may be modified to match the expected time intervals in your data.

Enabling the Open output file(s) checkbox opens each resulting text file in your text editor.

24.2. Use

The MICDump utility is invoked in in two ways.

First, if the binary file extensions have been associated with the application (see the File menu), then double-clicking on one of the associated binary data files automatically runs MICDump, creating and opening text file.

Second, the MICDump program may be executed manually (double-click on MICDump.exe in an explorer). One or more binary files may be dragged and dropped onto the dialog.

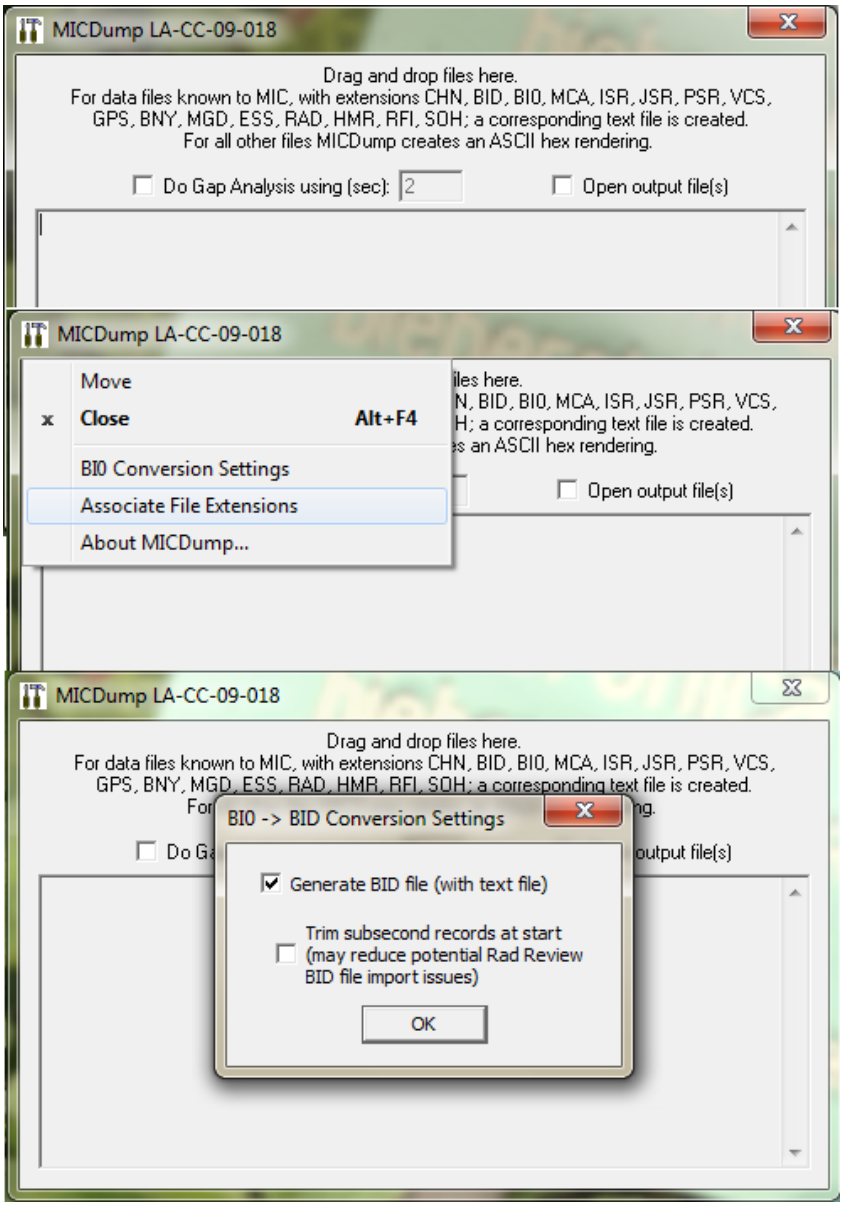


Figure 97 MICDump dialogs showing menus and settings.

MICDump processes all unassociated files, (identified only by the file extension) by generating a text representation in a hex dump format:

```
Unknown file type or bad header in SOH file:
C:\Users\186846\Pictures\P721 LOL.png.
89 50 4e 47 0d 0a 1a 0a  00 00 00 0d 49 48 44 52  .PNG........IHDR
00 00 03 00 00 00 01 f0  08 02 00 00 00 9e ee 9f  ................
e9 00 00 00 01 73 52 47  42 00 ae ce 1c e9 00 00  .....sRGB.......
00 04 67 41 4d 41 00 00  b1 8f 0b fc 61 05 00 00  ..gAMA......a...
00 09 70 48 59 73 00 00  0e c3 00 00 0e c3 01 c7  ..pHYs..........
```

```
6f a8 64 00 00 ff a5 49  44 41 54 78 5e ec 9d 05  o.d....IDATx^...
a0 1c d5 f5 c6 29 12 85  22 a5 0e 94 ca bf 2d a5  .....).."......-.
```

24.3. Command Line Syntax

When invoked by command prompt, MICDump performs batch file conversion processing of both single files and folders of files.

For BI0 files, BID file creation may be enabled alongside the text file.
Moreover, the target folder for the BID and text files may be specified at another location.

Flags are identified by a leading / or – character.
Flags –h or -? Present a help text, similar to this section.
Flags -g and –o correspond to the 'Do gap analysis' and 'Open output file' checkboxes described above.
The –s flag indicates the specific file suffix of interest. Multiple file suffixes cannot be processed with a single MICDump command.

```
<file>  [-g [#]] [-o]

<folder> -s [MGD,CHN,GRAND,MCA,ISR,JSR,PSR,HMR,VACOSS,BINARY,GPS,SOH,ESS,RAD,RFI] [-g
[#]] [-o]

<BI0 file>  [-g [#]] [-o] [-bid <bid folder>] [-trim]

<folder> -s BI0  [-g [#]] [-o] [-bid <bid folder>] [-trim]
```

`-bid <folder>` generate legacy BID file from BI0 file, save BID file in <folder>
`-trim` remove first 5 sub-second BI0 events, prevents Rad Review import error messages

25. MICSqrt

MICSqrt is a Windows application utility designed to help the user in setting up or reconfiguring a MiniGRAND. From an extended state of health file, generated by MIC, it will create a file which may be sent to a MiniGRAND to set its configuration.

25.1. Configuration

No configuration is required of this application.

25.2. Use

The MICSqrt utility may be run in two different ways. The user may execute the MICSqrt.exe by double clicking on it and then drag and drop a MIC generated state of health file onto the "MIC SOH to SQUIRT file Generator" dialog. In this case the three options of: "Ask for each instrument", "Include Comments", and "Open SQUIRT file(s)" may be selected as desired prior to doing the drag and drop. Alternately one

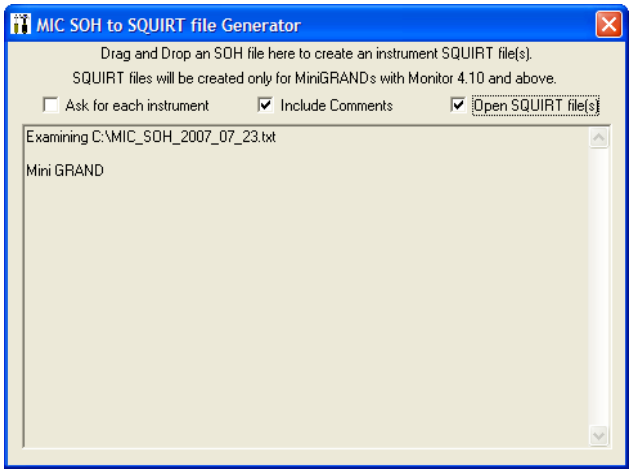


Figure 98 MICSqrt after generating a configuration file.

may simply drag and drop the state of health file directly onto the executable. In either case one or more configuration files will be generated suitable for download to a MiniGRAND. MICSqrt supports only MiniGRANDS and only those with monitor firmware 4.10 and above.

CAUTION! The user should validate each of the items in the file to verify the configuration is as desired! The configuration in the output file will only be as accurate as the state of health file it was generated by. For example, if the user manually changes a configuration item on an instrument then that change will not be reflected in the state of health file unless a DUMPSTAT is performed and subsequently a new state of health file is created.

25.3. Sample Output

The following is an example of a configuration file generated by MICSqrt.

```
;SQUIRT file generated from C:\MIC_SOH_2007_07_23.txt
;Created On 2007.07.25 at 10:44:21
;SOH File's internal date and time: 2007.07.23 15:53:04
;Read Date and Time
5f
;Read version numbers
71
;Set count time
01 1
;Set HV Set Point
05 1600
;Set HV type
1f 1
;Set Offset Mode
81 0
;Set Offset Intervals Nominal Max
82 24 72
;Set Ch 0 Gain Mode and Max or Index
83 0 0 0
;Set Ch 1 Gain Mode and Max or Index
83 1 0 0
;Set Ion Chamber HV Set Point
86 0
;Set Ion Chamber HV State
87 0
;Set Baud Rate
98 9
;Set Frame
99 5
;Set Mode Flags 1
9a 3C
;Set Mode Flags 2
9b 00
;Set Battery Rec. Int.
b0 15
;Set Filter on/off and save avg/first
b1 1 0
;Set Filter Control
b2 1
;Set Immediate buffer save size and size
b6 50 70
```

```
;Set Local Background save size and size
b7 5 25
;Set Insp. ID
b8 7777777
;Set Unit ID
b9 55
;Set Status Rec Intvl.
ba 1440
;Set Gamma Uncertaintly multiplier
bb 0.010
;Set channel 0 threshold 1 configuration
a1 0 100.00 0 3 10
;Set channel 1 threshold 1 configuration
a1 1 100.00 0 3 10
;Set channel 2 threshold 1 configuration
a1 2 100.00 0 3 10
;Set channel 3 threshold 1 configuration
a1 3 100.00 0 3 10
;Set channel 4 threshold 1 configuration
a1 4 100.00 0 3 10
;Set channel 0 threshold 2 configuration
a2 0 100.00 0 3 10
;Set channel 1 threshold 2 configuration
a2 1 100.00 0 3 10
;Set channel 2 threshold 2 configuration
a2 2 100.00 0 3 10
;Set channel 3 threshold 2 configuration
a2 3 100.00 0 3 10
;Set channel 4 threshold 2 configuration
a2 4 100.00 0 3 10
;Set channel 0 changing signal configuration
a3 0 1.5 3
;Set channel 1 changing signal configuration
a3 1 1.5 3
;Set channel 2 changing signal configuration
a3 2 1.5 3
;Set channel 3 changing signal configuration
a3 3 1.5 3
;Set channel 4 changing signal configuration
a3 4 1.5 3
;Set channel 0 filter limit and hysteresis configuration
a4 0 0.200 80
;Set channel 1 filter limit and hysteresis configuration
a4 1 0.200 80
;Set channel 2 filter limit and hysteresis configuration
a4 2 0.200 80
;Set channel 3 filter limit and hysteresis configuration
a4 3 0.020 80
;Set channel 4 filter limit and hysteresis configuration
a4 4 0.200 80
;Clear Trigger Pin 4, 5, 6, & 7
a5 4 9
a5 5 9
a5 6 9
a5 7 9
```

```
;Set Trigger Pin 4 Logic
a5 4 0 0/7 1/7 2/7 3/7
;Set channel 0 enabled state
a6 0 1
;Set channel 1 enabled state
a6 1 0
;Set channel 2 enabled state
a6 2 0
;Set channel 3 enabled state
a6 3 1
;Set channel 4 enabled state
a6 4 0
;Set Hourly Sync Time MMSS
c2 3030
;Set Daily Sync Time HHMMSS
c3 043030
;Set Sync Tolerances sec min
c4 2 5
;Set Time Sync State h d
c5 0 1
```

26. MsgUtil

MsgUtil is a 32-bit windows application used to break instrument messages up into their component parts and to display those parts. It is normally run when from one of the instrument support object's summary tab the user clicks on one of the scrolling message lines. It may also be run independently of MIC.

26.1. Configuration

No configuration is required of this application.

26.2. Use

When run from MIC, MsgUtil's main dialog box will be displayed and the message clicked on will be pre-loaded and broken apart as indicated below.

In the Message area the full message is displayed and each data item in the message is presented. The Julian date from the message is displayed in the Date area and has been converted to Gregorian date. The type of instrument support object which the message came from is depicted by the dotted selector on one of the GRAND, MCA, ISR, EVENT, JSR-12, or APC UPS buttons.

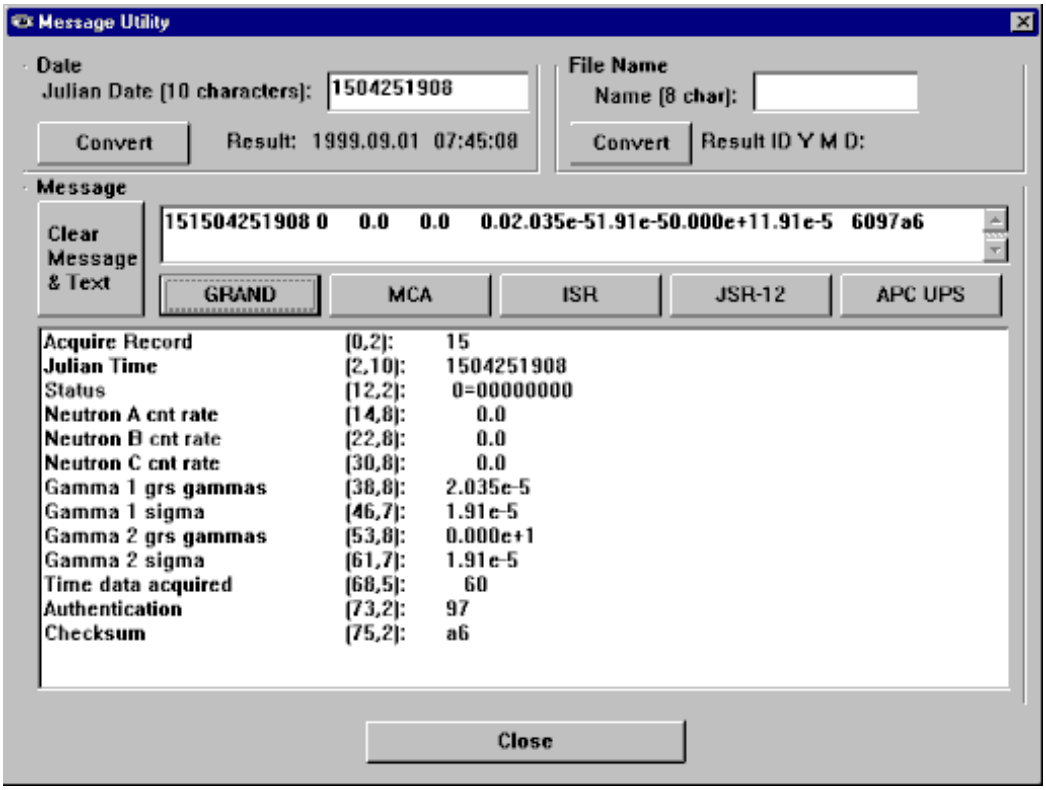


Figure 99 MsgUtil Showing Pre-loaded GRAND Acquire Record.

Clicking on the "Clear Message & Text" button will erase all of the data in the Message area. From this state, if one of the instrument buttons is clicked the user will be presented with most of the valid commands for that type of instrument.

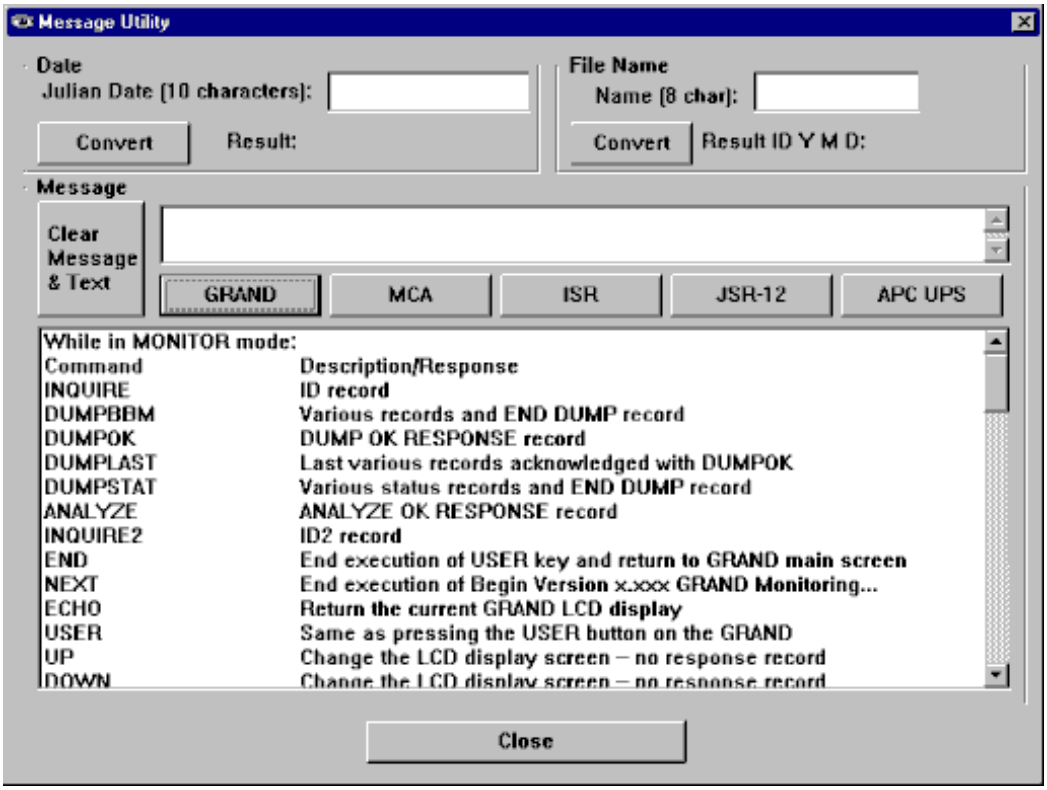


Figure 100 MsgUtil Showing Possible Commands.

27. DelFi

DelFi is a windows application designed to automatically delete files from multiple directories when they have reached a given age.

27.1. Configuration

The DelFi.INI file provides the configuration information for DelFi and may be edited manually or through the configuration dialogs. If this file does not exist when DelFi is run it will generate a default file and then open the configuration dialog. There will be a entry in the WATCHES section for each directory DelFi must watch. DelFi may be configured to look into sub-directories. When running, DelFi will look in each watch set, starting with "1" and proceed to "2" and so forth until the first missing numbered entry. The INI file is reread at the start of each cycle. The following is a typical DelFi.ini file (your actual file will vary depending on the configuration and the DelFi version).

```
[CONFIGURATION]
;how often to check dirs in seconds
;or CYCLETIME=DAYS:HOURS:MINUTES:SECONDS
CYCLETIME=0:0:1:0
;maximum pause in seconds
MAXPAUSE=60
;show or don't show dialog
SHOW=1
;age in seconds at which to delete
;or AGE=DAYS:HOURS:MINUTES:SECONDS
AGE=90:0:0:0
VERSION=1.7.0.0

[STATUS]
LAST FILE=
LAST FAIL=

[WATCHES]
1=C:\DATA
1DOSUBDIRECTORY=Yes
1USEARCHIVEFLAG=No
1DELETE_AT_AGE=90:0:0:0
```

27.2. Use

DelFi's main dialog box provides buttons which may be used to Pause, Configure, Hide, or Run Now the next file deletion process. The "Last Delete Error" area is reserved for deletion errors. For example, if DelFi is configured to attempt to delete a write protected file the date and time of the attempted deletion will be listed in this area. The "Last Deleted File" area will display the date, time, and file name of the most recently deleted file. Below the Last Deleted File area the date and time of the last cycle will be displayed.

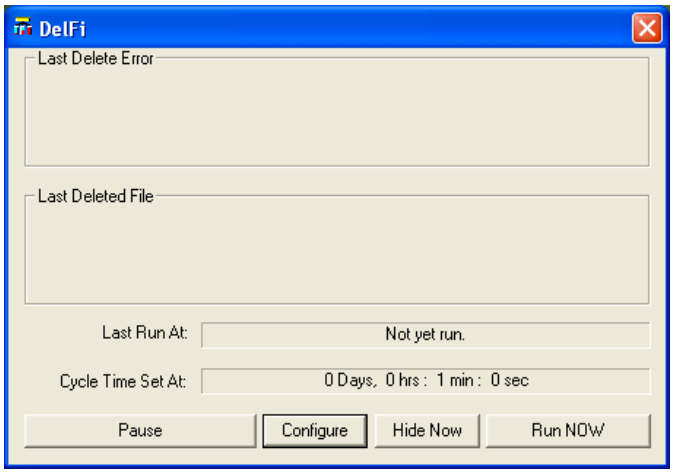


Figure 101 DelFi Main Dialog Box.

Clicking on the "Configure" button will cause the dialog "Delfi Configuration" to be displayed. This dialog is used to set the DelFi cycle time, maximum pause time, whether to hide the main dialog or not (when the dialog may be re-displayed by clicking on the Delfi icon in the icon tray usually in the bottom right of the screen). This dialog is also used to add, delete, or edit the files/directories for DelFi to watch. When the user clicks on "Add New" or "Edit Selected" a dialog box like the "Add New Entry" shown below will be displayed. The "Hide Dialog Box" may be checked to keep the screen clutter down; but may be brought back by clicking on the DelFi icon in the lower right of the task bar. Delfi may be paused but will automatically resume after the "Max Pause Interval (sec)" seconds have elapsed.

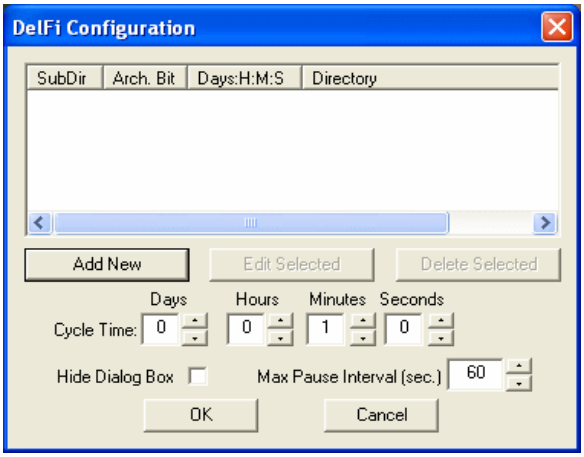


Figure 102 DelFi Configuration Dialog Box.

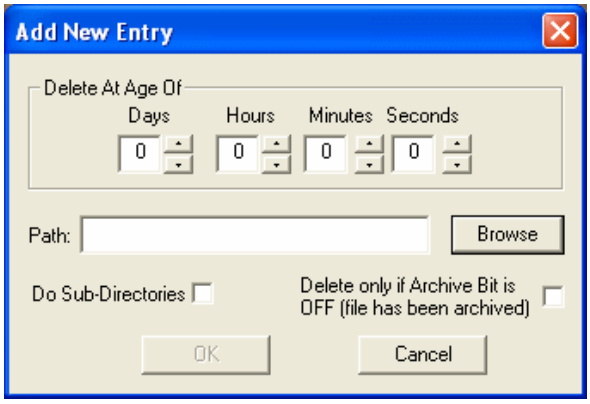


Figure 103 DelFi Add New Entry Dialog Box.

In the "Add New Entry" dialog box and the similar "Edit Entry" dialog box the user may select or change the age at which to delete files, the path (with wild cards), whither to step into sub-directories or not, and the effect of the archive bit. Check the "Do Sub-Directories" only if you wish DelFi to step into ALL of the subdirectories below the selected Path. Select the "Delete only if Archive Bit is OFF" if you want DelFi to delete only if the archive bit is off. Normally, the archive bit will be turned on by the operating system whenever the file contents are changed. If MICXfer is being used to transfer the files the archive bit will be turned off after the transfer has completed. In this case type you'll probably want the "Delete only…" checked so that files not yet transferred by MICXfer don't get deleted.

28. EZ-Copy and EZ-Move

EZ-Copy is a Windows application which assists the user in **copying** files from one or more source directories to destination directories. EZ-Move is a Windows application which assists the user in **moving** files from one or more source directories to destination directories. The files can be selected based on date as encoded in the name or based on the last modified date. MIC can function normally without EZ-Copy or EZ-Move installed. When one clicks on the Copy Files button EZ-Copy will check the path to the unzip utility and issue an error message if it is not available.

If EZ-Copy has been configured to attempt to get the date and time from the file name then it will attempt to do so for .JPG (using the BOT naming convention), .CEV, .PFM, .BIN, .BID, .DMP and .MCA (using the IAEA/MIC short name form), and for .ZIP using YYYY_MM_DD.zip. If any of these attempts fail EZ-Copy will revert to the "last modified" date associated with the file. The user should be aware that most short form named files that MIC creates have the time of 0 hours and 00 minutes encoded in the name (*e.g.* "A00"). Consequently, if a start time other than 00:00:00 is used and "Get Date from Name" is selected then the first day's files may not be included. In the case of .CEV etcetera if the date from the file name is ok then an hour, minute, and second corresponding to the end of the day is used for the test. This is because these file types are all "day files" which may contain data up to and including the end of day. This is a change associated with version 1.8.0.3 and beyond. Previously, the MIC day files generated on the "From" date may not have been included because the names all assume beginning of the day.

To copy zip files add *.zip to the Included File Types list box. If other file types are in the included list in addition to zip, and those types are also found in the zipped file, the entire zip file's contents will be copied over to the TO Directory. Note that EZ-Copy/EZ-Move will not search subdirectories in the zipped file folder structure.

Bulk unzip refers to the technique EZ-Copy uses to copy files from an archive zip file. While copying files EZ-Copy will look into an archive zip file to find files. If bulk unzip is selected then the entire zip file's contents are copied to the destination. If bulk unzip is not selected then the source file is copied out of the archive zip and then copied to the destination. Bulk unzip is highly recommended as it generally takes less time to perform.

28.1. Configuration

The EZ-Copy.INI and EZ-MOVE.INI files provide the configuration information for the application and are automatically maintained by the associated application. If this file does not exist when EZ-Copy or EZ-Move is run it will generate a typical configuration file. A button has been added above the "Exit" button that assists the user in finding the ZIP utility.

[CONFIGURATION]
ZIPPATH=C:\MIC\PKZIP25.EXE
ATX=144
ATY=142
LOGDEFAULT=1
DATEFROMNAME=1
TIMESPANMONTHS=1
DEFAULT=

[MOVES]
NAME=Camera 1 and 2
RECURS1=yes
SOURCE1=\\UM_COLLECT\Z$\DataOriginal\Images\Archive\Camera1
DESTIN1=\\UM_COLLECT\IRS\DataReAnalyze\Images\Archive\Camera1
FTYPES1=*.JPG
BULK1=Yes
SOURCE2=\\UM_COLLECT\Z$\DataOriginal\Images\Archive\Camera2
RECURS1=yes
DESTIN2=\\UM_COLLECT\IRS\DataReAnalyze\Images\Archive\Camera2
FTYPES2=*.JPG
BULK2=No

[MOVES1]
NAME=Rad and Video
SOURCE1=\\UM_COLLECT\Z$\DataOriginal\Images\Archive\Camera3
RECURS1=yes
DESTIN1=\\UM_COLLECT\IRS\DataReAnalyze\Images\Archive\Camera3
FTYPES1=*.JPG
BULK1=No
SOURCE2=\\UM_COLLECT\Z$\DataOriginal\Images\Archive\Camera3
RECURS2=yes
DESTIN2=\\UM_COLLECT\IRS\DataReAnalyze\Images\Archive\Camera2
FTYPES2=*.JPG
BULK2=No

[MOVES2]
NAME=Original to ReAnalyze
SOURCE1=\\UM_COLLECT\Z$\DataOriginal\Images\Archive\Camera1
DESTIN1=\\UM_COLLECT\IRS\DataReAnalyze\Images\Archive\Camera1

RECURS1=no
FTYPES1=*.JPG
BULK1=No
SOURCE2=\\UM_COLLECT\Z$\DataOriginal\Images\Archive\Camera2
DESTIN2=\\UM_COLLECT\IRS\DataReAnalyze\Images\Archive\Camera2
RECURS2=no
FTYPES2=*.JPG
BULK2=Yes

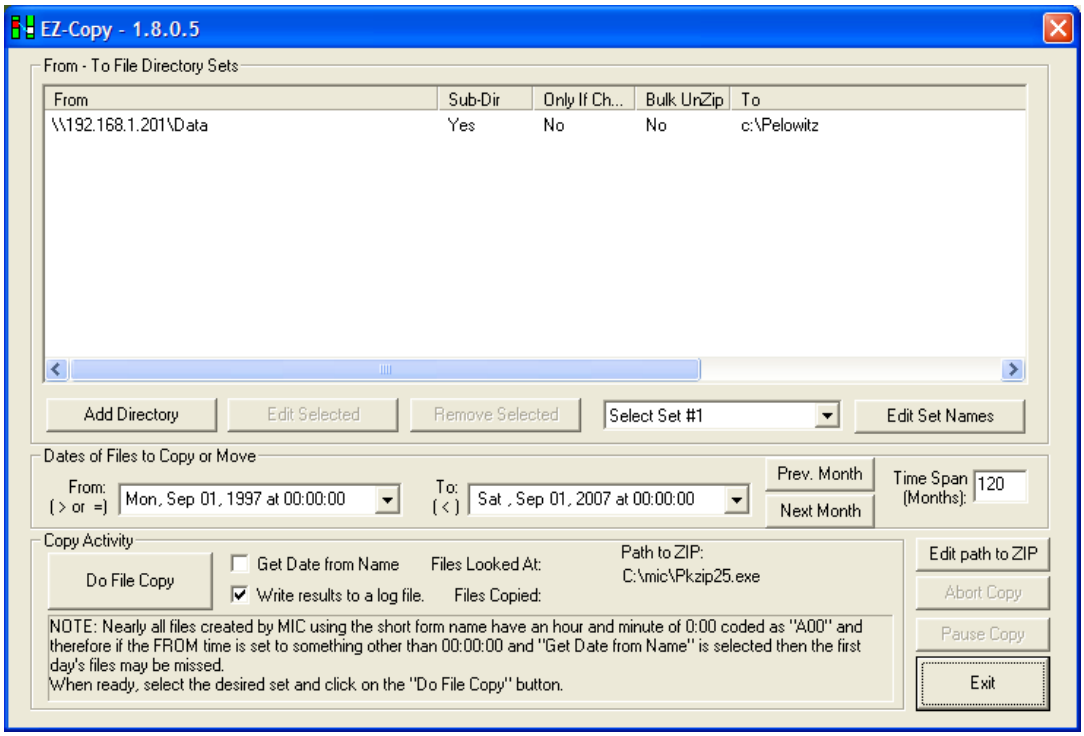


Figure 104 EZ-Copy Main Dialog Box. EZ-Move is nearly identical.

29. RunEZCpy

RunEZCpy is a Windows application which forces EZ-Copy to run once or twice per day. It is configured with multiple target IP addresses (*e.g.* 192.168.1.10), two window start times (*e.g.* 1:00:00 AM), two window end times (*e.g.* 3:00:00 AM), ping controls (*e.g.* 60 sec. 6 times), and a control to set the time (sec) to allow a modem to drop the connection. If running, RunEZCpy waits for a window start time and then begins sending a ping message to the first copy set target IP address. It repeats this action at the ping cycle time interval until it receives a response from the target system. When it receives the response it then executes EZ-COPY and commands it to do the associated set of EZ-COPY's file transfer settings. When EZ-COPY completes RunEZCpy detects the completion, terminates EZ-COPY, optionally it then runs programs configured in the ini file, and then repeats for each of the copy sets. It then waits for the next window start time or for the next day. If RunEZCpy does not receive a ping response from the target and the window end time is reached, RunEZCpy then stops pinging the target and waits for the next window, possibly on the next day. RunEZCpy.exe must reside in the same directory as the EZCopy executable. The optional log file, if selected, will be created according to the manually set "LOG_NAMELOC=" entry in the INI file.

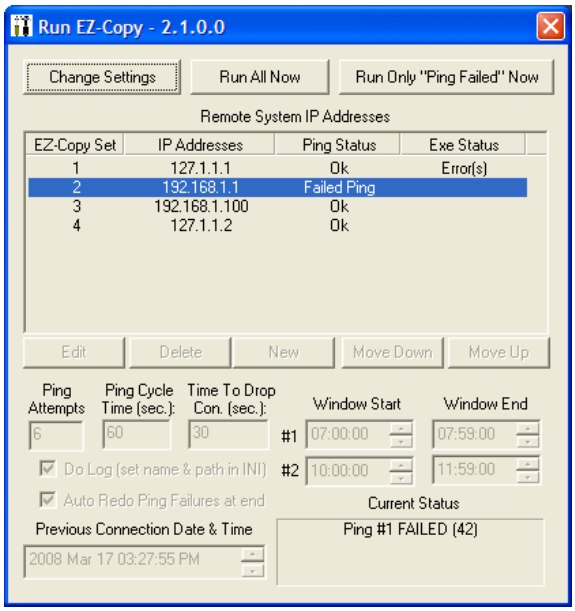


Figure 105 RunEZCpy Dialog Box.

29.1. Configuration

The RunEZCpy.INI file is where the configuration is saved. If on initial execution the file is not present, then RunEZCpy will create it with default values. To modify most of the changeable values the user may click on the "Change Setting" button. This action will cause the windows associated with configurable items to become active. The user may then modify each as needed and the click on the "Apply Settings" button. In the INI file the user may set the "TIMEFORMAT" parameter to 0 or 1. If set to 1 all times will be displayed on a 24 hour format; if set to 0 a 12 hour with AM or PM will be displayed. Note that the log file name may contain %Y, %m, and %d which will be replaced with the year, month, and day respectively. Each of the sections with IP addresses as titles may only be changed by editing the INI file. The #cmd line associated with each tells RunEZCpy how to execute the associated file. "EXECUTOR" is a built in technique which captures the target program's standard out and subsequently looks for the word "error" to flag a failure. "SHELLEXECUTE" calls the system call of the same name and should be used when the target isn't directly executable (*e.g.* a text file). "SPAWN" calls the system call of the same name and uses the return value to flag an error. A typical INI file contents follows:

[CONFIGURATION]
WINDOWSTART=07:00:00
WINDOWEND=07:59:00
WINDOWSTART2=10:00:00
WINDOWEND2=11:59:00
PINGCYCLE=60

```
TIME_FORMAT=1
PING_RETRIES=6
CONNECTDROP=30
DOLOG=1
LASTCONNECT=2008 March 18 07:58:23
LOG_NAMELOC=C:\Run EZ_COPY %Y_%m_%d LOG.txt
REDOFAILED=1
WINDOW_2_DONE=No
WINDOW_1_DONE=No

[IP_SECTION]
1=127.1.1.1
2=192.168.1.1
3=192.168.1.100
4=127.1.1.2

 [127.1.1.1]
PINGSTATUS=Ok
1=w32tm.exe /resync /computer:127.1.1.1
1cmd=EXECUTOR
2=wordpad "c:/data/New Folder/test1.txt"
2cmd=SHELLEXECUTE
3=wordpad "c:/data/New Folder/test1.txt"
3cmd=SPAWN

[192.168.1.1]
PINGSTATUS=Failed Ping
1=w32tm.exe /resync /computer:192.168.1.1
1cmd=EXECUTOR
2=wordpad "c:/data/New Folder/test2.txt"
2cmd=SHELLEXECUTE
3=wordpad "c:/data/New Folder/test2.txt"
3cmd=SPAWN

[192.168.1.100]
PINGSTATUS=Ok
1=w32tm.exe /resync /computer:192.168.1.100
1cmd=EXECUTOR
2=wordpad "c:/data/New Folder/test3.txt"
2cmd=SHELLEXECUTE
3=wordpad "c:/data/New Folder/test3.txt"
3cmd=SPAWN

[127.1.1.2]
PINGSTATUS=Ok
1=w32tm.exe /resync /computer:127.1.1.2
1cmd=EXECUTOR
2=wordpad "c:/data/New Folder/test1.txt"
2cmd=SHELLEXECUTE
3=wordpad "c:/data/New Folder/test1.txt"
3cmd=SPAWN
```

30. CopyAll

CopyAll is a Windows application which assists the user in copying files from one or more source directories to a destination directory. Movement and/or Copy order, source and destination are controlled by entries in the CopyAll.ini file. Each numbered section in the INI file contains the desired action and sufficient information to carry out that action. These sections are "executed" in numerical order. On all actions the first portion of the action (copy on COPYMOVE and move on MOVECOPY) are attempted up to five times with 100mSec pause between. This is to ensure the file action gets accomplished if MIC is currently writing to it.

30.1. Configuration

The CopyAll.INI file provides the configuration information for CopyAll. A typical CopyAll.INI file follows with comments to the right (not bold). The comments are not included in the file. As many action sections as needed may be added; but, they must be in monotonic numerical order--skipping a number will prevent CopyAll from seeing any remaining actions. The order they are in the ini file is inconsequential.

```
[CONFIG]
TITLE=Automated Inspection File Copy          Dialog box title
DOIP=Y                                        Generate IP file [Yes or No]
IPFILELOCATION=D:\SRDATA2                     Location to write IP file
PREVIOUS=                                     Date & Time of previous copy
FACILITY=VWCC                                 Facility name for IP file

;COPY,MOVE,COPYMOVE,MOVECOPY,DELETEFILE,DELETEDIR,CREATEDIR,RENAMEFI
LE,RENAMEDIR

[TODO_1]                                      First action to do
ACTION=MOVECOPY                               Move source files and then copy them
DOSUBDIR=N                                    Step into all subdirs [Yes or No]
FROM=C:\COLLECT\SRDATA\                       Source directory
FILE=*.*                                      Files to MOVECOPY
COPY=D:\SRDATA2                               Destination of Copy, source is MOVE
MOVE=C:\COLLECT\SRDATA\ARCHIVE                Destination of Move

[TODO_2]                                      Next action to do
ACTION=DELETEDIR                              Delete the from directory
FROM=C:\IMAGES\OLDEST                         Directory name to delete

[TODO_3]                                      Next action to do
ACTION=RENAMEDIR                              Rename a directory
FROM=C:\IMAGES\OLD                            Old name
TO=C:\IMAGES\OLDEST                           New name

[TODO_4]                                      Next action to do
ACTION=CREATEDIR                              Create a directory
FROM=C:\IMAGES\OLD                            Name for new directory

[TODO_5]                                      Next action to do
ACTION=COPYMOVE                               Copy source files then move them
DOSUBDIR=N                                    Step into all subdirs [Yes or No]
FROM=C:\IMAGES                                Copy and Move source
FILE=*.*                                      File to COPYMOVE
```

```
COPY=D:\ARCHIVE\SCU2                    Destination of Copy
MOVE=C:\IMAGES\OLD                      Destination of Move

[TODO_6]                                Next action to do
ACTION=COPY                             Copy source files
DOSUBDIR=N                              Step into all subdirs [Yes or No]
FILE=*.*                                File to COPY
FROM=C:\IMAGES                          Source directory
COPY=C:\IMAGES\ARCHIVE                  Destination directory

[TODO_7]                                Next action to do
ACTION=MOVE                             Move source files
DOSUBDIR=N                              Step into all subdirs [Yes or No]
FILE=*.*                                File to MOVE
FROM=C:\IMAGES                          Source directory
MOVE=C:\IMAGES\ARCHIVE                  Destination directory

[TODO_9]                                Next action to do
ACTION=DELETEFILE                       Delete source files
DOSUBDIR=N                              Step into subdirs [Yes or No]
FROM=C:\COLLECT\SRDATA\ARCHIVE          Source directory
FILE=*.*                                File to delete

[TODO_10]                               Next action to do
ACTION=RENAMEFILE                       Rename source file
FROM=C:\COLLECT\SRDATA\My.ini           Old file name
TO=C:\COLLECT\SRDATA\Your.ini           New file name
```

31. Frequently Asked Questions (FAQ)

31.1. How does MIC time sync with an ILON network?

An ILON connected to the collect computer and configured as a "Collect" node will send a special signal to MIC on each time sync in a similar manner to how it would to an instrument. The difference being that it will be over the serial line instead of over the discrete outputs. If MIC has been configured with an ILON Communications Support Object watching the serial port that the ILON is connected to then the signal will be received and the collect computer's time may be set. This occurs only if the following conditions have been met: the time difference is greater than 2 seconds and less than 5 minutes. Subsequently, two messages will be placed in the "[CONFIGURATION]" section of the MIC.INI file. The first indicating that a sync signal has been received and the second what the disposition of that signal was. There are four possible dispositions: MIC could not set the collect system clock (system permissions not set correctly), MIC did not need to change the clock (time difference was within tolerance), MIC set the collect system's time, and MIC did not set the time because the difference was greater than the upper limit. These values should rarely be changed—if ever. By adding the following two lines to the MIC.INI's section for the collect ILON's node you may change these two values:

```
MIN_TIME_SET=2
MAX_TIME_SET=300
```

Both values are in seconds. In the above example if the time difference is greater than 2 seconds and less than 300 seconds then the time of the computer will be updated. Both of these values are read/re-read from the MIC.INI file each time a time sync is received from the collect ILON. Consequently, you do not need to restart MIC after you've changed these values.

31.2. When is a LONG BREAK RESET sent?

The long break reset is sent only if MIC cannot communicate with the instrument. In all cases it will attempt a command and subsequently repeat the command as many times as that instrument has been configured to repeat a command before it gives up and sends the LONG BREAK RESET. This entire sequence is repeated the same number of times as a single command is repeated and then MIC will stop attempting to talk to the instrument for 15 minutes. At which time it will attempt to talk to the instrument again and restart the entire sequence. The exceptions to the number of times it attempts to resend a command is on initial startup or after the 15 minute wait. In this case MIC will attempt to restart the instrument after two no responses to the ECHO command. The ECHO, ECHO, LONGBREAK, sequence will be repeated the number of command resend time minus 1 and then will return to the 15 minute wait if no response has been received. The last LONG BREAK RESET also resets the communications port on the collect computer if no other instrument is using it successfully (as may be the case in the ILON). The user may shortstop the 15 minute timer by selecting the "Pause Collecting" and then "Start Collecting" button. Multiple LONG BREAK RESETs can cause an ILON to lock up. It is highly recommended that if GRAND IIIs or MiniGRANDs are being supported that MIC be configured to pause for 60 seconds after sending a LONG BREAK RESET.

UPDATE: An update to MIC (version 1.909) changes the startup and restart ECHO, ECHO, LONGBREAK sequence in the GRAND ISO to repeat the ECHO the same number of times as any other command is repeated.

31.3. When I select Re-Organize and enter the password it isn't accepted. Why?

This function requires the supervisor's password. MIC has two password sets stored in the MIC.INI file, one in the [USERS] section and one in the [SUPERUSERS] section. When you add or edit user/password pairs via the "Access Control" option only the [USERS] section will be modified. The [SUPERUSERS] section must be maintained manually by moving entries from the [USERS] section to the [SUPERUSERS] section.

31.4. How can I tell what version is running and what account name is being used by the MICXfer service?

Both of these data items are written back to the MICXfer.INI file each time MICXfer is started. The user may view them by executing MICXferC or if MICXferC is already running by clicking on the "Reload from INI" button. During MICXfer startup they are also written to the log file (if logging is enabled – use MICXferC to enable and name the log file) and to WatchMICXfer.

31.5. What are the differences when setting up the MICXfer service on XP?

New security enhancements included in Windows XP require that the account MICXfer is configured to run under have local administrator privileges on the machine it is running on and on each of the file destination systems. Each of the accounts must use the same password because MICXfer actually logs into the remote system to transfer files to or from it.

31.6. How should MicXfer be configured when copying *.jpg files?

MicXfer transfers *.jpg files no differently than it transfers any other type of file.

Because of the large number of image files, MicXfer should be configured to add *.jpg files to a daily *.zip file and then to move the *.zip file. In those cases where *.zip files are created by MicXfer, it is critical that MicXfer run on the source machine.

31.7. How can I tell what files MICXfer service is currently copying?

There are two ways to tell what files MICXfer is copying: by configuring to it to write a log file and by configuring it to do UDP logging. The two techniques are independent—neither, either, or both may be configured active. Use MICXferC, look in the "CONFIGURATION" section and turn them on as desired. If you are doing file logging you'll be able to examine the file being written to see what files are being transferred only if "Be Verbose in Log" is set to "Yes"; otherwise only failures will be logged. If you are doing UDP logging you can watch in real time by running the application WatchMICXfer. It should have been installed into the same directory MIC was installed into. As with the file logging, the "Be Verbose in UDP" must be set to "Yes" to see the successful file transfers. If using UDP then both MICXfer and WatchMICXfer port numbers must match and MICXfer may be configured to send the information to multiple locations.

Because new files can be added while MicXfer is working, the user should wait for two MicXfer cycles to pass for which nothing gets moved before assuming that MicXfer has transferred all files currently available.

31.8. How should I set the command timeout of each of the instruments?

When an instrument is talking through an ILON network the user must adjust the message timeout of each instrument to consider the time it may take the ILON to handle a message. Any ILON message addressed to a non-functioning node may take up to 600 milliseconds for the ILON to process—during which all subsequent messages going through that ILON will be

queued up and be waiting. Because of the ILON message protocol it is strongly recommended that any ILON talking instruments' message timeout be set to at least three and possibly five seconds times the number of instruments on the ILON network. For example, an ILON network with 5 instrument nodes, one collect node, one power switch over node, and one collect node, has a total of 8 nodes. In this case each MIC instrument support object's command timeout should be between 24 (3 x 8) seconds and 40 (5 x 8) seconds.

If an instrument is connected directly to the collect computer, through a remote serial port, or through a LOCNUT then a message timeout of 2 to 3 seconds is adequate; no adjustment for the quantity of instruments need be considered.

31.9. How can I change the node number of an Instrument Support Object?

From the "Reorganize" menu option (requires the supervisor password) you may change the communications object that the ISO is connected to, the node number it is using, and its name.

31.10. How can I edit the settings of a Communications Support Object?

The safest way is to use the "Reorganize" menu. This technique preserves the settings of the Instrument Support Objects (ISOs). Using the "Reorganize" menu option move all of the ISOs off of the bad Communications Support Object (CSO) and onto another CSO to hold them temporarily. Delete the errant CSO using the "Configuration" menu option, create a new CSO with the correct parameters, return to the "Reorganize" menu and move the ISOs you moved off earlier, onto the new CSO, and finally restart MIC. If only one CSO has been created when you start this procedure you may need to create one to temporarily hold the ISOs—don't forget to delete it when you are done.

31.11. How can I change what is displayed on the Legend tabs?

Use an editor that works with rich text files (files with an .RTF) extension. Microsoft Word© works well as does WordPad. Start with the "Default.rtf" file distributed with the MIC installation or copy from one of the existing legend tabs, modify it as needed, and finally save it out (in .RTF format) with either a specific instrument support object type, name or use "Default.rtf". When displayed the legend page first looks for a file with the same name as the instrument but with an .rtf extension (*e.g.* West Door GRAND.rtf), if it doesn't find that file it then looks for a instrument type file (*e.g.* GRAND.rtf), if that isn't found it then looks for the default.rtf file. If the default.rtf file isn't found it then uses a built in generic legend.

32. MIC 2.0.0.0 Uninstall Procedure

CAUTION! Performing this procedure will un-register all of the MIC components, will delete the entire contents of the MIC install folder, and will delete the MIC install folder itself.

32.1. High Level Steps for Uninstall

Step 1: Navigate to the folder where the MIC program files are installed.

Step 2: Run the batch file "`Stop MIC Services.bat`" by double clicking on the filename in the Windows Explorer panel.

Step 3: If MIC is running, exit MIC.

Step 4: Run the batch file "`Unregister_MIC_Components.bat`" by double clicking on the filename in the Windows Explorer panel.

Step 5: If the configuration files are to be saved, copy all of the files having the file extension "INI" into a folder that is outside of the MIC install folder.

Step 6: From Start/Control Panel, navigate to "Add or Remove Programs". Locate "Multi-Instrument Collect" in the list of "Currently installed programs". Click on the "Change/Remove" button. Confirm file deletion by clicking on the "Yes" button.

The uninstall is completed.

32.2. Detailed Steps for Uninstall

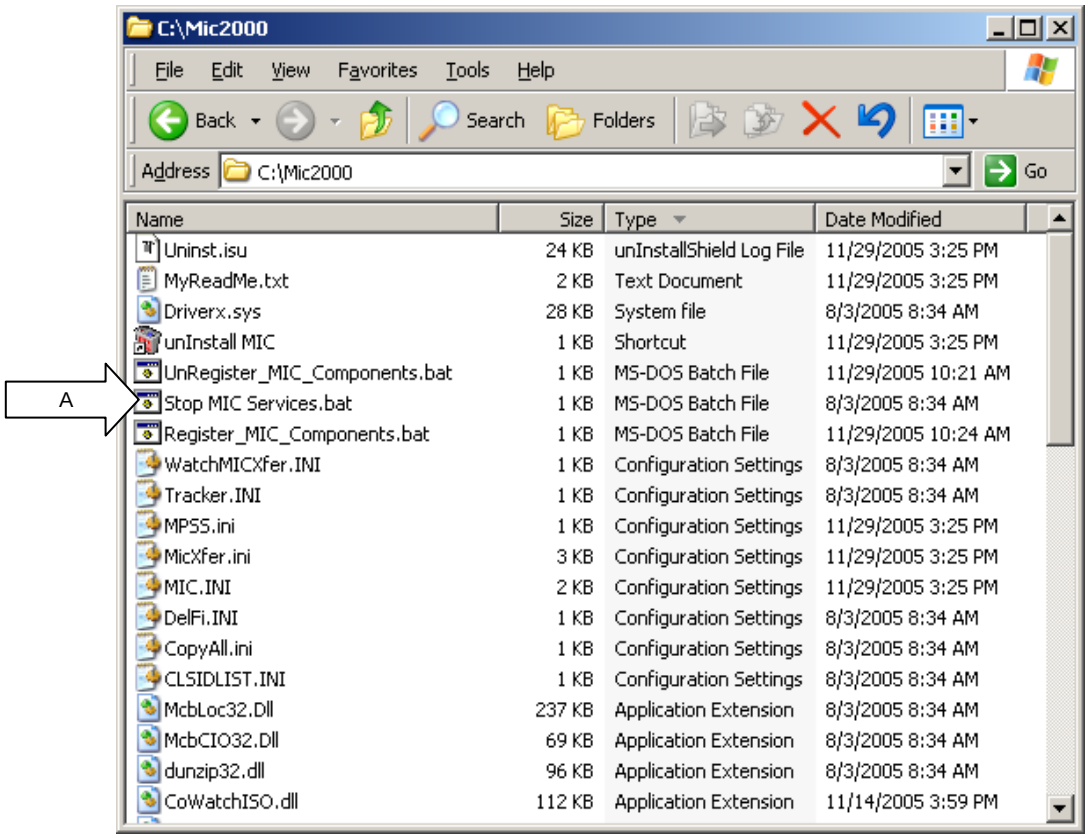
Step 1: Navigate to the folder where the MIC program files are installed.

a. On the desktop, double click on the My Computer icon.

b. In the My Computer dialog, double click on the icon for the disk drive where the MIC program files were installed.

(Step 1 is continued on the next page.)

c. Continue drilling down through the directory tree until the MIC installation folder is open. A sample of the contents of the installation folder is shown below.

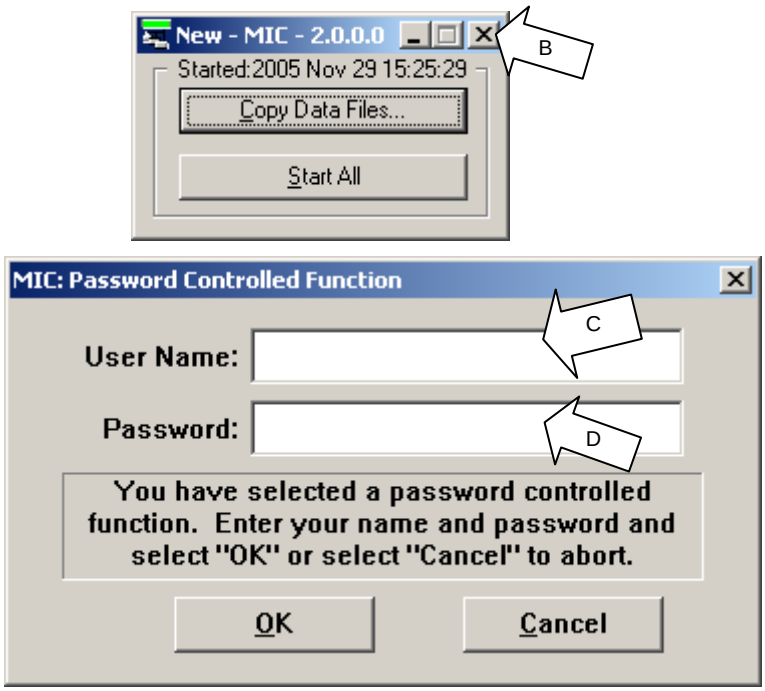


Step 2: Run the batch file "`Stop MIC Services.bat`" by double clicking on the filename in the Windows Explorer panel.

The correct batch file is indicated by the arrow labeled "A" above. Double click on the line containing the file name. A command prompt window will appear briefly showing the execution steps of the batch file. Wait until the command prompt window closes before proceeding.

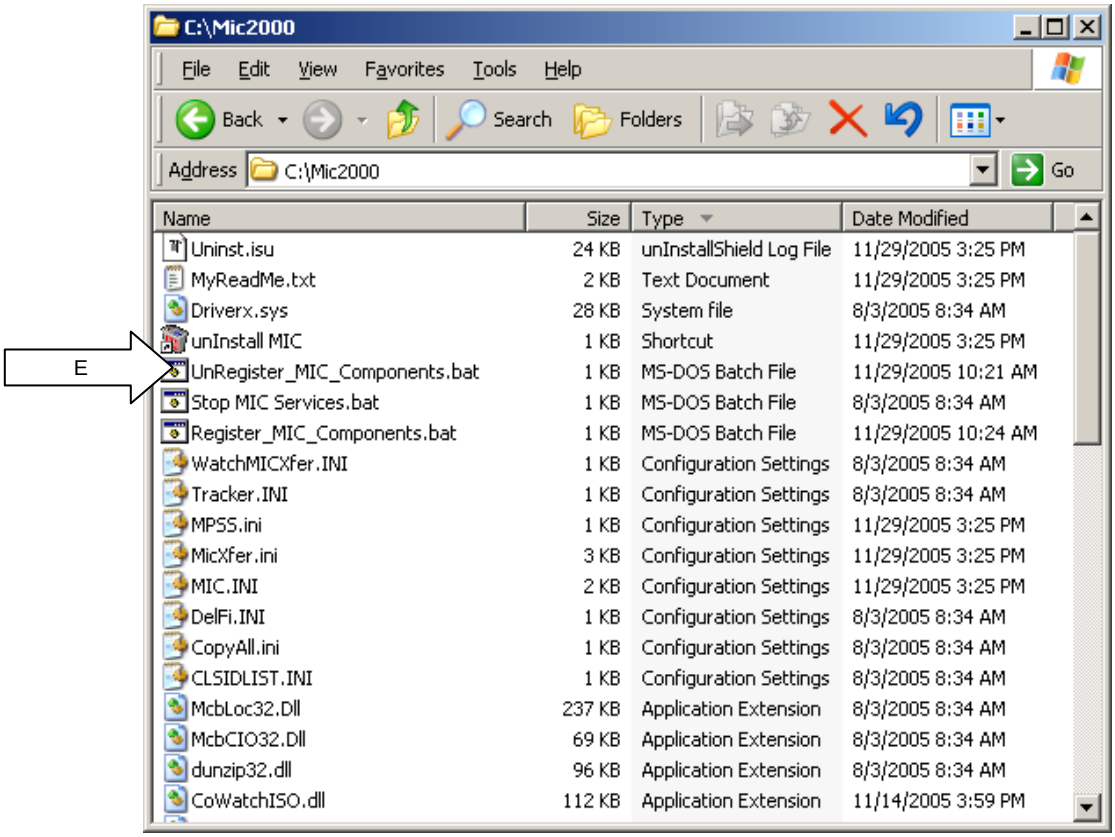
Step 3: If MIC is running, exit MIC.

If necessary, on the MIC main dialog, click the "X" in the upper right corner (See arrow "B" below). Enter a valid user name and password to exit MIC (See arrows ""C" and "D" below).



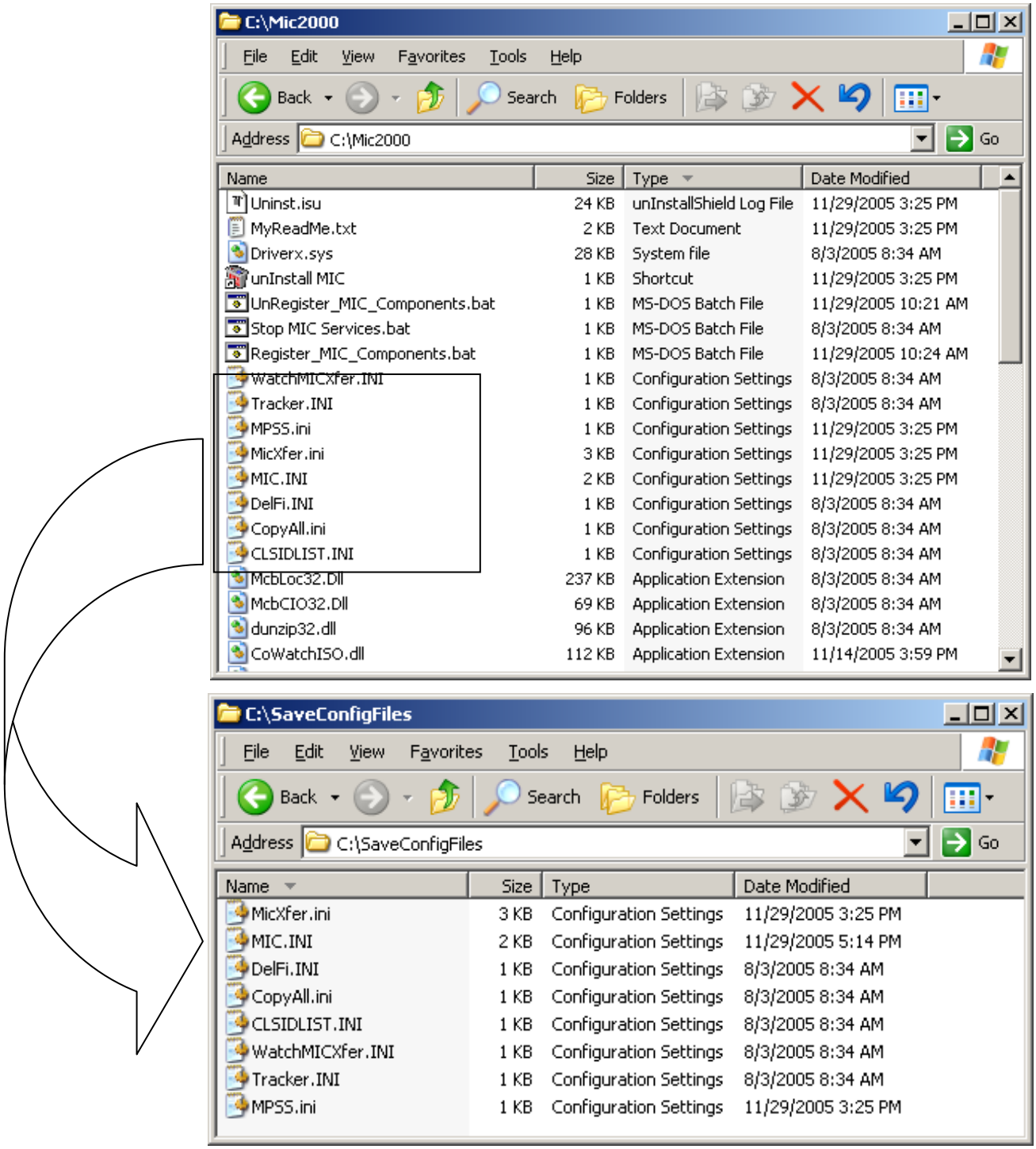
Step 4: Run the batch file "`UnRegister_MIC_Components.bat`" by double clicking on the filename in the Windows Explorer panel.

The correct batch file is indicated by the arrow labeled "E" below. Double click on the line containing the file name. A DOS window will appear briefly showing the execution steps of the batch file. Wait until the DOS window closes before proceeding.

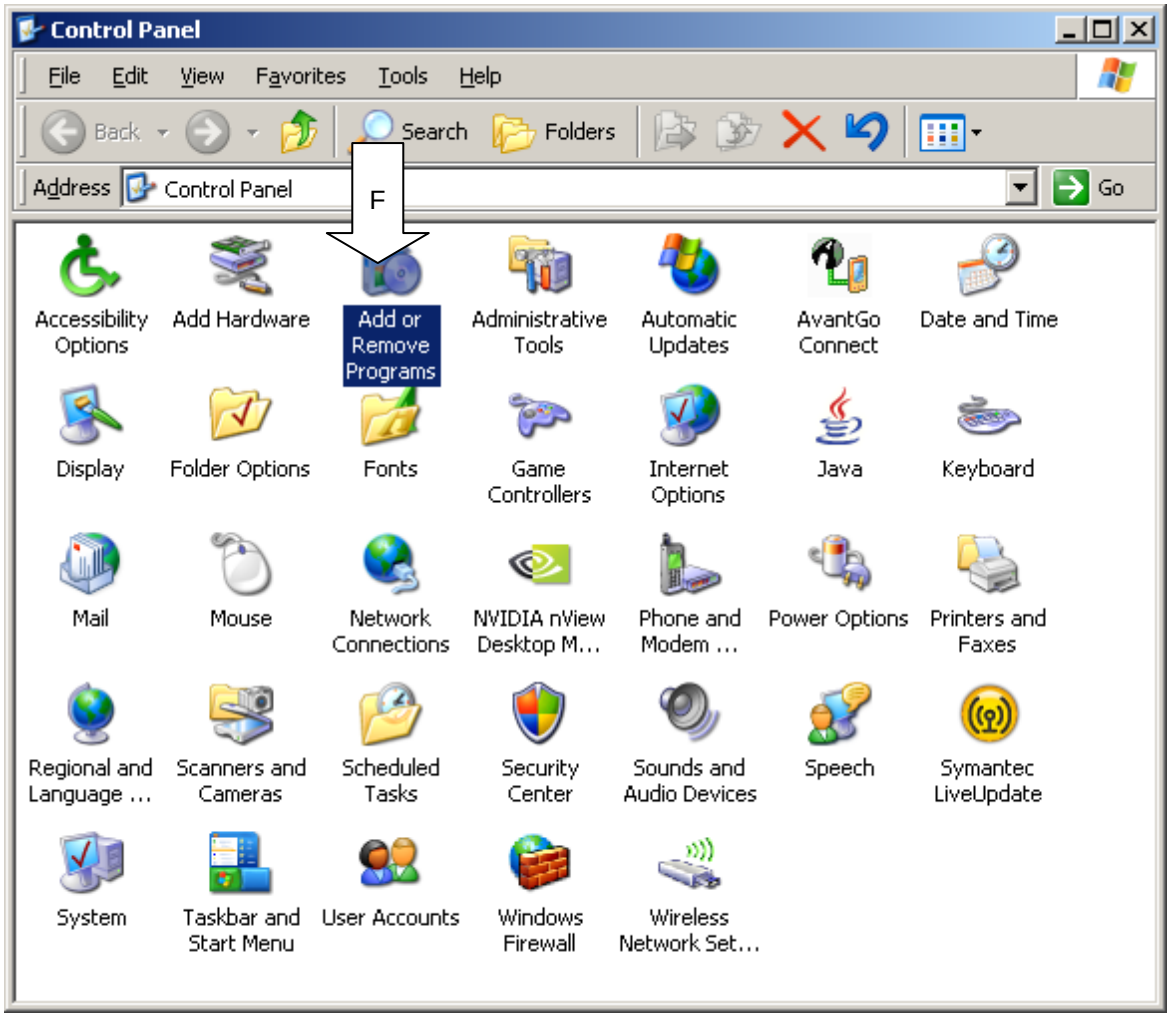


Step 5: If the configuration files are to be saved, copy all of the files having the file extension "INI" into a folder that is outside of the MIC install folder.

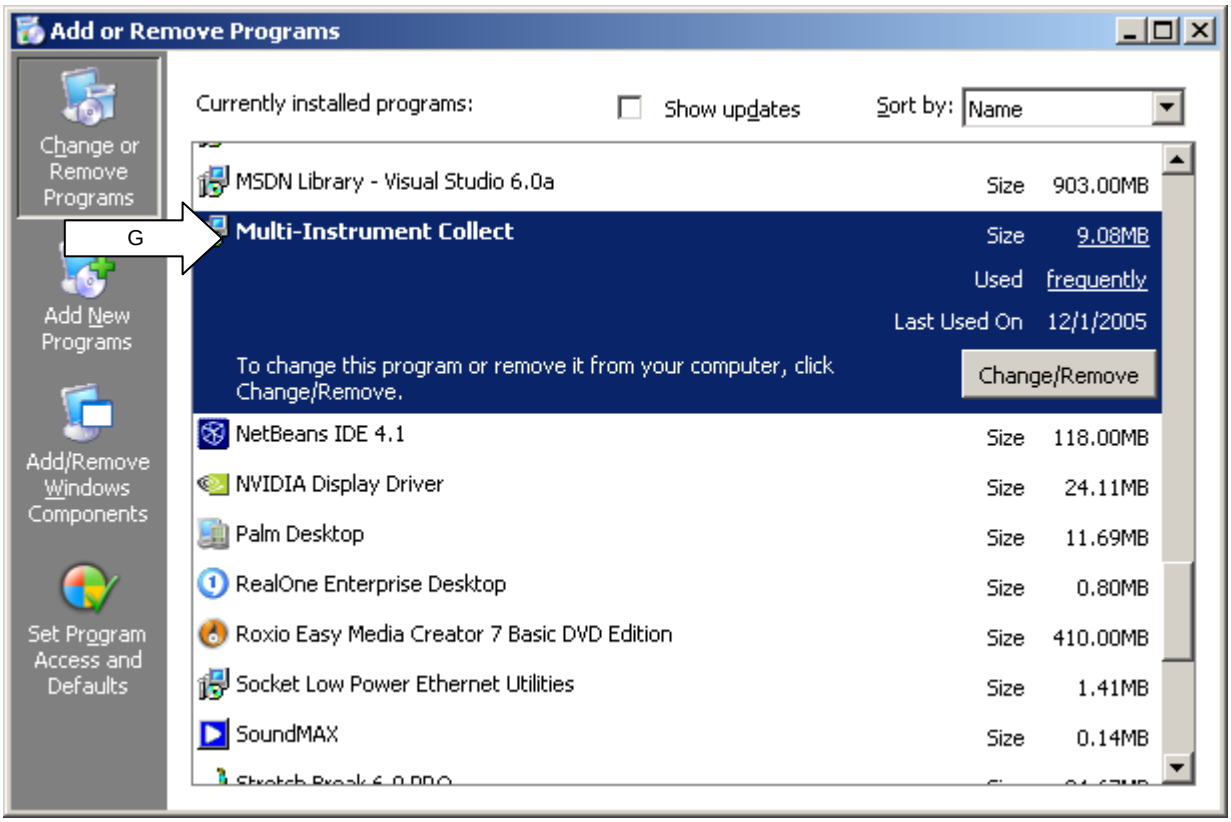
In the illustration below, the configuration files from the c:\MIC2000 directory have been copied into a new folder named C:\SaveConfigFiles.



Step 6: Click on the "Start" button at the lower left corner of the Windows screen. Locate the "Control Panel" menu item and click on it. Locate the "Add or Remove Programs" icon. See arrow F in the figure below. Click on it.



In the "Add or Remove Programs" panel, scroll to the "Multi-Instrument Collect" entry. Click on the line to expand the entry. See arrow G of the figure below.



Click on the "Change/Remove" button. The "Confirm File Deletion" dialog will be presented. Click on the "Yes" button to confirm.

This completes the procedure. MIC is now uninstalled.

33. MIC Startup Error Notification

New with MIC 2.0.0.6, a summary dialog is presented upon MIC startup showing communication and instrument support startup errors. This information can help diagnose issues with complex MIC installations. In the figure shown below, MIC has had trouble starting communication support for two COM ports (8 and 64), and the EOSS ISO is improperly installed. Previous versions of MIC handled communication startup errors with silence.

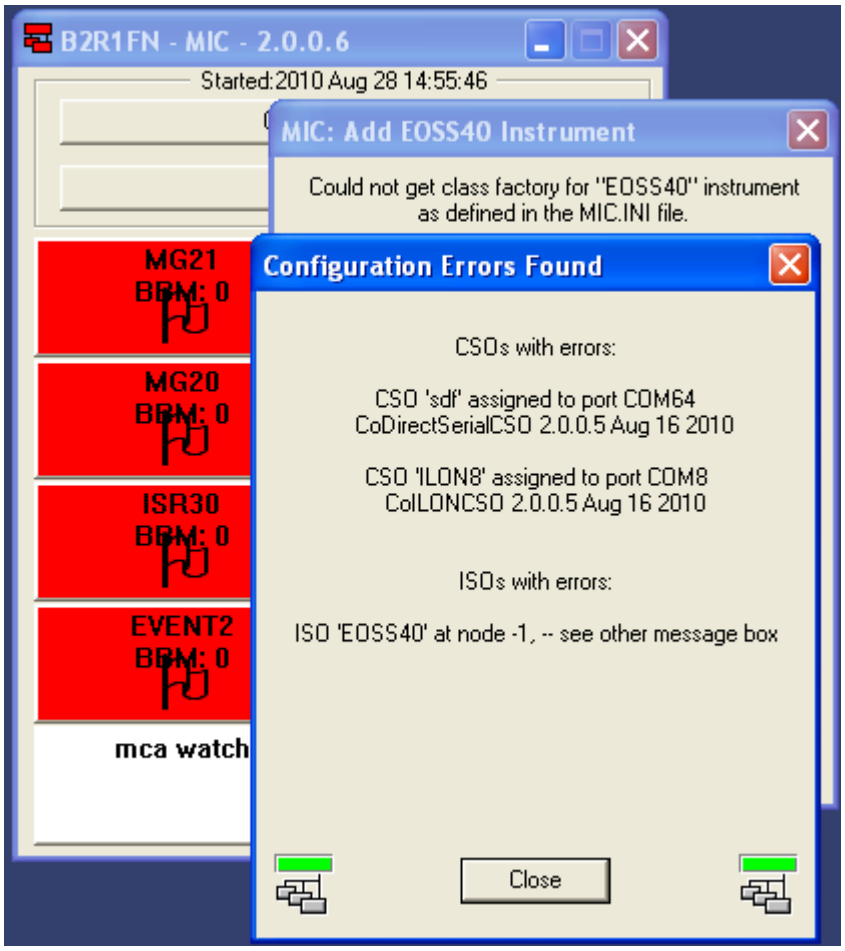


Figure 106 MIC Startup Error Summary

34. MIC Software Revision History

34.1. From Version 1.00 to 1.561

Add new trigger signal record in ISR.

Modify End Dump Record in ISR to be 6 characters in length and containing count of all records sent.

Change all CTime objects to COleDateTime to eliminate any possible date problems.

Modify "Force Instrument Time" to function only while instrument is paused.

Modify all WriteToBinaryFile functions to try multiple times.

Add support to ILON communications object for receipt of time sync record.

Minor display changes.

Added heart beat support to ILON communications object.

Modified status record length in ISR to adhere to new record format.

Created MicXfer NT service to automatically transfer files to a server or other system.

Created Multi-Program Startup Service NT service to force MIC or any other program to run continuously.

Added network aware instrument buttons to send state of health information to one or more trackers and created Tracker.exe to watch MIC state of health.

Added save current position when MIC or tracker main dialog is moved.

Minor modifications to MIC shutdown to insure all communications objects get closed.

Added code to allow a watcher to save to file.

Improved communications object's error on read recovery.

Removed watcher window's translate to uppercase on send.

Added APS UPS support.

Change instrument tab dialog boxes so that clicking on tab doesn't reset "time to close".

Modified DUMPBBM sequence to fall through various states to improve DUMPBBM sequence.

Fix MCA spectrum change indication.

Added repeat if fail on wait for dumpok response.

Modify ILON communications object to disallow local long break (reset of local ILON) if a message was received and sent to any registered instrument support object on this ILON within 3 minutes.

Modify handling of checksum or length error on dumpok response to save data.

Enhanced ILON communications object to allow "xxad dead" as sentinel while trying to resync.

Modified colored buttons to allow multi-line title.

Changed time delta when comparing computer to instrument to have a 1 second dead band. For example: x < set point is ok, x > set point is not ok, and x = set point is no change.

Modified MsgUtil to display as unlimited length list instead of fixed set of statics.

Added forced write time message when ID2 records day different.

Force instrument time action now logged in CEV and PFM.

Added feedback to instrument (which it now logs) when it requests a local long break and it is held off.

Modify DelFi to use the files' last modified time instead of creation time.

34.2. From Version 1.561 to 1.562

Doubled number of attempts to write to binary file from every 100 mSec for two seconds to 100 mSec for four seconds.

Added message to PFM and CEV when MIC fails to open binary file.

Added support to MIC and to TRACKER for MailSlots—allowing status transfer from MIC to TRACKER on non-tcp/ip networks (*e.g.* NetBEIU).

Modified MicXfer to test write access to destination directory prior to attempting to copy file.

34.3. From Version 1.562 to 1.563

Small modification of ILON to MIC time set message from 8 bytes to 6 bytes.

34.4. From Version 1.563 to 1.600

Small modification of ILON to MIC time set message from 8 bytes to 6 bytes.

Added instrument IDs to the header of the IP file.

Corrected typo on text in a dialog box.

Changed the default button on the create instrument dialog.

Removed "extra" stuff from the about dialog box.

Changed MIC heart beat message to 0x50

Changed minimum date in filename to match instruments'.

Added pause during time set on MiniGRAND.

JSR support (not completed -- no parallel port triggering yet).

Added simplified state of health file support.

34.5. From Version 1.600 to 1.651

Completed JSR support including parallel port triggering.

Added MIC version information to IP file.

34.6. From Version 1.651 to 1.652

Changed "Abort" button when copying files to "Exit and NO Archive"

Changed "Apply" button on JSR Modify Parameters tab to "Apply all to MIC only".

Added a check box to the JSR "Summary" tab page. Its text is "Allow click on Recent Command to decode message".

Added "Filter Factor" row in recent data on JSR Data Status tab.

Added radio check box on JSR Data Status tab to display data as raw or rates.

Selecting NONE on the JSR Camera Setup tab now disables appropriate entries.

Clicking on Apply on the JSR Camera Setup tab now disables it until a change is made.

Changes to MIC's JSR configuration are now recorded in the JSR's PFM file.

Replaced Accidentals with Reals in recent data on JSR Data Status tab.

Added command line parameter "kill" to ask this instance of MIC to send previous instance a message to quit.

Changed configuration from adding "Multi-Instrument Collect" in the dialog title to " – MIC – 1.652"

34.7. From Version 1.652 to 1.653

Modified WATCH to allow user to set end of line treatment.

Added registration of MICClass, DelFiClass, EZ-CopyClass, MsgUtilClass, and TrackerClass names to each of the associated executables.

Updated copyright notices.

Updated version numbers of DelFi, EZ-Copy, MsgUtil, and Tracker to 1.653.

Corrected bug in MIC's AMSR/ISR instrument support object state machine which could under specific instrument failure circumstances cause data loss.

Added code in GRAND, ISR, and MCA instrument support objects which will block some potentially repetitive messages from creating large CEV and PFM files.

On Tracker.exe added self configuration option on drop down menu.

Corrected handling of COMSTATUSDE and COMSTATUSLE commands to COMILON from WATCHER window.

Enhanced send file in watcher to send lines longer than max-packet size.

Modified progress bar in watcher window's send file to guess at number of characters actually sent instead of number of characters read.

Fine tune JSR instrument control object's state machine.

Added initialization of parameters in ComILON to avoid error on initialization failure.

Modified JSR instrument control object to write first setup record received each day to CEV and PFM file. This forces creation of PFM and CEV file for each day.

Modified text on Copy Files dialog box from "Inspector ID:" to "Inspector ID: or Facility MBA:".

Fixed save position on move to function only after fully instantiated.

Added "reals" display and option to select raw or rates to ISR's Data Status Tab.

Changed "\" on date in dump file to "." to match CEV and PFM file.

Added INI file configuration parameter to provide "good" and "bad" text in state-of-health file.

Modified Tracker.exe to act as both a server and a client to itself—changed version to 1.700.

Complete rewrite of MicXfer and EZ-Copy. MicXfer now has options to ZIP on a daily basis and to automatically traverse sub-directories. EZ-Copy now knows about ZIP files and will look into them as well as traverse sub-directories. Version to 1.700 on these.

Modified DelFi to optionally consider archive bit, have a self configuration, to traverse sub-directories and to present an icon in the system tray. Clicking on the icon will display the DelFi dialog box. Version to 1.700.

In MIC corrected display of Time Sync on ISR from 1=Hourly, 0 = Daily to vice versa.

In MIC modified ISR, GRAND, and MCA to send an ANALYZE command any time we are driving to 0 bbm (power fail or copy data).

In MIC added password validation on add comm object.

Added MicXferC program to support configuration of MicXfer.

Because of confusion on the to do flags on "copy files" dialogs I changed the moving yellow button like flag to a moving pointing hand.

In MIC added ½ second to COleDateTime when program uses GetDay, GetHour, GetMinute, or GetSecond. This corrects for floating point truncation problem in COleDateTime.

In MIC's JSR-12 support added Low Totals Threshold.

In MIC's ISR/AMSR, MCA, and GRAND/MiniGRAND instrument support object added capability to allow/disallow automatic forcing instrument's time to MIC's time when instrument's response to an inquire2 shows a year prior to 1990.

Modified all instrument support objects to send ANALYZE or equivalent command when exiting monitor mode to set clock. Setting the clock is the only time MIC commands the instrument out of the monitor mode.

Corrected MicXfer fault which would create .zip file instead of .2do file if the date could not be acquired from the file name.

34.8. From Version 1.653 to 1.700

In JSR-12 instrument support object added ability to handle status response when baud rate is 19.2K (5 characters received instead of 4). Updated MsgUtil also. Per Me.

Modified ISR instrument support object to support ?A, ?B, and ?C responses to ? (query mode) command. Also added "number of files" field received in end of dump ok response message. Changed ISR when AMSR to pause immediately in power fail mode. Per Hanson.

Added option in EZ-Copy to bulk copy zip file and contents. Per Halbig.

Changed sense on ISR status word 2 high order bit (filtering) to be bit on means filtering is off. Per Parker.

Modified MicXfer service to respect pause command from within any inner loop. Per Halbig.

Modified ISR instrument support such that on startup when a DUMPLAST response is not received the startup continues normally instead of restarting with a long break reset.

34.9. From Version 1.700 to 1.701

Modified MIC so double clicking on instrument button while instrument is paused forces restart of the MIC instrument support object's state machine when un-paused. Per Audia.

Modified MIC's direct connection serial support object to close the serial port and re-open it when a LOCALLONGBREAK is command is sent to it. Per Me.

Modified MIC's ISR support object to support the AMSR's new busy response. Per Audia.

34.10. From Version 1.701 to 1.702

Modified ISR support object to reset after retransmit max is reached in sending "still busy" query. Per Me.

Modified time sync on grand support object to include "Hourly" or "Daily" if 3 or 4. Per Parker.

Modified State of Health to force a new state of health file at the start of a new day. Per Me.

Fixed "weekly" scheduling bug in MicXfer and changed version to 1.701. Per Abhold.

Modified MICXFER to force PKZIP25's temp file into C:\TEMP. Added detection of failure to add to zip and subsequent rename of bad zip to *.zip.BADxx . Changed version to 1.702. Per Halbig.

Minor corrections in this document.

Added code to MIC to write entry into MIC.INI on each time sync received. Per Halbig.

MICXFERC (version 1.002 to 1.003) modified to display which .ini file it is using. Also if the exe's name ends in "2" then use MicXfer2.ini. Per Halbig. 2001/6/5

MICXFER2 created version with "2" attached to its name. This change required modifying the internal name and description only. Per Halbig. 2001/6/5

34.11. From Version 1.702 to 1.703

Added JSR-12 support for additional message being sent back in response to R command. This only happens rarely (~60 times per day at 3 sec count times). When it does part of the R message response is appended to the R command response. The appended text does not have a CR/LF appended so it gets prepended to the next message. In doing this adjustment I modified the state machine to work with count times down to 1 second. Per Me.

Added communications status indication to ISR/AMSR, GRAND/MiniGRAND, and MCA instrument support objects. Per Abhold.

Modified Install to provide selection to: Don't install configuration (ini) files, Install default configuration files, or install previously saved set of install files. Per Me to match IRS.

Added CopyAll to the utility set of MIC support programs. Per Beddingfield & Wentz

Modified buttons on MIC main dialog to extend full width of dialog. Per Me -- less awkward looking when multiple columns.

34.12. From Version 1.703 to 1.704

Modified the two serial com objects to correct a problem which could occur on some smaller computers if maximum baud rate on the hardware is lower than requested. Added some error messaging to the com objects.

Add ability to reorganize the buttons.

34.13. From Version 1.704 to 1.705

Increased the number of bytes used when reorganizing or during startup to read the instrument names. This fixes an old problem of not being able to instantiate newer instruments when the sum of all the name lengths was over 512 bytes. Per IAEA/Shirley/Me.

Increased the maximum number of bytes in an ILON packet to 1500 from 210. Per Parker.

Added support for MiniGRAND binary data during dumpbbbm and SETBAUD X in watcher window. Per Parker.

Added function to start with or without watcher windows. Per Halbig.

Modified Instrument action when it can't open the target binary file. Instead of locking up MIC for up to 80 tries * 250ms = 20 seconds it now uses the instrument's "# of Retransmits Before Fail", the "Response Time-Out", and the "Maximum Pause Time" to control the behavior. In effect moved the failure handling from the write to bin function to the state machine. Per Chernobyl.

Modified the configuration item "Maximum percent usage of hard disk" to be a float--it was an integer with a maximum value of 99%. Now, for example, such values as 99.999 may be used. Per Pelowitz.

Added support for Event type instrument support object (caused major rewrite of ILON Communications Support Object as well as the creation of the new Event Instrument Support Object. Per Chernobyl.

Modified all "Grand" to "GRAND" and all "Mini-GRAND" to "MiniGRAND" in MIC and in this document. Per Halbig.

Modified configuration dialog to not allow user to attempt to create instrument support object or communications support object until after at least one username/password pair has been entered. Also added on the configuration dialog the total number of BBM bytes in all instruments. Per Parker.

Modified Re-Organize dialog to support rename of an ISO, change Node number, and move ISO to different CSO--requires SUPERUSER password in INI file. Per Chernobyl (Halbig).

In the GRAND3 ISO modified ECHO repetitions from 2 to 3 during startup also added code to strip off non-printable characters at the beginning of a GRAND3 text message. These characters are erroneously introduced by the GRAND3 during a power on sequence or after a long break reset if an internal switch in the GRAND3 has been set to force reload of the EEPROM code. Added check box on Modify Params page of GRAND ISO to wait 60 seconds after a long break reset (when not checked the GRAND ISO only waits 3 seconds). Per Shirley.

Added code so that MIC can receive a special signal telling GRAND, ISR, and MCA ISOs to throw away data as it is being recorded to disk (go blind) for a limited period of time. Created MICExclude.exe to send the signal to MIC based on a mouse click or on input from serial port. This modification was done to meet the requirements of MIC of a specialized installation. It is programmed to be deactivated normally and can only be activated during compile time. When it is activated in MIC an "x" is added to the version number and a "LANL" bitmap is placed on the background of the main dialog. NORMALLY all of this modification is NOT included! Per Mike Browne.

Modified GRAND3/MiniGRAND ISO to validate instruments' "settable" parameters when it receives them. When a settable (not a measurable) parameter is different than expected it will be displayed in red text with a yellow background. Behavior otherwise is identical to a measurable parameter out of tolerance. A new tab has been added "Inst. Setup" which displays the currently reported, currently desired, and allows the user appropriate edit and save functions. This modification will eventually be done to the other ISOs; but is un-funded at this time. Per Chernobyl.

Modified controlled access functions to provide both "USERS" and "SUPERUSERS" access control lists. Only the "Re-Organize" dialog box is limited to SUPERUSERS. Per Halbig (Chernobyl).

Modified MIC main dialog to include a minimize button. Also modified to change the large and small icons to red when any button face is red (and back to green when no button faces are red). Per Halbig (Chernobyl).

Modified the "File Output Location" data item on the Modify Parameter pages on all instruments to be a multi-line display. Also modified the "Apply" button to be a colored button (gray when not active and yellow when active). Per Halbig (Chernobyl).

Minor change to Tracker to reset MailSlot if MIC running on the same machine as MIC and MIC starts first.

Modification to MIC's APC-UPS to support the unique Aquila UPS system as a superset of the APC-UPS system.

Modified MicXfer to post via UDP log entries back to the same system. If MIC has a APC UPS instrument support object instantiated and if it detects an Aquila UPS then the ISO will catch the messages and pass on the status to the Aquila UPS system. Otherwise, a new application called WatchMicXfer.exe may be used to monitor MicXfer's activity.

34.14. From Version 1.705 to 1.801

Modified state machines for all instruments (as appropriate) to check if "Acquire" command during power failure sequence is needed prior to checking for timeout on "Inquire" command. This solved the problem where if a power fail occurred between an inquire2 command and its response then the state machine would fail by quickly repeating the inquire2 command.

Modified all messages destine for CEV, PFM, or DMP files to contain a unique message number. This is to aid the up-coming scanning of these files. (Chernobyl and Rokkasho)

Major modifications to Tracker.exe to support receipt and forwarding of triggers to third party software. (Homeland Defense-King's Bay-et.al.).

Modify APC-UPS so that it will post a WM_QUIT message to one or more programs (usually configured to be SHUTDOWNPROGRAMx=DCMPOLL) when starting the shutdown sequence. On the first program "x" will be missing; on all subsequent it is a monotonically increasing number starting at 1.

Added support for manual and automated extended state of health file. There are two forms of the extended file. The first form contains only the disk space and the main dialog information whereas the second form also contains INI file information and all the information from each of the instrument dialogs. The file name is optionally processed through CString::Format() so any of the date and time values MAY be inserted into the file name (*e.g.* "MIC SOH %Y_%m_%d %h.%m.%s" will get converted to MIC SOH YYYY_MM_DD HH.MM.SS". (Chernobyl)

Added EZ-Move to the stable of MIC support programs. It does exactly the same thing as EZ-Copy with the exception that the source files are deleted. (Shirley, Chernobyl)

34.15. From Version 1.801 to 1.802

Added notification to all instruments when a time set is received in the ILON CSO. Each instrument now logs the event in their respective PFM file.

Each instrument now logs the event in their respective PFM file.

Changed treatment of dumpbbm sequence if a hard checksum error. When this occurs any received 15 records are now written to the bid file instead of throwing them away.

Modified support for auth flags on record 15 of GRAND/MiniGRAND.

Added support in MCA (1KADC) to display and save to disk spectra files.

Enhanced MicXfer to send UDP packets to multiple destinations.

34.16. From Version 1.802 to 1.803

Completed support for DSPEC Plus by creating a IPX communications support object and a DSPEC instrument support object. (Rokkasho)

Added "Long File Name" capability similar to the SOH file name support to all instruments. (Rokkasho)

Completed support for DUMPBBBM in MiniGRAND.

Modified all ISOs to add the TYPE and ID to the browse for Save File Location only if type and ID are not in the path already. (Rokkasho)

34.17. From Version 1.803 to 1.804

Modified APC_UPS support to provide PFM files containing all data received from APC UPS or Aquila UPS. (Chernobyl)

Minor fixes to APC_UPS.

Complete rebuild of install using new version of Install Shield.

MicXfer from 1.001 to 1.002 by adding "VERBOSE" in "CONFIGURATION" section that turns on more UDP messages and LOG entries.

34.18. From Version 1.804 to 1.805

Added SHUTDOWNSERVICEx to the APC UPS IPC (Chernobyl).

Modified APC shutdown of OS to be different for 4.0 than 2000 and above. Microsoft changed.

Some VACOSS seal support cleanup.

Cleanup of code in various modules.

Build number and date added to about dialog.

Added compile time option to turn on "pre-release" in background of dialog.

APC PFM files corrected use of % and cr\lf.

Added Peggy Moore as co-developer in about dialog.

Added SC_CLOSE and WM_QUIT, removed EWX_FORCE to APC shutdown sequence.

Changed all ClistCtrlStyled to pointers so that object gets constructed only if needed.

Some code modification to prepare for MIC GM (mostly m_szIniFile).

Modified MicXfer and MicXferC (now version 1.82) to support: complex log name, separate controls on verbose for LOG and UDP, and 0 max log size indicates no limit on size. Reorganized tree to be more user friendly.

Modified the new install procedure to provide quotes around path names if needed when it modifies the MPSS.INI file during install.

34.19. From Version 1.805 to 1.806

Added short filename support in DSPEC Instrument Support Object.

Rebuilt the APC-UPS Instrument Support Object to be more like the other ISOs.

Added modifications to GRAND Instrument Support Object to support the new GRAND Monitor Version 4.0 messages.

Modified MicXfer to break up zip and 2do files into hourly chunks instead of daily. ZIP file name will now be YYYY_MM_DD_HH.zip. Changed call to PKZIP25 to provide full path name to fix a bug when running under Windows 2000. Changed path name references to allow long names with spaces in them. Added ability to STOP MicXfer in the middle of a process cycle. Previously one could only pause it. Fixed a feature in the error handling that occurs when the network connection goes away and the socket being used becomes invalid. Changed version number on MicXfer.exe from 1.82 to 1.83.

Modified EZ-Copy and EZ-Move to allow long file names with spaces on path to ZIP utility. Added button to edit path to zip utility. Changed version number to 1.8 on both.

Added BELKIN UPS Instrument Support Object.

Added Aquila UPS Instrument Support Object. APC UPS support object still supports the Aquila also.

Updated the MIC User's Manual.

34.20. From Version 1.806 to 1.8.0.7

Added support for MiniGRAND Monitor 4.10+ commands.

Modified all "Legend" tabs to look for "<instrument name>.rtf" and if not found then "<instrument class>.rtf" and if not found then use the internal Rich Text Format information. The Legend page is now user modifiable and consists only of a RTF text display.

Modified GRAND/MiniGRAND support so that during start up if DUMPSTAT fails N times to go forward to ANALYZE instead of immediately doing a long break reset.

Modified GRAND/MiniGRAND such that any "red" or "yellow" item stays on; so that a square icon is displayed if any tab is not a round green icon; added the half square red and half yellow triangle if items on that tabbed page contain both red and yellow items; cleaned up yellow (doesn't match configuration) display. Removed saving the icons on the button and restoring them when restarted because the underlying cause is not saved. Modified CEV and PFM so that each line ends in carriage return and then line feed (following the PC/Windows standard). Modified tabbed dialog to be created when displayed and destroyed when not displayed. The previous code always created the dialog and simply toggled show or hide as needed.

Modified version number to match new standard and updated it to 1.8.0.7

Added RunEZCpy utility to suite.

34.21. From Version 1.807 to 1.9.0.6

On the GRAND ISO Data Status Page, changed "Data Filter Status" label to "Current Data Filter Status". This is to emphasize the value presented in the data field is not the filter setting, but is the ongoing current real-time filtering activity.

For the GRAND ISO Data Status Page, changed the readout of the current filtering activity to "Filtering" vs "Filtered" and to "Not filtering" vs "No Filter". This is to emphasize the value presented in the data field is not the filter setting, but is the ongoing current real-time filtering activity.

GRAND ISO expanded PFM text to indicate when a icon is turned on.

GRAND ISO added PFM entry "30008 Attempting recovery from communications failure."

GRAND ISO added PFM entry "30006 Flags acknowledged by user [FLAGS all off]."

Modified message (dialog and PFM) in JSR ISO saying JSR was being reset when in fact we were just reading status.

Modified JSR ISO to allow user to set the number of message timeouts constitutes a communications failure, forcing the ISO to restart a count cycle.

34.22. From Version 1.9.0.6 to 1.9.0.7

Minor fix to the GRAND ISO to ensure the MIC.INI file is updated when the "Acknowledge Flags" button is clicked. Fixes a problem induced in 1.9.0.6. Time, Communications Failure, and Power/BBM flags are now persistent across MIC re-executions only until they are acknowledged.

34.23. From Version 1.9.0.7 to 2.0.0.0

(DR 88) GRAND ISO: Corrected display of Rel/+;Rel/-;Abs/+;Abs/-. Meaning of the two bits was swapped.

(DR 88) MIC Manager: Modified trigger of write extended SOH to be based on time of previous and cycle time. Previously it was a timer that was started when MIC was started. MIC now checks every minute to see if it is time to print another extended SOH file.

(DR 88) GRAND ISO: Modified both HV error percents to be active only if voltage is setpoint reported by the instrument is above 50v.

(DR 90) MIC crashes when cable is unplugged from a GRAND instrument.

(DR 91) MIC Manager: Extended SOH file previously called the rectangle icon on the button face "QUEST" and placed it in the "question" column in the report. Changed it to be "SQUARE" and "square" respectively.

(DR 93) MCA ISO: Fixed coding errors to enable display of other than CHN files when clicked on.

(SCR 62) File copy operation from MIC fails if there is no A:\ drive installed on collect computer. This was a resource ID problem. Modified the code so that we use the actual resource ID rather than the base ID + index--now we don't care if they get out of order in the resources.

(DR 89) Fixed bug on initial create APC ISO that if run on shutdown item was modified could cause MIC to crash.

(DR 92) Fixed crash in JSR ISO to catch problems when using the parallel port for a camera trigger.

(DR 94, SCR 95) Segmented the monolithic MIC into MICMgr.exe (MIC Manager, the client) and 13 servers in the form of DLL's. These 13 DLL's encapsulate 3 communications components, 9 instrument components, and a component for the color buttons on the main MIC dialog. The 3 communications components implement the Direct Serial, ILON, and IPX capabilities. The 9 instrument components implement support for the APC UPS, the GRAND, the Aquila UPS, the DSPEC, the Event, the ISR/AMSR, the JSR, and the MCA instruments.

(SCR 96) Removed the experimental Belkin UPS instrument support. Removed the unused mailslot communications code.

(SCR 97) Reverted to the flat implementation of the Legend page as it was in 1.8.0.6.

(SCR 98) Changed GRAND instrument default values in the MIC.INI file. In particular, changed some of the default configuration setup parameters and the default voltage limits for the GRAND ISO. Additionally, modified the default voltage values written to the MIC.INI file by he GRAND ISO so that they also reflect the voltage limits changes.

(SCR 99) Changed the default value of MAX_REP from 9999 to 10 in both the installation default MIC.INI file and in the MIC Manager code.

(DR 66) Fixed a problem in the GRAND instrument software to ensure the time sync button (on Modify Params page and labeled "Force Instrument Date & Time to Computer's") is not enabled unless the instrument is paused.

(SCR 64) Changed the column labels on the ... to include the neutron and gamma channel labels. Disabled the fifth column and labeled it for future use.

(SCR 114) Made both JSR-12 Apply buttons on the JSR's Modify Parameters page yellow color buttons which indicate when the apply is allowed.

(DR 159) Added a browse button to the Copy Files function so that all removable storage devices are selectable.

34.24. From Version 2.0.0.0 to 2.0.0.1

(SCR 65) Added new screen shot to this manual showing the new MiniGRAND Channel Config Records chart labels.

(SCR 98) Updated this Users Manual to show the new default setup values introduced in MIC 2.0.0.0.

(SCR 71) Added information to the Users Manual describing the Delfi user interface.

(DR 185) Added FAQ's documenting how MicXfer should be set up to transfer *.jpg files (and all other types of files as well).

(DR 142) GRAND Instrument component: Made it so the GRAND windows don't show up on the task bar.

(SCR 235) GRAND Instrument component: Added code to process the 4F DUMPOK Response differently.

(SCR 236) GRAND Instrument component: Added code to accommodate change in the 15 record.

(DR 245) IPX Communications component: Repaired startup problem with IPX communications component for lower-end laptop installations.

(DR 169) All instrument components and MIC Manager: Repaired display of crowded and unusable buttons that resulted from the display DPI setting being set to Large.

(DR 199) MIC Manager: Fixed an error that allowed the wrong component to be selected from the drop-down selection control when adding components.

(DR 200) MIC Manager: Added error messages that were needed when installation is not as expected.

34.25. From Version 2.0.0.1 to 2.0.0.2

(DR 265) DSPEC Instrument component: Repaired problem that the GAIN FINE setting could not be modified.

(SCR 266) Corrected this manual where the DSPEC CEV files were said to contain DSPEC Change State messages. These messages only appear in the DSPEC PFM files.

(DR 267) DSPEC Instrument component: Corrected problem that the 61000 message in the PFM and CEV files does not print the CHN filename.

34.26. From Version 2.0.0.2 to 2.0.0.4

(DR00163) Modified MPSS and MPSU to create the "Cycle" parameter in a new ini file.

(SCR00064) Modified MPSS and MPSU to look for lower case mutex, class, and/or window name. Modified MIC to create both mixed case and all lower case mutex: MultiInstrumentCollect and multiinstrumentcollect.

(SCR00365) Added comment in text of this document that MIC is the only program that uses a named MUTEX and what that MUTEX is.

(DR00124) Verified correct PREVIOUS date processing in MICXfer.

(SCR00246) Modified MICXfer to provide error message when FindFirstFile fails.

(DR00364) Modified MICXferC to include .BNY and others in the default list.

(DR00068) Repaired dialog snapshot to file for AMSR ISO errors.

(DR00073) Repaired SOH file inaccuracies in JSR ISO.

(SCR00074) Modified GRAND and ISR ISO to do a dump stat when ever it finds an empty PFM file (*e.g.* first PFM entry after start of day).

(SCR00079) Added support in MICGM to trigger extended SOH at a specific time of day.

(DR00115) Added shutdown message with both Logon ID and MIC Id to all instruments. Also added LAST_VALIDATION to CONFIGURATION section of INI and code to initialize to that value on startup.

(DR00138) This document updated.

(DR00161) Provided two minute "grace period" in validation software. If a valid user and password was entered within the previous two minutes then the user will not be prompted again.

(DR00169) Tuned the main dialog button display positioning.

(DR00175) Added code in file copy activity to support automatic detection of a new drive, to automatically flush and dismount thumb drives, and to block the auto-run feature during the copy files activity.

(DR00401) Added warning in APC UPS ISO about some versions of the APC UPS not re-supplying power when mains is not available.

(DR00224) Fixed improperly formed message in UPS ISOs' PFM.

(DR00353) Fixed programming error that caused MIC to stop responding during copy files.

(NA) Fixed programming error that caused MIC to crash.

(DR00355) Fixed Trigger pin configuration reported with incurred logic in GRAND ISO.

(SCR00358) See DR00175 above.

(DR00359) Added support for long file name in the copy file section of MICGM.

(SCR00361) Added menu selection to drive BBM to zero on all instruments and then pause.

(NA) Added MICDump to the MIC utilities.

(NA) Fixed missing resources in some ISOs.

(NA) Changed from modal dialog boxes to timed dialog boxes.

(NA) Changed DSPEC ISO from \r\n\r to \r\n in PFM and CEV files.

(NA) Fixed resource error in TimedMessageBox.

(NA) Reactivated commented out startup after abnormal shutdown.

(NA) Added Maximum Peak Count display to DSPEC ISO.

(421) Added MICDump to this document.

(350) Added error message to EZ-Copy when pkunzip.exe cannot be found.

(NA) Removed Waiting for short dwell and Expecting short dwell messages from PFM file on DSPEC ISO (per TW).

(351) Added Pause/Restart button in EZ-Copy.

(76) Added option to have ISO set the time on an instrument (if out of tolerance) at a specific time of day (GRAND, ISR, MCA ISOs).

(356) MiniADC (MCA) extended user settable channel names to SOH file.

(74) Added code to force DUMPSTAT at the beginning of each PFM file (*e.g.* daily).

(178) Removed ability to edit and subsequently save to DSPEC parameters in DSPEC ISO.

(185) Beefed up MicXfer's description of network transfer of images.

(186) Beefed up MicXfer's description of network present determination.

(64) Decreased MPSS's case sensitivity. Some entries, because of how they are used, cannot be totally non-case sensitive.

(290) Added documentation on MICSqrt.

(393) Verified DSPEC start stop cycle doesn't lose 8 seconds at startup.

(394) Verified DSPEC HV doesn't get turned off during ISO pause.

(118) Added list of registered ISOs and CSOs to about box.

(53) MiniGRAND instrument reports of battery low are now only reported to the PFM and do not turn the battery low fields red.

(336) Added documentation on the DelFi interface.

(138) Cleaned up MIC SOH manual description.

(NA) Repaired CEV and PFM content descriptions for GRAND ISO.

34.27. From Version 2.0.0.4 to 2.0.0.5, released Feb. 20, 2010

BMEND-**16** RAD and MIC manuals have no EOSS description in them.

BMEND-**21** MICXferC has uninitialized content in the time and date fields.

BMEND-**22** MICXfer's default values of 0 or 1 for the status cycle interval binds PC CPU at 100%

BMEND-**24** MicMgr 'Menu pause state' mouse floater crash. Steps to replicate: start with two column MIC button display, do a pause all, then float mouse over the menu "Get BBM & Pause" item and whack!

BMEND-**25** EOSS reader crashes when PC disk is read-only.

BMEND-**27** JSR-12 skull icon persists even when JSR-12 MIC status is clean; (low priority, but this should have been fixed in this release, along with other MIC icon problems).

BMEND-**32** Snapshot file, MG version number truncated, max bias column mismatch too, trigger display is wrong in file, 2 for Abs/+.

BMEND-**33** EOSS ranges for voltage not being used (apparently). Also see #43.

BMEND-**34** EZ-Copy: Long file names not used. Date set to 2 days but still got all the days, appeared to not be working.

BMEND-**35** MicDump fails when gap analysis is checked using BID files.

BMEND-**37** Tracker needs a UDP heartbeat; obvious suggestion: configure optional interval in the .ini file.

BMEND-**43** The MIC EOSS default values for emergency battery voltage ranges are irrational.

BMEND-**44** Tracker's 5 minute flashing not documented, add to MIC manual.

BMEND-**49** DelFi works only for short file names, dating the software in the mid-90s: fix!

BMEND-**55** Insert -> gamma sigma on the acquire record needs new label (uncertainty) and explanation of numbers

BMEND-**61** When configuring the ILON and GPS, use the ILON id; document this fact.

BMEND-**62** MIC MPSS case issue still an issue. Documented, but should be loosened.

BMEND-**64** "Get BBM and Pause" duration forever, restart, and max pause times need documentation, please define in UG.

BMEND-**65** MIC UG and MIC UI term for battery is vague, voltage differs, fix manual

BMEND-**68** MIC trigger configuration for MG is confusing and may not have matched the UG, improve the documentation.

BMEND-**76** Section 27 of MIC UG on EZ-copy is unclear on zip file details and behavior. Clarify it.

BMEND-**82** Document the sub-second count time for the MG in the MIC manual

34.28. From Version 2.0.0.5 to 2.0.0.5 *EOSS Patch*, released Aug. 2, 2010

BMEND-**13** The EOSS state machine's drive to the red 'No seals found' state should encompass more conditions and happen more quickly: we want a routine quick test of seal presence without seal data and status query.

BMEND-**83** Fix and Detail all PFM entries in Documentation.

MIC-**3** HHMR cycle count slippage needs reduction.

Updated assets: CoEOSSISO.dll 2.0.1.0, MIC_EOSSReader.dll 1.3.0.0, CoHMMRISO.dll 2.0.0.5, this document.

34.29. From Version 2.0.0.5 *EOSS Patch* to 2.0.0.6, released Aug. 28, 2010

BMEND-**36** MIC started without any buttons once, and lost others due to COM loss. Would be more consistent if windows remained regardless.

BMEND-**38** PFM file entries on time synch have Instrument and ILON entries that conflict, ample examples in archived PFM files.

BMEND-**53** PFM file has repeated entries for some classes of errors and not others, it's inconsistent. All PFM entries should follow day limits.

BMEND-**123** MIC+PIP using rapid MPSS start-up results in data collection failures

Updated assets: Tracker.exe 1.9.0.0, MicMgr.exe 2.0.0.6,CoILONCSO.dll 2.0.0.5, CoDirectSerialCSO.dll 2.0.0.5, this document.

34.30. From Version 2.0.0.6 to 2.0.0.7, released Mar. 29, 2012

MIC-**7** MIC data download issue (Copy Data Files aka "Copy all data" feature broken).

BMEND-**42** The MIC "Copy all data" feature needs .ess files added to the default file set.

Updated assets: MicMgr.exe 2.0.0.7, CoEOSSISO.dll 2.0.1.1, MIC_EOSSReader.dll 1.3.0.1, this document.

34.31. From Version 2.0.0.7 to 2.0.0.8, released July 8, 2012

MIC-**4** AMSR/ISR ISO bad formatting on PFM/CEV output

MIC-**10** Some instruments have bad PFM/CEV long file names (e.g. AASR022_**18991230**_**000000**.PFM)

MIC-**11** JSR ISO using long file naming with CEV/PFM bug MIC-10 fails to create next day file

MIC-**12** 2036 02 05 dates appear in JSR/HHRM/PSR PFM/CEV files under some conditions

MIC-**13** schtasks syntax changed from XP to W7

MIC-**14** Annoying pervasive spelling error present in Grand PFM/CEV logging

Updated assets: MicMgr.exe 2.0.0.8, CoEventISO.dll 2.0.0.5, CoAquilaUPSISO.dll 2.0.0.5, CoAPCUPSISO.dll 2.0.0.5, CoMCAISO.dll 2.0.0.5, CoDESPECISO.dll 2.0.0.5, CoGrandISO.dll 2.0.0.6, CoISRISO.dll 2.0.0.6, CoEOSSISO.dll 2.0.1.2, CoPSRISO.dll 2.0.0.5, CoHHMRISO.dll 2.0.1.0, CoJSRISO.dll 2.0.1.0, this document.

34.32. From Version 2.0.0.8 to 2.0.0.9; MICDump tool updated, released Aug. 2, 2013

BEE-161 (MICDump) MIC must read DragonBall MG BI0 data files (this pre-2008 request was not recorded for the Pelowitz/Determan/Michel transition)

BMEND-150 (MICDump) The SD card files are in the .BI0 format which is not useful to either technical staff or inspectors in the field.

MIC-**16** Add Serial Port enumeration diagnostic

Updated assets: MicDump.exe 1.1.0.0, MicMge.exe 2.0.0.9, this document.