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METRA RECORDING SYSTEM

**ENGINEER'S
TRAINING GUIDE**

MICRO-AIDE
Rail Signal Products

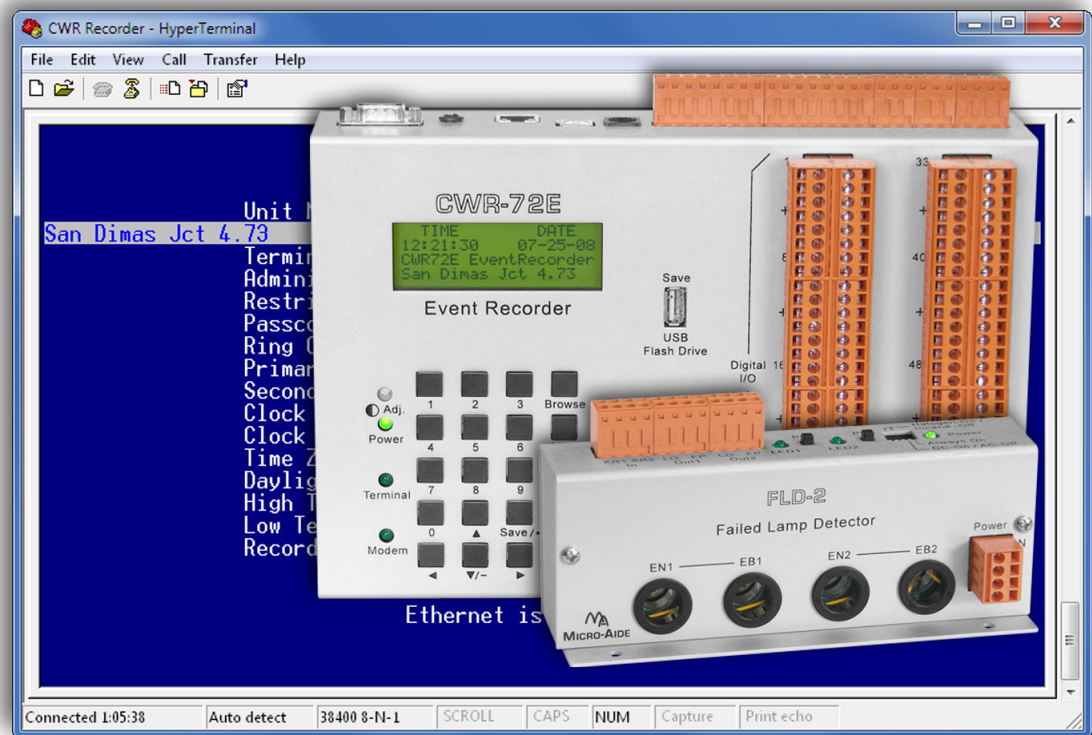
*EVENT RECORDERS ALARM REPORTERS DATA LOGGERS
CLOCK SYNCHRONIZERS CURRENT SENSORS VOLTAGE MONITORS
BATTERY MONITORS LIGHT OUT DETECTORS CUSTOM ENGINEERING*

MICRO-AIDE



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RAIL SIGNAL PRODUCTS



METRA RECORDING SYSTEM TRAINING GUIDE ENGINEER'S VERSION

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INTRODUCTION

WELCOME

This training guide was written with you in mind—our user. Since the late 1980s MICRO-AIDE has been designing and manufacturing Event Recorders for the Rail Signal Industry. Our recorders have been praised for their ease-of-use, utility and durability. Over the years we have also strived to provide you with comprehensive documentation. This guide's objective is to explain, step-by-step, how to perform one important recorder task at a time. We think you'll find this guide indispensable when working with our recorders.

THE METRA RECORDING SYSTEMS

Metra has defined requirements for two recording systems referred to as the 2-Track and 4-Track Recording Systems. Briefly stated, each system comprises an Event Recorder, a light out detector device and related PC software.

The 2-Track and 4-Track Recording Systems utilize the MICRO-AIDE CWR-40E and CWR-72E Event Recorders, respectively. The two recorders vary in only one regard. The CWR-40E is equipped with 32 Digital Inputs, the CWR-72E is equipped with 64. In all other aspects the two products are identical. They are both installed with and execute the same firmware.

MICRO-AIDE's Failed Lamp Detector (FLD-2) serves as the light out detector in both recording systems. Our Graphical Event Analyzer (GEA) software can be installed on any Windows® PC. It provides a convenient GUI-based interface for viewing and plotting data acquired from either recording system.

ABOUT THIS GUIDE

At the request of Metra, MICRO-AIDE has prepared two Training Guides. The Technician's Version has been written to provide instructions primarily for technicians and maintainers who must be able to use the recording systems primarily for the purpose of capturing and reviewing Event Record data. An example would include getting and saving to a PC file, event data related to a crossing incident. The same could be true of maintenance or performance data. In either case, the recording system has been previously set up and is now fully operational.

This copy is referred to as the Engineer's Version. It includes all of the instructions listed in the Technician's Version, but is written primarily for signal engineers and staff responsible for the setup and configuring of the CWR-40E, CWR-72E and FLD-2. It is much more comprehensive as it provides detailed instructions on how a variety of parameters are assigned.

The "[Table of Contents](#)" provides a concise overview of the contents of each version. In the preparation of this guide, data was captured from an actual CWR-40E or CWR-72E recorder. Version 1.02 of the firmware was used along with the Setup Databases approved by Metra in January of 2011.

TASKS

Both versions of the Training Guide contain individual blocks of instruction referred to as tasks. One task may include instructions on how to assign a site ID. Another task may provide details on how to capture Event Records to a PC file. In all cases, tasks are devoted to a particular activity that you will likely need to perform in the future.

All instruction guides have a starting point. This one is no different. [Task 1](#) entitled "Creating a HyperTerminal Serial Connection" and [Task 3](#) entitled "Getting to the Main Menu Using the Terminal Port" are key and must be understood and performed before you can proceed further. After that you are free to perform any task in any order that best suits your needs. However, the sequence of tasks listed in the guide is intentional. For the most part they are listed in a sequence consistent with normal use of the recorder; that is, the steps you would most likely take when using a recorder for the first time.

WHAT THIS GUIDE ASSUMES

You can access your recorder via several methods. Accessing a recorder can be accomplished via the front panel LCD and keypad, USB Device Port, internal modem or serial Terminal Port. This guide starts off by offering basic instructions on how to access the recorder via a Terminal Port. This is the most common method used to dialog with a recorder. Other tasks describe the use of the modem and USB Device Port. It is further assumed that you will be using a Windows-based PC and that HyperTerminal® is installed and available for use as the required communications application. Windows 7® was used throughout the preparation of this guide. Your operating system may differ, but the differences will not be significant.

CONVENTIONS

This guide uses several typographic and reference conventions to clarify what you must select, enter or type. Each are described in the following sections.

LABELS WITHIN WINDOWS

This guide shows you how to perform several tasks that rely upon your ability to exercise Windows-related commands. "Connect using" is an example of a command, field or tab that can be found within Windows. A Windows-related label will always be enclosed in quotes.

WHAT YOU MUST TYPE

By way of example, many of the tasks include cases where you must enter a parameter. **SIGNAL** illustrates the style of font used for this purpose. The user should assume that the letter-case shown must be used.

PRESSING A SPECIFIC KEY

In some cases a specific key on the keyboard of the PC must be pressed. **Enter** and **Esc** illustrate this convention. Your recorder is equipped with a front-panel-mounted keypad that comprises 20 pushbutton switches. Each pushbutton is identified with an appropriate silkscreened label. *Browse* and *Enter* illustrate the italic style used to identify these keys.

RECORDER LABELS AND REFERENCES

The recorder includes many of its own labels. A specific menu, command, field or setting must be properly identified. A normal font with appropriate first letter capitalization is used for this purpose. Main Menu illustrates this convention.

IDENTIFYING SUB-COMMANDS

The recorder implements numerous commands and sub-commands. As has been previously described, a normal font and first letter capitalization is used to identify recorder commands (e.g., Setup). Sub-commands include an intermediate right-angle bracket character (e.g., Setup>System Parameters).

LINKS

Like all MICRO-AIDE prepared user documentation, this manual is available for downloading as a PDF document at our website. The PDF version includes numerous click-able links. An example of a link is: ["The Metra Recording Systems" on page xi](#).

CWR-40E AND CWR-72E Usage

Finally, the CWR-40E and CWR-72E Event Recorders are identical in all aspects except one. The former is equipped with 32 Digital Inputs, the latter with 64. Throughout this Training Guide the terms recorder(s), Event Recorder(s) and CWR-72E are intended to refer to either product. The term CWR-40E is used only in those rare cases where a distinction must be made.

SETUP DATABASES

All MICRO-AIDE Event Recorders include a user-defined Setup Database. Each Setup Database must be unique to each recorder. A Setup Database can be thought of as a collection of various names, labels and settings that add clarity to the Event Records and various reports issued by the recorder. Setup Databases are saved in the non-volatile memory of the recorder.

Metra has prepared and approved three different Setup Databases for use with the recorders. A brief description of their use follows.

Mainline—This database is used exclusively with CWR-72E Event Recorders.

BEV—This database is used exclusively with CWR-40E Event Recorders. It features East/West labeling.

MED—This database is used exclusively with CWR-40E Event Recorders. It features North/South labeling.

Every Event Recorder shipped to Metra will have pre-installed an appropriate Setup Database. The shipping container will clearly identify the recorder type. All three Setup Databases are fully detailed in Appendix B of the CWR-40E/CWR-72E Event Recorder User Manual. A PDF copy of the manual can be downloaded from the MICRO-AIDE website at:

www.micro-aide.com/support/documentation.html

ACCESS CONTROL AND SECURITY

Each Event Recorder includes several access points (e.g., Terminal Port, front panel keypad, etc.) by which a user can interact with the recorder. However, irrespective of the access point each user must log onto the recorder by first honoring a password or the Passcode. There are no exceptions to this rule. There are two levels of access that are employed by the Terminal Port, modem and USB Device Port. Both levels of access control and the Passcode are described in the following.

ADMINISTRATIVE ACCESS

The Administrative Password allows the user full access and control of the recorder. Accordingly, its use must be guarded. Its assigned value will not be revealed anywhere in this Training Guide. The Engineer's version of the Training Guide explains Administrative and Restricted Access commands and features. The Administrative Password is used by the Terminal Port, modem and USB Device Port.

RESTRICTED ACCESS

The Restricted Password allows the user only limited access and control of the recorder. Irrespective of the Setup Database employed, the Restricted Password is **SIGNAL**. Passwords are always case-sensitive. The Administrative Password is used by the Terminal Port, modem and USB Device Port.

PASSCODE

The correct Passcode must be entered to gain access via the front panel keypad. Irrespective of the Setup Database employed, the Passcode is **547**.

IF YOU NEED HELP

If at any time you need help, we encourage you to contact us. We can be reached as follows:

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If you believe this Training Guide can be improved by the inclusion of an additional task(s), don't hesitate to inform us. Our objective is to make this document useful, and you know best how that can be accomplished.

How to . . .

PREPARE A PC SERIAL CONNECTION

Task 1

CREATING A HYPERTERMINAL SERIAL CONNECTION

The CWR-72E Event Recorder is equipped with one Terminal Port. Unless otherwise stated, this guide assumes that you will be accessing your recorder via a Terminal Port and that a PC running HyperTerminal will be used to facilitate the required connection.

BEFORE YOU START

Your PC must have HyperTerminal installed and ready for use. You should be familiar with the steps necessary to launch your Windows operating system and log on as a user. You should also be familiar with basic Windows operations, such as selecting commands and using the mouse.

WHAT TO DO

We'll begin by creating a new connection specifically for your CWR recorder. We'll then set the Baud rate, bit coding and terminal emulation for the connection. Perform the steps listed in each section in the order given.

CREATING A NEW SERIAL CONNECTION

1

1. Using your mouse, click in the lower left-hand corner of your desktop in the area labeled "Start". Then click in the area labeled "All Programs".
2. Click on the folder labeled "HyperTerminal" to expand it.
3. Click the sub-list item labeled "HyperTerminal". After a short delay the following dialog box labeled "Connection Description" will appear.



HyperTerminal—New Connection Dialog Box

4. In the edit box labeled "Name:" enter a label that identifies the new connection. As an example, type **CWR Recorder**. Click the button labeled "OK". The following dialog box named "Connect To" will appear.



HyperTerminal–Connect To Dialog Box

5. Click the down arrow at the right edge of the drop-down list box labeled "Connect using:". Select an available comm port such as "Com1", "Com2", "Com5", etc.
6. Click the button labeled "OK" to accept the new comm port assignment.

A new HyperTerminal connection has been created. It is now necessary to assign the correct Baud rate, bit coding and emulation for the connection.

SETTING THE BAUD RATE, BIT CODING AND EMULATION

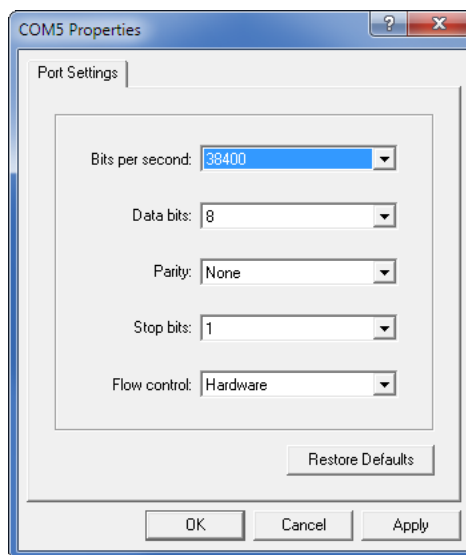
1

After selecting the comm port for the new connection the dialog box named "Com Properties" will be displayed. An example is shown in the following. Your dialog box will actually be labeled with the comm port number you selected earlier.



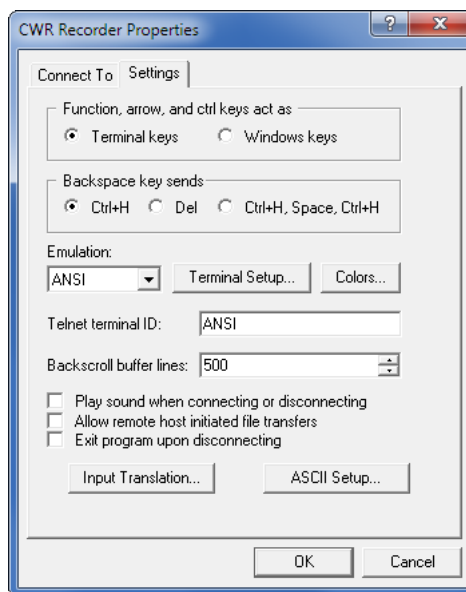
The default Baud rate setting for all CWR recorders is 38,400. This setting will work unless it was previously altered. The bit coding must be set as shown in the following. It must not be altered. The setting is referred to as 8-N-1.

7. Set the five fields as they are shown in the following.



HyperTerminal–Com Properties Dialog Box

8. Click the button labeled "OK". A blank HyperTerminal window will appear.
9. Click on the command named "File". It is located in the menu bar at the top of the HyperTerminal window. Click on the sub-command named "Properties". A dialog box labeled "CWR Recorder Properties" will be displayed.
10. At the top of the dialog box click the tab labeled "Settings". A dialog box similar to the following will be displayed.



HyperTerminal–Com Properties Dialog Box

11. Modify the various settings to match those listed in the previous screen. Make sure that the drop-down list box labeled "Emulation:" is set to "ANSI".
12. Double check everything. If all the settings are correct click the button labeled "OK".
13. The menu bar is located along the top of the HyperTerminal window. Click the command named "File" and then the sub-command named "Save".

Your PC now has a newly defined comm port connection that is tailored for your CWR recorder. You can also use it to access your other CWR recorders. To launch the new connection simply click the icon labeled "CWR Recorder.ht" that exists within the HyperTerminal Connections folder.



For easy access, you may wish to create a shortcut for the "CWR Recorder" connection and place it on your Windows desktop.

USER NOTES

[illegible]

How to . . .

PREPARE A PC MODEM CONNECTION

Task 2

CREATING A HYPERTERMINAL MODEM CONNECTION

Every CWR-72E Event Recorder used by Metra is also equipped with an internal 33,600Baud modem. Like the Terminal Port, it can be used to access your recorder via any PC equipped with HyperTerminal and a modem. Unlike the Terminal Port, the modem allows you to establish a remote connection to various recorders.

BEFORE YOU START

Your PC must have HyperTerminal installed and ready for use. You should be familiar with the steps necessary to launch your Windows operating system and log on as a user. You should also be familiar with basic Windows operations, such as selecting commands and using the mouse. A further requirement is that the PC have access to a modem. It is assumed that the modem is internal to the PC.

WHAT TO DO

We'll begin by creating a modem-based connection for a specific recorder. A unique telephone number will identify a recorder. Perform the steps listed in each section in the order given.



Each recorder is accessible via a unique phone number. Accordingly, the steps detailed in this task must be repeated for each recorder of interest to the user.

2

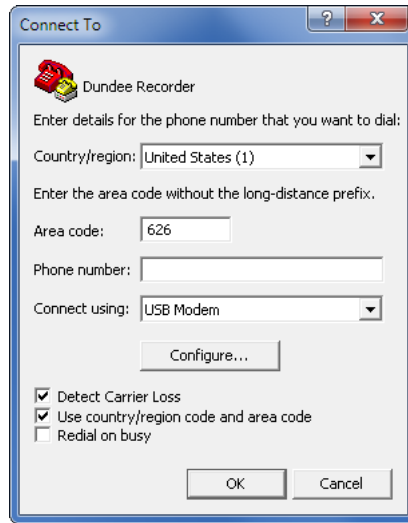
CREATING A NEW MODEM CONNECTION

1. Using your mouse, click in the lower left-hand corner of your desktop in the area labeled "Start". Then click in the area labeled "All Programs".
2. Click on the folder labeled "HyperTerminal" to expand it.
3. Click the sub-list item labeled "HyperTerminal". After a short delay the following dialog box labeled "Connection Description" will appear.



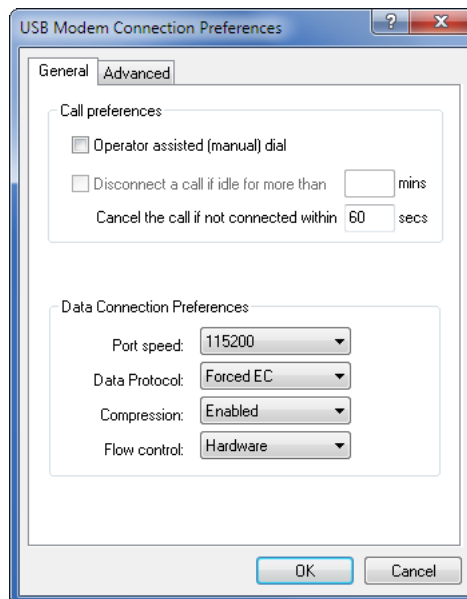
HyperTerminal–New Connection Dialog Box

4. In the edit box labeled "Name:" enter a label that identifies the new connection. As an example, type **Dundee Recorder**. Click the button labeled "OK". The following dialog box named "Connect To" will appear.



HyperTerminal–Connect To Dialog Box

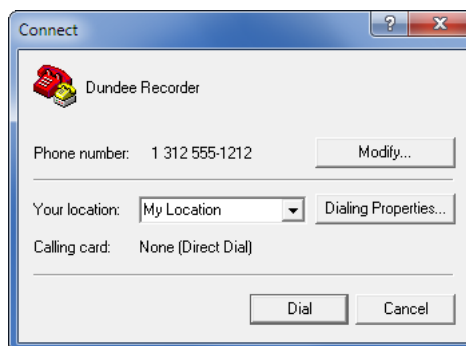
5. Click the down arrow at the right edge of the drop-down list box labeled "Connect using:". Select the internal modem (e.g., "USB Modem"). Enable the check boxes labeled "Detect Carrier Loss" and "Use country/region code and area code" settings as shown in the previous screen.
6. In the edit box labeled "Area code:", enter the area code portion of the phone number associated with the telephone line connected to the recorder. In the edit box labeled "Phone number:", enter the remaining seven digits of the phone number.
7. Click the button labeled "Configure...". A dialog box similar to the following will be displayed.



HyperTerminal–Modem Preferences Dialog Box

8. As shown in the previous screen, in the drop-down list box labeled "Data Protocol:" select the "Forced EC" setting. For the drop-down list box labeled "Compression:" select the "Enabled" setting. For the drop-down list box labeled "Flow control:" select the "Hardware" setting. Finally, click the button labeled "OK".

9. The "Connect To" dialog box depicted in step 4 will be displayed. Click the button labeled "OK". The following dialog box will be displayed.

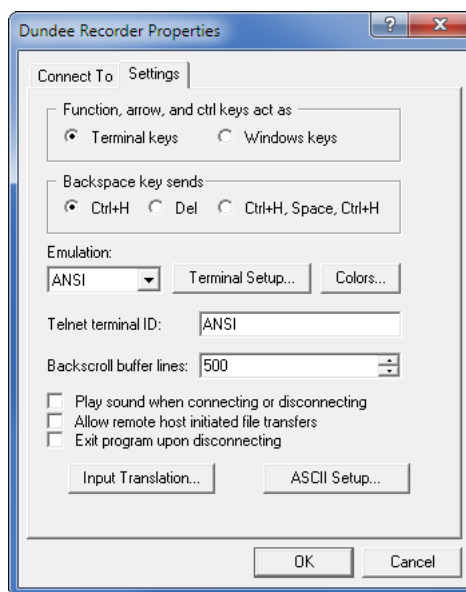


HyperTerminal–Connect Dialog Box

10. Verify the displayed settings and change them as necessary. If they are correct click the button labeled "Cancel". A blank HyperTerminal window will be displayed.

ASSIGNING THE EMULATION SETTINGS

11. Click the "File>properties" command located in the menu bar at the top of the HyperTerminal window. A dialog box named "Dundee Recorder Properties" will be displayed.
12. At the top of the dialog box click the tab labeled "Settings". A dialog box similar to the following will be displayed.



HyperTerminal–Properties Dialog Box

13. Modify the various settings to match those listed in the previous screen. Make sure that the drop-down list box labeled "Emulation:" is set to "ANSI".
14. Double check everything. If all the settings are correct click the button labeled "OK".
15. The menu bar is located along the top of the HyperTerminal window. Click the command named "File" and then the sub-command named "Save".

Your PC now has a newly defined modem connection that is tailored for your CWR recorder. To launch the new connection simply click the icon labeled "Dundee Recorder.ht" that exists within the HyperTerminal Connections folder.



For easy access, you may wish to create a shortcut for the new modem connection and place it on your Windows desktop.

How to . . .

LOG ON VIA A SERIAL CONNECTION

Task 3

GETTING TO THE MAIN MENU USING THE TERMINAL PORT

Regardless of the access point employed, all CWR recorders utilize two levels of access security. Before you are allowed to access the recorder you must enter a valid password. Which password is entered determines the level of access you are granted.

BEFORE YOU START

This task assumes that you will be connecting a PC running HyperTerminal to a Terminal Port of the recorder. It is further assumed that the HyperTerminal connection named "CWR Recorder" established in [Task 1](#) entitled "[Creating a HyperTerminal Serial Connection](#)" is available.

Terminal Ports for all CWR recorders utilize a nine-pin DE-9 male connector. Each port is compliant with the RS-232 serial interface standard. Your recorder was shipped with an RS-232 cable suitable for use with the serial comm port of a PC. The cable is wired one-to-one, that is pin 1 connects to pin 1, 2 to 2, etc. If your PC is not equipped with a serial comm port you will have to use a USB-to-serial cable adapter. These adapters are available at most computer retail stores.



Do not attempt to use a null modem cable.

To improve the ground isolation properties of the recorder, the MICRO-AIDE supplied cable has the shield wire disconnected. Only use the MICRO-AIDE supplied cable.

3

WHAT TO DO

If you haven't already done so, turn power on to your PC and launch Windows. After you have logged on to your PC, launch the HyperTerminal connection named "CWR Recorder". Perform the steps as listed in the following and in the order given.

1. Connect the MICRO-AIDE supplied RS-232 cable to the PC comm port selected for use by the HyperTerminal connection named "CWR Recorder". This connection may need to be made via a USB serial adapter.
2. Connect the other end of the RS-232 cable to the Terminal Port of the recorder.
3. Apply power to the recorder. After a brief delay a message similar to the following will appear in your HyperTerminal window.

```
Micro-Aide CWR-72E Flash Boot Loader 1.01
Press ESC for boot loader
```

Escape to Boot Loader

4. Ignore the message concerning the **Esc** key. After five seconds a password challenge similar to the following will be displayed.

```
Model CWR-72E Metra Event Recorder. Ver 1.02 (C) 2011 MICRO-AIDE INC.
***** NOT SET *****
Event storage capacity: 111481
Enter password:
```

Password Challenge

5. Enter the Administrative or Restricted Password. Complete the entry by pressing the **Enter** key. You are now logged on to the recorder. The Main Menu as shown in the following will be displayed.

```
MICRO-AIDE CWR-72E Event Recorder

S Setup
L Live Status
Q Query Events
V View Events
M Measure Flash Rate
T Transfer Files
D Diagnostics
X Log Off
```

Main Menu



The Restricted Password has been defined by Metra as **SIGNAL**. For security reasons, the Administrative Password will not be identified anywhere in this guide.

Congratulations. Using your previously defined HyperTerminal connection, you can now exercise the capabilities of your recorder. Remember, the Main Menu is always your initial launching point.

3

RELATED FEATURES

DEFAULT PASSWORDS

Your CWR recorder utilizes two levels of password security that are applicable to the Terminal Port, USB Device Port and internal modem. The Administrative Password allows you to access all recorder features and functions. It allows you to alter the Setup Database of the recorder. The Restricted Password allows you unlimited access to viewing and retrieval of data from the recorder. However, it provides for only limited alteration of the Setup Database.



By Metra request, the Administrative Password will not be documented within this guide. The preassigned Restricted Password is **SIGNAL**. Passwords are case-sensitive.

LOGGING ON USING A MODEM

Logging on to the recorder via a modem connection is described in [Task 4](#).

NAVIGATING AND SELECTING COMMANDS

The emulation setting of your HyperTerminal connection is set to "ANSI". This setting allows you to highlight a specific recorder command or field by simply pressing the up and down arrow keys at the keyboard of your PC. After the highlight is positioned properly, press the **Enter** key to select the command.

LOGGING OFF

When you have completed your session with the recorder you should get in the habit of logging off. There are two ways to perform a log off. From the Main Menu you can press the **X** key at your keyboard. Highlight the Yes option and then press the **Enter** key to log off. Alternatively, you can simply disconnect the cable attached to the Terminal Port. In either case, the next user will have to enter a valid password to access the recorder.

How to . . .

LOG ON VIA A MODEM CONNECTION

Task 4

GETTING TO THE MAIN MENU USING A MODEM

Regardless of the access point employed, all CWR recorders utilize two levels of access security. Before you are allowed to access the recorder you must enter a valid password. Which password is entered determines the level of access you are granted.

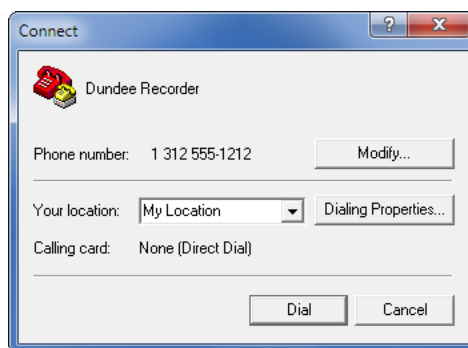
BEFORE YOU START

This task assumes that you will attempt to log on to the recorder via a remote modem connection. It is further assumed that the modem connection will be established via a PC running HyperTerminal. The modem connection named "Dundee Recorder" described in [Task 2](#) entitled "[Creating a HyperTerminal Modem Connection](#)" will be used as an example throughout this task.

WHAT TO DO

Verify the modems at both ends are connected to functioning phone lines. If you haven't already done so, turn power on to your recorder and PC. Launch Windows and log on to your PC. Perform the steps as listed in the following and in the order given.

1. Launch the modem connection named "Dundee Recorder". After a short delay a blank HyperTerminal window and a dialog box similar to the following will be displayed.



HyperTerminal–Connect Dialog Box

2. Click the button labeled "Dial". The PC's modem will proceed to dial the number previously assigned. If the volume level of your PC has been turned up adequately you should be able to hear the dial tone, tone dialing, ring back and modem answer tone signals. The modems will then attempt to negotiate a Baud rate appropriate for the phone line conditions.
3. Provided the sequence proceeds to a successful completion, a password challenge similar to the following will be displayed. If the modems fail to connect you may wish to redial the connection.

```
Model CWR-72E Metra Event Recorder. Ver 1.02 (C) 2011 MICRO-AIDE INC.
***** NOT SET *****
Event storage capacity: 111481
Enter password:
```

Password Challenge

4. Enter the Administrative or Restricted Password. Complete the entry by pressing the **Enter** key. You are now logged on to the recorder. The Main Menu as shown in the following will be displayed.

```
MICRO-AIDE CWR-72E Event Recorder

S Setup
L Live Status
Q Query Events
V View Events
M Measure Flash Rate
T Transfer Files
D Diagnostics
X Log Off
```

Main Menu



The Restricted Password has been defined by Metra as **SIGNAL**. For security reasons, the Administrative Password will not be identified anywhere in this guide.

Congratulations. Using your previously defined HyperTerminal modem connection, you can now exercise the capabilities of your recorder. Remember, the Main Menu is always your initial launching point.

4

RELATED FEATURES

DEFAULT PASSWORDS

Your CWR recorder utilizes two levels of password security that are applicable to the Terminal Port, USB Device Port and internal modem. The Administrative Password allows you to access all recorder features and functions. It allows you to alter the Setup Database of the recorder. The Restricted Password allows you unlimited access to viewing and retrieval of data from the recorder. However, it provides for only limited alteration of the Setup Database.



By Metra request, the Administrative Password will not be documented within this guide. The preassigned Restricted Password is **SIGNAL**. Passwords are case-sensitive.

LOGGING ON USING THE TERMINAL PORT

Logging on to the recorder via a serial RS-232 connection is described in [Task 3](#).

NAVIGATING AND SELECTING COMMANDS

The emulation setting of your HyperTerminal connection is set to "ANSI". This setting allows you to highlight a specific recorder command or field by simply pressing the up and down arrow keys at the keyboard of your PC. After the highlight is positioned properly, press the **Enter** key to select the command.

LOGGING OFF

When you have completed your session with the recorder you should get in the habit of logging off. There are two ways to perform a log off. From the Main Menu you can press the **X** key at your keyboard. Highlight the Yes option and then press the **Enter** key to log off. Alternatively, you can click the command labeled "Call>Disconnect" located on the menu bar at the top of the HyperTerminal window. In either case, the phone line connection will be immediately terminated.

Task 5

SETTING AND SYNCHRONIZING THE REAL-TIME CLOCK

All Metra recorders include a real-time clock (RTC) circuit that is accurate to 3ppm (.0003%) which works out to ± 26 seconds per day or ± 8 seconds per month. Nevertheless, if left unattended this error can accumulate into a significant amount. However, this potential inconvenience is avoided by having the RTC synchronized to GPS time. The clock can also be manually set.



The Time /Date and Sync Mode settings can only be altered in an Administrative Access session.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

The Metra signaling staff has defined three distinct Setup Databases for use with the Event Recorders. As a result of this effort, the preferred operation of the RTC has already been established. The Mainline, BEV and MED Setup Databases all share the same settings. In the future, if changes to any of these settings are required they should be made in accordance with the following descriptions.

5

WHAT TO DO

MANUALLY SET THE TIME AND/OR DATE

From the Main Menu select the Setup>Time /Date command. A screen similar to the following will be displayed.

Time/Date
HH:MM:SS
Time: 13:57:13
MM-DD-YY
Date: 09-11-11 Sunday

Time /Date Command

To change the current time or date move the highlight to any of the fields and enter a new value. Leading zeros are not required. Press the **Enter** key or move the highlight to accept the new value. The day of week will be indicated automatically by the recorder. When the time and date are correct press the **Esc** key. Select the Yes option to make the change. Press the **Esc** key to return to the Main Menu.



Your recorder uses a military-style clock. Accordingly, 12:45:23 AM is reported as 00:45:23 and 11:58:06 PM is reported as 23:58:06.

SYSTEM PARAMETER SETTINGS

Important clock-related features are also controlled by settings categorized as System Parameters. From the Main Menu select the Setup>System Parameters command. A screen similar to the following will be displayed.

```

                                System Parameters
                                -----
Unit Name
DIST_SUBDR_XING-NAME_DOT-NUMBER_MILE-POST-NUMBER
Terminal Port Baud Rate 38400
Administrative Password
Restricted Password SIGNAL
Passcode 547
Ring Count 2
Primary Dial Number
Secondary Dial Number
Clock Sync Mode GPS
Clock Sync Input ---
Time Zone CST (UTC-6)
Daylight Saving Time Enabled
High Temp Limit 257 Degrees F
Low Temp Limit -67 Degrees F
Record Flash Details Disabled

                                Ethernet is NOT installed
                                -----
                                System Parameters Command
    
```

The Metra-preferred settings are listed in the previous sample data. The four clock-related settings are fully described in the following sections. The preferred settings are also cited in each section.

Clock Sync Mode—The correct setting is GPS. This setting allows the RTC to be synchronized to GPS time. Once every hour an Event Record will be saved to memory. The record verifies that the clock was set to precise GPS time. The setting can be changed by pressing the **Spacebar** key.

Clock Sync Input—The correct setting is ---. An assigned Clock Sync Input is only used if GPS is not available and a PLC can be used to output a periodic sync bit. Any Digital Input can be assigned as the Clock Sync Input. This setting is enabled only if the Clock Sync Mode is set to Digital Input.

Time Zone—The correct setting is CST. There should be no reason to change this setting.

Daylight Saving Time—The correct setting is Enabled. Press the **Spacebar** to enable or disable the adjustment for Daylight Saving Time. If enabled, the clock will be changed by one hour on the second Sunday in March and the first Sunday in November.

RELATED FEATURES

CLOCK SYNC RECORDS

As was previously stated, an Event Record is written to memory whenever the recorder's RTC is adjusted by the GPS time source. Refer to the screen entitled "[Query Events Command—Report Type Set to Browse](#)" on page 55. The last Event Record listed is a GPS clock sync record. Collectively these records can be used to establish a performance log of the GPS Receiver.

How to . . .

SECURE THE EVENT RECORDER

Task 6

ASSIGNING PASSWORDS AND THE PASSCODE

Your recorder can be accessed via its serial Terminal Port, modem and USB Device Port. The front panel keypad and LCD provide an additional point of access. Access to commands and features that allow the Setup Database to be altered are always challenged by either a Password or Passcode. This security measure applies to all points of access, without exception.



The Password and Passcode settings can only be altered in an Administrative Access session.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

The Metra signaling staff has defined three distinct Setup Databases for use with the Event Recorders. As a result of this effort, the Passwords and Passcode have already been assigned. In the future, if changes to these settings are required they should be made in accordance with the following descriptions.

WHAT TO DO

USING A PC AND HYPERTERMINAL

From the Main Menu select the Setup>System Parameters command. A screen similar to the following will be displayed.

```
System Parameters
-----
DIST_SUBDR_XING Unit Name
NAME_DOT-NUMBER_MILE-POST-NUMBER
Terminal Port Baud Rate 38400
Administrative Password
Restricted Password SIGNAL
Passcode 547
Ring Count 2
Primary Dial Number
Secondary Dial Number
Clock Sync Mode GPS
Clock Sync Input ---
Time Zone CST (UTC-6)
Daylight Saving Time Enabled
High Temp Limit 257 Degrees F
Low Temp Limit -67 Degrees F
Record Flash Details Disabled

Ethernet is NOT installed
```

System Parameters Command

The Passwords and Passcode are fully described in the following sections.

Administrative Password—The Administrative Password can be any combination of eight or fewer alphanumeric characters. The Administrative Password allows the user unrestricted control of the recorder.

In an Administrative Access session all commands and features are accessible and the Setup Database can be altered.

To change the Administrative Password move the highlight to the appropriate field and type a new Password. To save the new Password either reposition the highlight or press the **Enter** key.

Restricted Password—The Restricted Password can be any combination of eight or fewer alphanumeric characters. The Restricted Password allows the user limited ability to alter the contents of the Setup Database. In a Restricted Access session commands that do not alter the Setup Database are fully accessible.

To change the Restricted Password move the highlight to the appropriate field and type a new Password. To save the new Password either reposition the highlight or press the **Enter** key.



All Metra-defined Setup Databases use a Restricted Password of **SIGNAL**.

Passcode—By Metra request, only a small portion of the Setup Database can be altered from the recorder's front panel. Nevertheless, access to the Setup Database is controlled by the Passcode. The Passcode can only be entered from the front panel keypad. It consists of eight or fewer numeric values.

To change the Passcode move the highlight to the appropriate field and type a new series of digits. To save the new Passcode either reposition the highlight or press the **Enter** key.



All Metra-defined Setup Databases use a Passcode of **547**.

After the required assignments have been completed, press the **Esc** key twice to exit and return to the Main Menu.

RELATED FEATURES

6

RESTRICTED ACCESS COMMANDS

Table 1 lists the various commands and features that are available in a Restricted Access session.

Command Name	Usage and Description
Setup>System Parameters>Unit Name	Change the Unit Name
Setup>System Parameters>Terminal Port Baud Rate	Change the Baud rate of the Terminal Port
Setup>System Parameters>Ring Count	Change the modem's Ring Count setting
Setup>Print Setup Data	View or print all or part of the Setup Database
Live Status	View the current status of Digital and Analog Inputs
Query Events	Browse and Dump Event Record data
View Events	View Event Records in real-time
Measure Flash Rate	Measure the flash rate of a Flashing Input
Transfer Files>Download	Save the Setup Database to a PC file
Diagnostics (except Relay Test)	Perform six different diagnostic tests of the recorder
Log Off	Terminate the current user session

Table 1: Commands Available in a Restricted Access Session

FRONT PANEL ACCESSIBLE COMMANDS AND FEATURES

Table 2 lists the Passcode-controlled commands that can be accessed from the recorder's front panel.

Command Name or Feature	Usage and Description
UName	Change the Unit Name
Modem	Change the modem's Ring Count setting
Baud	Change the Baud rate of the Terminal Port
Diag	Perform six different diagnostic tests of the recorder
Update	Update the firmware executed by the recorder
Browse>Event Records	View Event Record data
Browse>Input Status	View the current status of Digital and Analog Inputs
Browse>Flash Rate	Measure the flash rate of a Flashing Input
Save	Save Event Record data to a USB flash drive

Table 2: Front Panel Commands and Features

IN CASE THE ADMINISTRATIVE PASSWORD IS LOST

Without a valid Administrative Password the current Password cannot be viewed or changed. This presents a serious problem if the Administrative Password is lost. In the unlikely event that this occurs, a member of the signal engineering staff at Metra should contact MICRO-AIDE immediately.

MICRO-AIDE CORPORATION

685 Arrow Grand Circle
Covina, CA 91722

Tel: 626-915-5502 Fax: 626-331-9484

E-mail: support@micro-aide.com

USER NOTES

[illegible]

Task
7

ASSIGNING THE UNIT NAME

The Unit Name serves a dual purpose. It can be used to distinguish different recorders. Additionally, it can be used to identify the site where the recorder is located. Including a DOT tag or milepost designation can be quite useful. The Unit Name is included at the top of every report.



The Unit Name setting can be altered in either an Administrative or Restricted Access session.

RULES FOR CREATING A PROPER UNIT NAME

The recorder's assigned Unit Name is a versatile piece of information. The full Unit Name is printed at the top of various reports. The first 20 characters of the Unit Name appear as the fourth line of text on the LCD while it is in Idle Mode. Refer to the illustration entitled "[LCD During Idle Mode](#)" on page 20. Additionally, the first 20 characters of the Unit Name are used to name the data folder created when saving Event Records to the USB flash drive. Refer to the Windows Explorer® screen entitled "[Data Folder Saved to USB Flash Drive](#)" on page 20.

Clearly, the first 20 characters of the Unit Name must be assigned carefully. Since these characters are used to form a folder name they must adhere to strict rules imposed by all Windows operating systems.



Various characters must not appear anywhere within the first 20 characters of the Unit Name. The 11 prohibited characters are / \ ? % * : | " < >.



Additionally, a **Space** character must not appear as either the first or twentieth character in the Unit Name. For this reason it is best to use an underscore (i.e., _) in place of the **Space** character.

Metra has defined a preferred composition for the Unit Name. An example of the definition is included towards the top of the screen entitled "[System Parameters Command](#)" on page 20. From left to right the Unit Name shall include the information listed in [Table 3](#) as read from top to bottom.

Field	Example	Character Count
District Name	DIST	1 to 4
Subdistrict Name	_SUBDR	2 to 6
Crossing Name	_XING-NAME	2 to 10
DOT Number	_DOT-NUMBER	As required
Mile Post Number	_MILE-POST-NUMBER	As required

Table 3: Unit Name Definition

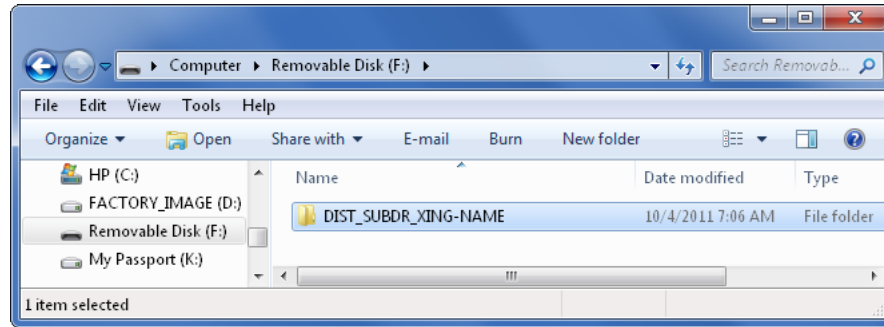
The following rules also apply to the creation of the Metra-defined Unit Name.

- The District, Subdistrict and Crossing Names must not exceed 20 characters in total.
- The **Space** character is not used for word separation. The underscore (i.e., _) and dash (i.e., -) characters are used instead for such purposes.
- The overall length of the Unit Name is limited to 80 characters.

```

TIME          DATE
16:35:52*    09-11-11
CWR72E EventRecorder
DIST_SUBDR_XING-NAME
    
```

LCD During Idle Mode



Data Folder Saved to USB Flash Drive

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

WHAT TO DO

From the Main Menu select the Setup>System Parameters command. A screen similar to the following will be displayed.

```

                                System Parameters
                                -----
DIST_SUBDR_XING-NAME DOT-NUMBER MILE-POST-NUMBER
Terminal Port Baud Rate 38400
Administrative Password
Restricted Password      SIGNAL
Passcode                 547
Ring Count               2
Primary Dial Number
Secondary Dial Number
Clock Sync Mode          GPS
Clock Sync Input         ---
Time Zone                CST (UTC-6)
Daylight Saving Time     Enabled
High Temp Limit          257 Degrees F
Low Temp Limit           -67 Degrees F
Record Flash Details     Disabled

                                Ethernet is NOT installed
    
```

System Parameters Command

1. Locate the highlight in the Unit Name field. Press the **Spacebar** once to erase the existing name (e.g., ***** NOT SET *****).
2. Type the new Unit Name as required, but subject to the limitations described in the section entitled ["Rules for Creating a Proper Unit Name"](#) on page 19.
3. To accept the new name either press the **Enter** key or move the highlight.
4. Press the **Esc** key twice to exit and return to the Main Menu.

How to . . .

CHANGE THE TERMINAL PORT BAUD RATE

Task 8

ASSIGNING A DIFFERENT TERMINAL PORT BAUD RATE

Your recorder is equipped with a Terminal Port. The Terminal Port allows for serial communications, is RS-232 based and utilizes a male DE-9 connector. The Baud rate used by the Terminal Port can be assigned using either of two procedures.



The Terminal Port Baud Rate setting can be altered in either an Administrative or Restricted Access session.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

WHAT TO DO

USING A PC AND HYPERTERMINAL

From the Main Menu select the Setup>System Parameters command. A screen similar to the following will be displayed.

System Parameters

DIST_SUBDR_XING

Unit Name
NAME DOT-NUMBER MILE-POST-NUMBER
Terminal Port Baud Rate 38400
Administrative Password
Restricted Password SIGNAL
Passcode 547
Ring Count 2
Primary Dial Number
Secondary Dial Number
Clock Sync Mode GPS
Clock Sync Input ---
Time Zone CST (UTC-6)
Daylight Saving Time Enabled
High Temp Limit 257 Degrees F
Low Temp Limit -67 Degrees F
Record Flash Details Disabled

Ethernet is NOT installed

System Parameters Command

1. Move the highlight to the Terminal Port Baud Rate field.
2. Press the **Spacebar** repeatedly until the required Baud rate is displayed. The rate may be set to any of 10 values in the range from 300 to 115,200.
3. Press the **Esc** key twice to exit and return to the Main Menu. The following message will be displayed.

Change baud rate now, then
Press any key to continue

4. The Baud rate of your HyperTerminal connection must now be changed to accommodate the new setting. However, HyperTerminal will not allow you to change the Baud rate while a connection is active. Disconnect by clicking the command named "Call" located in the HyperTerminal menu bar. Click the sub-command named "Disconnect". You can no longer communicate with the recorder.
5. Change the Baud rate of your HyperTerminal connection in accordance with the procedure described in ["Setting the Baud Rate, Bit Coding and Emulation" on page 2](#). The new setting must match the newly assigned Terminal Port Baud rate.
6. Click the HyperTerminal command named "Call" and then the sub-command also named "Call". After a short delay a new connection at the new Baud rate will be established. The password challenge will be displayed.

FROM THE FRONT PANEL

Alternatively, perform the steps listed in the following section to assign a different Baud rate for the Terminal Port.

1. Press the **Setup** key. The following Passcode challenge will be displayed.

Enter the passcode:

Passcode Challenge

8



The Mainline, BEV and MED Setup Databases utilize the same Passcode. The Metra-defined Passcode is **547**. It can only be entered using the numeric keys of the keypad.

2. Press the **547** keys and then the **Enter** key. The following information message will be displayed briefly.

Use ←→↑↓ to select
items and then ENTER

3. The following abbreviated command menu will be displayed.

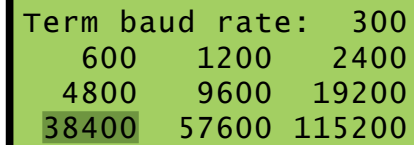
UName	Modem	Baud
Diag	Update	

LCD Menu of Commands



By Metra decision, the accessible front panel commands are limited to those commands available to the user during a Restricted Access session.

4. Using the arrow keys, highlight the Baud command. Press the **Enter** key. The following collection of Baud rates will be displayed.



```
Term baud rate: 300
      600      1200    2400
      4800     9600   19200
      38400    57600  115200
```

Baud Command

5. It is likely the 38,400 setting will be highlighted. To change the Baud rate use the arrow keys to relocate the highlight to the desired setting. Press the *Enter* key. The LCD menu of commands will be displayed. Press the *Esc* key to return to the Idle Mode.
6. The new rate will take effect immediately. The Baud rate used by the PC's comm port must match the newly assigned Terminal Port rate. If it needs to be changed follow the steps listed in the section entitled ["Setting the Baud Rate, Bit Coding and Emulation"](#) on page 2.

USER NOTES

[illegible]

How to . . .

SET THE MODEM ANSWER DELAY

Task 9

MODEM RING COUNT

Your recorder is equipped with an internal 33,600Baud internal modem. The Ring Count parameter determines the number of rings that must occur before the modem answers. This parameter can be assigned using either of two procedures.



The Ring Count setting can be altered in either an Administrative or Restricted Access session.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

WHAT TO DO

USING A PC AND HYPERTERMINAL

From the Main Menu select the Setup>System Parameters command. A screen similar to the following will be displayed.

9

System Parameters

DIST_SUBDR_XING-

Unit Name
NAME DOT-NUMBER MILE-POST-NUMBER
Terminal Port Baud Rate 38400
Administrative Password
Restricted Password SIGNAL
Passcode 547
Ring Count 2
Primary Dial Number
Secondary Dial Number
Clock Sync Mode GPS
Clock Sync Input ---
Time Zone CST (UTC-6)
Daylight Saving Time Enabled
High Temp Limit 257 Degrees F
Low Temp Limit -67 Degrees F
Record Flash Details Disabled

Ethernet is NOT installed

System Parameters Command

1. Move the highlight to the Ring Count field.
2. The initial value for the Ring Count established in the Mainline, BEV and MED Setup Databases is 2. Enter a value ranging from 0 to 99.



A Ring Count value of 0 will prevent the modem from answering an incoming call. Use this value to disable the auto-answer feature of the modem.

3. To accept the new setting either press the **Enter** key or move the highlight.
4. Press the **Esc** key twice to exit and return to the Main Menu.

FROM THE FRONT PANEL

Alternatively, perform the steps listed in the following section to assign a different Ring Count for the modem.

1. Press the **Setup** key. The following Passcode challenge will be displayed.

A green rectangular screen with a black border displaying the text "Enter the passcode:" in a monospaced font.

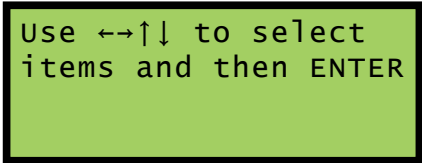
Enter the passcode:

Passcode Challenge




The Mainline, BEV and MED Setup Databases utilize the same Passcode. The Metra-defined Passcode is **547**. It can only be entered using the numeric keys of the keypad.

2. Press the **547** keys and then the **Enter** key. The following information message will be displayed briefly.

A green rectangular screen with a black border displaying the text "Use ←→↑↓ to select items and then ENTER" in a monospaced font.

Use ←→↑↓ to select
items and then ENTER

3. The following abbreviated command menu will be displayed.

A green rectangular screen with a black border displaying a menu with two rows of text: "UName Modem Baud" and "Diag Update".

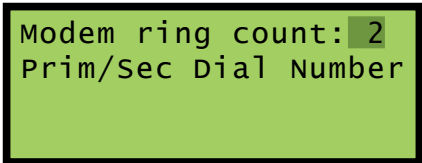
UName Modem Baud
Diag Update

LCD Command Menu



By Metra decision, the accessible front panel commands are limited to those commands available to the user during a Restricted Access session.

4. Using the arrow keys, highlight the Modem command. Press the **Enter** key. The current Ring Count setting will be highlighted as illustrated in the following.

A green rectangular screen with a black border displaying the text "Modem ring count: 2" and "Prim/Sec Dial Number". The number "2" is highlighted with a white box.

Modem ring count: 2
Prim/Sec Dial Number

Modem Command

5. The initial value for the Ring Count established in the Mainline, BEV and MED Setup Databases is 2. To change the current setting press the **Enter** key. Enter the new value by pressing the appropriate numeric keys. Leading zeros are not required. Enter a value ranging from 0 to 99.



A Ring Count value of 0 will prevent the modem from answering an incoming call. Use this value to disable the auto-answer feature of the modem.

6. Accept the new value by pressing the **Enter** key. Press the **Esc** key twice to return to the Idle Mode.

How to . . .

REPORT EXCESSIVE TEMPERATURES

Task 10

ASSIGNING TEMPERATURE LIMIT VALUES

A temperature sensor is included inside every Event Recorder. The sensor readings are reported and compared to user-defined Limit Values. The High and Low Temperature Limit Values establish a range of acceptable and unacceptable operation. Event Records are saved to memory if these limits are exceeded.



The Temperature Limit Values can only be altered in an Administrative Access session.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

The Metra signaling staff has defined three distinct Setup Databases for use with the Event Recorders. As a result of this effort, the Temperature Limit Values have already been assigned. In the future, if changes to these settings are required they should be made in accordance with the following descriptions.

WHAT TO DO

USING A PC AND HYPERTERMINAL

From the Main Menu select the Setup>System Parameters command. A screen similar to the following will be displayed.

```
System Parameters
-----
DIST_SUBDR_XING Unit Name
NAME_DOT-NUMBER MILE-POST-NUMBER
Terminal Port Baud Rate 38400
Administrative Password
Restricted Password SIGNAL
Passcode 547
Ring Count 2
Primary Dial Number
Secondary Dial Number
Clock Sync Mode GPS
Clock Sync Input ---
Time Zone CST (UTC-6)
Daylight Saving Time Enabled
High Temp Limit 257 Degrees F
Low Temp Limit -67 Degrees F
Record Flash Details Disabled

Ethernet is NOT installed
```

System Parameters Command

The Temperature Limit Values operate in a very simple manner as follows.

Temperature Exceeds High Limit Value—An On Event Record is saved to memory when the temperature exceeds the High Limit Value. System Input S2 identifies the record.

Temperature Drops Below High Limit Value—An Off Event Record is saved to memory when the temperature drops below the High Limit Value. System Input S2 identifies the record.

Temperature Drops Below Low Limit Value—An On Event Record is saved to memory when the temperature drops below the Low Limit Value. System Input S3 identifies the record.

Temperature Exceeds Low Limit Value—An Off Event Record is saved to memory when the temperature exceeds the Low Limit Value. System Input S3 identifies the record.

To change either Limit Value, position the highlight in the appropriate field and type a new value. Temperature Limit Values can range from -67°F to 257°F. Leading zeros are not required. To save the new setting either reposition the highlight or press the **Enter** key.

After the required assignments have been completed, press the **Esc** key twice to exit and return to the Main Menu.

RELATED FEATURES

TEMPERATURE REPORTING

The temperature inside the recorder is always listed in the headers of the Query and Live Status reports. An example of the latter can be seen in the sample data entitled "[Live Status Command](#)" on page 77. The Diagnostics and front panel Diag commands can also be used to report the current temperature. The internal temperature of the recorder is typically 10 to 15°F greater than the external ambient temperature.



The internal temperature should never exceed 180°F.

SYSTEM EVENTS

Notable aspects of the recorder's operation are checked and saved to memory by creating System Event Records. Extreme temperatures, power on and off and synchronizing of the real-time clock utilize System Event Records for their reporting. The Metra-defined Setup Databases allow for reporting of System Event Records as listed in [Table 4](#). The content of each record is also listed.

Input Number	Input Name	Identifier	Event Name Pair
S1	System Power	Power	ON / OFF
S2	High Temperature	HighTemp	ON / OFF
S3	Low Temperature	LowTemp	ON / OFF
S5	GPS 5 Sec Correction	GPS 5Sec	ON / OFF
S6	GPS Clock Record	GPS Rec	ON / OFF

Table 4: System Event Records

**Task
11****CREATING A SET OF EVENT NAME PAIRS**

An Event Recorder is only as useful as its ability to provide record data that is accurate and meaningful to its user. The Metra Recording System includes several features that, when properly used, can make Event Records easy to read and understand. Event Names are key among these features.



The Event Names command is only available to Administrative Access sessions.

BACKGROUND INFORMATION**THE PURPOSE OF EVENT NAMES**

As can be seen in [Figure 1](#), Event Records always include an Input Name, Identifier (the subject of [Task 12](#)) and an Event Name.

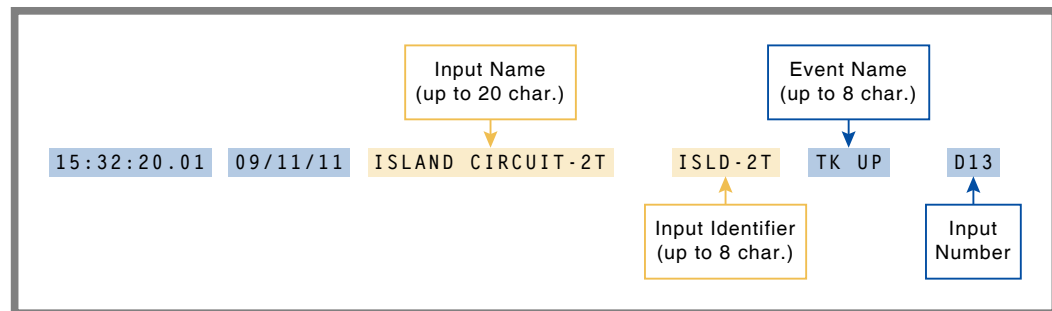


Figure 1: Typical Event Record—No Details Format

The concept of Event Names is illustrated in [Figure 2](#). The lamp circuit is controlled by a simple relay circuit. The voltage applied to the lamp is being monitored by a Digital Input in the recorder. The lamp can assume either of two states. It is either On or Off. An Event Record associated with the lamp circuit will include an Input Name and Identifier to distinguish the input. However, it takes an Event Name to properly identify the state (i.e., On or Off) of the lamp circuit. It follows that Event Names will always occur in pairs. One name is used to label an On Event. Its counterpart is used to label an Off Event.

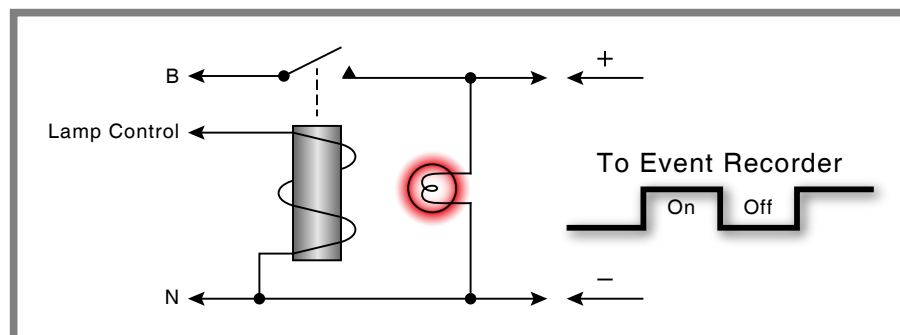


Figure 2: Event Names as They Apply to a Lamp Circuit

An On Event occurs whenever voltage is applied to a Digital Input or an Analog Input transitions into its unacceptable range of operation. Conversely, an Off Events occurs whenever voltage is removed from a Digital Input or an Analog Input transitions back into its acceptable range of operation.

Finally, it should be stressed that Event Names such as On and Off, while helpful, lack clarity. Event Names such as WARN ON, WARN OFF, GATES UP, NOT UP, LITE ON and LITE OFF describe more precisely what the circuit state was when the event occurred.

SHARING EVENT NAME PAIRS

Your recorder allows up to 20 Event Name Pairs to be created. However, a CWR-72E is equipped with 72 physical inputs. This implies that the 20 Event Name Pairs form a pool that can be shared over the entire range of recorder inputs. [Figure 3](#) illustrates this shared behavior.

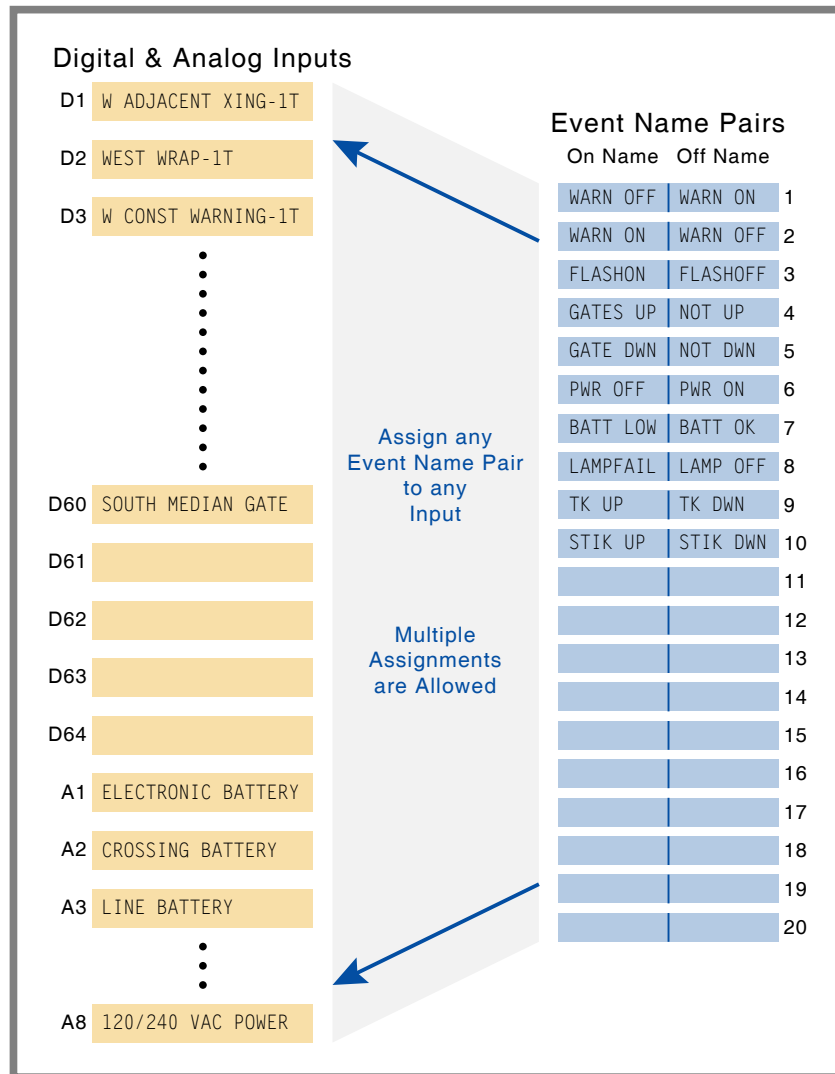


Figure 3: Event Name Pairs Shared Among Inputs

There is no need to include a unique Event Name Pair for every Digital Input. Names like WARN OFF/ WARN ON and STIK UP/STIK DWN can be used effectively among several Digital Inputs. The same applies to Analog Inputs monitoring battery voltages.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

The Metra signaling staff has defined three distinct Setup Databases for use with the Event Recorders. As a result of this effort, the Event Name Pairs have already been established. In the future, if changes to these settings are required they should be made in accordance with the following descriptions.

WHAT TO DO

From the Main Menu select the Setup>Event Names command. A screen similar to the following will be displayed. The data shown is from a CWR-72E using the Mainline Setup Database.

Event Names		
Number	ON Name	OFF Name
1	WARN OFF	WARN ON
2	WARN ON	WARN OFF
3	FLASHON	FLASHOFF
4	GATES UP	NOT UP
5	GATE DWN	NOT DWN
6	PWR OFF	PWR ON
7	BATT LOW	BATT OK
8	LAMPFAIL	LAMPOFF
9	TK UP	TK DWN
10	STIK UP	STIK DWN
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Event Names Command

An Event Name can be any combination of alphanumeric characters not exceeding eight characters in total length. To create a new Event Name, position the highlight and start typing. Repositioning the highlight or pressing the **Enter** key will save the new name.

After all of the Event Names have been completed, press the **Esc** key twice to exit and return to the Main Menu.

RELATED FEATURES

ASSIGNING EVENT NAME PAIRS TO INPUTS

This task has described why it is important to use and how to create effective Event Name Pairs. However, assigning Event Name Pairs to specific inputs is performed using another command. [Task 12](#) entitled "Assigning Input Names, Identifiers and Event Name Pairs" describes the required procedure.

USER NOTES

[illegible]

How to . . .

NAME AND IDENTIFY INPUTS

Task 12

ASSIGNING INPUT NAMES, IDENTIFIERS AND EVENT NAME PAIRS

The CWR-40E is equipped with 32 Digital and 8 Analog Inputs. The CWR-72E is equipped with 64 Digital and 8 Analog Inputs. Each of these inputs can be labeled with a distinctive and informative Input Name and Identifier. In tandem these labels (sometimes referred to as mnemonics) are useful in quickly determining a relay's identity within an Event Record report. Event Names Pairs can be used to add further clarity to Event Records.



The Input Names/Identifiers command is only available to Administrative Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

The Metra signaling staff has defined three distinct Setup Databases for use with the Event Recorders. As a result of this effort, the Input Names, Identifiers and Event Name Pairs have already been established. In the future, if changes to any of these settings are required they should be made in accordance with the following descriptions.

12

WHAT TO DO

From the Main Menu select the Setup>Input Names/Identifiers command. A screen similar to the following will be displayed. The data shown is from a CWR-72E using the Mainline Setup Database.

Input Names/Identifiers				
Input	Name	ID	OnEvent/OffEvent	Event Pair
D01	W ADJACENT XING-1T	WAX-1T	TK UP/TK DWN	9
D02	WEST WRAP-1T	WWRAP-1T	TK UP/TK DWN	9
D03	W CONST WARNING-1T	WCWTD-1T	TK UP/TK DWN	9
D04	ISLAND CIRCUIT-1T	ISLD-1T	TK UP/TK DWN	9
D05	E CONST WARNING-1T	ECWTD-1T	TK UP/TK DWN	9
D06	EAST WRAP-1T	EWRAP-1T	TK UP/TK DWN	9
D07	E ADJACENT XING-1T	EAX-1T	TK UP/TK DWN	9
D08	DIRECTIONAL STICK-1T	DSR-1T	STIK UP/STIK DWN	10
D09	HOLDDOWN CIRCUIT-1T	HLDDN-1T	TK UP/TK DWN	9
D10	W ADJACENT XING-2T	WAX-2T	TK UP/TK DWN	9
D11	WEST WRAP-2T	WWRAP-2T	TK UP/TK DWN	9
D12	W CONST WARNING-2T	WCWTD-2T	TK UP/TK DWN	9
D13	ISLAND CIRCUIT-2T	ISLD-2T	TK UP/TK DWN	9
D14	E CONST WARNING-2T	ECWTD-2T	TK UP/TK DWN	9
D15	EAST WRAP-2T	EWRAP-2T	TK UP/TK DWN	9
D16	E ADJACENT XING-2T	EAX-2T	TK UP/TK DWN	9
D17	DIRECTIONAL STICK-2T	DSR-2T	STIK UP/STIK DWN	10
D18	HOLDDOWN CIRCUIT-2T	HLDDN-2T	TK UP/TK DWN	9
D19	GC&XR-F	GC&XR-F	WARN OFF/WARN ON	1
D20	GC&XR-B	GC&XR-B	WARN ON/WARN OFF	2

[F1]=Next Page [F2]=Prev Page

Input Names/Identifiers Command

The Input Name for Digital Input D1 will be initially highlighted. The highlight can be moved to any field by simply pressing the appropriate arrow key at the keyboard. As described in the last line of text, press the **F1** or **F2** function keys to view and/or edit a different group of inputs. Analog Inputs follow Digital Inputs.



Virtual Inputs and Timer Inputs follow Analog Inputs. The Metra-defined Setup Databases do not utilize the Virtual and Timer Input features. Accordingly, their Input Names and Identifiers should be ignored.

Figure 4 illustrates a typical Event Record from a Digital Input. The assigned Input Name, Identifier and Event Name within the record have been labeled.

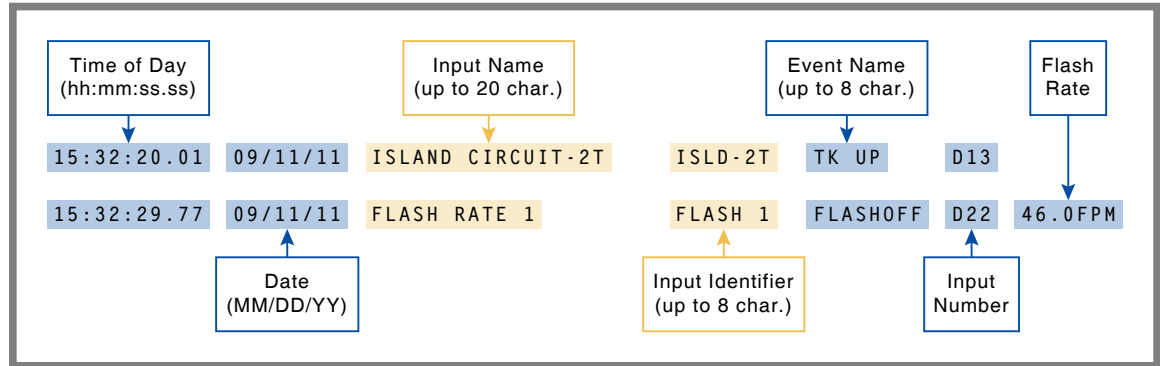


Figure 4: Typical Event Record–No Details Format

Assigning Input Names, Identifiers and Event Name Pairs is described in each of the following sections.

INPUT NAMES

The Input Name can be any combination of alphanumeric characters not exceeding 20 characters in total length. Common practice is to use a relay circuit label or battery name as the Input Name. It is always included in the first line of every Event Record. To create a new Input Name, position the highlight and start typing. Repositioning the highlight or pressing the **Enter** key will save the new name.

IDENTIFIERS

The Identifier can be thought of as an abbreviated name. It can be any combination of alphanumeric characters not exceeding 8 characters in total length. It is a companion to the Input Name. It too is always included in the first line of every Event Record. The Identifier is included within the Live Status report and many of the front panel commands where the size of the LCD provides limited space for text. The screen entitled "Live Status Command" on page 77 shows Analog Inputs labeled by their Identifiers. To create a new Identifier position the highlight and start typing. Repositioning the highlight or pressing the **Enter** key will save the new identifier.

EVENT NAME PAIRS

Task 11 described how to create useful Event Name Pairs. This task assumes that all of the Event Names have been created. What remains is to assign the Event Name Pairs to the appropriate inputs. This can be done by using either of the following methods.

Spacebar Method–Move the highlight to the appropriate row in the OnEvent/OffEvent column. Press the **Spacebar** repeatedly until the desired Event Name Pair is listed.

Numeric Method–Event Name Pairs are numbered 1 through 20. The number of the assigned Event Name Pair is listed in the last column. To change it, position the highlight appropriately and type in a new number. Repositioning the highlight or pressing the **Enter** key will save the new assignment. The new assignment will appear immediately in the OnEvent/OffEvent column.

After all of the assignments have been completed, press the **Esc** key twice to exit and return to the Main Menu.

**Task
13****DE-BOUNCE RELAYS USING DETECTION TIMES**

Contact bounce is a phenomenon that all mechanical relays and switches experience. In an Event Recorder, if not correctly accounted for, it can cause multiple events to be logged when only one occurred. Your Event Recorder includes a feature called Detection Time that can be used to de-bounce contacts, thus preventing the problems caused by false Event Records.



The Detect Times / Flash Enable and Global Detect Time commands are only available to Administrative Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

The Metra signaling staff has defined three distinct Setup Databases for use with the Event Recorders. As a result of this effort, the Detection Times have already been established. In the future, if changes to any of these settings are required they should be made in accordance with the following descriptions.

13**WHAT TO DO**

From the Main Menu select the Setup command. The following sub-command menu will be displayed.

```

Setup Menu
T Time/Date
E Event Names
I Input Names/Identifiers
D Detect Times/Flash Enable
G Global Detect Time
A Analog Configuration
V Virtual Inputs
W Timer Inputs
M Measure Speed
N Network
S System Parameters
P Print Setup Data
R Reset System
  
```

Setup Commands

The Detect Times / Flash Enable and Global Detect Time sub-commands can be used to de-bounce contacts. Both commands are described in the sections that follow.

DETECT TIMES / FLASH ENABLE

After selecting this sub-command a screen similar to the following will be displayed. The data shown is from a CWR-72E.

Detect			Detect Times/Flash			Enable			Detect		
Input	Time	Flash	Input	Time	Flash	Input	Time	Flash	Input	Time	Flash
D01	0.30	No	D17	0.30	No	D33	0.30	No	D49	0.30	No
D02	0.30	No	D18	0.30	No	D34	0.30	No	D50	0.30	No
D03	0.30	No	D19	0.30	No	D35	0.30	No	D51	0.30	No
D04	0.30	No	D20	0.30	No	D36	0.30	No	D52	0.30	No
D05	0.30	No	D21	0.30	No	D37	0.30	No	D53	0.30	No
D06	0.30	No	D22	0.55	Yes	D38	0.30	No	D54	0.55	Yes
D07	0.30	No	D23	0.30	No	D39	0.30	No	D55	0.30	No
D08	0.30	No	D24	0.55	Yes	D40	0.30	No	D56	0.55	Yes
D09	0.30	No	D25	0.30	No	D41	0.30	No	D57	0.30	No
D10	0.30	No	D26	0.30	No	D42	0.30	No	D58	0.30	No
D11	0.30	No	D27	0.30	No	D43	0.30	No	D59	0.30	No
D12	0.30	No	D28	0.30	No	D44	0.30	No	D60	0.30	No
D13	0.30	No	D29	0.30	No	D45	0.30	No	D61	0.30	No
D14	0.30	No	D30	0.30	No	D46	0.30	No	D62	0.30	No
D15	0.30	No	D31	0.30	No	D47	0.30	No	D63	0.30	No
D16	0.30	No	D32	0.30	No	D48	0.30	No	D64	0.30	No

Detect Times / Flash Enable Command

To change a specific setting simply position the highlight in the Detect Time column of the desired Digital Input and type a new value. Detection Times can range from 0.00 to 327.67seconds. Leading and trailing zeros are not required. Press the **Enter** key or reposition the highlight to save the new setting.



To disable a Digital Input from creating any Event Records, set its Detection Time to zero.



A Detection Time of .3seconds generally provides excellent results for typical vital and non-vital relays used in railroad applications.

After all of the Detection Times have been set, press the **Esc** key twice to exit and return to the Main Menu.

13

GLOBAL DETECT TIME

After selecting this sub-command the following screen will be displayed.

Global Detect Time

Detect Time for All Inputs: 0.00

Global Detect Time Command

This command applies a single Detection Time setting to all Digital Inputs. If a single value is appropriate for all Digital Inputs this command will save the user a substantial amount of time. To apply a universal setting type a number in the range from 0.00 to 327.67seconds. Leading and trailing zeros are not required. Press the **Enter** key to save the new setting.



The Global Detect Time command will overwrite all Detection Times, including those associated with Flashing Inputs. After using this command it may be necessary to re-establish specific settings for Flashing Inputs.

Press the **Esc** key twice to exit and return to the Main Menu.

RELATED FEATURES

FLASHING INPUTS

The screen entitled "[Detect Times / Flash Enable Command](#)" lists different values for the Detection Times of Digital Inputs D22, D24, D54 and D56. These inputs are enabled for flashing operation. The Detection Times for Flashing Inputs represent a special case. The unique aspects of Flashing Inputs are described in [Task 14](#).

RECORD EVENTS FROM FLASHING INPUTS

Task 14

SETTING DETECTION TIMES FOR FLASHING INPUTS

Task 13 described how Detection Times are used to prevent false Event Records from being created. However, a different set of guidelines are used when assigning Detection Times to Flashing Inputs. Additionally, it is best to create a single On Event Record at the start of flashing and a single Off Event Record at the cessation of flashing. Once the Flashing Input is properly configured, its Off Event Record will report the average flash rate while the crossing was active.



The Detect Times / Flash Enable command is only available to Administrative Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

The Metra signaling staff has defined three distinct Setup Databases for use with the Event Recorders. As a result of this effort, the Detection Times have already been established. In the future, if changes to any of these settings are required they should be made in accordance with the following descriptions.

WHAT TO DO

From the Main Menu select the Setup>Detect Times/Flash Enable command. A screen similar to the following will be displayed. The data shown is from a CWR-72E.

Detect			Detect Times/Flash			Enable			Detect		
Input	Time	Flash	Input	Time	Flash	Input	Time	Flash	Input	Time	Flash
D01	0.30	No	D17	0.30	No	D33	0.30	No	D49	0.30	No
D02	0.30	No	D18	0.30	No	D34	0.30	No	D50	0.30	No
D03	0.30	No	D19	0.30	No	D35	0.30	No	D51	0.30	No
D04	0.30	No	D20	0.30	No	D36	0.30	No	D52	0.30	No
D05	0.30	No	D21	0.30	No	D37	0.30	No	D53	0.30	No
D06	0.30	No	D22	0.55	Yes	D38	0.30	No	D54	0.55	Yes
D07	0.30	No	D23	0.30	No	D39	0.30	No	D55	0.30	No
D08	0.30	No	D24	0.55	Yes	D40	0.30	No	D56	0.55	Yes
D09	0.30	No	D25	0.30	No	D41	0.30	No	D57	0.30	No
D10	0.30	No	D26	0.30	No	D42	0.30	No	D58	0.30	No
D11	0.30	No	D27	0.30	No	D43	0.30	No	D59	0.30	No
D12	0.30	No	D28	0.30	No	D44	0.30	No	D60	0.30	No
D13	0.30	No	D29	0.30	No	D45	0.30	No	D61	0.30	No
D14	0.30	No	D30	0.30	No	D46	0.30	No	D62	0.30	No
D15	0.30	No	D31	0.30	No	D47	0.30	No	D63	0.30	No
D16	0.30	No	D32	0.30	No	D48	0.30	No	D64	0.30	No

Detect Times / Flash Enable Command

Two settings control the behavior of Flashing Inputs. The Flash setting (either yes or no) and the Detect Time value. Both settings are described in the following sections.

FLASH (ENABLE / DISABLE)

For a Digital Input to respond properly to a sequence of flashing pulses it must be enabled for flashing operation. To do so, simply move the highlight to the Flash column of the appropriate Digital Input. Press the **Spacebar** key to change the setting to Yes. Change additional settings as required. The correct Detection Time must now be assigned.

DETECT TIME VALUE

Briefly stated, the goal is to assign a Detection Time that is appropriate for the nominal flash rate. A simple formula can be used for this purpose. The formula is:

$$\text{Detection Time (in seconds)} = 30 \div \text{FPM Rate}$$

Using the formula, a flash rate of 55 fpm yields a Detection Time of .55 seconds. A flash rate of 45 fpm yields a Detection Time of .67 seconds. Detection Times are explained further in [Figure 5](#).

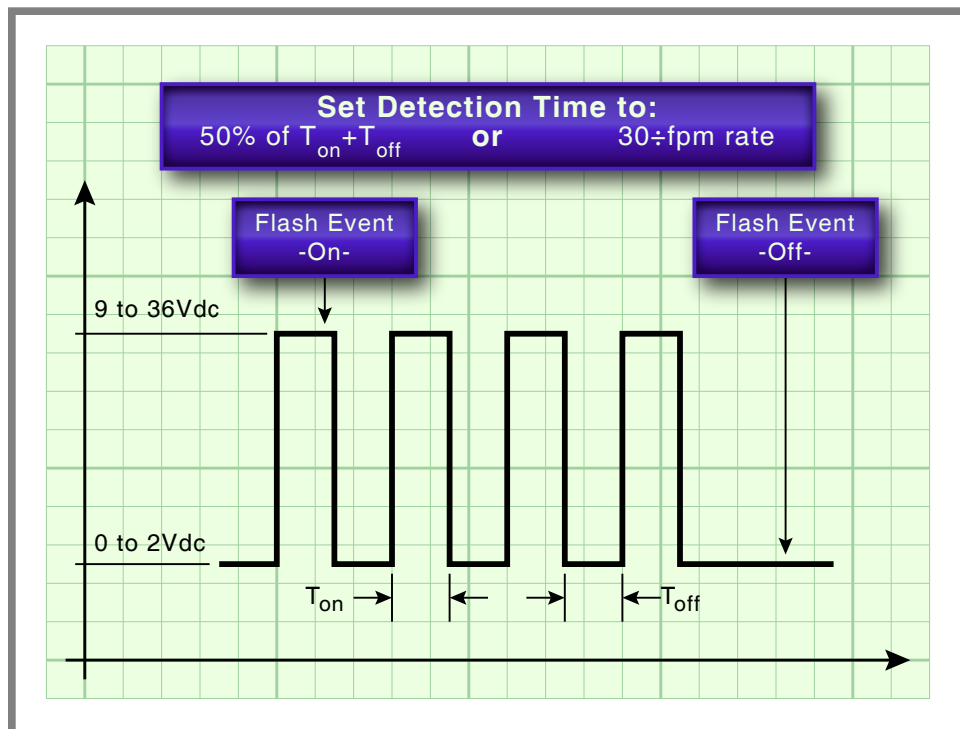


Figure 5: Typical Flashing Pulse Sequence

To change a specific setting simply, position the highlight in the Detect Time column of the desired Digital Input and type a new value. Leading and trailing zeros are not required. Press the **Enter** key or reposition the highlight to save the new setting.

After all of the settings have been correctly established, press the **Esc** key twice to exit and return to the Main Menu.

RELATED FEATURES

MEASURE FLASH RATE

Your recorder can precisely measure and report the flash rate of a circuit. This feature will also report the correct Detection Time to be used for the measured flash rate. Refer to [Task 25](#) entitled "Using the Measure Flash Rate Features".

FLASH RATE REPORTING

As illustrated in [Figure 5 on page 38](#) an Off Event Record will be saved to memory when the flashing sequence terminates. It is then possible to report the average flash rate while the crossing was active. [Figure 6](#) shows two Event Records. Digital Input D13 is not enabled as a Flashing Input. Digital Input D22 is enabled. An average flash rate of 46.0fpm was reported in the second Event Record.

15:32:20.01	09/11/11	ISLAND CIRCUIT-2T	ISLD-2T	TK UP	D13	
15:32:29.77	09/11/11	FLASH RATE 1	FLASH 1	FLASHOFF	D22	46.0FPM

Figure 6: Flash Rate Reported in Event Record

FAILED LAMP DETECTOR

The Metra Event Recorders actually measure and report the flash rate of a signal that is output by the FLD-2. The recording system relies upon the FLD-2 to sense current flow in the lamp circuits to determine if one or more lamps have failed. Sensing the actual current flows allows the FLD-2 to output a signal, referred to as its Flash pulse (FP), to the recorder which mimics the behavior of a flashing relay.

USER NOTES

[illegible]

How to . . .

USE ANALOG INPUTS TO MONITOR POWER

Task 15

CONFIGURING ANALOG INPUTS FOR USE WITH BATTERIES AND AC POWER

Your Event Recorder is equipped with eight Analog Inputs. These inputs are wired to AC power and various battery sources. Unlike Digital Inputs, Analog Inputs are continuously scanned to determine if their voltages are at levels outside of acceptable limits. An Event Record is saved to memory every time an Analog Input crosses a user-defined Limit Value.



The Analog Configuration command is only available to Administrative Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

The Metra signaling staff has defined three distinct Setup Databases for use with the Event Recorders. As a result of this effort, the configuration used by the Analog Inputs has already been established. The Mainline, BEV and MED Setup Databases all share the same settings. In the future, if changes to the Analog Input configuration are required they should be made in accordance with the following descriptions.

15

WHAT TO DO

From the Main Menu select the Setup>Analog Configuration command. The following screen will be displayed.

Input	Range	Filter*	Low Limit	High Limit
A01	+51.1Vdc	Fast	9.0	18.0
A02	+51.1Vdc	Fast	9.0	18.0
A03	+51.1Vdc	Fast	9.0	18.0
A04	+51.1Vdc	Fast	9.0	18.0
A05	+51.1Vdc	Fast	9.0	18.0
A06	+51.1Vdc	Fast	9.0	18.0
A07	+51.1Vdc	Fast	9.0	18.0
A08	255Vac	Slow	90	255

*Recommend "Slow" for AC

Analog Configuration Command

A description of each Analog Configuration setting is provided in the sections that follow.

Analog Input—Each Analog Input includes a positive and negative terminal. Analog Inputs are configured independently of each other. They are identified as A1 through A8.

Voltage Range—Like a Digital Volt Meter (DVM), each Analog Input can be assigned a voltage scale, referred to as a Range. Inputs A1 through A7 are used to monitor battery voltages. Accordingly, their Range settings are all assigned to the 0 to +51.1 Vdc scale. This Range setting reports voltages in incre-

ments of .1 Vdc. Input A8 is used to monitor the commercial AC power that supplies the battery charger. Its Range setting is assigned to the 0 to 255 Vac scale. This Range setting reports voltages in increments of 1 Vac.

To change the Range setting simply move the highlight to the desired setting and press the **Spacebar** repeatedly until the required setting is displayed. Seven distinct Ranges are available. Among them are $\pm 25.5\text{Vdc}$, $\pm 255\text{Vdc}$ and 25.5Vac .

Filter—The Fast setting is generally best suited for monitoring DC voltages. The Slow setting should always be used with AC inputs. To change the setting simply press the **Spacebar**.

Low and High Limit Values—Limit Values are used to establish an acceptable and unacceptable range of operation for each Analog Input. They always occur in pairs. The range between the Low and High Limit Values defines the acceptable range. The range outside these Limit Values defines the unacceptable range.

Event Records are saved to memory whenever a Digital Input transitions from Off to On or from On to Off. For Analog Inputs, Event Records are saved to memory whenever their voltage transitions into or out of the acceptable range. Figure 7 illustrates this behavior.

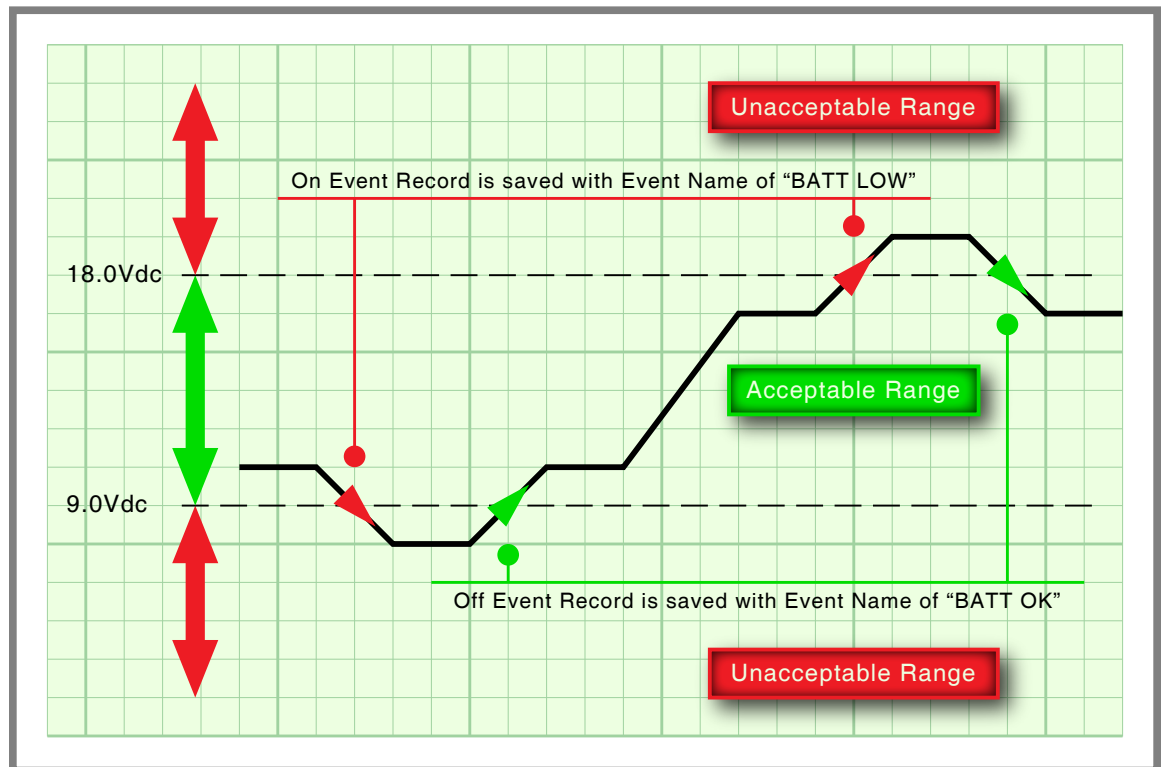



Figure 7: Limit Values and Event Name Pair Correspondence

The previous figure also illustrates the correspondence between Event Name Pair assignments and transitions into and out of the acceptable range of operation. The correspondence is described in the following.

- When the Analog Input voltage falls below the Low Limit Value or exceeds the High Limit Value an Event Record is saved to memory using the assigned On Event Name (e.g., BATT LOW). The input voltage has transitioned into the unacceptable range.
- Conversely, when the Analog Input voltage exceeds the Low Limit Value or falls below the High Limit Value an Event Record is also saved to memory using the assigned Off Event Name (e.g., BATT OK). The input voltage has transitioned into the acceptable range.

Press the **Esc** key twice to exit and return to the Main Menu.

 Event Records for Analog Inputs are saved to memory once per transition. Only when the voltage crosses a Limit Value is the record time stamped with the current time and saved. No additional records are saved provided the voltage remains within the same range.


RELATED FEATURES

ANALOG INPUT CONNECTIONS

As previously stated, the Analog Inputs are configured identically in all three Metra-defined Setup Databases. The inputs are also similarly wired. [Table 5](#) lists the Input Names assigned to each Analog Input. The Input Name explains the source of the voltage.

Analog Input	Assigned Input Name by Setup Database	
	Mainline	BEV and MED
A1	ELECTRONIC BATTERY	ELECTRONIC BATTERY
A2	CROSSING BATTERY	CROSSING BATTERY
A3	LINE BATTERY	LINE BATTERY
A4	BATTERY EAST	BATTERY EAST
A5	BATTERY WEST	BATTERY WEST
A6		BATTERY NORTH
A7		BATTERY SOUTH
A8	120/240 VAC POWER	120/240 VAC POWER

Table 5: Analog Input Wiring and Input Names

 Analog Inputs A6 and A7 are not connected when the Mainline Setup Database is used.

EVENT NAME PAIRS

Over time, Digital and Analog Inputs will transition On and Off or into and out of their acceptable range of operation, respectively. The Event Name Pair feature allows the user to distinguish Event Records based upon the state of the input. An On transition may indicate an occupied track condition. An Off transition may indicate an unoccupied track condition. Assigning Event Names such as Occupied and Idle add immediate clarity to the records. Event Names are the subject of [Task 11](#). The formatting of Event Records is fully described in [Task 23](#). The Metra signaling staff has defined a useful set of Event Name Pairs for the Mainline, BEV and MED Setup Databases.

USER NOTES

[illegible]

**Task
16****PRINTING THE SETUP DATABASE**

At any time while you are configuring your recorder you can easily and quickly review your assignments. This can be very helpful in verifying the accuracy and completeness of the configuration. The entire collection of Unit Name, Input Names, Detection Times, etc. is referred to as the Setup Database.



The Print Setup Data command is available to Administrative and Restricted Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

WHAT TO DO

From the Main Menu select the Setup>Print Setup Data command. The following screen will be displayed.

```
Print Setup Data
P Print All
E Print Event Names
I Print Input Names/Identifiers
D Print Detect Times/Flash Enable
A Print Analog Configuration
V Print Virtual Inputs
T Print Timer Configuration
M Print Measure Speed Parameters
N Print Network Settings
S Print System Parameters
```

Print Setup Data Command

Select any of the print options that best suit your inquiry. The Print All command allows you to review every setting in the Setup Database. The following sample data shows the end of a Print All report. It lists the system parameters for the Mainline Setup Database.

```
Report printed on 09-11-11
DIST SUBDR XING-NAME_DOT-NUMBER_MILE-POST-NUMBER
Unit Name:
DIST SUBDR XING-NAME_DOT-NUMBER_MILE-POST-NUMBER
Terminal Port Baud Rate: 38400
Administrative Password:
Restricted Password: SIGNAL
Passcode: 547
Ring Count: 2
Primary Dial Number:
Secondary Dial Number:
Clock Sync Mode: GPS
Clock Sync Input: ---
Time Zone CST (UTC-6)
Daylight Saving Time Enabled
High Temp Limit: 257 Degrees F
Low Temp Limit: -67 Degrees F
Record Flash Details Disabled
Report Done
hit any key to continue
```

End of Print All Report

At the completion of the report press any key to return to the Print Setup Data menu. Press the **Esc** key twice to exit and return to the Main Menu.

RELATED FEATURES

PRINTING THE SETUP DATABASE

The on-screen, readable version of the Setup Database can be captured as a .txt file using HyperTerminal. The procedure for doing so is described in the section entitled "[Setting Up Capture Mode](#)" on [page 61](#). Once captured, the .txt file can be printed at any time.

PREASSIGNED SETUP DATABASES

The Metra signal engineers have worked together with MICRO-AIDE to develop three different databases. They are referred to as Mainline, BEV and MED. [Table 6](#) details the use of each Setup Database.

Database Name	Used With
Mainline	CWR-72E
BEV	CWR-40E
MED	CWR-40E

Table 6: Setup Database Usage

All three Setup Databases are fully detailed in Appendix B of the CWR-40E/CWR-72E Event Recorder User Manual. A PDF copy of the manual can be downloaded from the MICRO-AIDE website at: www.micro-aide.com/support/documentation.html

How to . . .

SAVE A COPY OF THE SETUP DATABASE

Task 17

DOWNLOAD THE SETUP DATABASE TO A PC FILE

Once the Setup Database has been verified as complete and accurate it is advisable to save a copy of it in a PC. The recorder includes an additional command that allows the saved database to be loaded into the recorder in case it is accidentally erased or altered. The latter feature is the subject of [Task 18](#).



The Download Setup Data command is available to Administrative and Restricted Access sessions.

BEFORE YOU START

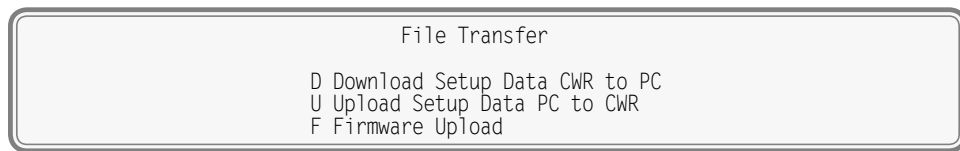
This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

The Metra signaling staff has defined three distinct Setup Databases for use with the Event Recorders. Copies of these databases have been saved by Metra and MICRO-AIDE. The procedures described in this task may have to be exercised in the event that a new Setup Database is prepared in the future.

WHAT TO DO

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From the Main Menu select the Transfer Files command. The following screen will be displayed.



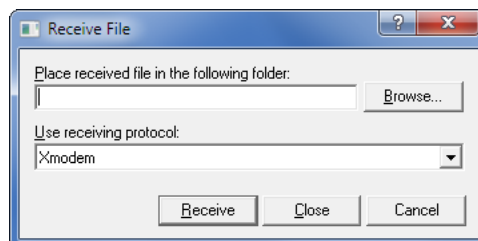
Transfer Files Command

To save a copy of the current database perform the following steps.

1. Select the Download Setup Data sub-command. The following message will be displayed.



2. Click on the command named "Transfer". It is located in the menu bar at the top of the HyperTerminal window. Click on the sub-command named "Receive File...". The following dialog box will be displayed.



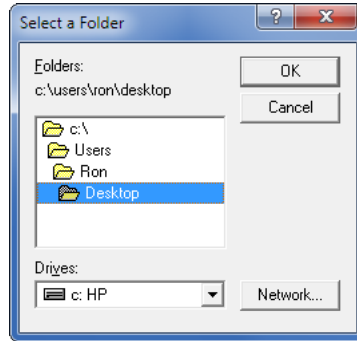
HyperTerminal-Receive File Dialog Box

- Click the down arrow at the right edge of the drop-down list box labeled "Use receiving protocol:". Select Xmodem for the protocol.



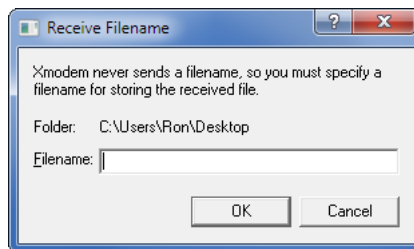
This procedure will fail if Xmodem is not selected as the transfer protocol.

- Click the button labeled "Browse...". A dialog box similar to the following will be displayed.



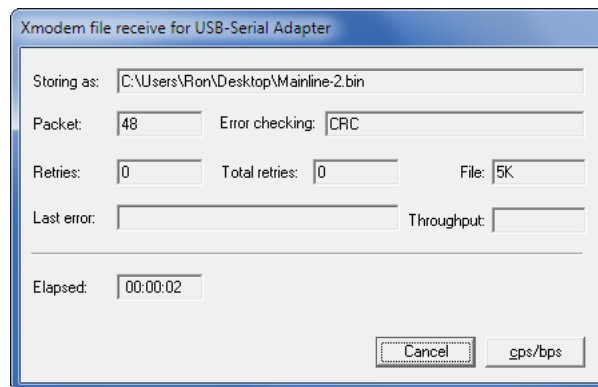
HyperTerminal—Select a Folder Dialog Box

- Navigate to and select the folder where the file will be saved. Click the button labeled "OK". The Receive File dialog box shown in step 2 will reappear. Click the button labeled "Receive". The following dialog box will be displayed.



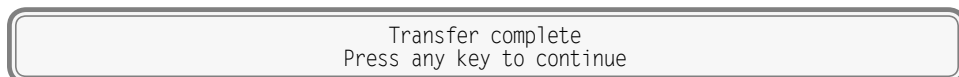
HyperTerminal—Receive Filename Dialog Box

- In the edit box labeled "Filename:" enter a descriptive name (e.g., "Mainline-2.bin") for the file. The file's extension must be ".bin". Click the button labeled "OK". A dialog box similar to the following will be displayed for several seconds. It indicates the progress of the file transfer. It will close automatically.



HyperTerminal—Xmodem File Receive Dialog Box

- Upon the successful conclusion of the file transfer, the recorder will display the following message.



- Press the **Esc** key twice to exit and return to the Main Menu.

How to . . .

RESTORE THE SETUP DATABASE

Task 18

UPLOAD THE SETUP DATABASE FROM A PC FILE

Once the Setup Database has been saved, it can be used to restore a functional database to the recorder in the event that the current database is accidentally erased or altered. This procedure requires access to one of the three Metra-defined Setup Database files. The procedure used to save a database to a PC file is described in [Task 17](#).



The Upload Setup Data command is only available to Administrative Access sessions.

BEFORE YOU START

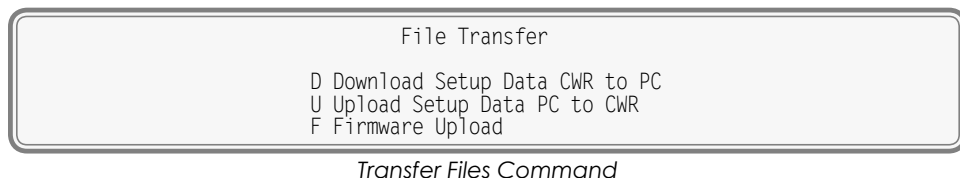
This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

The Metra signaling staff has defined three distinct Setup Databases for use with the Event Recorders. The appropriate Setup Database is pre-installed by MICRO-AIDE in every Event Recorder delivered to Metra. The procedures described in this task should be exercised only in the event that the Setup Database has been corrupted as a result of user activity.

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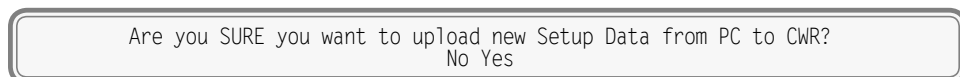
WHAT TO DO

From the Main Menu select the Transfer Files command. The following screen will be displayed.



To restore a database perform the following steps.

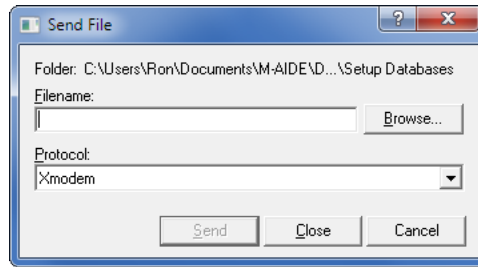
1. Select the Upload Setup Data sub-command. The following message will be displayed.



2. To proceed with the file transfer select the Yes option. The following message will be displayed.



3. Click on the command named "Transfer". It is located in the menu bar at the top of the HyperTerminal window. Click on the sub-command named "Send File...". The following dialog box will be displayed.



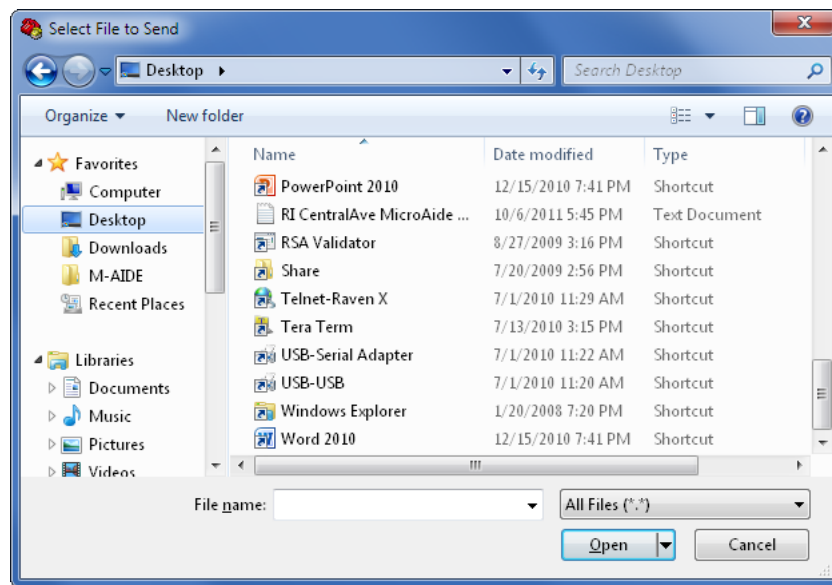
HyperTerminal-Send File Dialog Box

- Click the down arrow at the right edge of the drop-down list box labeled "Protocol:". Select Xmodem for the protocol.



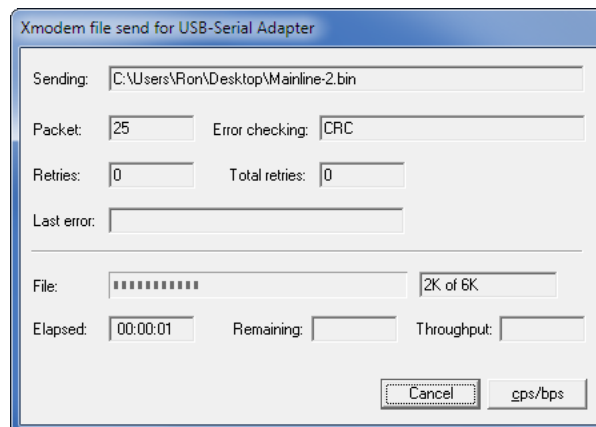
This procedure will fail if Xmodem is not selected as the transfer protocol.

- Click the button labeled "Browse...". A dialog box similar to the following will be displayed.



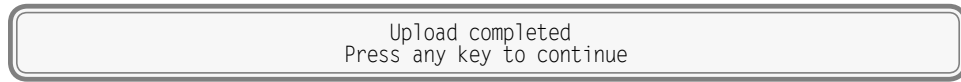
HyperTerminal-Select File to Send Dialog Box

- Navigate to and select the file to be sent. Click the button labeled "Open". The Send File dialog box shown in step 3 will reappear. Click the button labeled "Send". The following dialog box will be displayed.



HyperTerminal-Xmodem File Send Dialog Box

7. The preceding dialog box will be displayed for several seconds. It indicates the progress of the file transfer. It will close automatically.
8. Upon the successful conclusion of the file transfer, the recorder will display the following message.



Upload completed
Press any key to continue

9. Press the **Esc** key twice to exit and return to the Main Menu.

USER NOTES

[illegible]

How to . . .

VIEW EVENT RECORDS

Task 19

QUERY USING THE BROWSE OPTION

The Query Events command can be used to view Event Records at your PC monitor that have been previously logged to memory. The command allows you to select a range of dates and times for the data that is of interest to you. Alternatively, Event Records can be viewed directly at the front panel's LCD. A PC is not required using this method. In both cases several additional features control the range and content of the viewed records.



The Query Events command is available to Administrative and Restricted Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

To follow the examples cited in this task, your recorder must have Event Records logged to memory spanning two or more days.

WHAT TO DO

USING A PC AND HYPERTERMINAL

From the Main Menu select the Query Events command. A screen similar to the following will be displayed.

Select Range of Dates

08-25-11	08-26-11	08-27-11	08-28-11	08-29-11	08-30-11	08-31-11	09-01-11
09-02-11	09-03-11	09-04-11	09-05-11	09-06-11	09-07-11	09-08-11	09-09-11
09-10-11	09-11-11	09-12-11	09-13-11	09-14-11	09-15-11	09-16-11	09-17-11
09-18-11	09-19-11	09-20-11					

Use arrow keys to move, Space=start selection, Enter=accept, ESC=cancel

Query Events Command—Table of Dates

In the previously cited sample data, 27 consecutive dates are displayed. As many as 128 dates can be listed. At least one Event Record was logged to memory for each date listed. The highlight will always be located at the first date position (e.g., 08-25-11). A two-step process is required to view records. First, a date or range of dates must be selected. It is followed by selecting a range of times and report options.

SELECTING DATES

To select the date(s) perform either of the following procedures.

- To view records from a single date simply move the highlight to the desired date.
- To view records from two or more contiguous dates, move the highlight to the first date in the range. Press the **Spacebar** to anchor this position. Use the arrow keys to extend the highlight to encompass additional dates.

After the highlight has selected the correct date(s) press the **Enter** key. The time range and report options can now be selected.

SELECTING TIMES AND REPORT OPTIONS

After selecting the range of dates a screen similar to the following will be displayed.

Query Report	
Start Date:	09-11-11
Start Time:	00:00:00
End Date:	09-11-11
End Time:	23:59:59
Record Details:	No Details (1)
Reverse order:	No
Report Type:	Dump
Inputs: (blank=all)	
[F1]=Execute Report, ESC=cancel	

Query Events Command—Times and Report Options

The highlight will be located in the hour position of the Start Time field. The Start Date and End Date fields will be inaccessible as they were assigned as the result of the date selection process. There are six fields that you can control within the Query command. The use of each of these is described in the sections that follow.

Start Time and End Time—Event Records are time stamped using the 24-hour clock convention. To change either the Start Time or End Time move the highlight to the appropriate hour, minute or second field and enter a new value. Leading zeros are not required. Moving the highlight will accept the new value.

Record Details—The Record Details setting controls the amount of data included within each Event Record. The number in parenthesis (e.g., 1) indicates the number of text lines per Event Record. The latter can range from one to four. All of the options are fully described in [Task 23](#) entitled "[Event Record Formatting Options](#)". Press the **Spacebar** one or more times to change the Record Details setting.

Reverse Order—The Reverse Order option allows you to list Event Records in either forward or reverse chronological order. Selecting No will issue records starting from the oldest. Selecting Yes will issue records starting from the newest. Press the **Spacebar** to toggle the setting.

Report Type—The Report Type option can be assigned one of three settings. They are: Dump, Browse and Comma. Dump is the subject of [Task 20](#) entitled "[Query Using the Dump Option](#)". Press the **Spacebar** until the Browse setting is highlighted. Browse allows you to view records at your leisure. It will display multiple records, one screen at a time. This option should be selected if you intend to view records but not save them to a PC file. The records will be displayed indefinitely until you press the **Esc** key or advance forward or backward to a new record or set of records. The number of records listed per screen will vary with the Record Details setting. A sample report is shown at the end of the next section.

Inputs—The Inputs option can be left blank (default setting) in which case every record satisfying the assigned date and time requirements will be included within the report. However, the Inputs option can also be used to issue the report listing a specific (i.e., filtered) set of inputs.

A specific Digital Input can be entered as Dn. A range of Digital Inputs can be entered as Dn-n. Analog and System Inputs use a prefix of A and S, respectively. Leading zeros are not required. Use a space to separate different groups of inputs. Press the **Enter** key to accept the inputs you have selected. Table 7 lists the single-letter code that is used to identify each input type.

Letter Code	Type of Input
D	Digital
A	Analog
V	*Virtual
T	*Timer
F	*Flashing
S	System

Table 7: Input Type Identifiers



The single-letter codes V, T and F can be ignored. The Metra-defined Setup Databases do not implement any Virtual, Timer or Flashing Inputs.

By way of example, setting the Inputs field to D1-10 D17 A1 S4-6 will allow you to view records from Digital Inputs 1 through 10 and 17, Analog Input 1 and System Events 4, 5 and 6.

After the six Query fields are properly assigned press the **F1** function key. After a short delay the report will be available for viewing. A single-line, sample report (i.e., not listing any additional details) is shown in the following.

Browse Events						
13:32:20.01	09/11/11	ISLAND CIRCUIT-2T	ISLD-2T	TK UP	D13	
13:32:21.50	09/11/11	W CONST WARNING-2T	WCWTD-2T	TK UP	D12	
13:32:21.73	09/11/11	GC&XR-B	GC&XR-B	WARN OFF	D20	
13:32:21.76	09/11/11	GC&XR-F	GC&XR-F	WARN OFF	D19	
13:32:23.07	09/11/11	SOUTH GATE	SG DWN	NOT DWN	D28	
13:32:25.27	09/11/11	WEST WRAP-2T	WWRAP-2T	TK UP	D11	
13:32:29.15	09/11/11	ALL GATES UP	GATE UP	GATES UP	D26	
13:32:29.77	09/11/11	FLASH RATE 1	FLASH 1	FLASHOFF	D22 46.0FPM	
13:32:29.77	09/11/11	FLASH RATE 2	FLASH 2	FLASHOFF	D24 47.5FPM	
13:33:26.78	09/11/11	EAST WRAP-2T	EWRAP-2T	TK UP	D15	
14:00:00.21	09/11/11	GPS Clock Record	GPS Rec	OFF	S06 0.00SEC	
[DOWN]=Next Page [UP]=Prev Page [RIGHT]=Next Event [LEFT]=Prev Event [ESC]=Quit						

Query Events Command—Report Type Set to Browse

As the legend at the bottom of the report indicates, the arrow keys can be used to view additional records either one at a time or a full screen at a time. After you have reviewed all of the records of interest, press the **Esc** key to exit and return to the Main Menu.

FROM THE FRONT PANEL

To view Event Records using the front panel keypad, perform the steps listed in the following.

1. Press the **Browse** key. The following menu of commands will be displayed.

```

Browse:
Event Records
Input Status
Flash Rate
    
```

Browse Command

- Using the up and down arrow keys, highlight the Event Records option. Press the **Enter** key. One or more dates arranged and formatted similar to the following will be displayed.

```

082511 082611 082711
082811 082911 083011
083111 090111 090211
090311 090411 090511
    
```

Browse Command-Table of Dates

- In the previous example, 12 dates are listed in MMDDYY format. Only 12 dates can be displayed at once; however, as many as 128 different dates can be selected. Use the arrow keys to highlight the date of interest. Press the **Enter** key.
- The following Start Time selection field will be displayed.

```

Browse Event Records

Start Time: 00:00:00
    
```

Browse Command-Start Time

- Proceed directly to the next step to view records starting at midnight (i.e., 00:00:00). To select a different start time, first move the highlight to the desired field. From left to right the fields are: hours, minutes and seconds. To change the currently displayed setting press the **Enter** key followed by the appropriate numeric key(s). Leading zeros are not required. Accept the new setting by pressing the **Enter** key once again. Repeat this procedure for the other fields as required.
- Press the **Esc** key. The following information message will be displayed briefly.

```

Use ←→↑↓ to scroll,
Browse to select
input to query
    
```

- The first Event Record satisfying the selected date and time criteria will be displayed. A sample record from Digital Input D13 is shown in the following.

```

13:32:20.01 09-11-11
D13          11..x.....
ISLAND CIRCUIT-2T
ISLD-2T      TK UP
    
```

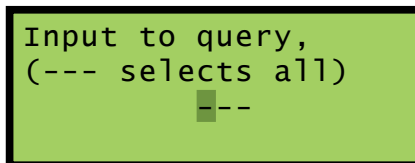
Event Record-Digital Input



The section entitled "From the Front Panel" on page 75, which is a part of Task 23, provides an explanation of how Event Records are formatted at the LCD.

- Press the up and down arrow keys to view the next record in the chronological sequence.

9. Press the **Browse** key at any time to view records from a specific input. The following input selection field will be displayed.



```
Input to query,
(--- selects all)
---
```

Browse Command–Selected Input

10. Start by pressing the **Alpha** key. The letter D will be displayed to indicate a Digital Input Number can now be entered.
11. Continue to press the **Alpha** key until the desired input type is highlighted. The Input Number can be entered by pressing the appropriate numeric key. Leading zeros are not required. Finally, press the **Enter** key to complete the selection. The first Event Record satisfying the date, time and input criteria will be displayed.
12. Press the up and down arrows keys to view the next record in the chronological sequence.
13. Press the **Browse** key at any time to select another input for viewing.
14. When the last record of interest has been viewed, press the **Esc** key to return to the Idle Mode.

RELATED FEATURES

PAUSING, RESTARTING AND TERMINATING A DUMP REPORT

Setting the Report Type field to Dump rather than Browse also allows you to view records. However, the Dump setting will stream all of the records one after the other. This feature makes it ideal for capturing records to a PC file. If you use the Dump setting to view records, the streaming can be paused by pressing the **Ctrl** and **S** keys simultaneously. To restart the streaming, press the **Ctrl** and **Q** keys simultaneously. Press the **Esc** key at any time to terminate the report, otherwise it will terminate automatically. At the end of the report the number of records will be listed along with a checksum that is unique to the report's record content.

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Be aware that HyperTerminal will occasionally garble text within its window that has been scrolled backwards and then forwards. This is not a recorder-related problem.

SAVING EVENT RECORDS TO A PC FILE

This task described how to view Event Records using HyperTerminal. Saving records to a PC file is the subject of [Task 20](#) entitled "Query Using the Dump Option".

SAVING EVENT RECORDS TO A USB FLASH DRIVE

Your recorder includes a USB Host Port. This feature allows you to save Event Records directly a USB flash drive for later viewing at your PC. The procedure used to create and save an Event Record file to a flash drive can be performed from the front panel of the unit. A PC is not required. [Task 21](#) entitled "Saving Event Records to a USB Flash Drive" describes this procedure.

USER NOTES

[illegible]

How to . . .

SAVE EVENT RECORDS TO A PC FILE

Task 20

QUERY USING THE DUMP OPTION

The Query Events command can also be used to save Event Records to a PC file. The command allows you to select a range of dates and times for the data that is of interest to you. Several additional features control the range and content of the saved records.



The Query Events command is available to Administrative and Restricted Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

To follow the examples cited in this task, your recorder must have Event Records logged to memory spanning two or more days.

WHAT TO DO

From the Main Menu select the Query Events command. A screen similar to the following will be displayed.

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Select Range of Dates

08-25-11	08-26-11	08-27-11	08-28-11	08-29-11	08-30-11	08-31-11	09-01-11
09-02-11	09-03-11	09-04-11	09-05-11	09-06-11	09-07-11	09-08-11	09-09-11
09-10-11	09-11-11	09-12-11	09-13-11	09-14-11	09-15-11	09-16-11	09-17-11
09-18-11	09-19-11	09-20-11					

Use arrow keys to move, Space=start selection, Enter=accept, ESC=cancel

Query Events Command—Table of Dates

In the previously cited sample data, 27 consecutive dates are displayed. As many as 128 dates can be listed. At least one Event Record was logged to memory for each date listed. The highlight will always be located at the first date position (e.g., 08-25-11). A two-step process is required to save records. First, a date or range of dates must be selected. It is followed by selecting a range of times and report options.

SELECTING DATES

To select the date(s) perform either of the following procedures.

- To view records from a single date simply move the highlight to the desired date.
- To view records from two or more contiguous dates, move the highlight to the first date in the range. Press the **Spacebar** to anchor this position. Use the arrow keys to extend the highlight to encompass additional dates.

After the highlight has selected the correct date(s) press the **Enter** key. The time range and report options can now be selected.

SELECTING TIMES AND REPORT OPTIONS

After selecting the range of dates a screen similar to the following will be displayed.

Query Report

Start Date:	09-11-11
Start Time:	00:00:00
End Date:	09-11-11
End Time:	23:59:59
Record Details:	No Details (1)
Reverse order:	No
Report Type:	Dump

Inputs:
(blank=all)

[F1]=Execute Report, ESC=cancel

Query Events Command—Times and Report Options

The highlight will be located in the hour position of the Start Time field. The Start Date and End Date fields will be inaccessible as they were assigned as the result of the date selection process. There are six fields that you can control within the Query command. The use of each of these is described in the sections that follow.

Start Time and End Time—Event Records are time stamped using the 24-hour clock convention. To change either the Start Time or End Time move the highlight to the appropriate hour, minute or second field and enter a new value. Leading zeros are not required. Moving the highlight will accept the new value.

Record Details—The Record Details setting controls the amount of data included within each Event Record. The number in parenthesis (e.g., 1) indicates the number of text lines per Event Record. The latter can range from one to four. All of the options are fully described in [Task 23](#) entitled "[Event Record Formatting Options](#)". Press the **Spacebar** one or more times to change the Record Details setting.

Reverse Order—The Reverse Order option allows you to list Event Records in either forward or reverse chronological order. Selecting No will issue records starting from the oldest. Selecting Yes will issue records starting from the newest. Press the **Spacebar** to toggle the setting.

Report Type—The Report Type option can be assigned one of three settings. They are: Dump, Browse and Comma. Browse is the subject of [Task 19](#) entitled "[Query Using the Browse Option](#)". Press the **Spacebar** until the Dump setting is highlighted. Dump allows you to save Event Record data to a PC file that can be read using a text editor application (e.g., Notepad®). The procedure for creating and saving the file is described in the section entitled "[Setting Up Capture Mode](#)" on page 61.

Inputs—The Inputs option can be left blank (default setting) in which case every record satisfying the assigned date and time requirements will be included within the report. However, the Inputs option can also be used to issue the report listing a specific (i.e., filtered) set of inputs.

A specific Digital Input can be entered as Dn. A range of Digital Inputs can be entered as Dn-n. Analog and System Inputs use a prefix of A and S, respectively. Leading zeros are not required. Use a space to

separate different groups of inputs. Press the **Enter** key to accept the inputs you have selected. Table 8 lists the single-letter code that is used to identify each input type.

Letter Code	Type of Input
D	Digital
A	Analog
V	*Virtual
T	*Timer
F	*Flashing
S	System

Table 8: Input Type Identifiers



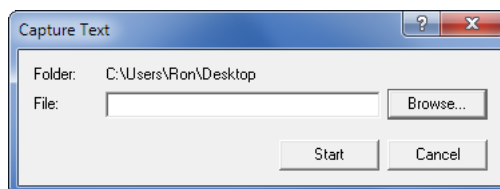
The single-letter codes V, T and F can be ignored. The Metra-define Setup Databases do not implement any Virtual, Timer or Flashing Inputs.

By way of example, setting the Inputs field to D1-10 D17 A1 S4-6 will allow you to view records from Digital Inputs 1 through 10 and 17, Analog Input 1 and System Events 4, 5 and 6.

SETTING UP CAPTURE MODE

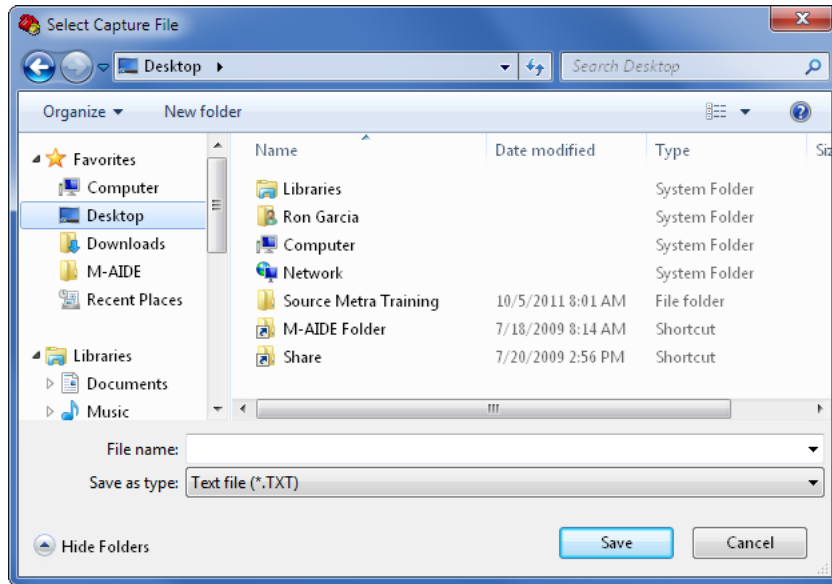
After the six Query fields are properly assigned, HyperTerminal must be configured to capture and save the Event Records. Event Records are comprised of simple text characters. To save records as a file the capture text feature of HyperTerminal is used as described in the following.

1. Click the command named "Transfer" from the HyperTerminal menu bar.
2. Click the sub-command named "Capture Text...". A dialog box similar to the following will be displayed.



HyperTerminal–Capture Text Dialog Box

3. Click the button labeled "Browse...". A dialog box similar to the following will be displayed.



HyperTerminal–Select Capture File Dialog Box

4. Navigate to or create the folder where the file will be saved. In the edit box labeled "File name:" enter a descriptive name for the file. The file's extension should be left as ".TXT". Click the button labeled "Save".
5. The Capture Text dialog box shown in step 2 will reappear. Click the button labeled "Start". The Captured Text file is now fully specified. The dialog box will close automatically.
6. Press the **F1** function key. After a short delay the selected Event Records will scroll across the HyperTerminal window while they are being saved to the Captured Text file.
7. The report will terminate automatically. At the end of the report the number of records will be listed along with a checksum that is unique to the report's record content. If at any time you wish to prematurely terminate the report press the **Esc** key. The end of a sample report is shown in the following.

```

13:32:29.77  09/11/11  FLASH RATE 2      FLASH 2  FLASHOFF D24 47.5FPM
13:33:26.78  09/11/11  EAST WRAP-2T    EWRAP-2T TK UP   D15
14:00:00.21  09/11/11  GPS Clock Record  GPS Rec  OFF     S06 0.00SEC
Number of records = 34  Checksum = 3523
End of report
Hit any key to continueHit any key to continue
    
```

End of Sample Report

8. Once the report has been completed or terminated, click the command named "Transfer" from the HyperTerminal menu bar.
9. Close the Captured Text file by clicking the sub-command named "Capture Text>Stop".



Between the time you start and stop the capture mode, HyperTerminal will save every Event Record character along with every one of your keystrokes. Press the **F1** function key only after the Captured Text file is fully specified. Additionally, do not press any keys until after the report has been completed and the Captured Text file is closed.

10. Press the **Esc** key to exit and return to the Main Menu.

RELATED FEATURES

VIEW A CAPTURED TEXT FILE

The Captured Text file includes, by default, a .txt file extension. The file can be viewed and printed using any word processing application (e.g., Notepad or Word®). To open the file, use Windows Explorer to navigate to the folder you selected in step 4. Double-click the file of interest. Unless you specify otherwise, the Captured Text file will open in your default text file application.

PAUSING, RESTARTING AND TERMINATING A DUMP REPORT

You can view Event Record data by setting the Report Type field to Dump and not creating a capture file. However, the Dump setting will stream all of the records one after the other. The streaming can be paused by pressing the **Ctrl** and **S** keys simultaneously. To restart the streaming, press the **Ctrl** and **Q** keys simultaneously. Press the **Esc** key at any time to terminate the report, otherwise it will terminate automatically. At the end of the report the number of records will be listed along with a checksum that is unique to the report's record content.



Be aware that HyperTerminal will occasionally garble text within its window that has been scrolled backwards and then forwards. This is not a recorder-related problem.

BROWSING EVENT RECORDS

This task described how to save Event Records using HyperTerminal. To view records one screen at a time (i.e., no streaming) refer to [Task 19](#) entitled "Query Using the Browse Option".

SAVING EVENT RECORDS TO A USB FLASH DRIVE

Your recorder includes a USB Host Port. This feature allows you to save Event Records directly to a USB flash drive for later viewing at your PC. The procedure used to create and save an Event Record file to a flash drive can be performed from the front panel of the unit. A PC is not required. [Task 21](#) entitled "Saving Event Records to a USB Flash Drive" describes this procedure.

USER NOTES

[illegible]

How to . . .

SAVE EVENT RECORDS WITHOUT USING A PC

Task 21

SAVING EVENT RECORDS TO A USB FLASH DRIVE

The front panel of your Event Recorder includes a USB Host Port. The port is designed to accept commonly available flash drives (aka thumb drives). This capability allows you to save Event Record data without using a PC. The portability of the flash drive allows you to review and share your record data as you please.



The front panel Save command is available to all users.

BEFORE YOU START

This task requires that you have access to a USB flash drive. A PC is not required to save the records to the drive. However, a PC with a word processing application installed (e.g., Notepad or Word) is required to review the records.

To follow the examples cited in this task, your recorder must have Event Records logged to memory spanning two or more days.

WHAT TO DO

Your recorder allows you to quickly save all of the Event Records from a complete day. A slightly different procedure is used to save records from a specific range of dates and times. Follow the steps listed in the appropriate section.

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SAVING EVENT RECORDS FROM A COMPLETE DAY

1. Insert the USB flash drive into the front panel connector labeled "USB Host Port".
2. Press the **Save/** key. The following message will be displayed.

```
Save to flash drive:
Records for one day
Records for a range
```

Save Command

3. Press the **Enter** key after highlighting the Records for one day option.
4. A table of dates similar to the following will be displayed.

```
082511 082611 082711
082811 082911 083011
083111 090111 090211
090311 090411 090511
```

Table of Dates

At least one Event Record will be logged for each date listed. Dates are listed in the MMDDYY format. The Event Records option may list as many as 128 dates. Only 12 dates are listed in the example cited previously. The up and down arrow keys can be used to scroll quickly through a large collection of dates.

5. Press the **Enter** key after highlighting a date. The following message will be displayed briefly after the delay required to create the text file.

```
Writing events.txt
Writing events.bin
Writing setupdata
Success!
```

6. Records from additional complete days can be saved by repeating this procedure starting at step 2.
7. Remove the flash drive from the USB Host Port after all the required records have been saved.

SAVING EVENT RECORDS FROM A RANGE OF TIMES AND DATES

1. Insert the USB flash drive into the connector labeled "USB Host Port".
2. Press the **Save/.** key. The following message will be displayed.

```
Save to flash drive:
Records for one day
Records for a range
```

Save Command

3. Press the **Enter** key after highlighting the Records for a range option.
4. A table of dates similar to the following will be displayed. The dates represent the available start date of the range.

```
082511 082611 082711
082811 082911 083011
083111 090111 090211
090311 090411 090511
```

Table of Dates—Select Start Date

At least one Event Record will be logged for each date listed. Dates are listed in the MMDDYY format. The Event Records option may list as many as 128 dates. Only 12 dates are listed in the example cited previously. The up and down arrow keys can be used to scroll quickly through a large collection of dates.

5. Press the **Enter** key after highlighting a date. The following message will be displayed.

```
Start time:
Enter=edit, Esc=OK
00:00:00
```

Select Start Time

6. To accept the 00:00:00 midnight setting as the start time, press the **Esc** key. To modify the start time move the highlight to the hours, minutes or seconds position. Press the **Enter** key. Press the number keys as required to create a new value. The recorder utilizes a military-style clock. Accordingly, 12:01:02 AM is defined as 00:01:02 and 12:59:58 PM is defined as 23:59:58. Leading zeros are not

required. To accept the new value, press the *Esc* key. Using the same technique, adjust the other values as required. When the start time is correct, press the *Esc* key.

7. A table of dates similar to the following will be displayed. The dates represent the available end date of the range.

082511	082611	082711
082811	082911	083011
083111	090111	090211
090311	090411	090511

Table of Dates—End Date

8. Press the *Enter* key after highlighting a date. The following message will be displayed.

```
End time:
Enter=edit, Esc=OK
  23:59:59
```

Select End Time

9. To accept the 23:59:59 setting as the end time, press the *Esc* key. To modify the end time use the procedure described in step 6. When the end time is correct, press the *Esc* key.
10. The following message will be displayed briefly after the delay required to create the text file.

```
Writing events.txt
Writing events.bin
Writing setupdata
      Success!
```

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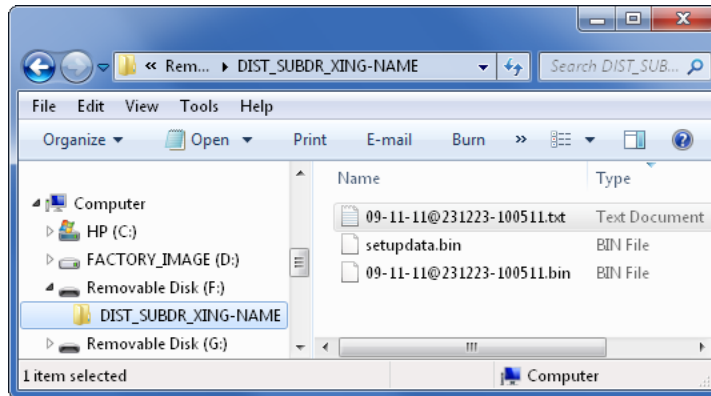
11. Records from other times and dates can be saved by repeating this procedure starting at step 2.
12. Remove the flash drive from the USB Host Port after all the required records have been saved.

RELATED FEATURES

FILES WRITTEN TO THE FLASH DRIVE

As noted in step 4 of the previous section, this procedure writes three different files to your drive. The first is a simple text file consisting of Event Records. The second is a smaller binary version of the same Event Record data. The third is another binary file that contains the complete contents of the Setup Database used by the recorder. The latter two files are used exclusively by MICRO-AIDE's GEA (Graphical Event Analyzer) software.

The following Windows Explorer screen shows the contents of a recorder data file named "DIST_SUBDR_XING-NAME" which has been saved to a USB flash drive and is now installed as Drive F of the PC. The three files associated with the Save command, as described in this task, are shown in the right-side window pane.



Windows Explorer—Folder and Files Written to Flash Drive

REVIEWING THE TEXT FILE

The text version of the Event Record data will include a .txt file extension. The file can be viewed and printed using any word processing application. To open the file insert the USB flash drive into an available USB port on your PC. Use Windows Explorer to navigate to the drive. The text file of interest will be saved in a folder named after the first 20 characters of the assigned Unit Name. Unit Names are the subject of [Task 7](#). Double-click the file of interest. Unless you specify otherwise, the file will open in your default text file application.

The text and binary files you save to your USB flash drive are always saved in a folder unique to the recorder. Additionally, each text file is assigned a specific filename that eliminates confusion with other files in the same folder. A typical file may be named as follows: 09-11-11@231223-100511.txt. The format of the filename is illustrated in [Figure 8](#).

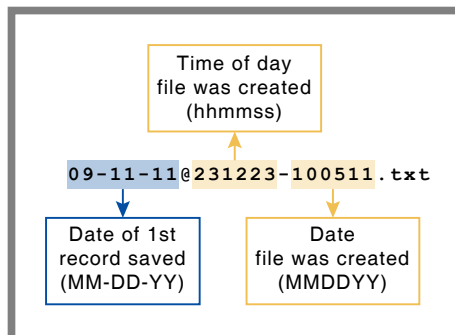


Figure 8: Filename Format Used by USB Host Port

How to . . .

VIEW EVENT RECORDS IN REAL-TIME

Task 22

VIEW EVENTS AS THEY OCCUR

In some cases it may be advantageous to view and/or capture Event Records as they occur in real-time. The View Events command provides this capability. Its use is similar to that of the Query Events command with the Dump option selected.



The View Events command is available to Administrative and Restricted Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

WHAT TO DO

From the Main Menu select the View Events command. A screen similar to the following will be displayed.

View Events Report

Include Details: No Details (1)

Inputs:
(blank=all)

[F1]=Execute Report, ESC=cancel

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View Events Command

The content of the ensuing report is controlled by the Include Details and Inputs settings. Their use is described in the following two sections.

Include Details—The include Details setting controls the amount of data included within each Event Record. The number in parenthesis (e.g., 1) indicates the number of text lines per Event Record. The latter can range from one to four. All of the options are fully described in [Task 23](#) entitled "[Event Record Formatting Options](#)". Press the **Spacebar** one or more times to change the Record Details setting.

Inputs—The Inputs setting can be left blank (default setting) in which case every record satisfying the assigned date and time requirements will be included within the report. However, the Inputs setting can also be used to issue the report listing a specific (i.e., filtered) set of inputs.

A specific Digital Input can be entered as Dn. A range of Digital Inputs can be entered as Dn-n. Analog and System Inputs use a prefix of A and S, respectively. Leading zeros are not required. Use a space to separate different groups of inputs. Press the **Enter** key to accept the inputs you have selected. [Table 9 on page 70](#) lists the single-letter code that is used to identify each input type.

Letter Code	Type of Input
D	Digital
A	Analog
V	*Virtual
T	*Timer
F	*Flashing
S	System

Table 9: Input Type Identifiers



The single-letter codes V, T and F can be ignored. The Metra-defined Setup Databases do not implement any Virtual, Timer or Flashing Inputs.

By way of example, setting the Inputs field to D1-10 D17 A1 S4-6 will allow you to view records from Digital Inputs 1 through 10 and 17, Analog Input 1 and System Events 4, 5 and 6.

After the two View Events fields are properly assigned press the **F1** function key. After a short delay the report will be available for viewing. A brief sample report, set to No Details, is shown in the following.

13:32:29.77	09/11/11	FLASH RATE 2	FLASH 2	FLASHOFF	D24 47.5FPM
13:33:26.78	09/11/11	EAST WRAP-2T	EW RAP-2T	TK UP	D15
14:00:00.21	09/11/11	GPS Clock Record	GPS Rec	OFF	S06 0.00SEC

View Events Command—Include Details Set to No Details

After you have viewed all of the records of interest, press the **Esc** key to terminate the report and return to the Main Menu.

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RELATED FEATURES

SAVING REAL-TIME EVENT RECORDS TO A PC FILE

The capture text to a file feature of HyperTerminal can be used to save real-time Event Records. The procedure for doing so is described in the section entitled "[Setting Up Capture Mode](#)" on page 61. Remember to press the **F1** function key only after the Captured Text file has been opened and named.

VIEW A CAPTURED TEXT FILE

The Captured Text file includes, by default, a .txt file extension. The file can be viewed and printed using any word processing application (e.g., Notepad or Word). To open the file, use Windows Explorer to navigate to the file of interest. Unless you specify otherwise, the Captured Text file will open in your default text file application.

PAUSING, RESTARTING AND TERMINATING A VIEW EVENTS REPORT

The View Events command will stream records to your PC as they occur in real-time. The streaming can be paused by pressing the **Ctrl** and **S** keys simultaneously. To restart the streaming, press the **Ctrl** and **Q** keys simultaneously. Press the **Esc** key at any time to terminate the report, otherwise it will continue on indefinitely.

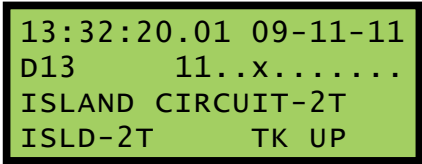


Be aware that HyperTerminal will occasionally garble text within its window that has been scrolled backwards and then forwards. This is not a recorder-related problem.

EVENT RECORDS VIEWED AT THE LCD

Event Records will also be displayed in real-time at the LCD panel. The record will only be displayed briefly, however. This is done, not to provide a readable record, but rather as an indication that the Event

Recorder's most critical task is functioning properly. It follows that a failure to display record activity at the LCD is perhaps an indication that events are not being logged to memory. A typical Event Record from Digital Input D1 is shown in the following.



Event Record–Digital Input

VIEWING LIVE STATUS

The current state of all Digital and Analog Inputs can also be viewed. Refer to [Task 24](#) entitled “Live Status Views”.

USER NOTES

[illegible]

**Task
23****EVENT RECORD FORMATTING OPTIONS**

Your recorder can format Event Records to include varying degrees of content. These options allow you to inspect the status of all Digital Inputs and Analog Input voltage levels simultaneously. Irrespective of the formatting option you select, the first line of each record will always list the time, date, input identity and type of event.



All Event Record formatting options are available to Administrative and Restricted Access sessions

BEFORE YOU START

The primary purpose of this task is to provide useful information to the user. At the completion of this task you will understand the content of all Event Records. This applies to records displayed at the monitor of your PC or as seen at the recorder's front panel LCD.

Sample records are listed throughout this task. However, if the user wishes to review actual Event Records, a PC running HyperTerminal will have to be connected to the recorder. The first four tasks of this guide explain how to prepare your PC and log on. Additionally, several Event Records from various inputs will have to be saved in the memory of the recorder.

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EVENT RECORD CONTENT**USING A PC AND HYPERTERMINAL**

The Main Menu includes two commands that allow the user to view and/or capture Event Records while using a PC. The Query Events command is the subject of [Task 19](#) and [Task 20](#). The View Events command is described in [Task 22](#). Included within these commands is the ability to selectively control the content of the displayed Event Records. The Query Events and View Events commands use the Record Details and Include Details settings, respectively, to control the content. Five identical settings are available with each command. The settings and resultant content are summarized in [Table 10](#).

Record Details & Include Details Settings	Description	Lines of Text
No Details (1)	Event Record with no added details	1
Digital Details (2)	Event Record with status of all other Digital Inputs	2
Analog Details (2)	Event Record with voltages of all 8 Analog Inputs	2
Virtual Details (2)	Event Record with status of all Virtual Inputs	2
All Details (4)	Event Record with Digital, Analog and Virtual data	4

Table 10: Formatting Options

In the sections that follow, each setting is described and examples of the resultant Event Record content are cited. The same Event Records are used in each example. Only their formatting options have been varied. The descriptions are listed in order of increasing detail.

No DETAILS

In the vast majority of cases you will select the No Details option. Its text is concise and easy to interpret. Two sample records are illustrated in [Figure 9](#) on [page 74](#). The first record is from Digital Input D13. The

second is from Digital Input D22. According to the Mainline Setup Database, D22 is connected to one of the flashing outputs of the FLD-2. Accordingly, the Off Event reported includes a flash rate of 46.0fpm.

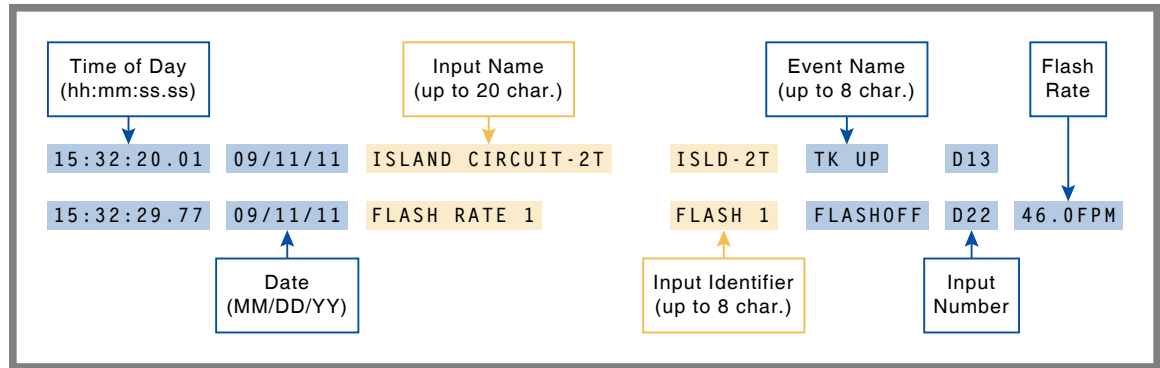


Figure 9: No Details Options

The entire content of an Event Record formatted with the No Details option is included as the first line of text in all other options.



Event Records saved to the USB flash drive always use the No Details formatting option.

DIGITAL DETAILS

This formatting option includes information regarding the status of all other Digital Inputs at the time the event was recorded. This option can be useful as it provides an instantaneous snapshot of the Digital Inputs. The second line of text, when read from left to right, indicates the status of Digital Inputs D1 through D64 (see trailing note). The following characters are used to denote the status information.

Upper-case (X)—This Digital Input transitioned from Off to On. It is the source of the Event Record.

Lower-case (x)—This Digital Input is in its On state. It is not the source of the Event Record.

Semi-colon (;)—This Digital Input transitioned from On to Off. It is the source of the Event Record.

Period (.)—This Digital Input is in its Off state. It is not the source of the Event Record.

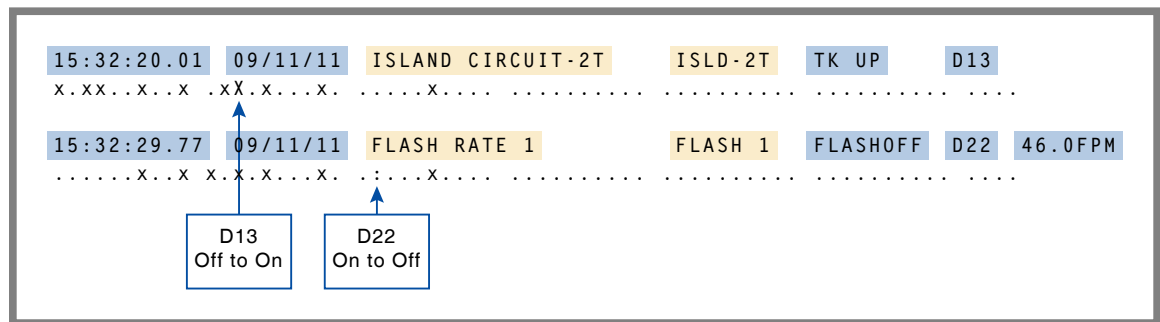


Figure 10: Digital Details Option



Digital Inputs D33 through D64 can be ignored for the CWR-40E.

ANALOG DETAILS

This formatting option will report the voltages of all eight Analog Inputs at the time the event was recorded. This option can be useful as it provides an instantaneous snapshot of the Analog Inputs. The second line of text, when read from left to right, lists the levels of Analog Inputs A1 through A8. The following characters, appended to the end of each reading, are used to provide additional information as explained in the following.

- Asterisk (*)**–This Analog Input has transitioned into its unacceptable range of operation. It is the source of the Event Record.
- Exclamation Mark (!)**–This Analog Input remains in its unacceptable range of operation. It is not the source of the Event Record.
- Equal Sign (=)**–This Analog Input has transitioned into its acceptable range of operation. It is the source of the Event Record.
- Blank ()**–This Analog Input remains in its acceptable range of operation. It is not the source of the Event Record.

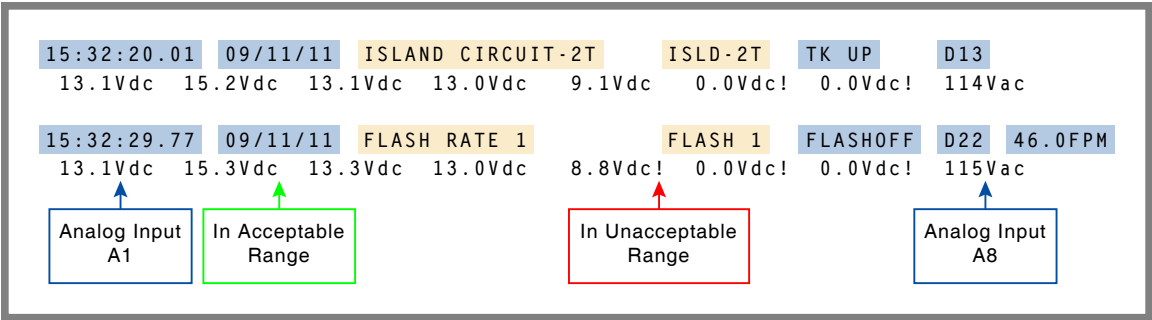


Figure 11: Analog Details Option

VIRTUAL DETAILS

The Virtual Details option also adds a second line of text to the Event Record. It lists the state of each of the 32 Virtual Inputs. However, the Metra-defined Setup Databases do not include definitions for any Virtual Inputs. This formatting option can be ignored.

ALL DETAILS

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The All Details option is self-explanatory. It formats each record using four lines of text. The first is unchanged as it is common to all formatting options. The second line can be ignored as it lists the state of Virtual Inputs (see previous section). The third line lists the state of all Digital Inputs. Finally, the fourth line lists the present voltage level for each Analog Input.

Figure 12 illustrates the Event Records, previously cited, with the All Details formatting option selected.

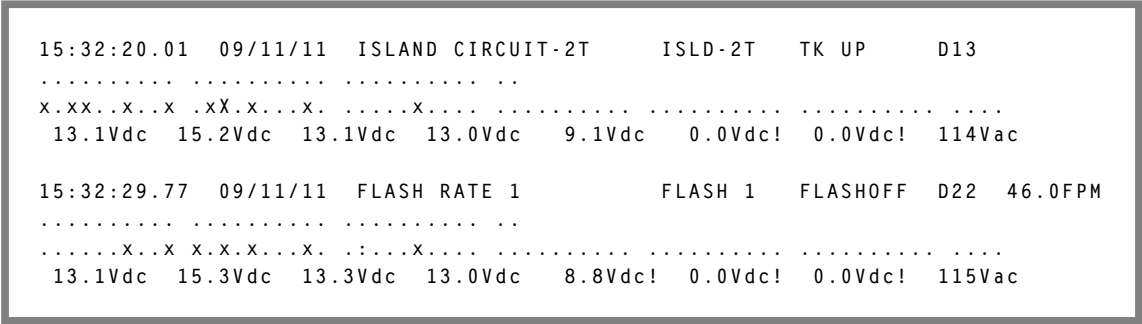


Figure 12: All Details Option

FROM THE FRONT PANEL

The front panel keypad allows the user to perform a variety of tasks. Among these is the ability to view Event Records at the LCD. This feature is described in [Task 19](#) in the section entitled "From the Front Panel". Listed in the following are two sample Event Records as they would appear at the LCD. The formatting of each type is fully described.

DIGITAL EVENT RECORD

The first Event Record included in the previous section is depicted in the following as it would appear at the LCD.

```
13:32:20.01 09-11-11
D13      11.XX.X...X.
ISLAND CIRCUIT-2T
ISLD-2T      TK UP
```

Event Record—Digital Input

The LCD record data is described in the following from top to bottom and left to right.

First line—The time is reported in hh:mm:ss.ss format. The date is listed in MM-DD-YY format.

Second Line—The Input Number is listed (e.g., D13). A group of . and x characters are used to indicate the status of 10 Digital Inputs. A . indicates the input was Off. An x indicates the input was On. The number (e.g., 1, 11, 21, etc.) to the immediate left of the group is used to indicate the first input in the group.

Third Line—The full Input Name is listed.

Fourth Line—The Input Identifier (e.g., ISLD-2T) is listed. It is followed by the Event Name (e.g., TK UP).

ANALOG EVENT RECORD

An Event Record from an Analog Input is formatted very similarly.

```
16:03:19:06 09-11-11
A02      8.7Vdc.x.....
CROSSING BATTERY
B14-N14      BATT LOW
```

Event Record—Analog Input

The LCD record data is described in the following from top to bottom and left to right.

First line—The time is reported in hh:mm:ss.ss format. The date is listed in MM-DD-YY format.

Second Line—The Input Number is listed (e.g., A02). The measured voltage (e.g., 10.7Vdc) at the instant the record was created is reported. A group of . and x characters are used to indicate the status of all eight Analog Inputs. Inputs A1 through A8 are reported from left to right. A . indicates the input was in its acceptable range of operation. An x indicates the input was in its unacceptable range of operation.

Third Line—The full Input Name is listed.

Fourth Line—The Input Identifier is listed (e.g., B14-N14). It is followed by the Event Name (e.g., BATT LOW).

RELATED FEATURES

ANALOG LIMIT VALUES

Limit Values and how they are used to define acceptable and unacceptable ranges of operation for Analog Inputs is the subject of [Task 15](#) entitled "[Configuring Analog Inputs for Use with Batteries and AC Power](#)".

VIEWING LIVE STATUS

The current state of all Digital and Analog Inputs can also be viewed. Refer to [Task 24](#) entitled "[Live Status Views](#)".

How to . . .

VIEW THE CURRENT STATUS OF INPUTS

Task 24

LIVE STATUS VIEWS

At times it may be handy to know the current status of several Digital Inputs simultaneously. The state of an XR, gate down and flashing indication serves as an example. There are two features of your recorder that provide this capability.



The Live Status command and front panel Browse feature are available to Administrative and Restricted Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

WHAT TO DO

USING A PC AND HYPERTERMINAL

From the Main Menu select the Query Events command. A screen similar to the following will be displayed. The sample data is from a CWR-72E using the Mainline Setup Database.

[ESC]=exit		79 Degrees F		Live Status		12:59:42 10-05-11	
D01-D32		X	.	.	X	.	X
D33-D64		X	X
VInput01:	VInput02:	VInput03:	VInput04:				
VInput05:	VInput06:	VInput07:	VInput08:				
VInput09:	VInput10:	VInput11:	VInput12:				
VInput13:	VInput14:	VInput15:	VInput16:				
VInput17:	VInput18:	VInput19:	VInput20:				
VInput21:	VInput22:	VInput23:	VInput24:				
VInput25:	VInput26:	VInput27:	VInput28:				
VInput29:	VInput30:	VInput31:	VInput32:				
B12-N12	B14-N14	B-N	BL-NL/E	BL-NL/W	0.0Vdc	0.0Vdc	AC PWR
13.1Vdc	12.9Vdc	13.2Vdc	13.4Vdc	13.2Vdc			118Vac
BATT OK	BATT OK	BATT OK	BATT OK	BATT OK			PWR ON

Live Status Command

The Live Status report will be continuously updated in real-time as events are created. The report comprises four sections. Each section is described in the following.

Header—From left to right, the header lists the internal temperature of the recorder, report title and current time and date.

Digital inputs—The second section includes two lines of text. It reports the state of each Digital Input. An X indicates that the input is On (i.e., voltage is applied to the input). A period character (.) indicates that the input is Off (i.e., no voltage is applied to the input). In the sample data, inputs D1, D4, D32, D33 and D34 are all On. All other inputs are Off.

Virtual Inputs—The third section lists the state of each Virtual Input. This section can be ignored. Virtual Inputs are not used in any of the three Metra-defined Setup Databases.

Analog Inputs—The fourth section comprises three lines of text. The first line lists, from left to right, the assigned Identifier for each of the eight Analog Inputs (e.g., B12-N12). The second line lists the voltage at each input. Finally, the third line reports the appropriate Event Name for the voltage at its present value. The sample data reports that all voltages are within their acceptable range of operation. Event Name reporting is based upon the present measured voltage and how it compares to the assigned Limit Values. This procedure is illustrated in [Figure 7 on page 42](#). Event Names are the subject of [Task 11](#).

Press the **Esc** key to exit and return to the Main Menu.

FROM THE FRONT PANEL

The current status of an individual input can also be viewed directly from the front panel. To use this feature, perform the steps listed in the following.

1. Press the **Browse** key. The following menu of commands will be displayed.

```

Browse:
Event Records
Input Status
Flash Rate
    
```

Browse Command

2. Using the up and down arrow keys, highlight the Input Status option. Press the **Enter** key. The following information message will be displayed briefly.

```

Use ←→↑↓ to scroll,
Browse=select input
    
```

3. The current status of Digital Input D1 will be displayed. In the following sample data D1 has, by virtue of the Mainline Setup Database, been assigned an Input name of W ADJACENT XING-1T and an Input Identifier of WAX-1T. Its current state is TK DWN.

```

D01
W ADJACENT XING-1T
WAX-1T      TK DWN
    
```

Input Status—Digital Input



To view the status of the preceding or succeeding input, press and release the up or down arrow key, respectively. To advance quickly in either direction press and hold the appropriate arrow key.

4. By way of example, view the status of Digital Input D26 by pressing the **Browse** button. The highlight will be alternating between the input type designator (e.g., D) and the number of the input (e.g., 01). Press the **2** key, followed by the **6** key. Accept the new number by pressing the **Enter** key. Data similar to the following will be displayed.

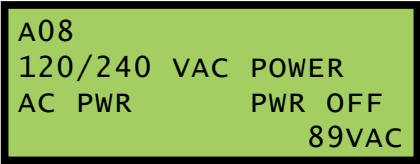
```

D26
ALL GATES UP
GATE UP      NOT UP
    
```

Input Status—Digital Input

The LCD is now reporting the current status of Digital Input D26.

- 5. View the status of Analog Input A08 by pressing the **Browse** button. The highlight will be alternating between the input type designator (e.g., D) and the number of the input (e.g., 26). Press the **Alpha** key once to change the input type designator to analog (e.g., A). Press the **8** key. Accept the new number by pressing the **Enter** key. Data similar to the following will be displayed.




Input Status–Analog Input


In this case, Analog Input A8 is reporting a voltage of 89 Vac. This is below the Lower Limit Value of 90 Vac established by the Mainline Setup Database. Accordingly, the Event Name is reported as PWR OFF (as opposed to PWR ON).


Table 11 lists the single-letter code that is used to identify each input type.

Letter Code	Type of Input
D	Digital
A	Analog
V	*Virtual
T	*Timer
F	*Flashing
S	System

Table 11: Input Type Identifiers

- 

The single-letter codes V, T and F can be ignored. The Metra-defined Setup Databases do not implement any Virtual, Timer or Flashing Inputs.
- 

6. After viewing the status of the last input of interest, press the **Esc** key to return to the Idle Mode.
- 

Like its Terminal Port counterpart, the Browse Input Status feature reports updated status continuously and in real-time. Unlike its counterpart, it reports the status of only one input at a time.

RELATED FEATURES

VIEW EVENTS AS THEY OCCUR

This task demonstrated how to view the status of inputs in real-time. [Task 22](#) entitled “[View Events as They Occur](#)” describes how to view and capture Event Records in real-time.

USER NOTES

[illegible]

Task
25

USING THE MEASURE FLASH RATE FEATURES

Your recorder system allows you to measure and report the flash rate of any flashing circuit equipped with incandescent or halogen lamps. The MICRO-AIDE Failed Lamp Detector (FLD-2) is used to sense the current flow through the lamp circuits. The Flash Pulse (FP) outputs of the FLD-2 are wired to Digital Inputs of the recorder. The FP signals will pulse high and low with each flash of the lamps. The recorder scans the pulse sequence and in turn is able to report the average flash rate while the crossing was active.



The Measure Flash Rate command is available to Administrative and Restricted Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

The Metra-defined Setup Databases require that flashing outputs of the FLD-2 be wired to specific Digital Inputs of the recorder. Table 12 lists these assignments. Accordingly, only the referenced inputs will be configured for flashing operation.

Recorder Type	Setup Database	Input Names	Digital Inputs
CWR-72E	Mainline	FLASH RATE 1, 2, 3, 4	D22, D24, D54, D56
CWR-40E	BEV	FLASH RATE 1, 2	D22, D24
CWR-40E	MED	FLASH RATE 1, 2	D22, D24

Table 12: Flashing Inputs

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WHAT TO DO

USING A PC AND HYPERTERMINAL

From the Main Menu select the Measure Flash Rate command. The following screen will be displayed.

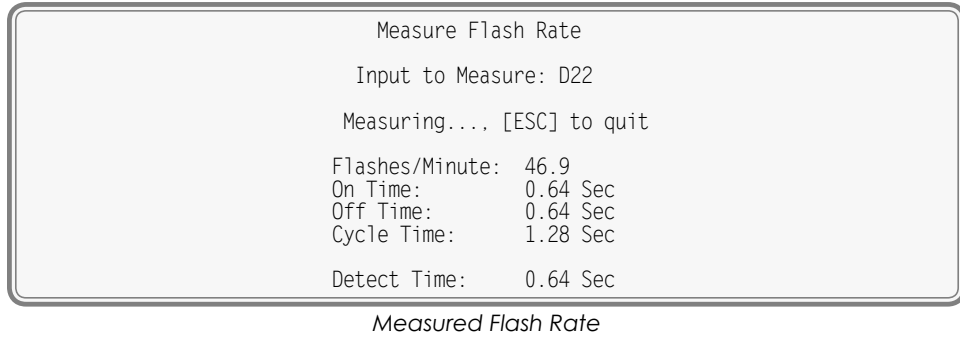
Measure Flash Rate

Input to Measure: D01

[F1] to measure, [ESC] to quit

Measure Flash Rate Command

1. The highlight will be located in the Input to Measure: field. Type **D** followed by the Digital Input Number of the input to be measured (e.g., **D22**).
2. Press the **F1** function key to initiate the measurement. A screen similar to the following will be displayed. It may take a few seconds for the value reported in the Flashes/Minute: field to settle to a consistent number.



3. To terminate the measurement press the **Esc** key twice to exit and return to the Main Menu.



As shown in the previous screen, the Measure Flash Rate command reports a Detect Time setting. For the example cited, this value is the optimum Detection Time to be used for the Digital Input.

Table 13 lists Detection Time settings for the various Flashing Inputs. These values are preassigned as part of the Metra-defined Setup Databases.

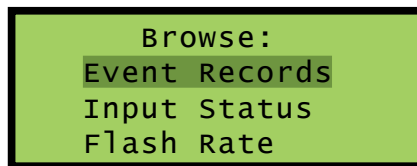
Recorder Type	Setup Database	Detection Time Flashing Inputs Only (seconds)
CWR-72E	Mainline	.55
CWR-40E	BEV	.67
CWR-40E	MED	.67

Table 13: Detection Times for Flashing Inputs

FROM THE FRONT PANEL

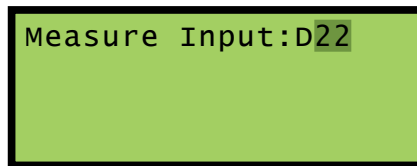
The flash rate of a circuit can also be measured from the front panel without using a PC. To do so perform the following steps.

1. Press the **Browse** key. The following menu of commands will be displayed.



Browse Command

2. Using the up and down arrow keys, highlight the Flash Rate option. Press the **Enter** key. The following will be displayed.



Flash Rate Command

3. If the Digital Input Number listed is already correct, simply proceed to the next step. Otherwise, enter the required Input Number by pressing the appropriate numeric keys. Table 12 on page 81 lists the Flashing Inputs assigned by each Setup Database.
4. Press the **Enter** key to accept the displayed input and proceed with the measurement. Data similar to the following will be displayed. It may take a few seconds for the value reported in the Flashes/Min: field to settle to a consistent number.

```
Measure Input:D22
Flashes/Min: 46.9
On/off: 0.64/ 0.64
Cycle Time: 1.28
```

Measured Flash Rate

5. To terminate the measurement press the *Esc* key to return to the Idle Mode.

RELATED FEATURES

FLASH RATE REPORTING WITHIN EVENT RECORDS

An Event Record will be saved to memory each time the Flashing Input signal becomes active (i.e., shortly after the crossing is activated). Similarly, an Event Record will be saved to memory shortly after the crossing becomes inactive. The latter Event Record will report the average flash rate in flashes per minute (fpm) while the crossing was active. Refer to the Event Record examples cited in [Task 23](#) entitled "Event Record Formatting Options".

Using the Query command with the input filter option, a maintainer can quickly determine the crossing's flash rate performance over time. Refer to the section entitled "[Selecting Times and Report Options](#)" in [Task 19](#).

LIGHT OUT DETECTION

The FLD-2 includes an additional output referred to as Light Out (LO). Like the FP signal, the LO is wired to a comparably named Digital Input of the recorder. The LO signal will become active whenever flashing is detected and one or more lamps have failed. Any Event Records from these inputs provides cause for further testing of the lamp circuits.

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USER NOTES

[illegible]

How to . . .

TEST YOUR RECORDER

Task 26

RUNNING A DIAGNOSTIC CHECK

You have the ability to run a series of diagnostic tests of your recorder. The tests can be performed at any time to verify the recorder's health. Each of the tests are non-destructive. Their selection will not alter the recorder's setup configuration. This task can be performed from a PC or from the front panel.



The Diagnostics command is available to Administrative and Restricted Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

WHAT TO DO

USING A PC AND HYPERTERMINAL

From the Main Menu select the Diagnostics command. The following menu of commands will be displayed. Each diagnostic test is described in the sections that follow. The various tests can be performed in any order that suits the user.

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```
System Diagnostics
C Checksum Test Program Memory
F Flash Memory Test
G GPS Receiver Test
E Ethernet Test
M Modem Test
K Keypad Test
R Relay Test
T Temperature
```

Diagnostic Command Menu

At the conclusion of each test, press any key to return to the Diagnostic command menu. After all of the tests have been completed press the **Esc** key to exit and return to the Main Menu.

PROGRAM MEMORY TEST

This test verifies the integrity of the program memory. As shown in the following, the test will return a four-digit hexadecimal number that is the checksum. The checksum is unique to the firmware version. It will be tagged as either GOOD or BAD.

```
Program Memory Checksum=68d6
                                GOOD

Test Complete
Press any key to continue
```

Program Memory Test



Versions 1.01 and 1.02 of the CWR-72E firmware have checksum values of 19b4 and 68d6, respectively.

FLASH MEMORY TEST

This test will return the size (in kilobytes) of the installed Event Record memory. Metra versions of the recorder are equipped with a 2048KByte (4096KByte in some cases) flash memory device. The results of the test should be similar to the following.

```
Flash Memory #1: 2048K
Flash Memory #2: 0K
Flash Memory #3: 0K

Test Complete
Press any key to continue
```

Flash Memory Test



A flash memory size of 2048KBytes yields a memory capacity of 111,481 Event Records.

GPS RECEIVER TEST

Your Event Recorder is equipped with an internal GPS Receiver and mating external antenna. The GPS Receiver allows the recorder's real-time clock (RTC) to be automatically and precisely controlled by a 100% accurate time source.

After power application, the GPS Receiver will take a few minutes to synchronize with an available GPS satellite. After sync is achieved, the test results should be similar to the following.

```
GPS Time: 14:29:01.203 is Valid
Location: 34.1044°, -117.8784°

Test Complete
Press any key to continue
```

GPS Receiver Test

If the GPS Receiver has temporarily lost sync, the Valid reference will change to Not Valid. This is not necessarily a concern. The recorder's RTC is accurate in free-running mode to within ± 26 seconds per day.



Once sync is achieved the GPS Receiver test will always report time relative to UTC-0. CST is six hours behind UTC-0 (e.g., 19:00 UTC is 1:00PM CST. The latitude and longitude of the recorder's geographical location are also reported.



An Event Record is written to memory whenever the recorder's RTC is adjusted by the GPS time source. Refer to the screen entitled "[Query Events Command—Report Type Set to Browse](#)" on page 55. The last Event Record listed is a GPS clock sync record. Collectively these records can be used to establish a performance log of the GPS Receiver.

ETHERNET PORT

The Metra recorders are not equipped with an Ethernet Port. Accordingly, this test can be ignored.

MODEM

Your Event Recorder is also equipped with an internal 33.6KBaud modem. The Modem test will verify that the recorder's microprocessor is able to dialog with the modem. The results of a successful test are displayed in the following.

```
Modem Test in progress...
Modem found: H

Test Complete
Press any key to continue
```

Modem Test

If the recorder's microprocessor cannot communicate with the modem, the Modem found: H reference will be replaced by Modem found: NONE. This should be noted as a failure.

KEYPAD TEST

This test will return a unique character for each key that is pressed at the front panel.

RELAY TEST

Your Event Recorder is equipped with two relay outputs. The operation of the relays is controlled by the Virtual Input definitions. However, a test of the relays can be performed at any time. The following menu of sub-commands will be displayed after selecting Relay Test.



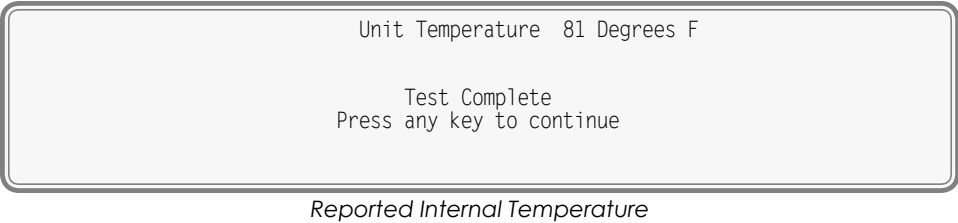
Press the appropriate numbered key to operate either relay.



The Metra-defined Setup Databases do not include any Virtual Input definitions.

TEMPERATURE

As shown in the following example, Temperature reports the internal temperature of the recorder. It is typically 10 to 15°F greater than the external ambient temperature.



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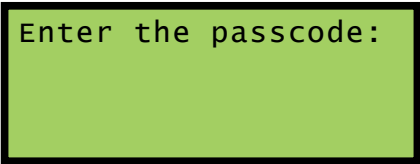


The internal temperature should never exceed 180°F.

FROM THE FRONT PANEL

Alternatively, the Diagnostic tests can be run from the front panel by performing the following steps.

- 1. Start by pressing the *Setup* key. The following Passcode challenge will be displayed.



Passcode Challenge



The Mainline, BEV and MED Setup Databases utilize the same Passcode. The Metra-defined Passcode is 547. It can only be entered using the numeric keys of the keypad.

- 2. Press the *547* keys and then the *Enter* key. The following information message will be displayed briefly.

Use ←→↑↓ to select items and then ENTER

3. The following abbreviated command menu will be displayed.

UName Modem Baud
Diag Update

LCD Command menu



By Metra decision, the accessible front panel commands are limited to those commands available to the user during a Restricted Access session.

4. Using the arrow keys, highlight the Diag command. Press the *Enter* key. The following sub-menu of commands will be displayed.

Select test: ProgMem
FlashMem GPS Rcvr
Ethernet Modem
Temperature

Diagnostic Command Menu

5. Any of the six tests can be performed at any time. To perform a test use the arrow keys to position the highlight, then press the *Enter* key. A description of each test is listed in the following sections.



The Relay Test has been excluded from the front panel Diagnostics command menu. This is consistent with its treatment within a Restricted Access session.

At the conclusion of each test, press any key to return to the Diagnostic command menu.

PROGMEM

This test verifies the integrity of the program memory. As shown in the following, the test will return a four-digit hexadecimal number that is the checksum. The checksum is unique to the firmware version. It will be tagged as either (GOOD) or (BAD).

Program Memory
Checksum=68d6 (GOOD)

Hit any key...

Program Memory Test



Versions 1.01 and 1.02 of the CWR-72E firmware have checksum values of 19b4 and 68d6, respectively.

FLASHMEM

This test will return the size (in kilobytes) of the installed Event Record memory. Metra versions of the recorder are equipped with a 2048KByte (4096KByte in some cases) flash memory device. The results of the test should be similar to the following.

```
Flash Mem #1:2048K
          #2:0K
          #3:0K
Hit any key...
```

Flash Memory Test

A flash memory size of 2048KBytes yields a memory capacity of 111,481 Event Records.

GPS Rcvr

Your Event Recorder is equipped with an internal GPS Receiver and mating external antenna. The GPS Receiver allows the recorder's RTC to be automatically and precisely controlled by a 100% accurate time source.

After power application, the GPS Receiver will take a few minutes to synchronize with an available GPS satellite. After sync is achieved, the test results should be similar to the following

```
GPS Rcvr test: Okay
22:20:36.218 valid
34.1042,-117.8784
Hit any key...
```

GPS Receiver Test

If the GPS Receiver has temporarily lost sync, the Valid reference will change to Invalid. This is not necessarily a concern. The recorder's RTC is accurate in free-running mode to within ± 26 seconds per day.



Once sync is achieved the GPS Receiver test will always report time relative to UTC-0. CST is six hours behind UTC-0 (e.g., 19:00 UTC is 1:00pm CST). The latitude and longitude of the recorder's geographical location are also reported.



An Event Record is written to memory whenever the recorder's RTC is adjusted by the GPS time source. Refer to the screen entitled "[Query Events Command—Report Type Set to Browse](#)" on page 55. The last Event Record listed is a GPS clock sync record. Collectively these records can be used to establish a performance log of the GPS Receiver.

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ETHERNET

The Metra recorders are not equipped with an Ethernet Port. Accordingly, this test can be ignored.

MODEM

Your Event Recorder is also equipped with an internal 33.6KBaud modem. The Modem test will verify that the recorder's microprocessor is able to dialog with the modem. The results of a successful test are displayed in the following.

```
Modem Test...
Modem found:H

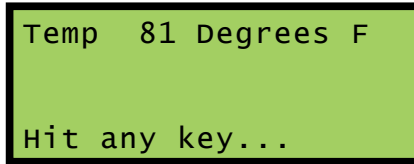
Hit any key...
```

Modem Test

If the recorder's microprocessor cannot communicate with the modem, the Modem found: H reference will be replaced by Modem found: NONE. This should be noted as a failure.

TEMPERATURE

As shown in the following example, Temperature reports the internal temperature of the recorder. It is typically 10 to 15°F greater than the external ambient temperature.



Temp 81 Degrees F
Hit any key...



The internal temperature should never exceed 180°F.

RELATED FEATURES

IN CASE OF A TEST FAILURE

A failure in any test should be reported. You can contact MICRO-AIDE as noted in the following. Our "Material Return" and "Limited Warranty" policies are detailed inside the back cover of this guide.

MICRO-AIDE CORPORATION

685 Arrow Grand Circle

Covina, CA 91722

Tel: 626-915-5502 Fax: 626-331-9484

E-mail: support@micro-aide.com

How to . . .

INSTALL THE LATEST FIRMWARE

Task 27

UPDATE THE FIRMWARE TO A NEW REVISION

As with any microprocessor-based product, the various features of the product are largely implemented in stored program code referred to as firmware. As new features and capabilities are made available you may wish to update the stored firmware. This can be accomplished using either of the two methods described in this task.



The Transfer Files / Firmware Upload command is only available to Administrative Access sessions.

GETTING THE LATEST FIRMWARE

Before attempting to update the installed firmware, a copy of the new firmware must be available. New firmware is posted to the MICRO-AIDE website at the following web page.

www.micro-aide.com/support/downloads.html

The latest firmware will be identified as CWR-72E Metra. Downloading from the website will yield a zipped file. After unzipping, it will yield a file with a .hex extension. This file must be saved to your PC or a USB flash drive.



Do not alter the filename of the unzipped .hex file.

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BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

WHAT TO DO

USING A PC AND HYPERTERMINAL

From the Main Menu select the Transfer Files command. The following menu of sub-commands will be displayed.

```
File Transfer
D Download Setup Data CWR to PC
U Upload Setup Data PC to CWR
F Firmware Upload
```

Transfer Files Command

1. Select the Firmware Upload command. The following precaution will be displayed.

```
Are you SURE you want to upload new Firmware?
No Yes
```

2. To proceed, select the Yes option. The following instruction will be displayed.

OK to erase Firmware and upload new Firmware in Intel HEX format?
No Yes

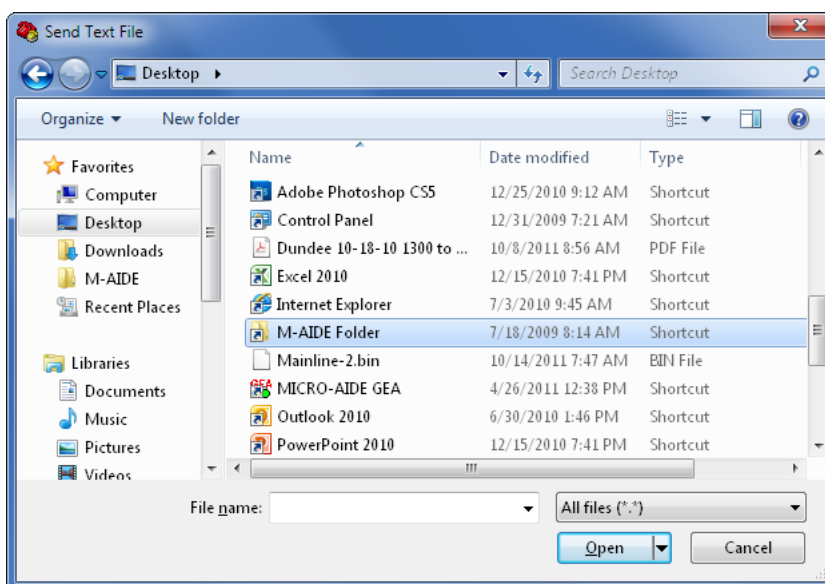
3. To proceed, select the Yes option. The following final precaution will be displayed.

Do you want to ABORT this operation
No Yes

4. Select the No option. The following instruction will be displayed.

Please send Intel HEX file now.

- Click on the command named "Transfer". It is located in the menu bar at the top of the HyperTerminal window. Click on the sub-command named "Send Text File...". A dialog box similar to the following will be displayed.



HyperTerminal–Send Text File Dialog Box

6. Above the button labeled "Open" is a drop-down list box. As shown in the previous sample data, select "All files (*.*)" from the list of entries. Navigate to and select the file to be sent. It must have a .hex file extension. Click the button labeled "Open".
7. A series of period characters will be displayed. They indicate the progress of the transfer. After a few minutes the following message will indicate the successful conclusion of the firmware upload.

[illegible]

Firmware Upload Completed

8. Press the **Esc** key as instructed. The following message will be displayed.

Do you want to restart the CWR-72E event recorder now?
No Yes

9. Select the Yes option. The recorder will restart. At the completion of the re-initialization, the new firmware version will be reported in the first line of the password challenge as noted in the following sample data.

```
Model CWR-72E Metra Event Recorder. Ver 1.02 (C) 2011 MICRO-AIDE INC.
DIST_SUBDR_XING-NAME_DOT-NUMBER_MILE-POST-NUMBER
Event storage capacity: 111481
Enter password:
```

Password Challenge

The recorder will resume its activities consistent with the Setup Database. The Setup Database that was previously installed remains unaffected by the firmware update.

FROM THE FRONT PANEL

The firmware can also be updated from the front panel by means of the USB Host Port. A PC is not required; however, the new firmware file must be stored on a USB flash drive.



Updating the firmware via the USB Host Port is a feature introduced in version 1.02 of the Metra CWR-72E firmware. The following procedure cannot be performed with earlier versions.

To update the firmware from the front panel perform each of the following steps.

1. Insert the flash drive into the USB Host Port.
2. Press the **Setup** key. The following Passcode challenge will be displayed.

```
Enter the passcode:
```

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Passcode Challenge



The Mainline, BEV and MED Setup Databases utilize the same Passcode. The Metra-defined Passcode is **547**. It can only be entered using the numeric keys of the keypad.

3. Press the **547** keys and then the **Enter** key. The following information message will be displayed briefly.

```
Use ←→↑↓ to select
items and then ENTER
```

4. The following abbreviated command menu will be displayed.

```
UName  Modem  Baud
Diag   Update
```

LCD Command Menu



By Metra decision, the accessible front panel commands are limited to those commands available to the user during a Restricted Access session.

5. Using the arrow keys, highlight the Update command. Press the *Enter* key. The following message will be displayed.

```
Update Firmware
From USB Flash Drive
Yes No
```

Update Command

6. Select the Yes option to proceed. The following message will be displayed.

```
Insert flash drive
with HEX file and
select OK
CANCEL OK
```

7. Select the OK option to proceed. Information similar to the following will be displayed.

```
Select hex file:
CWR-72E Met V102.hex
CWR-72E Met V101.hex
CWR-72E Met V100.hex
```

File Selection

8. The Update command allows the user to select a file from a list of nine. The first group of three are depicted in the example. To navigate to the second or third group, press the up or down arrow keys.
9. Once the correct file is highlighted, select it by pressing the *Enter* key.
10. The LCD will indicate that the new firmware file is being transferred. A single-line progress bar is used to indicate transfer activity. After approximately 30 seconds the transfer will automatically terminate and the following message will be displayed.

```
Updating Firmware...
Success!
Press any key...
```

Successful Update

11. Press the *Esc* key to proceed. Finally, the following message allows the user to run or ignore (refer to closing note) the new firmware. Select the Yes option to execute the new firmware by restarting the recorder. The Update procedure has been completed.

```
Restart Recorder?
Yes No
```

Restart Option



At the completion of the transfer, the new firmware is saved in the non-volatile memory of the recorder. However, the new firmware is not executed until such time as a restart is performed. A restart can also be performed by simply cycling power to the recorder.

Task
28

RESET THE EVENT RECORD MEMORY

Prior to putting the recorder into service, it may have logged to memory a number of Event Records that were created as the result of testing. These records should be removed so they do not confuse or otherwise mar the maintenance and incident record data that will be collected in the future.



The Reset System command is only available to Administrative Access sessions.

BEFORE YOU START

This task assumes you have already connected the recorder to a PC running HyperTerminal and you have logged on to the recorder with the Administrative Password. The first four tasks of this guide explain how to prepare your PC and the log on procedure. The Main Menu should be displayed.

WHAT TO DO

From the Main Menu select the Setup>Reset System command. The following screen will be displayed.

```

Reset System
S Reset Setup Data
E Reset Event Memory
B Reset Both
  
```

Reset System Command

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The Reset Event Memory sub-command is used to erase the Event Records. The consequences of its use are described in the following points.

- The command is destructive. Erased records cannot be retrieved.
 - The command erases all Event Records from memory. It cannot be used to selectively erase records.
1. If you elect to proceed with the reset, the following precaution will be displayed.

```

ERASE ALL EVENTS FROM MEMORY, ARE YOU SURE?
No Yes
  
```

Reset Event Memory Command

2. If the Yes option is selected the reset will commence immediately. The following instruction will be displayed.

```

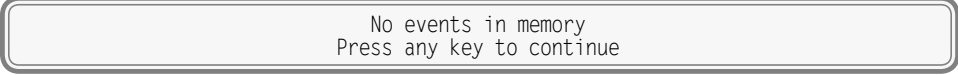
Erasing memory, do not turn power off for 60 seconds,
Press any key to continue
  
```



As instructed, do not interrupt power for 60seconds after initiating the reset. If power is interrupted it may be necessary to perform a second reset.

3. Press the **Esc** key twice to return to the Main Menu.

4. From the Main Menu press the **Q** key to select the Query command. The following message will confirm the erasure.



No events in memory
Press any key to continue

RELATED FEATURES

RESETTING THE SETUP DATABASE MEMORY

The Reset System command includes two additional sub-commands that are described in the following section.

Reset Setup Data—This command will immediately restore the factory default settings to the current Setup Database. This command should never be used. The recorders must always operate with one of the three Metra-approved Setup Databases. The procedure for restoring a Metra-defined Setup Database is described in [Task 18](#).

Reset Both—This command will reset the Event Record memory, as previously described, and simultaneously restore the factory defaults settings to the current Setup Database. For this reason it should never be selected.

Task 29

ACCESSING THE RECORDER VIA ITS USB DEVICE PORT

The previous tasks have assumed that you would access the recorder via its serial Terminal Port. A modem-based connection is used in a similar manner. A third method can be used to access the recorder. It utilizes the USB Device Port which is located on the top panel of the recorder. Like the other access methods, HyperTerminal can be used to control the connection and provide the user interface environment. A USB connection provides one very distinct advantage. It is very fast. You may elect to use this method when Dumping large numbers of Event Records to a PC file. The Query command Dump feature is described in [Task 20](#).

BEFORE YOU START

Your PC must have HyperTerminal installed and ready for use. You should be familiar with the steps necessary to launch your Windows operating system and log on as a user. You should also be familiar with basic Windows operations, such as selecting commands and using the mouse.

This task describes how to establish a high speed USB-based connection between your recorder and PC. To take advantage of this method, your PC will require that specific drivers and related software be installed and running. The installation of this software is outside the scope of this guide. However, the procedure for doing so is fully described in Appendix D of the Metra-version CWR-72E User Manual. A PDF copy of this document can be downloaded from the following web page.

www.micro-aide.com/support/documentation.html

The required PC software is available for downloading from:

www.micro-aide.com/support/downloads.html

The required software is titled "USB Drivers". For the remainder of this task it is presumed that the USB Device Port software is installed and running within your PC. A USB type A-B cable will also be required.

WHAT TO DO

We'll begin by creating a new USB-based connection specifically for your CWR recorder. We'll then set terminal emulation for the connection. Perform the steps listed in each section in the order given.

CREATING A NEW USB CONNECTION



1. Use the USB type A-B cable to connect the recorder's USB Device Port to a spare USB port on the PC.

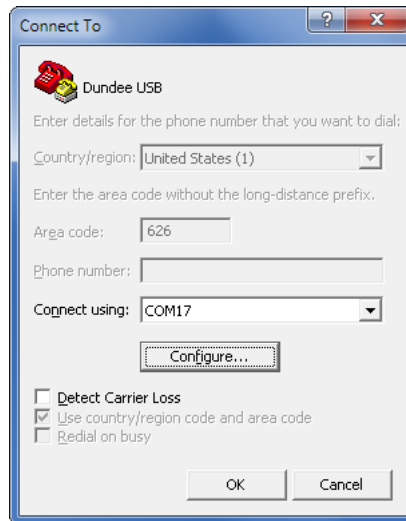
Since the appropriate driver software has already been installed, you can ignore any Windows messages regarding the new USB connection.

2. Using your mouse, click in the lower left-hand corner of your desktop in the area labeled "Start". Then click in the area labeled "All Programs".
3. Click on the folder labeled "HyperTerminal" to expand it.
4. Click the sub-list item labeled "HyperTerminal". After a short delay the following dialog box labeled "Connection Description" will appear.



HyperTerminal–New Connection Dialog Box

5. In the edit box labeled "Name:" enter a label that identifies the new connection. As an example, type **Dundee USB**. Click the button labeled "OK". The following dialog box named "Connect To" will appear.



HyperTerminal–Connect To Dialog Box

6. Click the down arrow at the right edge of the drop-down list box labeled "Connect using:". Select the newly created comm port (e.g., "Com17").



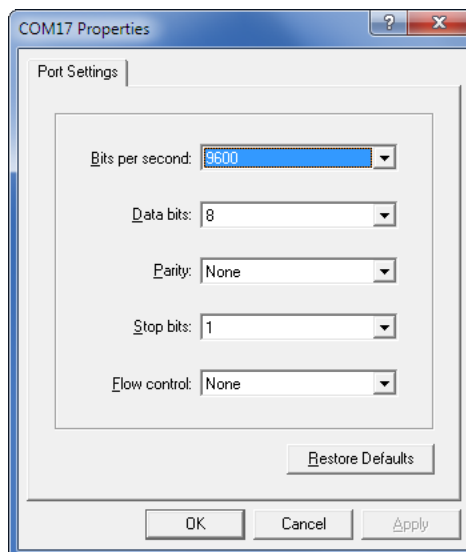
The term "newly created comm port" refers to the port created when the USB driver software was installed.

7. Click the button labeled "OK" to accept the new comm port assignment.

A new HyperTerminal connection has been created. It is now necessary to assign the correct emulation for the connection.

SETTING THE EMULATION

8. After selecting the comm port for the new connection the dialog box named "Com Properties" will be displayed. An example is shown in the following. Your dialog box will actually be labeled with the comm port number you selected earlier.



HyperTerminal–Com Properties Dialog Box

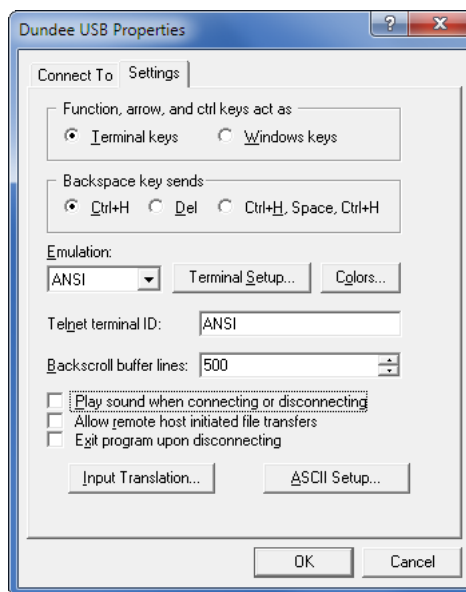
9. Click the button labeled "Cancel". A blank HyperTerminal window will appear.



Baud rate and bit coding settings do not apply to USB-based connections.

10. Click on the command named "File". It is located in the menu bar at the top of the HyperTerminal window. Click on the sub-command named "Properties". A dialog box labeled "Dundee USB Properties" will be displayed.
11. At the top of the dialog box click the tab labeled "Settings". A dialog box similar to the following will be displayed.

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HyperTerminal–Com Properties Dialog Box

12. Modify the various settings to match those listed in the previous screen. Make sure that the drop-down list box labeled "Emulation:" is set to "ANSI".
13. Double check everything. If all the settings are correct click the button labeled "OK".
14. The menu bar is located along the top of the HyperTerminal window. Click the command named "File" and then the sub-command named "Save".

Your PC now has a newly defined comm port connection that is tailored for this specific recorder. To launch the new connection simply click the icon labeled "Dundee USB.ht" that exists within the HyperTerminal Connections folder.



For easy access, you may wish to create a shortcut for the "Dundee USB" connection and place it on your Windows desktop.

CREATING CONNECTIONS FOR ADDITIONAL RECORDERS.

The serial port comm connection created in [Task 1](#) can be used with any recorder whose Terminal Port is set to operate at the same Baud rate. Conversely, the modem connection created in [Task 2](#) can only be used to access the recorder at a specific telephone number. Nevertheless, the modem's various settings can be used to create a new connection whose only difference is the telephone number.

The USB Device Port of every recorder is identified with uniquely coded information. For this reason, when you connect your PC to the USB Device Port of another recorder a new connection must be created. The only difference is that a different comm port will need to be assigned to the new connection. This can be done by simply selecting a new comm port number (e.g., Com18) in step 6 of the previous procedure. Remember to save the new connection with a different name (e.g., Central Ave).

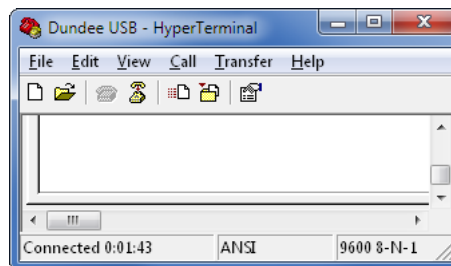


When creating USB connections for additional recorders it is not necessary to install the USB driver software once again. The drivers only need to be installed once.

LOG ON USING THE USB DEVICE PORT

The log on procedure used with the USB Device Port is similar to that used with the Terminal Port. The procedure can be performed as follows.

1. Use the USB type A-B cable to connect the recorder's USB Device Port to a spare USB port on the PC.
2. Launch the appropriate, and previously created, HyperTerminal connection for this recorder. The upper left-hand corner of the HyperTerminal window should appear as shown in the following. Note the yellow phone icon that is in the up position. This indicates that a connection is active.



HyperTerminal—Active USB Connection

3. Press the **Enter** key. A Password challenge will be issued. Enter the appropriate Password to complete the Log On.

The USB Device Port utilizes a hardware interface that is substantially different than that used by the Terminal Port. The recorder cannot automatically determine if a device, like a PC, is connected to its port. Accordingly, the Password challenge is not issued when the connection is first established. It occurs only after a key is pressed and read by the recorder.



For security reasons, always disconnect the USB type A-B cable from the recorder when the current user session has been terminated.

Task 30

INTRODUCTION TO THE FLD-2

The Metra Recording System must include the ability to detect and report the failure of one or more lamps at a crossing. The FLD-2 was also designed to meet the following additional requirements.

- Either incandescent or halogen lamps will be used (as opposed LED devices).
- The flash rate of the lamp circuit, while active, must be reported by the recorder.
- An EOR relay will not be available at installations equipped with a Safetran SSCC.

This task is only informative in nature. Before describing tasks that target specific behavior of the FLD-2, it is best to summarize the purpose of the unit and how it contributes to the capabilities of the system as a whole. This task and the two succeeding tasks are not intended to replace or duplicate content included within the FLD-2 User Manual. Rather, its purpose is to provide a concise and targeted description of how to use the FLD-2 effectively.

INSTALLATION SUMMARY

CONNECTIONS TO THE LAMP CIRCUITS

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The FLD-2 monitors lamp current in each leg of the circuit as opposed to monitoring only the current in the common return path. By using separate, dual sensors the FLD-2 is able to discern each current pulse in both legs of a circuit.

The current carrying conductors of a typical lamp circuit are inserted through appropriate holes in the FLD-2. This wiring method is illustrated in [Figure 13 on page 102](#). The FLD-2 is equipped with two separate circuits. They are referred to as EN1-EB1 and EN2-EB2. A maximum of 12 lamps can be monitored per circuit. Both circuits sense current independently of the other. Their separate outputs allow them to independently report light out conditions and flash pulsing. Their operating parameters are calibrated separately.

CONNECTIONS TO THE RECORDER

Specific connections must also be made between the recorder and FLD-2. These connections are illustrated in [Figure 14 on page 102](#). The outputs of the FLD-2 are available on detachable, tension clamp connectors located along the unit's top panel. The FLD-2 to recorder connections are listed by silkscreened labels and assigned Input Names in [Table 14 on page 103](#).



The wiring assignments must not be modified. They are strictly imposed by the Metra-defined Setup Databases.



The larger Digital Input capacity of the CWR-72E allows it to support two FLD-2 units. The lower portion of [Table 14](#) lists the additional assignments which may on occasion be required.

Additionally, the crossing's XR relay must be wired to the FLD-2. The XR is used by the FLD-2 to indicate when a check of the lamp current can be initiated. A precise measurement of each lamp current is made shortly after the XR goes active. The duration of the current measurement allows the current to stabilize and yield a consistent reading.

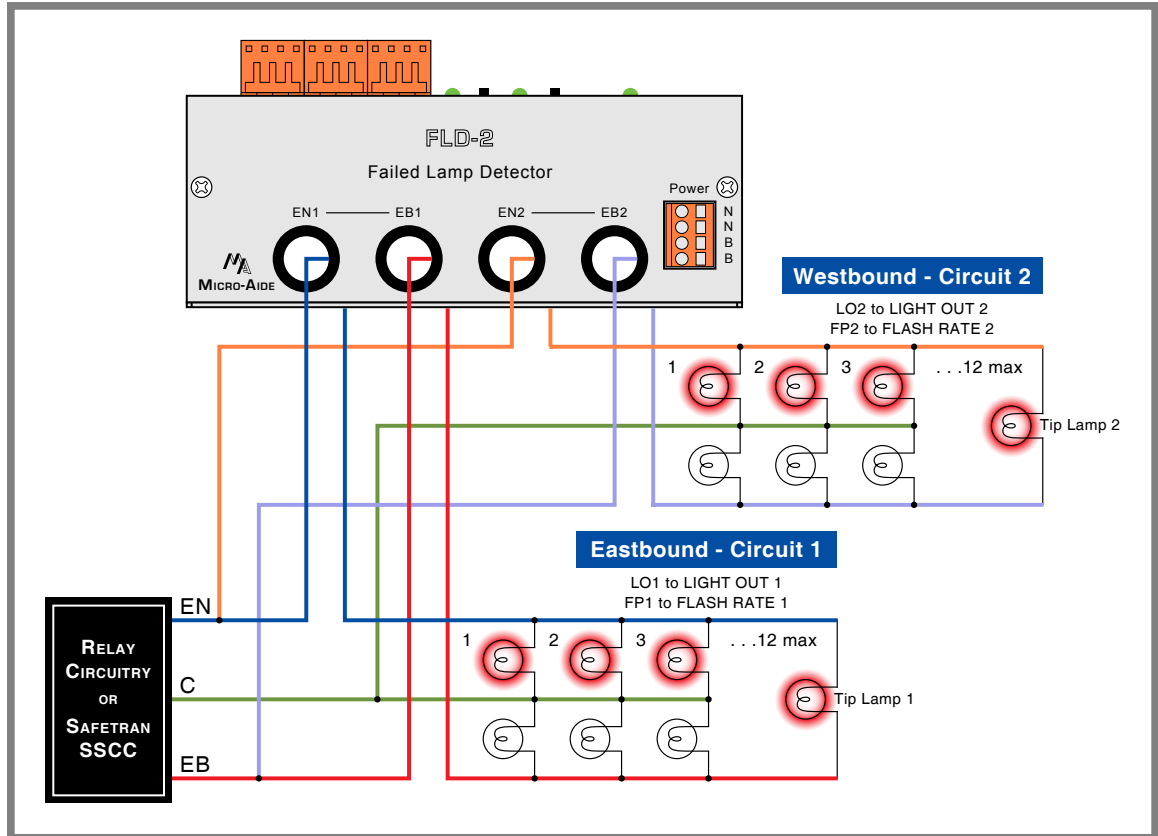


Figure 13: Typical FLD-2 Lamp Circuit Wiring

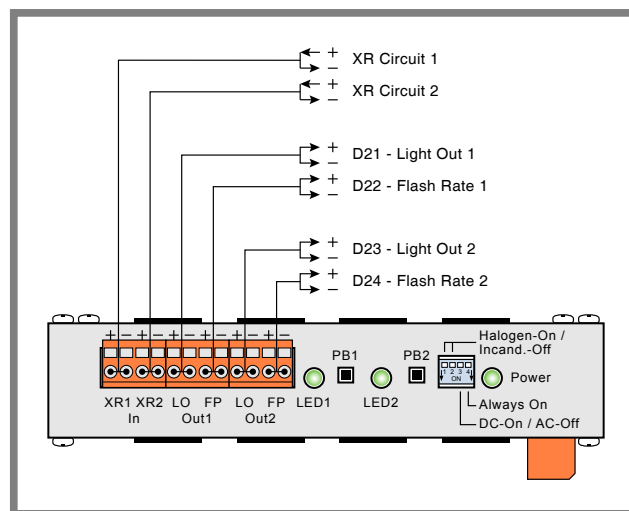


Figure 14: FLD-2 to Event Recorder Wiring

1st FLD-2	CWR-40E & CWR-72E	
	Digital Input Number	Input Name
LO1	D21	LIGHT OUT 1
FP1	D22	FLASH RATE 1
LO2	D23	LIGHT OUT 2
FP2	D24	FLASH RATE 2
2nd FLD-2	CWR-72E Only	
	Digital Input Number	Input Name
LO1	D53	LIGHT OUT 3
FP1	D54	FLASH RATE 3
LO2	D55	LIGHT OUT 4
FP2	D56	FLASH RATE 4

Table 14: Setup Database Assignments

USER NOTES

[illegible]

How to . . .

CALIBRATE THE FLD-2

Task 31

CALIBRATING FOR A SINGLE LAMP FAILURE

The FLD-2 utilizes a microprocessor-based, all digital design to precisely measure lamp current. The outputs of the four current sensors are scanned and their samples are immediately converted to numerical values. The microprocessor firmware then analyzes the data to determine if a failure has occurred. However, this check cannot be performed accurately until such time as the FLD-2 is fully calibrated.

BEFORE YOU START

This task presumes that the FLD-2 is properly installed, wired and powered on as described in [Task 30](#). A PC is not required to complete the task.

WHAT TO DO

The FLD-2 calibration procedure consists of three parts. It requires that the crossing be activated at least twice and that one lamp be removed. For this reason it is recommended that you perform this procedure while traffic is lighter than usual.

SETTING THE CONFIGURATION SWITCHES

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As illustrated in [Figure 15](#), the top panel of the FLD-2 includes a four-position DIP switch assembly.

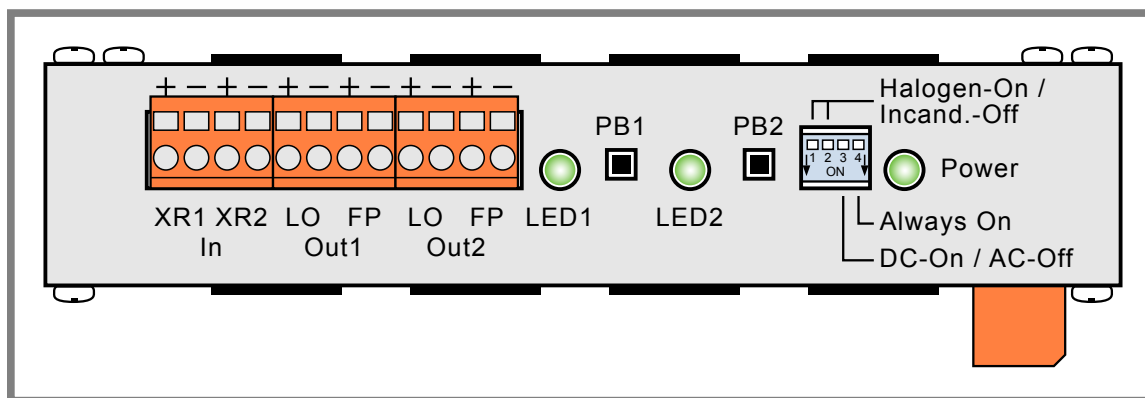


Figure 15: Top Panel View of the FLD-2

The four individual switches select various operating modes as detailed in [Table 15 on page 106](#). Switch positions SW-1 and SW-2 control the type of lamp used by circuits 1 and 2, respectively. Switch position SW-3 provides for either AC or DC lamp current.



Switch SW-4 must never be set to the off (up) position.

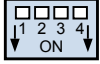



Lamp Type	Current	SW-1	SW-2	SW-3	SW-4	
Halogen	DC	On	On	On	On	
Incandescent	DC	Off	Off	On	On	
Halogen	AC	On	On	Off	On	
Incandescent	AC	Off	Off	Off	On	

Table 15: Switch Settings

CALIBRATION WITH ALL LAMPS FLASHING

The following procedure requires that all lamps be installed in both the EB and EN sides of the lamp circuit. [Figure 16 on page 107](#) illustrates the sequence of steps and observations that comprise this portion of the calibration procedure.

1. Briefly press and then release the pushbutton switch labeled "PB1". Verify that the indicator labeled "LED1" is blinking approximately once per second.
2. Manually activate the crossing. LED1 will continue to blink.
3. Verify that all of the crossing lamps are flashing properly and that the tip lamp is on. After one second the FLD-2 will validate the XR1 input. LED1 will then be on, but not blinking.
4. Wait approximately 10seconds. LED1 will turn off automatically. This indicates that the FLD-2 has calibrated a reading for the first of its two circuits.
5. Deactivate the crossing. This portion of the procedure has been completed.

CALIBRATION WITH ONE FAILED LAMP

The FLD-2 takes separate current readings from the EB and EN sides of the lamp circuit. Accordingly, this portion of the calibration procedure requires that one lamp be removed from each side. After calibration, the FLD-2 will be able to detect the occurrence of a single lamp failure from either side. [Figure 17 on page 108](#) illustrates the sequence of steps and observations that comprise this portion of the calibration procedure.

1. Disconnect two flashing lamps (i.e., not a tip lamp), one each from the EB and EN sides of the lamp circuit.
2. Briefly press and then release twice in rapid succession the pushbutton switch labeled "PB1". Verify that the indicator labeled "LED1" is blinking approximately twice per second.
3. Manually activate the crossing. LED1 will continue to blink.
4. Verify that only the disconnected lamps are not flashing. After one second the FLD-2 will validate the XR1 input. LED1 will then be on, but not blinking.
5. Wait approximately 10seconds. LED1 will turn off automatically. This indicates that the FLD-2 has calibrated a single lamp failure reading for the first of its two lamp circuits.
6. Deactivate the crossing. The procedure has been completed.

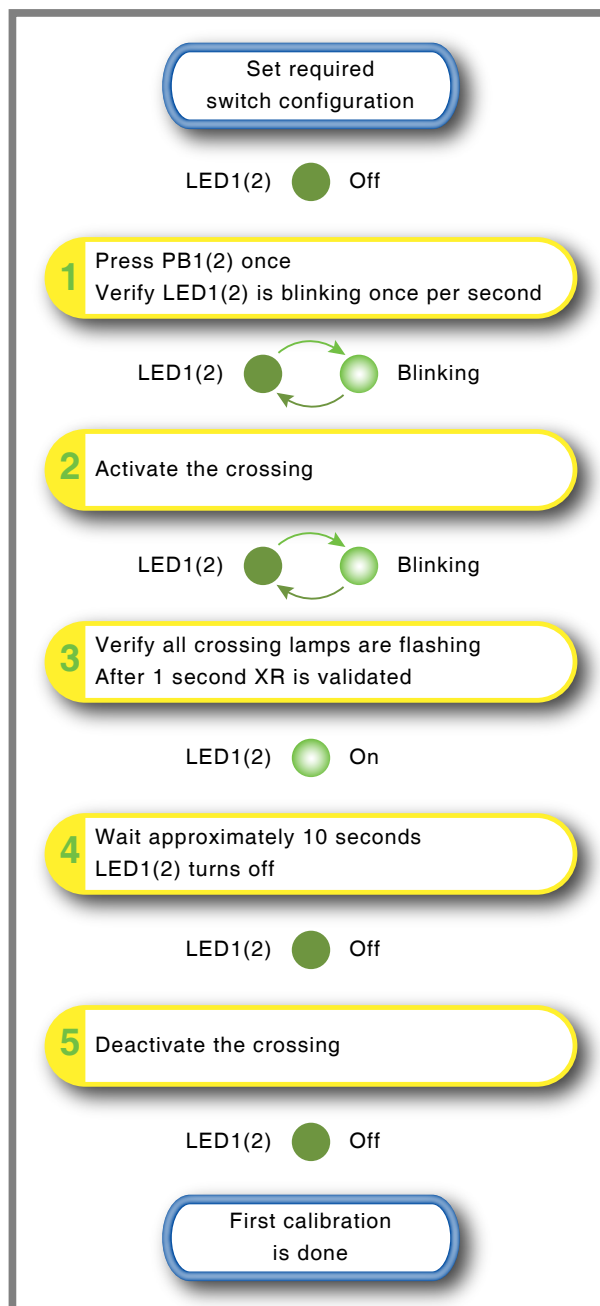
If required, repeat the two portions of the calibration procedure for the second lamp circuit. The labels "PB2", "LED2" and "XR2" will apply.



Either portion of the calibration procedure starts when the appropriate PB switch is pressed. To immediately terminate the sequence, press the PB switch once prior to the validation of the XR input. The LED will stop blinking and the FLD-2 will return to its normal operation.



MICRO-AIDE recommends that the calibration procedure also be performed whenever lamps are replaced or changes are made to any of the lamp control systems.



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Figure 16: Calibration with All Lamps Flashing

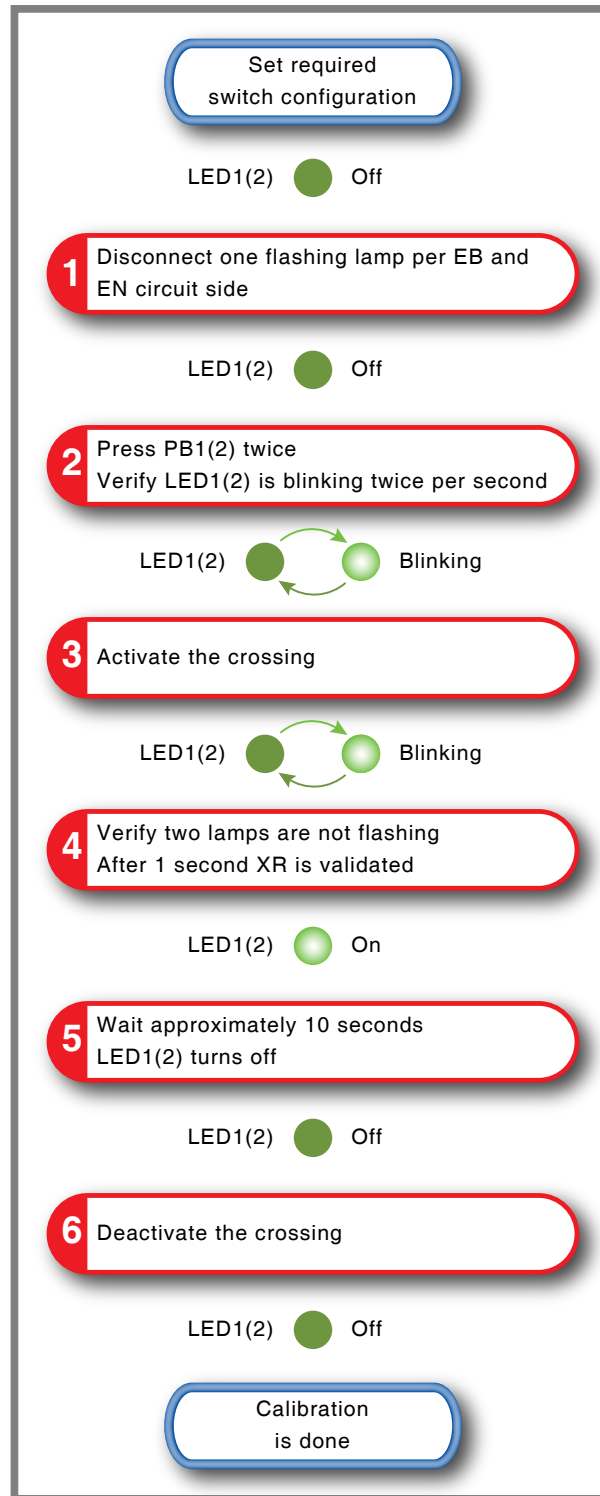


Figure 17: Calibration with One Failed Lamp

Task
32

ACCESSING AND INTERPRETING FLD-2 BASED DATA

Operating the Event Recorder is largely a matter of accessing and understanding the information it provides. The same is true of the FLD-2. Like the recorder, the FLD-2 operates automatically without the need for user intervention once it has been properly configured. Unlike the recorder, the information it provides is not directly accessible. The information it provides is discerned by the recorder from the FLD-2 Light Out (LO) and Flash Pulse (FP) outputs. In summary, operating the FLD-2 consists of looking at Event Record data from inputs of the Event Recorder that are connected to outputs of the FLD-2.

BEFORE YOU START

The primary purpose of this task is to provide useful information to the user. This task draws attention specifically to Event Record data that pertains to the operation of the FLD-2. A more comprehensive explanation of Event Record content can be found in [Task 23](#) entitled "Event Record Formatting Options".

Sample records are listed throughout this task. However, if the user wishes to review actual Event Records, a PC running HyperTerminal will have to be connected to the recorder. The first four tasks of this guide explain how to prepare your PC and log on. Additionally, several Event Records from the LIGHT OUT and FLASH RATE Digital Inputs will have to be saved in the memory of the recorder.

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OPERATION OF THE LO AND FP OUTPUTS

The FLD-2 can only interact with the Event Recorder via its LO and FP outputs. The operation of these outputs is described in the following. [Table 14 on page 103](#) details the connections made between the FLD-2 outputs and Digital Inputs of the recorder. The Metra-defined Setup Databases are responsible for these assignments.

LO—The Light Out output is connected to a LIGHT OUT Digital Input of the recorder. This signal assumes an On state when the crossing is active and the FLD-2 has determined that one or more lamps have failed. The LO returns to its Off state when the crossing is once again idle. It follows that any Event Record from a LIGHT OUT input should be investigated. Furthermore, a failure will be reported via an Event Record each time the crossing is activated, provided the lamp continues to fail.

LED1 and LED2 are also used to indicate lamp failures. The LEDs follow the activity of LO output as illustrated in [Figure 18 on page 110](#).

FP—The Flash Pulse output is connected to a FLASH RATE input of the recorder. This signal pulses high and low in sync with the flash rate of the lamps. It operates much like an EOR relay would in the case of a relay-based crossing system. The recorder uses the FP signal to create Event Records that mark the start and end of each flashing sequence. The end or Off Event Record includes a field that reports the average flash rate while the crossing was active.

[Figure 19 on page 110](#) illustrates the pulsing nature of the FP output while the crossing is active and the lamps are flashing.

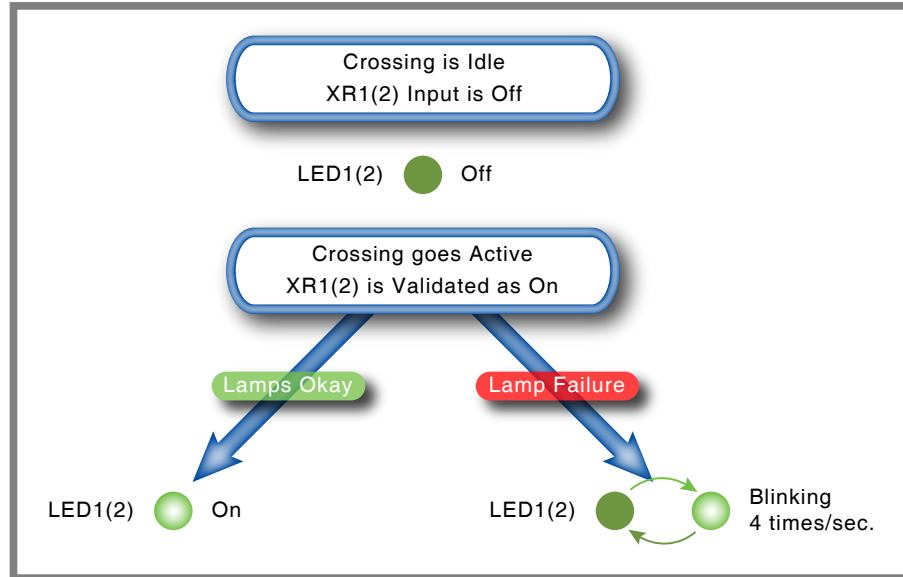


Figure 18: LEDs Indicating Lamps are Okay and Lamp Failure

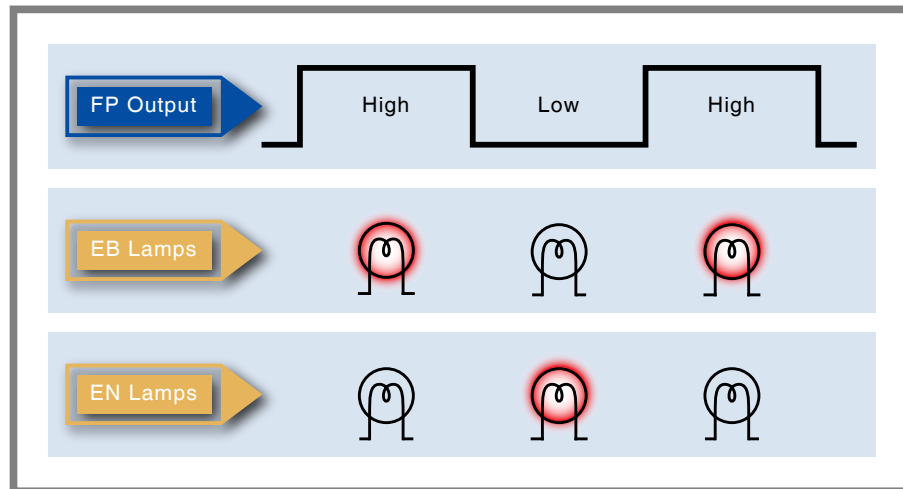


Figure 19: FP Output Pulsing Sequence

EVENT RECORD DATA PROVIDED BY THE FLD-2

Figure 20 shows two Event Records that include information derived from an FLD-2. The first record reports a typical flash rate. The second record indicates a lamp failure.

15:32:29.77	09/11/11	FLASH RATE 1	FLASH 1	FLASHOFF	D22	Flash Rate 46.0 FPM
20:46:18.14	09/11/11	LIGHT OUT 2	L OUT 2	LAMPFAIL	D23	

Figure 20: Flash Rate and Light Out Reporting

How to . . .

INSTALL THE GEA SOFTWARE

Task 33

GEA INSTALLATION PROCEDURE

MICRO-AIDE's Graphical Event Analyzer (GEA) software can be used to access, save, review and plot Event Record data from a variety of MICRO-AIDE recording devices. However, the focus of our attention will be limited to how GEA can be used with the Metra Event Recorders.

GEA features an easy-to-use point and click user interface and will run on any commonly used Windows PC. Its features and capabilities will be the subject of the remaining tasks in this guide. We'll start by learning how to install GEA.

GETTING THE LATEST VERSION OF GEA

You'll need the latest version of the GEA software which can always be downloaded at:
www.micro-aide.com/support/downloads.html

Save the downloaded GEA software to a convenient location such as your desktop. The downloaded file will be a zip file with a .zip extension.



At the present time the latest version of GEA is 3.11 and the downloadable file is named `gea_v311.zip`.

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BEFORE YOU START

The GEA software is supported by a separate User Manual that includes additional information. This guide is not intended to be a substitute for the User Manual. A PDF copy of the manual can be downloaded at:
www.micro-aide.com/support/documentation.html

It is important to note that the latest version of GEA is always designed to work with the latest version of the Event Recorder firmware. For this reason, before installing GEA it is advisable to visit the MICRO-AIDE website and verify that your Event Recorders are running the current firmware.

As with any application, in order to install GEA you will need to log on to your PC as an administrator. If this is not possible you will have to contact a responsible member of the Metra I.T. department.

Lastly, if you already installed GEA on your PC and it is not version 3.11, it must be uninstalled. Older versions of GEA must always be uninstalled before a newer version can be installed. The GEA uninstall procedure is described in the section entitled "[Uninstalling GEA](#)" on [page 115](#).

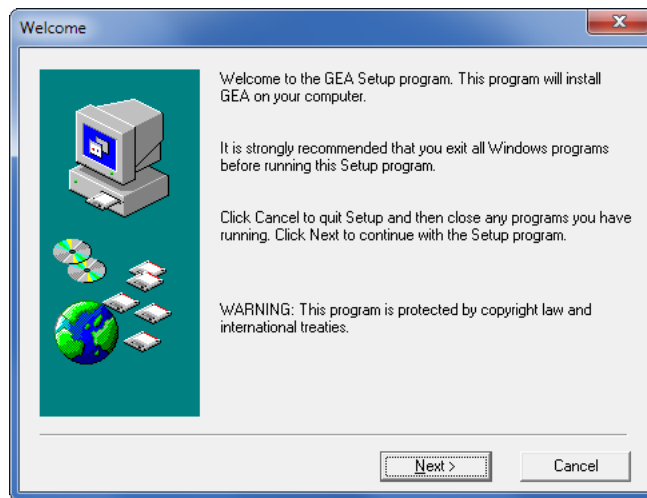
WHAT TO DO

To install GEA perform each of the steps listed in the following section.

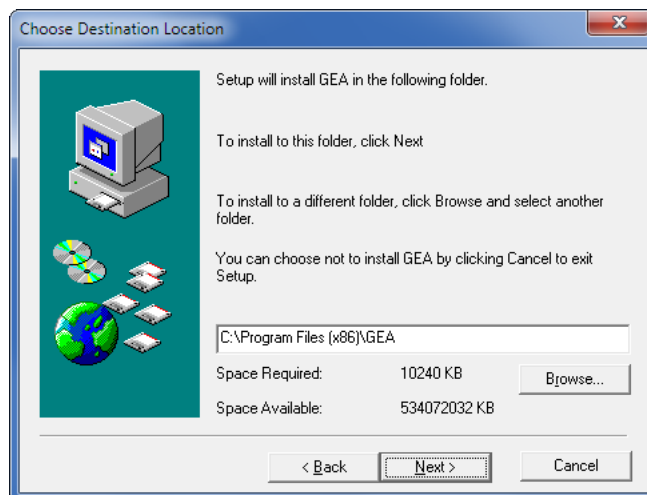
1. Navigate to your desktop or folder where you saved the `gea_v311.zip` file. Double-click on the zip file. It will list an executable file named `SetupGEA311.exe`. Double-click the .exe file. A dialog box similar to the following may be displayed. If not, skip the next step.



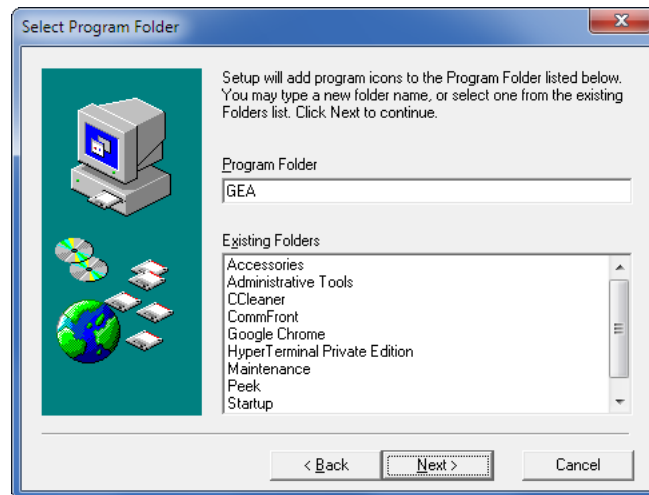
2. Click the button labeled "Run". The following dialog box will be displayed.



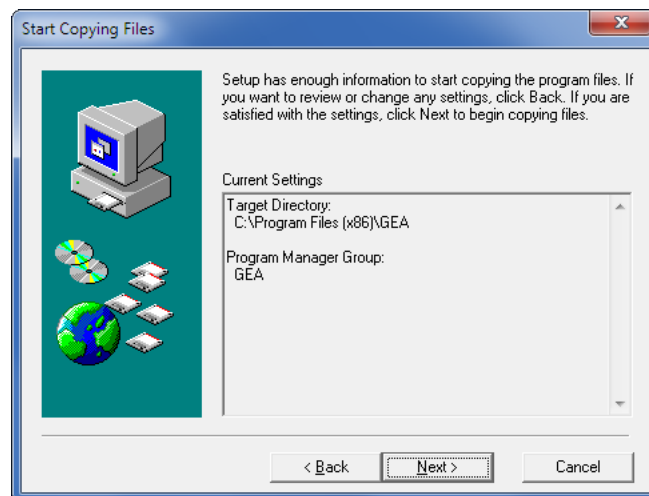
3. Click the button labeled "Next>" to display the following dialog box.



4. Accept the default folder location to install GEA by clicking the button labeled "Next>". The following dialog box will be displayed.

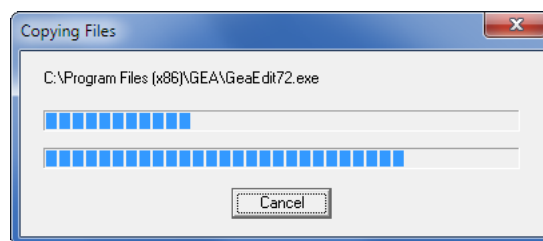


5. Accept the default folder name by clicking the button labeled "Next>". The following dialog box will be displayed.

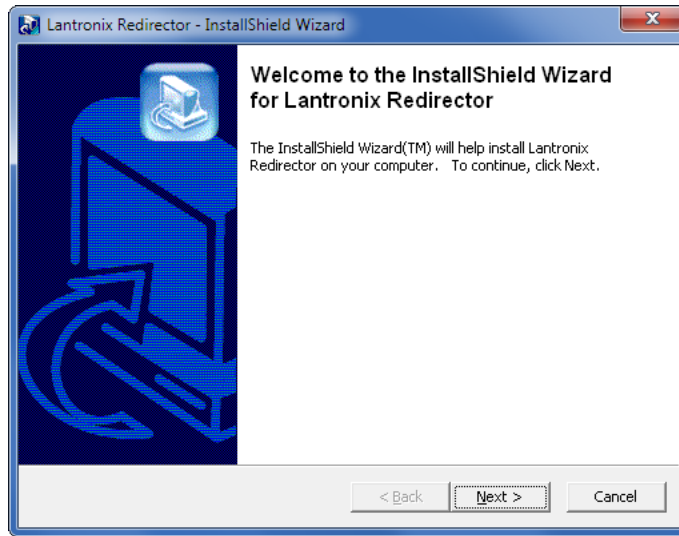


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6. Click the button labeled "Next>" to proceed with the installation. The following dialog box will be displayed. It notes the progress of the installation. It will close automatically within a few seconds.

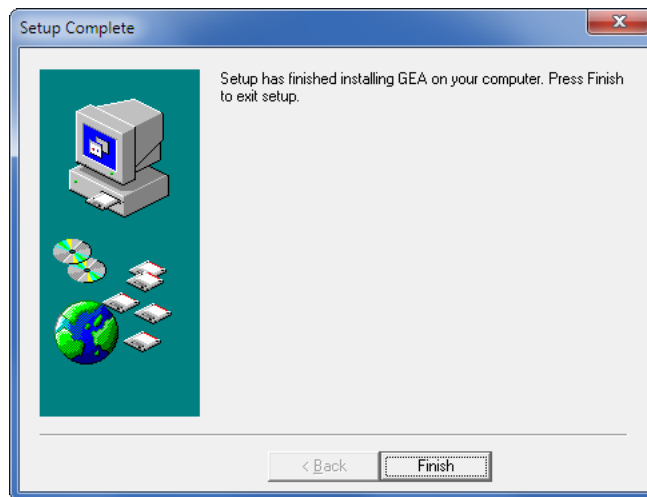


7. The installation of the GEA files has now been completed. The following dialog box will be displayed.

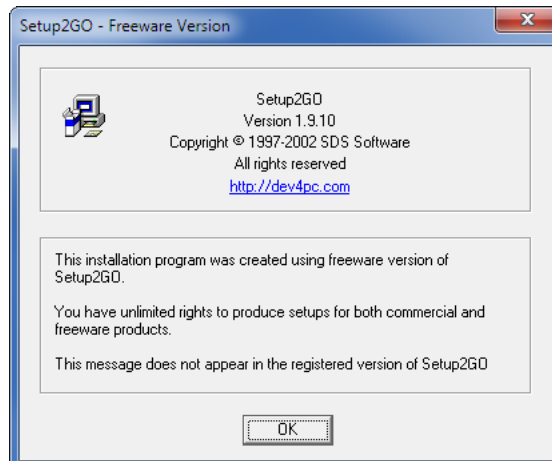


The Lantronix Redirector software must not be installed. The Metra recording system does not require its use.

8. Click the button labeled "Cancel" to ignore this option. The following dialog box will be displayed



9. Click the button labeled "Finish". The following and final dialog box will be displayed.



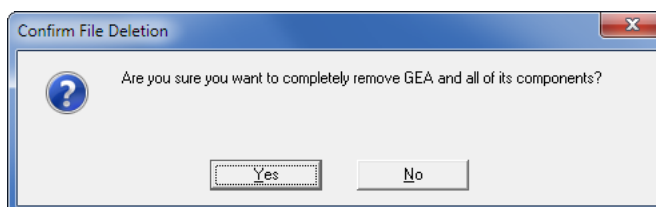
10. As the final step in this procedure click the button labeled "OK" to close the dialog box. GEA is now fully installed and ready for use.

An icon named GEA will be added to your PC's desktop. It can be double-clicked at any time to launch GEA.

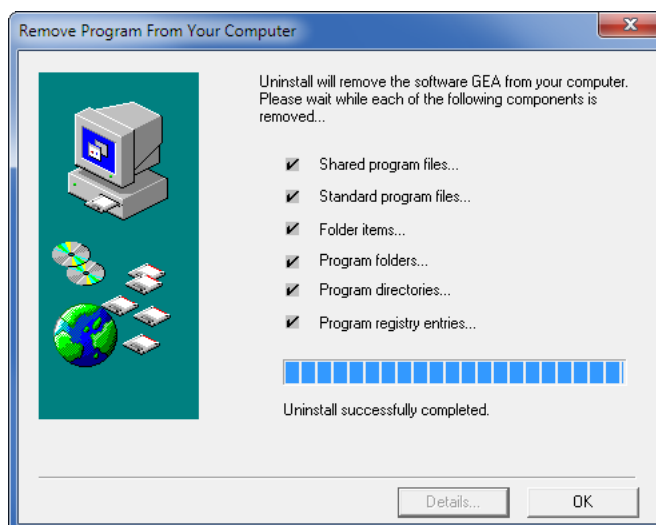
UNINSTALLING GEA

If an older version of GEA is presently installed on your PC it must be removed prior to installing a new version. Likewise, if you wish to reinstall the existing version it must first be uninstalled. The uninstall procedure is described in the following steps.

1. Using your mouse, click in the lower left-hand corner of your desktop in the area labeled "Start". Then click in the area labeled "All Programs".
2. Click on the folder labeled "GEA" to expand it.
3. Click the sub-list item labeled "Uninstall GEA". After a short delay the following dialog box will be displayed.



4. Click the button labeled "Yes" to proceed with the removal. As the removal takes place the following dialog box will be displayed. The removal will only take a few seconds.



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5. Click the button labeled "OK" to complete this procedure.



Uninstalling GEA will not remove any previously saved Event Record data or plot templates. The entire contents of the GEA Recorder Data folder will remain unaltered as a result of this procedure.

USER NOTES

[illegible]

Task
34

ASSIGNING THE GEA SYSTEM PARAMETERS

Two things must be done before GEA can be used with your Event Recorders. A few system level parameters must be assigned. As their name implies these parameters apply to the GEA software as a whole. Assigning these parameters configures GEA to then accept recorder-specific parameters that it will use when accessing recorders as you direct. Assigning recorder-specific parameters is the subject of the next task.

BEFORE YOU START

You should be familiar with the steps necessary to launch your Windows operating system and log on as a user. You should also be familiar with basic Windows operations, such as selecting commands and using the mouse. To complete this task GEA must be properly installed on your PC.

WHAT TO DO

To assign the system-level parameters that will configure GEA perform each of the following steps.

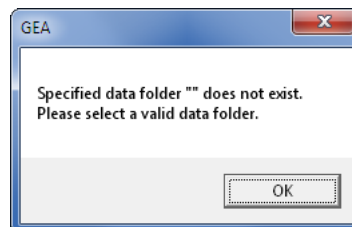
1. Before you launch GEA you must create a new folder referred to as the Main GEA Data Folder. This folder will serve as the container for other sub-folders and files that will be created for each Event Recorder that GEA will access. The Main GEA Data Folder will not be used by other applications.

Create the new folder by right-clicking on an empty space in your desktop. A context menu of several commands will appear. Click the command labeled "New>Folder". A folder identified as "New folder" will appear on your desktop. Rename the folder "GEA Recorder Data".

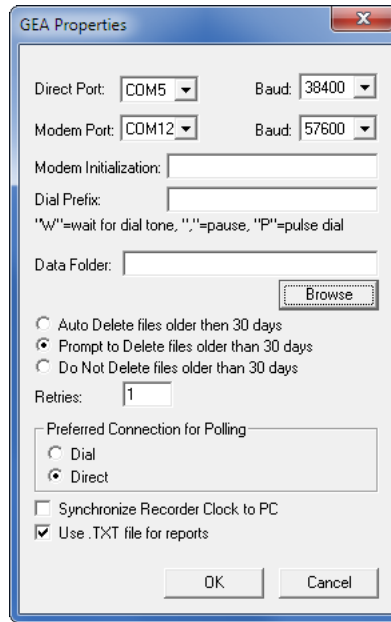


The Main GEA Data Folder can be named differently and located elsewhere; however, the user is strongly encouraged to accept the folder definition used throughout this guide. Throughout the remainder of this guide a folder name of "GEA Recorder Data" will be used. The various screens included in the guide will depict the GEA Recorder Data folder located on the desktop.

2. Launch GEA by double-clicking the GEA desktop icon. Assuming you have not previously used GEA, a dialog box similar to the following will be displayed.

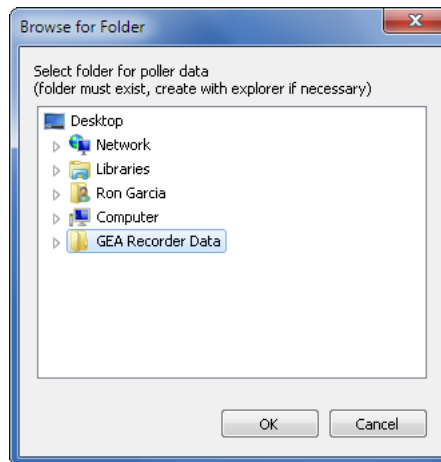


3. Click the button labeled "OK" to close the dialog box and proceed. Assuming that GEA has not been previously launched, the following dialog box will be displayed. If GEA has been launched previously, it can be displayed by selecting the GEA command named "Edit>Properties".



Edit Properties Command

4. In the top section of the dialog box are four drop-down list boxes. The box labeled "Direct Port:" should be assigned the comm number of the PC's serial comm port. The Baud rate should be left as 38400. The modem settings are only useful once telephone lines are made available to the crossing sites.
5. Click the button labeled "Browse". A dialog box similar to the following will be displayed.



Select the GEA Recorder Data Folder

6. Navigate to and select the GEA Recorder Data folder previously created in step 1. Click the button labeled "OK". The folder that will serve as the Main GEA Data Folder has now been identified. The GEA Properties dialog box will once again be displayed.
7. If not already enabled, click the radio button labeled "Prompt to Delete files older than 30 days". With time, GEA will save many Event Record data files. This setting will prompt the user before deleting files that are older than 30 days. Click one of the other two radio buttons in this group if you prefer another setting for the file delete feature.
8. It is assumed that GEA will use a serial comm port to access various Event Recorders. In the block labeled "Preferred Connection for Polling" select the setting labeled "Direct".
9. The checkbox labeled "Synchronize Recorder Clock to PC" must be left blank (i.e., not checked).



It is critically important that the Synchronize Recorder Clock to PC feature be disabled. If enabled, it will conflict with the GPS Receiver clock sync option that Metra has selected.

10. Click the checkbox labeled "Use .TXT file for reports". Once enabled, this feature forces GEA to use Notepad to create simple text files when Event Record data and the Setup Database need to be reviewed by the user.
11. After all of the settings have been verified as correct, close the dialog box by clicking the button labeled "OK". The main GEA window will be displayed.

You can now add a list of Event Recorders that GEA will access. This is the subject of the next task.

USER NOTES

[illegible]

How to . . .

CREATE THE GEA LIST OF RECORDERS

Task 35

IDENTIFYING EVENT RECORDERS GEA WILL ACCESS

In any given Metra district you may be responsible for several different crossings. Each crossing will be equipped with a similar, but not identical Event Recorder. Each recorder will be identified with a unique Unit Name. If you intend to use GEA to retrieve Event Record data and to review and plot that data, GEA will need specific information for each recorder. The GEA list of recorders is nothing more than an organized list of recorder-specific information that tells GEA how to access and save recorder data.

BEFORE YOU START

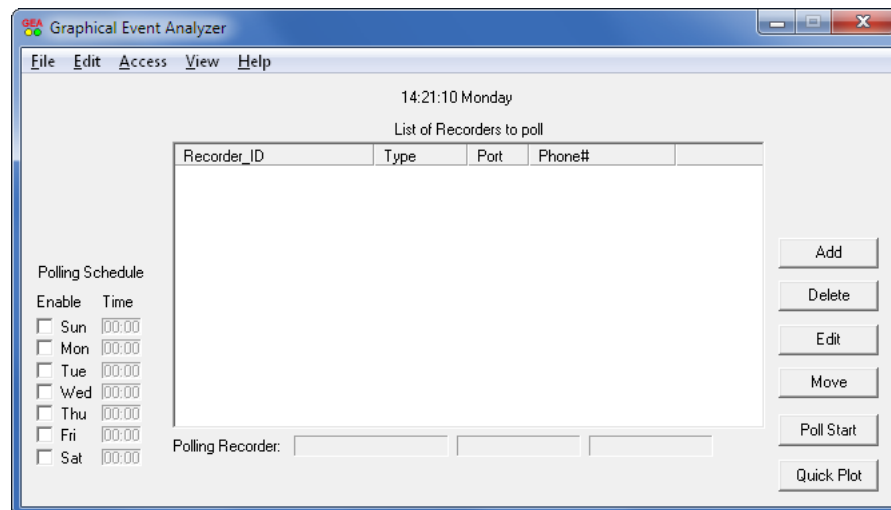
You should be familiar with the steps necessary to launch your Windows operating system and log on as a user. You should also be familiar with basic Windows operations, such as selecting commands and using the mouse. To complete this task GEA must be properly installed on your PC and the Main GEA Data Folder must be assigned and named GEA Recorder Data.

WHAT TO DO

To create a list of GEA accessible recorders perform each of the steps listed in the following section.

1. Begin by launching GEA. This can be done by double-clicking the GEA icon on your desktop. The following GEA window will be displayed. The center section of the window is presently empty. It will eventually contain a list of accessible recorders.

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GEA Window—Shown Empty

2. Click the button labeled "Add". The following dialog box will be displayed.

The image shows a Windows-style dialog box titled "Add Recorder". It contains several input fields and dropdown menus. The fields are: Recorder ID (empty), Type (dropdown menu showing "CWR-22XT"), Direct port (dropdown menu showing "Default Port"), Phone# (empty), Password (empty), Checksum (empty), and Flash Size (four dropdown menus labeled Position 1, Position 2, Position 3, and Position 4, all showing "0"). At the bottom are "OK" and "Cancel" buttons.

Add Recorder Dialog Box–Empty

3. Add a recorder to the list by filling in the edit box labeled "Recorder ID:". This edit box must match the first 20 characters of the recorder's Unit Name. Unit Names are the subject of [Task 7](#).



It is absolutely imperative, for reasons that will be discussed later, that the GEA Recorder ID match the first 20 characters of the recorder's assigned Unit Name.

4. Click the drop-down list box labeled "Type:". From the list of recording devices select the entry labeled "CWR-72E".
5. The setting for the drop-down list box labeled "Direct port:" can be left as "Default Port". The Default Port is the comm port assigned as part of the GEA Properties group.
6. Since you will not be accessing your recorder via a modem, the edit box labeled "Phone#:" can be left blank.
7. In the edit box labeled "Password:" type **SIGNAL**. The recorder's Administrative Password can be used as well. The asterisk (*) character is used to hide the assigned Password.
8. The edit box labeled "Checksum:" should be assigned either of two values. If the recorder is running V1.01 firmware, use a checksum value of **19B4**. If version 1.02 firmware is being used, enter a value of **68D6**. Checksum values are not case-sensitive.



At the time this guide was written V1.01 firmware was installed in every recorder. However, V1.02 was available for installation.

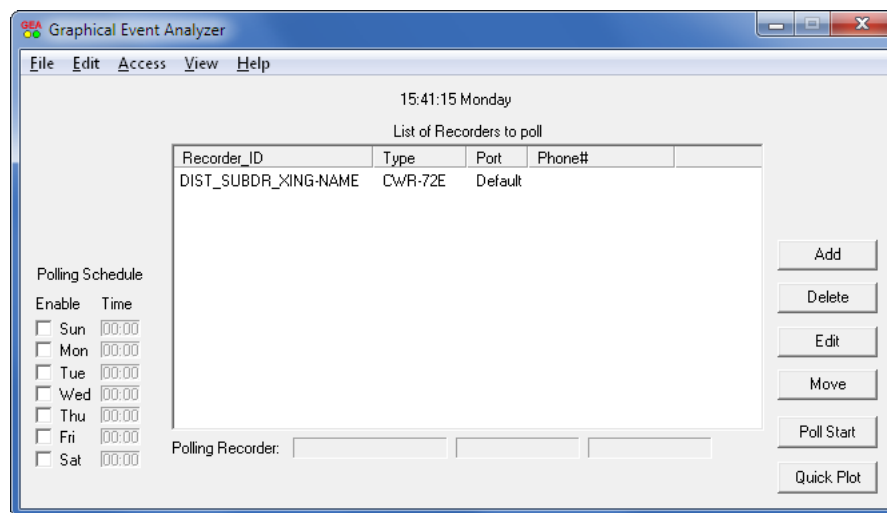
9. Click the drop-down list box directly underneath the label "Position 1". Select the "2048K" entry. Leave the other drop-down list boxes in this group unassigned.
10. The following screen depicts a typical Add Recorder dialog box after it has been completed.

The image shows the "Add Recorder" dialog box after it has been filled out. The Recorder ID is "DIST_SUBDR_XING-NAME". The Type is "CWR-72E". The Direct port is "Default Port". The Phone# is empty. The Password is "*****". The Checksum is "68D6". The Flash Size dropdowns are: Position 1 is "2048", Position 2 is "0", Position 3 is "0", and Position 4 is "0". The "OK" and "Cancel" buttons are at the bottom.

Add Recorder Dialog Box–Typical Example

11. If everything appears to be correct, click the button labeled "OK" to close the dialog box and return to the GEA window.

12. The GEA window will now include a single entry in its list of recorders. An example is shown in the following.



GEA Window—Typical Recorder Entry

This task has been completed. You may wish to exit GEA at this time. If you elect to do so, click the "File>Exit" command. Select the "Yes" option to close the GEA application.

RELATED FEATURES

ADD ANOTHER RECORDER

To add additional recorders to the list, simply click the button labeled "Add" as you did in step 2 of the previous procedure. An empty Add Recorder dialog box will be displayed. Fill-in its contents as previously described. The new recorder entry will be added to the bottom of the list.

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DELETE AN EXISTING RECORDER

If you have accidentally added a recorder entry or would like to remove an entry, perform the following steps.

1. With your mouse, click the entry to be deleted. The entry will be highlighted with a blue background.
2. Click the button labeled "Delete". The entry is immediately removed from the list.



When a recorder is added to the list, GEA immediately creates a sub-folder in its Main GEA Data Folder specifically for that recorder. Deleting a recorder from the list does not delete its sub-folder nor its contents. If the user wishes to remove the sub-folder, this must be done using Windows Explorer. When doing so, be careful to remove the correct sub-folder and only after the recorder has been deleted.

EDIT AN EXISTING RECORDER

The various settings of an existing recorder entry can be changed by performing the following steps.

1. With your mouse, click the entry to be edited. The entry will be highlighted with a blue background.
2. Click the button labeled "Edit". A dialog box labeled "Edit Recorder" will be displayed. Alter any of the settings as required. Click the button labeled "OK" to accept the new settings.

CHANGE THE LIST ORDERING

The list of recorders will include the first recorder added at the top and the most recent recorder added at the bottom. You may wish to change the order by geographical proximity or alphabetize it. The position of any single entry can be moved by performing the steps listed in the following.

1. With your mouse, click the entry to be moved. The entry will be highlighted with a blue background.
2. Click the button labeled "Move". The entry's highlight will disappear.
3. Click the position in the list where the selected recorder will now be positioned. For example, to make it the fourth recorder in the list, click the existing fourth entry from the top. The remaining recorders will be relocated downward by one position .

Repeat these steps to reorder other portions of the list.

How to . . .

ACCESS A RECORDER AND ITS SETUP DATABASE

Task 36

DOWNLOAD AND REVIEW THE SETUP DATABASE

Before GEA can acquire data from an Event Recorder it must be able to access it via a communication pathway. This task demonstrates a simple method of verifying that GEA can communicate with a selected recorder. The various reports and plots that GEA can create are all contingent upon GEA having a copy of the Setup Database used by the recorder. This task will also describe the procedure for getting the Setup Database.

BEFORE YOU START

You should be familiar with the steps necessary to launch your Windows operating system and log on as a user. You should also be familiar with basic Windows operations, such as selecting commands and using the mouse. To complete this task GEA must be properly installed on your PC. At least one recorder must be listed in the GEA window.

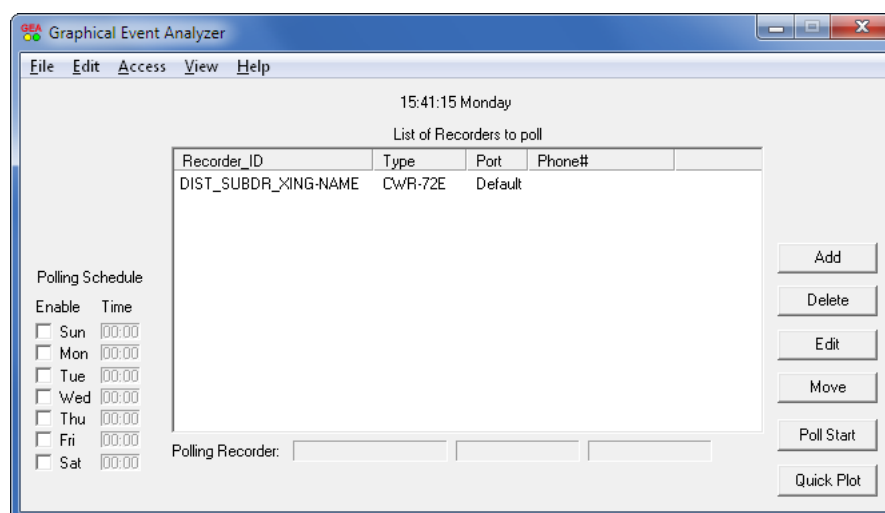
Launch GEA by double-clicking its desktop icon. Connect the MICRO-AIDE provided one-to-one cable to the appropriate comm port of the PC and the Terminal Port of the recorder you wish to access.

WHAT TO DO

VERIFYING ACCESSIBILITY

The following procedure allows you to verify that GEA can communicate with a recorder of your choice.

1. A screen similar to the following should be displayed.



GEA Window—Typical Recorder Entry

2. Click the list entry of the recorder you wish to access. The entry will be highlighted in blue. Click the "Access>Connect>Direct" command. After a few seconds the following GEATerm window will be displayed.



GEATerm Window

3. GEATerm allows the user to interact with the recorder. However, it is not intended to be a substitute for HyperTerminal. After entering a Password the Main Menu of recorder commands will be displayed.
4. Terminate the GEATerm session by closing the window or pressing the **Alt** and **F4** keys simultaneously.

Interacting with the recorder via GEATerm verifies that the comm port and Baud rate for the recorder are correctly assigned within GEA. You may wish to use this procedure on other recorders in the list.

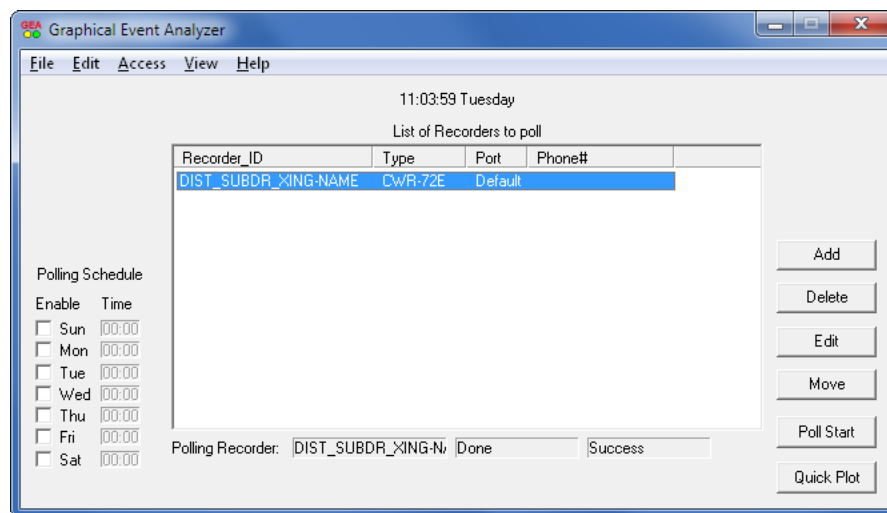
DOWNLOADING THE SETUP DATABASE

GEA can be used to retrieve, review and plot Event Record data. However, these capabilities require that GEA have access to a copy of each recorder's Setup Database. The following procedure must be used to access and save each recorder's database.



As previously explained, it is imperative that this procedure be performed before proceeding further.

1. Click the list entry of the recorder you wish to access. The entry will be highlighted in blue. Click the "Access>Download Setup Data>Direct" command.
2. GEA will proceed to establish communications with the selected recorder. Using the assigned Password, it will log on. GEA will then issue a series of commands allowing it to retrieve the Setup Database. GEA will save it as a binary file within a sub-folder of the Main GEA Data Folder. The sub-folder will be uniquely associated with and named after the selected recorder.
3. As shown in the following example, the status bar at the bottom of the GEA window is used to indicate the progress of the download.



Status Bar Indicating Successful Retrieval

This procedure must be performed for each entry in the GEA list of recorders.

REVIEW THE SETUP DATABASE

GEA now has access to each recorder's Setup Database. The following procedure allows you to review the database by using your PC's Notepad application.

1. Click the list entry of the recorder you wish to access. The entry will be highlighted in blue. Click the "View>Recorder Setup Data" command.
2. A text file named "setupdata.txt" will be opened in Notepad. The file will contain the entire contents of the Setup Database just as if it were accessed directly from the recorder.
3. Close the Notepad window when you are done reviewing the file.

When the setupdata.txt file is first opened in Notepad, it is automatically saved to the selected recorder's sub-folder. This allows you to read the file at any time without launching GEA.

RELATED FEATURES

EDIT THE SETUP DATABASE

The "Edit>Edit Recorder Setup Data" command can be used to alter the contents of the recorder's Setup Database. The procedure for doing so is fully explained in Chapter 4 of the GEA User Manual, the chapter is entitled "Preparing the Setup Database".



Metra has defined three Setup Databases for use with the Event Recorders. These databases must not be altered. A new database should only be required by a special application or temporary test.

UPLOAD THE SETUP DATABASE

If a recorder's Setup Database (BEV, MED or Mainline) is corrupted, it can be restored by using GEA. However, before doing so it is important to verify that GEA is using an unaltered version of one of the three Metra-defined databases. The "Access>Upload Setup Data>Direct" command is used to perform the restoration. Since restoring a Setup Database overwrites the existing database, an Administrative Access session is required. This can only be accomplished if the recorder entry in the list includes the Administrative Password rather than the Restricted Password cited in the previous descriptions. The upload will fail if the Administrative Password is not used by GEA.

The procedure for restoring the Setup Database using HyperTerminal is the subject of [Task 18](#).

USER NOTES

[illegible]

How to . . .

VIEW INPUT STATUS AND TODAY'S RECORDS

**Task
37**

ACCESSING BASIC DATA FROM THE RECORDER

GEA includes features that provide many different ways to access and review data from your recorders. The complexity of these features varies from the very simple (e.g., single mouse click) to the more sophisticated that require user input. This task describes the basic methods of getting and viewing data. It will serve as an introduction to the more specialized and powerful methods described in the next task.

BEFORE YOU START

You should be familiar with the steps necessary to launch your Windows operating system and log on as a user. You should also be familiar with basic Windows operations, such as selecting commands and using the mouse. To complete this task GEA must be properly installed on your PC. At least one recorder must be listed in the GEA window. A partial day's worth of Event Records from the current date should be saved in the recorder. This will allow the reader to follow the second lesson cited in this task. Finally, the Setup Database for each recorder must be saved. The latter is the subject of [Task 36](#).

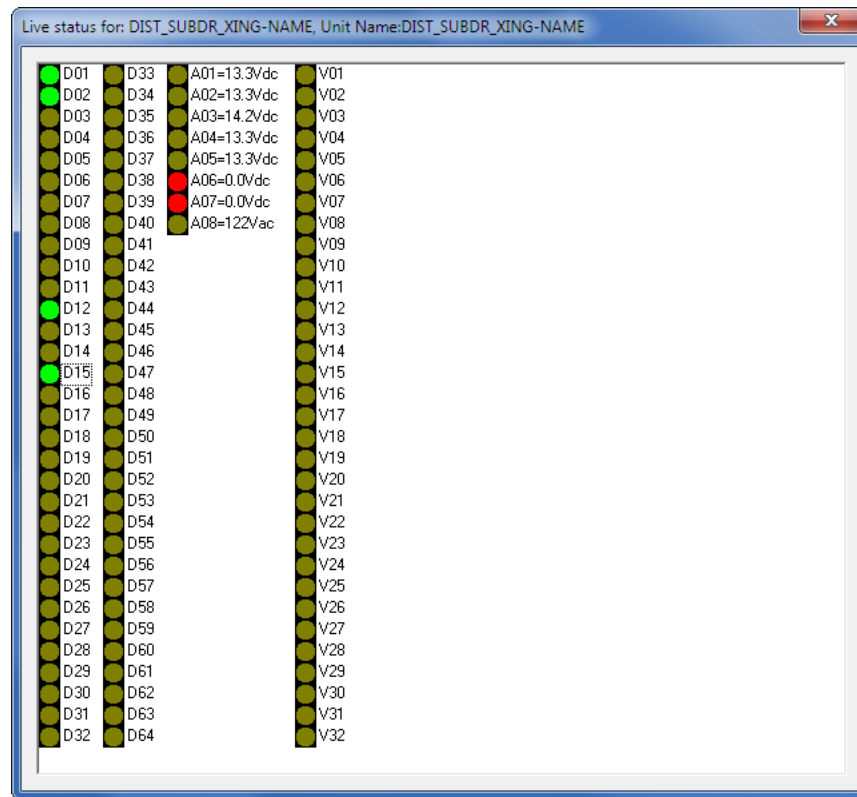
Launch GEA by double-clicking its desktop icon. Connect the MICRO-AIDE provided one-to-one cable to the appropriate comm port of the PC and the Terminal Port of the recorder you wish to access.

WHAT TO DO

VIEWING REAL-TIME STATUS

[Task 24](#) entitled "Live Status Views" described how the real-time status of each Digital and Analog Input could be viewed in a HyperTerminal window. GEA includes a similar feature that is graphical in nature rather than text based. To view the real-time status of each input, click the "Access>Status>Direct" command. After a delay of several seconds a screen similar to the following will be displayed.

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GEA Live Status

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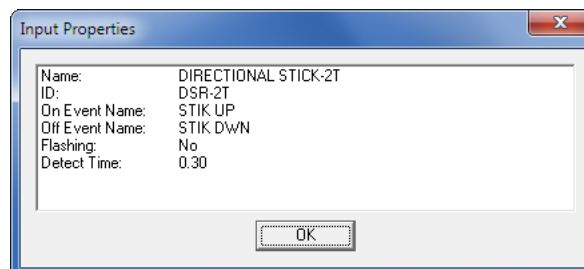
The Live Status screen simulates an array of LEDs. There is one LED per Digital, Analog and Virtual Input. Virtual Inputs can be ignored as they are not defined by any of the Metra Setup Databases. The simulated LEDs illuminate in accordance with the following rules.

Digital Inputs—If the input is On (adequate voltage is applied to its terminals) the LED is bright green. For example, D1 is On. If the input is Off (no voltage is applied to its terminals) the LED is dark green. For example D3 is Off.

Analog Inputs—If the input voltage is within its acceptable range of operation the LED is dark green. For example, A1 is within its acceptable range of operation. If the input voltage is outside its acceptable range of operation the LED is red. For example, A6 is outside its acceptable range of operation. The present voltage is also reported for each Analog Input.

The Live Status screen will update automatically as the status changes. Additional information regarding each input can be viewed by performing the steps described in the following section.

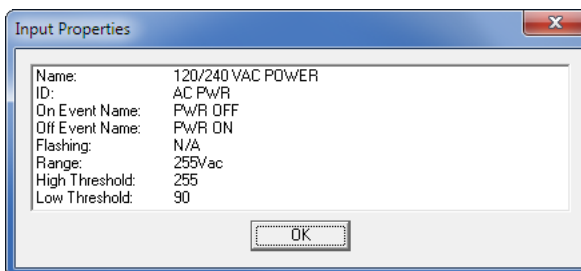
Digital Inputs—With your mouse, right-click the Input Number of any Digital Input (e.g., D17). Data similar to the following will be displayed.



Input Properties—Digital Input

The data includes all of the Setup Database information for the selected input.

Analog Inputs—With your mouse, right-click the Input Number of any Analog Input (e.g., A8). Data similar to the following will be displayed.



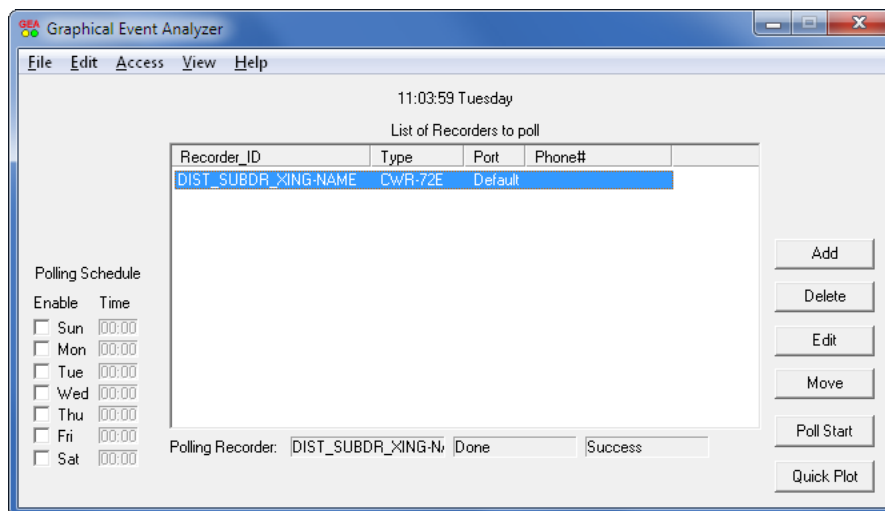
Input Properties—Analog Input

The data includes all of the Setup Database information for the selected input.

GETTING EVENT RECORDS FROM TODAY

Another simple command allows GEA to acquire all of the Event Records for the current day. The resultant file will include Event Records from midnight (i.e., 00:00:00) through the current time.

1. Click the list entry of the recorder you wish to access. The entry will be highlighted in blue. Click the "Access>Poll Todays Data>Direct" command.
2. GEA will proceed to establish communications with the selected recorder. Using the assigned Password, it will log on. GEA will then issue a series of commands allowing it to retrieve the requested data. GEA will save it as a binary file within a sub-folder of the Main GEA Data Folder. The sub-folder will be uniquely associated with and named after the selected recorder.
3. As shown in the following example, the status bar at the bottom of the GEA window is used to indicate the progress of the download.

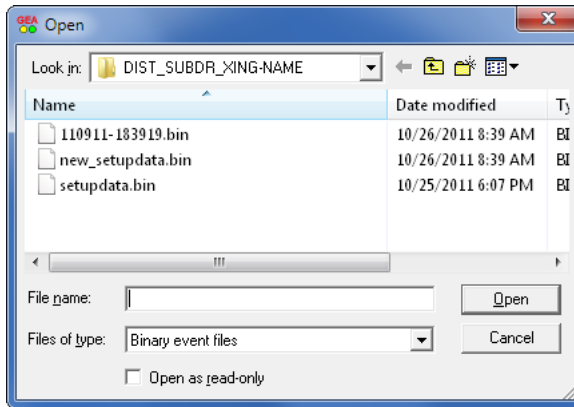


Status Bar Indicating Successful Retrieval

VIEW EVENT RECORDS

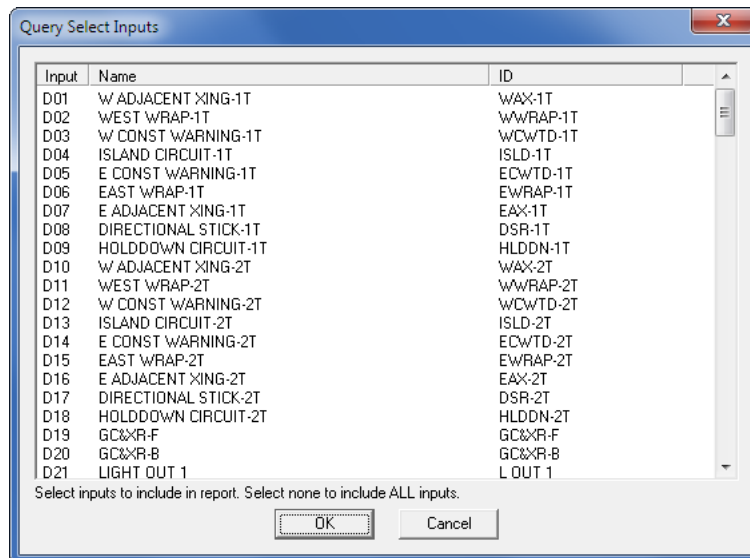
The previous exercise will create a binary Event Record file that will be saved within a sub-folder of the Main GEA Data Folder. The sub-folder is named after the selected recorder that was polled. The user is unable to view the highly compressed, binary Event Record file directly. However, a GEA command can be used to convert it into a readable text document.

1. Click the list entry of the recorder you wish to access. The entry will be highlighted in blue. Click the "View>Recorder Event Records" command. A screen similar to the following will be displayed.



Open File Dialog Box

2. The dialog box displays the contents of the sub-folder named "DIST_SUBDR_XING-NAME". The sub-folder contains a binary Event Record file named "110911-183919.bin". This is the file that the Poll Todays Data command created. The filename is in the form YYMMDD-hhmmss.bin, where the date and time reflect when the file was saved.
3. In the sample screen previously cited only one Event Record file is shown. Over time, many files will likely be saved to the sub-folder. Select the file you wish to view by clicking its filename. Click the button labeled "Open". A screen similar to the following will be displayed. The following list of Input Names is from the Mainline Setup Database.



Query Select Inputs Dialog Box

4. To view records from every input, click the button labeled "OK". To view records from specific inputs, click those inputs in the list. Use the normal Windows techniques of **Shift** and **Ctrl** clicking to select contiguous and non-contiguous ranges, respectively. Click the button labeled "OK" when you are done selecting inputs.
5. The Event Records will be displayed in an open Notepad file. The document will always be assigned a filename of "Events.txt". A small excerpt from a typical Events.txt file is shown in the following screen.


```

Events.txt - Notepad
File Edit Format View Help
CWR-72E Event record report for unit
DIST_SUBDR_XING-NAME
Report interval 09/11/11 00:00:00.00 to 09/11/11 23:59:59.99
15:31:58.75 09/11/11 EAST WRAP-1T EWRAP-1T TK DWN D06
15:32:14.89 09/11/11 W CONST WARNING-1T WCWTD-1T TK DWN D03
15:32:14.94 09/11/11 GC&XR-F GC&XR-F WARN ON D19
15:32:14.94 09/11/11 GC&XR-B GC&XR-B WARN ON D20
15:32:17.12 09/11/11 FLASH RATE 1 FLASH 1 FLASHON D22
15:32:17.13 09/11/11 FLASH RATE 2 FLASH 2 FLASHON D24
15:32:20.92 09/11/11 ALL GATES UP GATE UP NOT UP D26
15:32:26.42 09/11/11 SOUTHWEST PED GATE SWPG DWN GATE DWN D30
15:32:26.58 09/11/11 SOUTH GATE SG DWN GATE DWN D28
15:32:27.01 09/11/11 NORTHWEST PED GATE NWPG DWN GATE DWN D29
15:32:27.62 09/11/11 NORTH GATE NG DWN GATE DWN D27
15:32:54.90 09/11/11 ISLAND CIRCUIT-1T ISLD-1T TK DWN D04
15:33:08.47 09/11/11 ISLAND CIRCUIT-1T ISLD-1T TK UP D04
15:33:09.68 09/11/11 EAST WRAP-1T EWRAP-1T TK UP D06
15:33:10.16 09/11/11 W CONST WARNING-1T WCWTD-1T TK UP D03
15:33:10.36 09/11/11 GC&XR-B GC&XR-B WARN OFF D20
15:33:10.38 09/11/11 GC&XR-F GC&XR-F WARN OFF D19

```

Typical Events.txt Report

6. The file can be renamed and saved in any location the user desires. The Event Records are always reported using the single-line record format. Event Record formatting and content options are described in [Task 23](#).

User Notes

[illegible]

How to . . .

ACCESS SELECTED EVENT RECORD DATA

Task 38

QUERYING A SELECTED INTERVAL

The previous task described a method by which the current day's Event Records could be acquired and viewed as text. This task will describe a method that allows you to acquire record data that spans any range of times and dates. This method is referred to as the Query Selected Interval method.



Pay careful attention to the details of this task. It describes the method you will use in many cases to get Event Record data from the recorder that you will later read, plot and analyze.

BEFORE YOU START

You should be familiar with the steps necessary to launch your Windows operating system and log on as a user. You should also be familiar with basic Windows operations, such as selecting commands and using the mouse. To complete this task GEA must be properly installed on your PC. At least one recorder must be listed in the GEA window. To follow the example cited in this task, it is helpful if the recorder contains record data spanning two or more days. Finally, the Setup Database for each recorder must be saved. The latter is the subject of [Task 36](#).

Launch GEA by double-clicking its desktop icon. Connect the MICRO-AIDE provided one-to-one cable to the appropriate comm port of the PC and the Terminal Port of the recorder you wish to access.

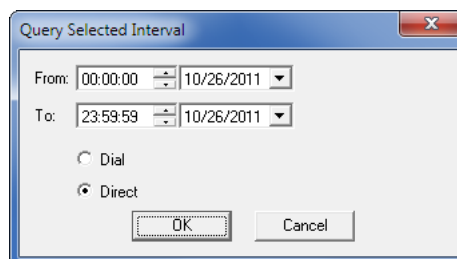
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WHAT TO DO

GET RECORDS FROM A SELECTED INTERVAL

To acquire Event Record data from an arbitrary interval, perform each of the following steps.

1. Click the list entry of the recorder you wish to access. The entry will be highlighted in blue. Click the "Access>Query Selected Interval>Get Data" command. A screen similar to the following will be displayed.



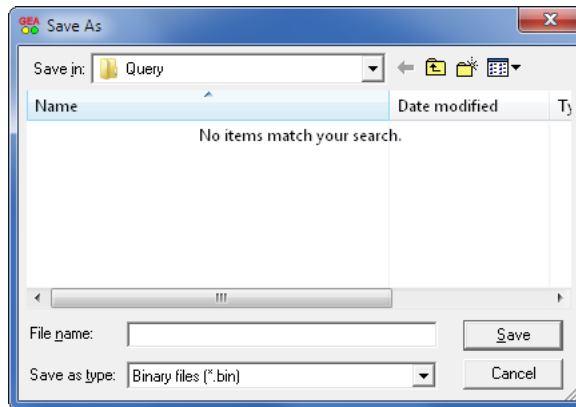
Query Selected Interval Dialog Box

2. The four entry boxes allow you to specify any start and end time and any start and end date. Click the down arrow on either of the drop-down list boxes along the right side. A calendar of dates will appear as shown in the following. Select the month and then click a date. The box will immediately close.



Calendar of Dates

Make sure that the times and dates reflect the desired interval. The radio button labeled "Direct" should be enabled. Click the button labeled "OK". The following dialog box will be displayed.



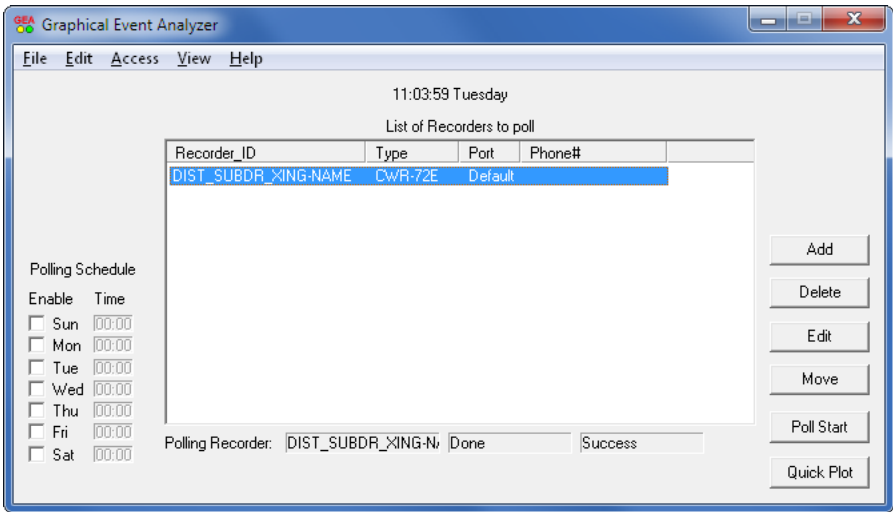
Save As Dialog Box

3. In the edit box labeled "File name:" type a descriptive name for the file. The filename can be any Windows acceptable name such as "Dundee Incident 09-11". The .bin file extension will be added automatically. Click the button labeled "Save" to proceed.



As noted in the Save As Dialog Box, the new file will be saved in a sub-folder named Query. GEA will automatically create the Query sub-folder. It exists within the sub-folder associated with the selected recorder. Unless you navigate to another location, the Query Selected Interval command will always save the data file it creates in the Query sub-folder.

4. GEA will proceed to establish communications with the selected recorder. Using the assigned Password, it will log on. GEA will then issue a series of commands allowing it to retrieve the requested data.
5. As shown in the following example, the status bar at the bottom of the GEA window is used to indicate the progress of the download.



Status Bar Indicating Successful Retrieval

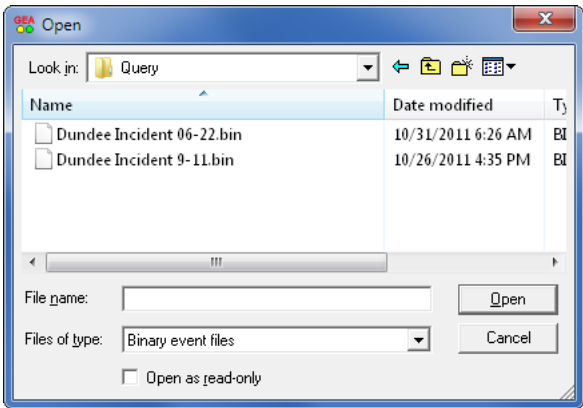
- 6. At the completion of the data transfer, the "Dundee Incident 9-11.bin" file (for the example cited herein) will be available for viewing and plotting.

VIEW THE QUERY EVENT RECORDS

The previous exercise will create a highly compressed binary data file. It will be saved in a sub-folder named "Query" The user is unable to view the file directly. However, a GEA command can be used to convert it into a readable text document.

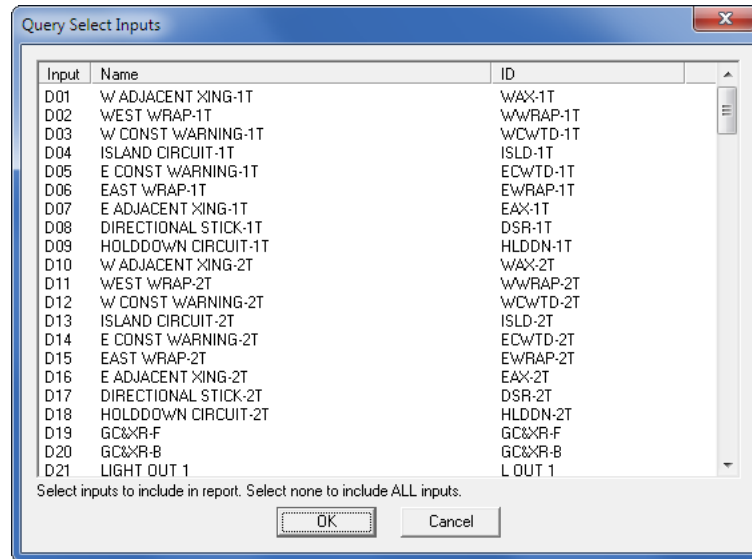
- 1. Click the list entry of the recorder you wish to access. The entry will be highlighted in blue. Click the "Access>Query Selected Interval>View Data" command. A screen similar to the following will be displayed.

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Open File Dialog Box

- 2. By default the dialog box will always display the contents of the Query sub-folder. In the sample screen previously cited only one Event Record file is shown. Over time, many files will likely be saved to the sub-folder. Select the file you wish to view by clicking its filename. Click the button labeled "Open". A screen similar to the following will be displayed. The following list of Input Names is from the Mainline Setup Database.



Query Select Inputs Dialog Box

3. To view records from every input, click the button labeled "OK". To view records from specific inputs, click those inputs in the list. Use the normal Windows techniques of **Shift** and **Ctrl** clicking to select contiguous and non-contiguous ranges, respectively. Click the button labeled "OK" when you are done selecting inputs.
4. The Event Records will be displayed in an open Notepad file. The document will always be assigned a filename taken from the original binary data file. As an example, the "Dundee Incident 9-11.bin" file will yield a text file named "Dundee Incident 9-11.txt". It too will always be saved in the Query sub-folder.
5. The Event Records are always reported using the single-line record format. Event Record formatting and content options are described in [Task 23](#).

How to . . .

COPY FLASH DRIVE DATA

Task 39

TRANSFERRING FLASH DRIVE FILES TO GEA

Task 21 described a procedure for saving Event Record data to a flash drive device. The recorder will save files to the USB flash drive in a manner that is completely compatible with GEA. Once the flash drive files are copied to the appropriate sub-folder in your PC, GEA can be used to read and plot the record data. This task will describe how the transfer of flash drive files to your PC is performed.

BEFORE YOU START

You should be familiar with the steps necessary to launch your Windows operating system and log on as a user. You should also be familiar with basic Windows operations, such as selecting commands and using the mouse. To complete this task GEA must be properly installed on your PC. To follow the example cited in this task, your USB flash drive must contain record data from at least one Save operation.

Launch GEA by double-clicking its desktop icon. Insert the flash drive into any available USB port on your PC.

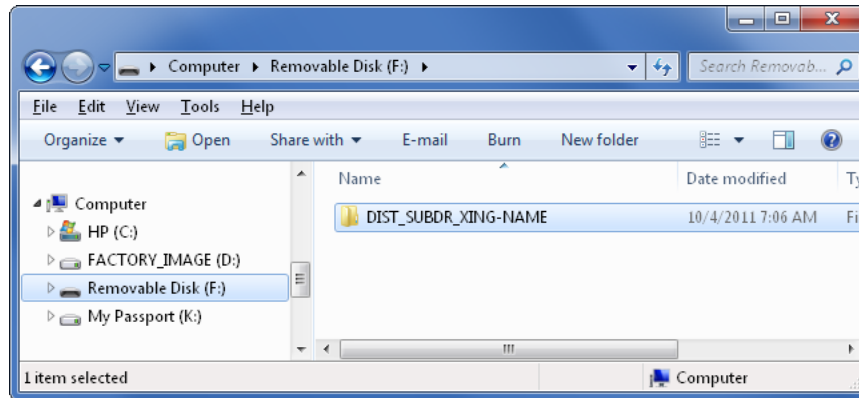
WHAT TO DO

COPYING THE FILES

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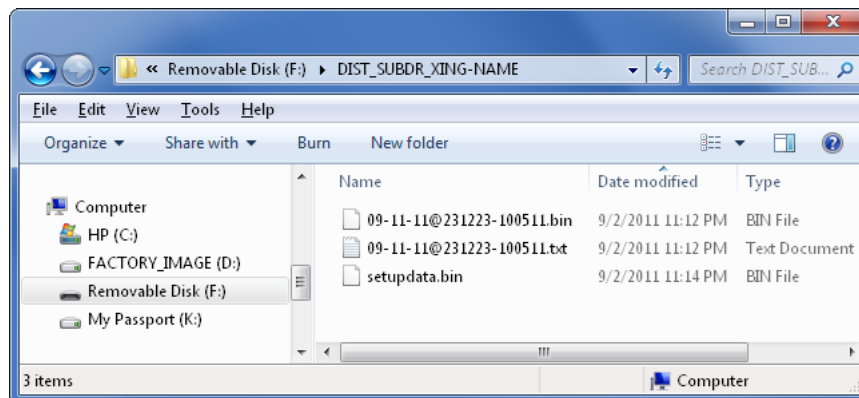
Our objective is to copy files from the flash drive to specific locations within the Main GEA Data Folder. The following procedure explains how this is accomplished by using Windows Explorer.

1. Using your mouse, click in the lower left-hand corner of your desktop in the area labeled "Start". Then click in the area labeled "All Programs".
2. Click on the folder labeled "Accessories" to expand it.
3. Click the sub-list item labeled "Windows Explorer". Click the link, located along the left column of the Windows Explorer window, that is labeled "Computer". This will display the various drives that your PC can access.
4. The USB flash drive will be identified as a removable media with a single letter designator of "E:", "F:", etc. Click its icon or link to reveal its contents. Verify that the flash drive contains a folder named after the recorder that was used in the Save operation. In the following example, the folder and recorder are named "DIST_SUBDR_XING-NAME".



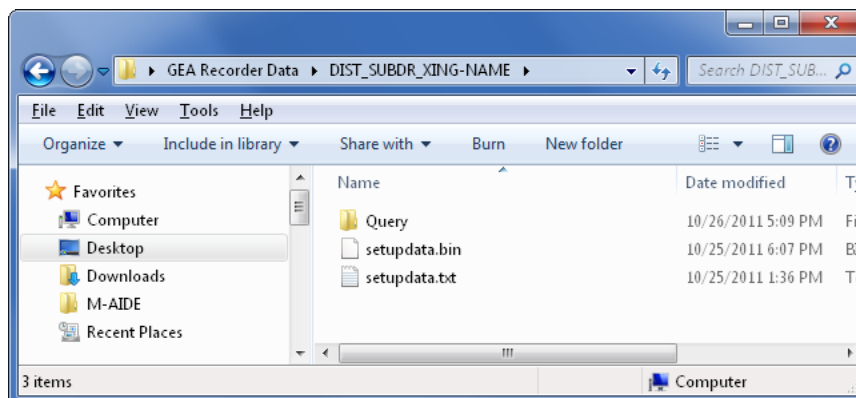
Windows Explorer–Recorder's Folder Shown

5. Double-click on the folder to open its contents. The folder contents will reveal a minimum of three files as shown in the following screen. The folder will contain a .txt file and .bin file for each Save operation that was performed. A file named "setupdat.bin" will also be included.



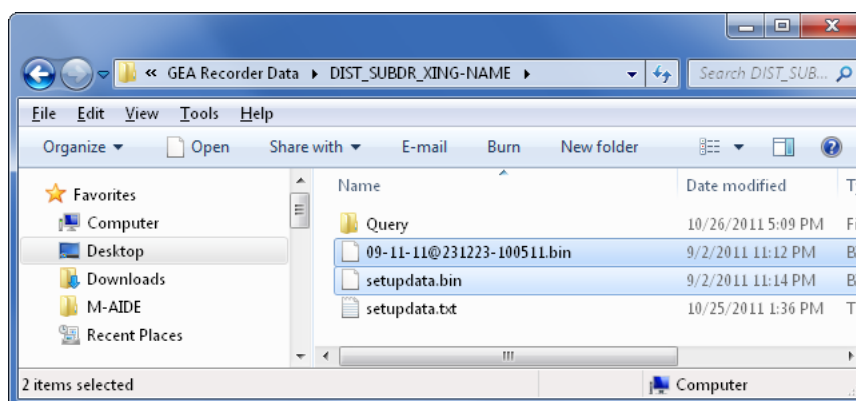
Windows Explorer–Recorder's Files Shown

6. Click the file named "setupdata.bin". **Ctrl**-click the Event Record binary file that was saved. For the sample data shown, it is named "09-11-11@231223-100511.bin". Both files should now be highlighted. Right-click the highlighted files. Select the command labeled "Copy" from the context menu.
7. Using Windows Explorer, navigate to the Main GEA Data Folder. If you have followed the recommendations in this guide, it will be located on your desktop and named "GEA Recorder Data". Click on the folder to reveal its contents. It may contain several files and folders. However, it will contain a folder named after the recorder whose data you have copied. For the example cited, it is named "DIST_SUBR_XING-NAME".
8. The following screen depicts the contents of a sample recorder sub-folder.



Windows Explorer–Recorder Sub-Folder Contents

9. Move your mouse to a blank area within the right-side pane of the window and right-click. From the context menu that appears, select the command labeled "Paste".
10. You have successfully copied the files to the GEA sub-folder uniquely associated with the recorder that was used to perform the original Save operation. In the example cited herein, Windows Explorer will reveal the following folder contents. Note the Event Record data file named "09-11-11@231223-100511.bin".



Windows Explorer–Sub-Folder After Paste

HELPFUL TIPS

When copying files from your flash drive to a sub-folder of the GEA Recorder Data folder, the following tips may prove to be helpful.

- More than one Event Record binary data file can be copied and pasted at a time. In step 6 simply **Ctrl**-click additional .bin files saved on the USB flash drive.
- Do not copy and paste any .txt files. You can use GEA to read the contents of record and database files. Copying .txt files does no harm to GEA, but after time these files may become numerous and therefore add possible confusion over the contents of the recorder sub-folders.
- The recorder sub-folder may already contain a copy of the setupdata.bin file. This was discussed in the section entitled "[Downloading the Setup Database](#)" on page 126. If it does have the file, there is no need to copy it from the USB flash drive. On the other hand, if the file is missing then it must be copied.

VIEW EVENT RECORDS COPIED FROM THE FLASH DRIVE

This task has explained how to copy flash drive data to appropriate folders that GEA can access. The Event Record binary data files can now be translated by GEA into readable text. This can be done as previously described in [Task 37](#). Refer to the section entitled "[View Event Records](#)" on [page 131](#).

**Task
40****USING THE PLOT WINDOW FEATURES**

The three preceding tasks have described how GEA can access Event Record data and how it can be read in text form via a .txt document. The Poll Today's Data, Query Selected Interval and USB file transfer features provide GEA with Event Record data that is saved in the recorder's sub-folder or its Query folder. This task will describe a variety of techniques that can be used to plot your data and then highlight, analyze, print and capture the plotted image.

BEFORE YOU START

You should be familiar with the steps necessary to launch your Windows operating system and log on as a user. You should also be familiar with basic Windows operations, such as selecting commands and using the mouse. To complete this task GEA must be properly installed on your PC. To follow the examples cited in this task, the GEA Recorder Data folder must contain at least one Event Record data file.

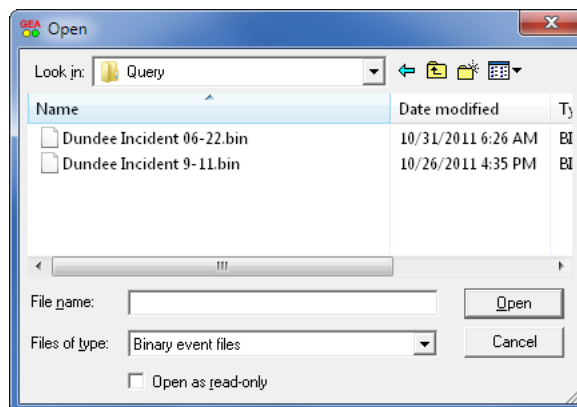
Launch GEA by double-clicking its desktop icon.

WHAT TO DO**BASIC PLOTTING TECHNIQUES**

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To plot Event Record data you'll begin by selecting either of two commands. Both procedures will yield identical results. The choice of the initial step is yours. After that, perform each of the succeeding numbered steps to create a basic plotted image. Several GEA features can then be employed to further refine the content of the Plot Window. Each of these features is described as a separate topic (e.g., Sizing, Panning and Zooming).

1. Click the list entry of the recorder you wish to access. The entry will be highlighted in blue. Click the "Access>Query Selected Interval>Plot Data" command. Alternatively, click the "View>Plot Event Records" command. In either case, an open file dialog box similar to the following will be displayed.



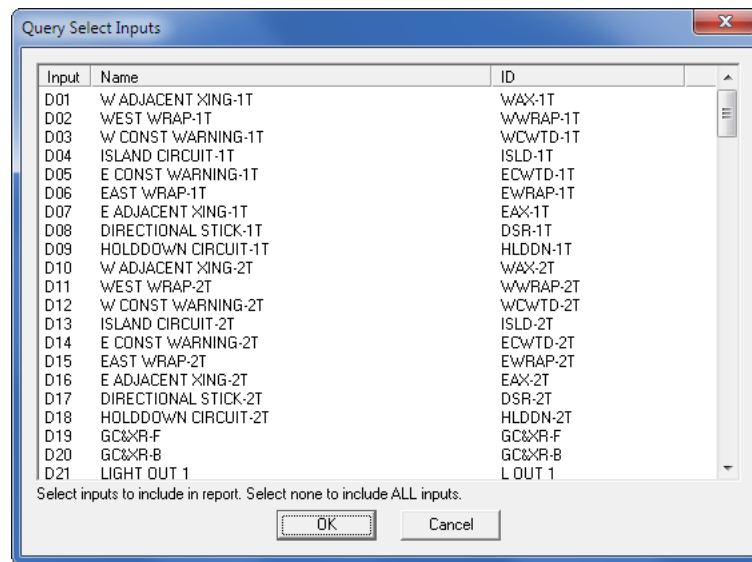
Open File Dialog Box

2. Navigate to and select the file that you wish to plot. Click the button labeled "Open". The following dialog box may open if you have not previously plotted data from this recorder. If it does, click the

button labeled “OK” to plot all of the inputs. If the dialog box does not appear, proceed to the next step.

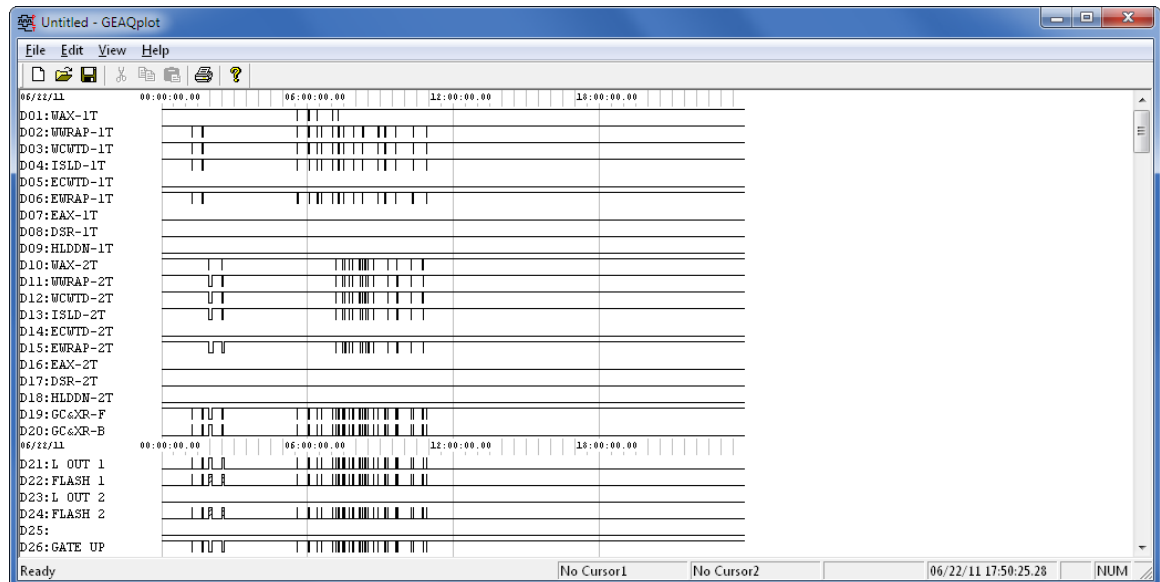


GEA can only plot Event Record data files with a .bin extension. If you wish to plot a file that was saved as the result of a Query Selected Interval command, the data file will reside in the Query sub-folder.



Query Select Inputs Dialog Box

3. The GEA Plot Window will be displayed in its basic form. An example is shown in the following.



Basic Plot Window

The Plot Window will be described in more detail in the following sections. However, you should note that it always includes the following properties.

Menu Bar–The Menu Bar is located along the top edge of the window. It includes several commands that allow you to control the content and appearance of the window.

Time Scale–Just below the Menu Bar is a time scale that changes automatically as the zoom factor is changed.

Plotting Channels–The Plot Window includes 256 channels, each of which can be assigned a specific input to plot. Each plotted input is identified by its assigned Input Identifier (e.g., WAX-1T).

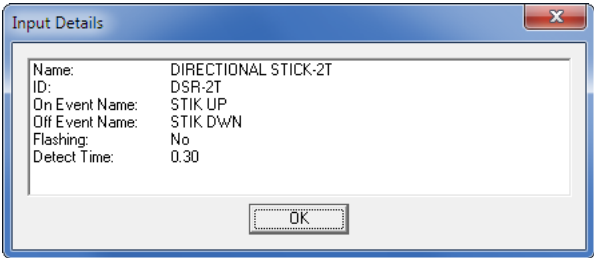
Scroll Bars–Horizontal and vertical scroll bars are available along the bottom and right side of the Plot Window.

Status Bar–At the very bottom of the Plot Window is the Status Bar. The Status Bar is used to provide information regarding the Plot Window content when various optional features are used.

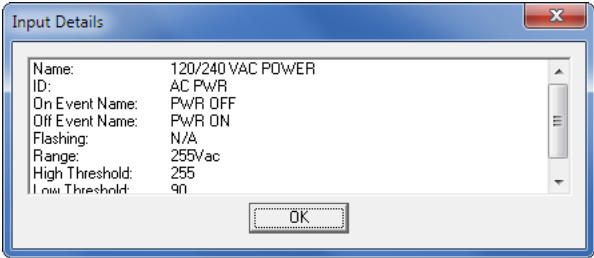
The content and appearance of the Plot Window can be controlled by using several different features. The basic methods of doing so are described in the following sections. The sample screen entitled “Plot Window Showing Different Content and Appearance” on page 147 depicts a Plot Window in which several of the following features have been employed.

GETTING INPUT INFORMATION

Before you alter the content or appearance of the Plot Window it may be helpful to review which inputs are assigned to which channels. Information saved in the Setup Database for each input can be easily viewed. Position the mouse over the Input Identifier of interest. Right-click the mouse. From the context menu, select the “Details...” command. The following dialog boxes depict information for Digital Input D17 and Analog Input A8.



Input Details–Digital Input

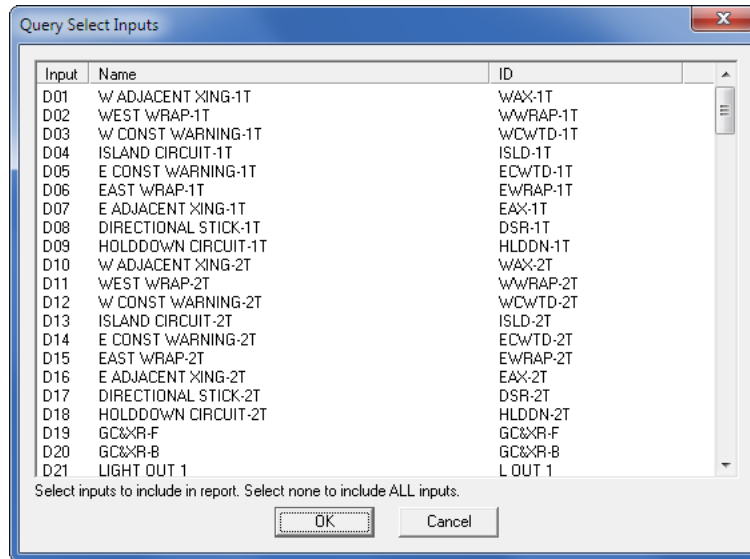


Input Details–Analog Input

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SELECTING INPUTS

The Plot Window always includes 256 channels, ordered 1 through 256, top to bottom. However, the assignment of inputs to channels is under your control. To change a channel's presently assigned input, position the mouse over the Input Identifier. Right-click the mouse. From the context menu, select the “Select Input(s)...” command. A dialog box similar to the following will be displayed.



Query Select Inputs Dialog Box

Click the input you wish to plot. Click the button labeled "OK". The channel will now plot the input you selected. Reassign other channels using the same technique.

A variation of this procedure can be used to change several channel assignments at once. Instead of selecting a single input from the dialog box, select several. The additional inputs you select will be assigned to channels in consecutive order. As an example, if you start with channel 12 and select 10 inputs, channels 12 through 21 will be reassigned. The new assignments will follow the numerical order of the inputs taken from lowest to highest. Selected inputs do not have to be contiguous. Non-contiguous inputs can be selected by pressing the **Ctrl** key while clicking the mouse.

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MOVING AN INPUT

Channels are always ordered from top to bottom as 1 to 256. This cannot be changed. Normally, Digital Inputs 1 through 64 will be assigned channels 1 through 64. Analog Inputs 1 through 8 follow and they are assigned channels 65 through 72. Although not defined by the Metra Setup Databases, the 32 Virtual Inputs follow the Analog Inputs. The remaining channels are initially left unassigned.

In some cases it may be helpful to change the top-to-bottom order of plotted inputs. To do so, position the mouse over the Input Identifier that will be moved. Left-click the mouse. Without releasing the button, drag the mouse vertically to the desired channel location and release the mouse button. The Plot Window will be immediately redrawn. Move additional inputs using the same technique.

REMOVING AN INPUT

You may not wish to plot an input that does not provide useful information for the incident or maintenance issue you are addressing. In this case, the input should be removed from its presently assigned channel. Position the mouse over the Input Identifier that will be removed. Right-click the mouse. From the context menu, select the "Remove" command. The plot of the vacated input will be blank and the channel's assigned Input Identifier will read "(none)". Remove additional inputs using the same technique.

SIZING, PANNING AND ZOOMING

Sizing—Like any Windows application, its window size can be changed by dragging any of its four borders. It can also be maximized to fill your monitor.

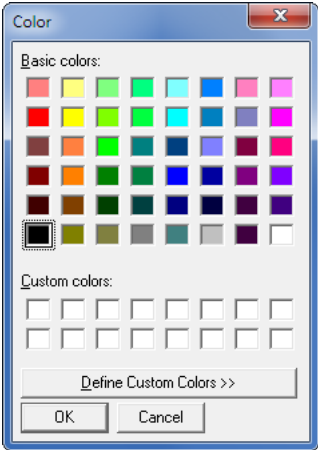
Panning—After you have sized the window to your liking you may wish to pan the view either left or right. To do so, click in a blank area of the window and then drag left or right. The plot area near the horizontal

location where the initial click occurred will be relocated to the area where you release the mouse button. You can also change the view by moving the horizontal and vertical scroll bars.

Zooming—Position the mouse in the area you wish to zoom in or zoom out. Right-click and select the zoom in or zoom out factor you prefer. Zoom factors of 2, 4, 8 and 16 are available. Alternatively, use the Menu Bar commands named "View>Zoom In" and "View>Zoom Out".

ASSIGNING A COLOR TO A CHANNEL

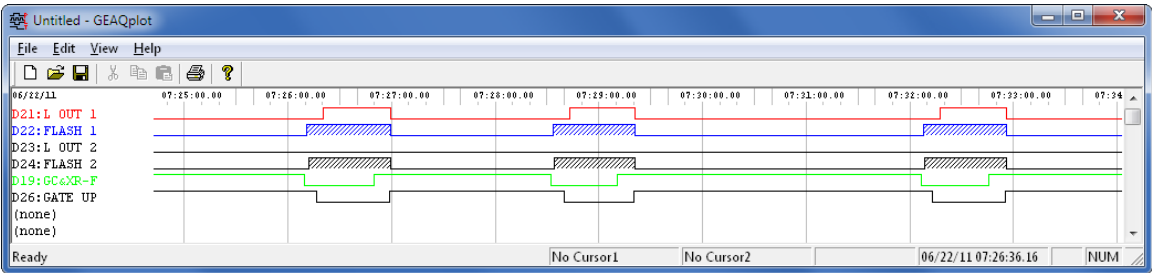
Normally a channel will be plotted in black. To draw attention to a particular input, you may wish to change its color. Position the mouse over the Input Identifier whose color will be changed. Right-click the mouse. From the context menu, select the "Color..." command. The following dialog box will be displayed.



Assign Color Dialog Box

Click any color chip followed by the button labeled "OK". The channel's entire content will be drawn in the newly assigned color. Color additional channels using the same technique.

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Plot Window Showing Different Content and Appearance

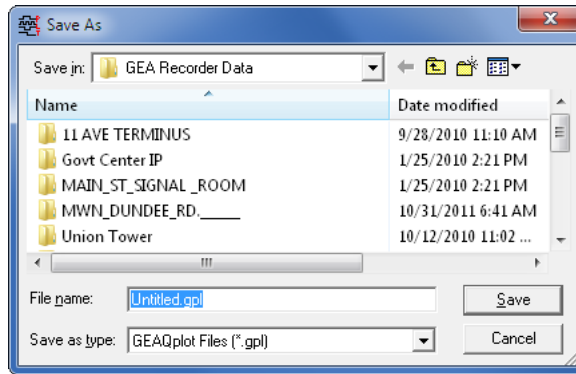
ADVANCED PLOTTING TECHNIQUES

The previous section described the plotting techniques that are most commonly used. Once you become familiar with their use, you may wish to employ additional techniques that provide even greater control of the Plot Window.

SAVING AND OPENING A PLOT TEMPLATE

In the previous section you learned how to assign, move, remove and color an input. This allowed you to reorder the top-to-bottom sequence of plotted inputs. The result is a Plot Window suited to your specific needs. The template feature allows you to save the Plot Window assignments you created. The saved template can then be reused to plot other data according to your preferences. Using this feature, you may create several different templates for specialized needs. As an example, one template may be used for analyzing approach time issues. Another template may be used to investigate gate up and down problems. Yet another may be established as part of a Metra-defined standard.

To create a plot template, first create the Plot Window content and appearance you desire. Once this is done, click the "File>Save" command. A dialog box similar to the following will be displayed.



Template Save As Dialog Box

Give the template any filename that helps describe its intended use. Save the template in the Main GEA Data Folder. Saved templates can be used on any Event Record data that is from a similar recorder. For this reason you may not wish to save it in the sub-folder of a specific recorder. Saved templates must include a file extension of .gpl which will be automatically assigned.

To apply a saved template to a basic Plot Window, click the "File>Open" command. Navigate to, select and open the .gpl template file you require. The template will immediately redraw the Plot Window in accordance with the channel assignments and colors you defined.

Saving and applying templates are illustrated in Figure 21. The upper portion of the figure shows how a basic Plot Window has been modified. The result is saved as a template file. The lower part of the figure shows how a saved template is applied to a basic Plot Window to modify its content and appearance.

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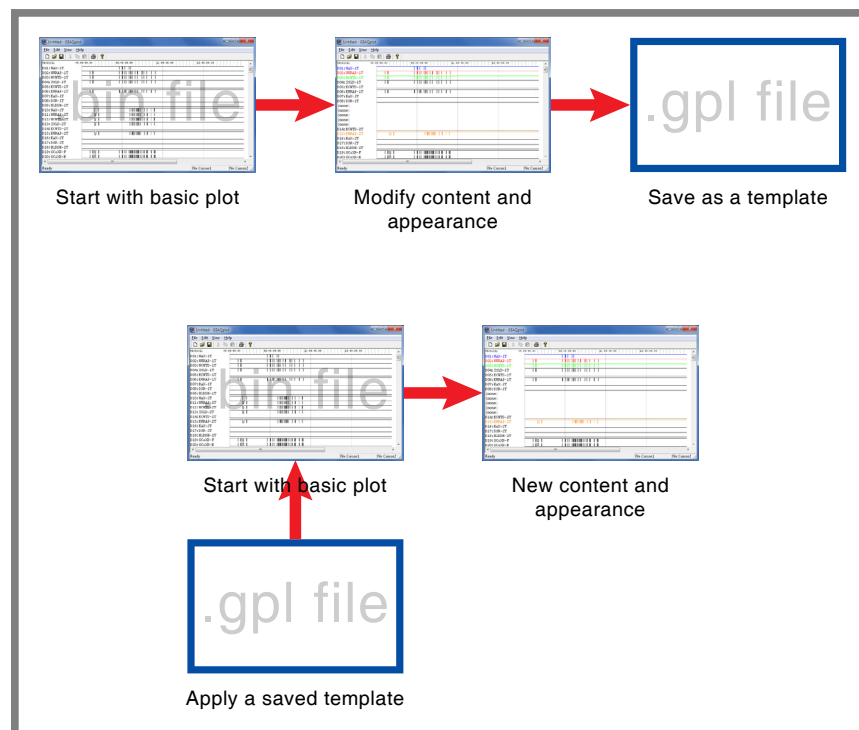




Figure 21: Saving and Applying a Template

- 

It is important to remember that saving a template is not the same as saving the record data. The data was saved when GEA accessed the recorder and created a .bin record file. The saved template contains the rules that govern the channel content and appearance.
- 

Templates do not save the pan, scroll position, zoom or cursor settings.

GETTING EVENT RECORD DETAILS

A plotted input will depict a series of high and low levels. [Figure 22](#) illustrates how events are graphically represented as level transitions.

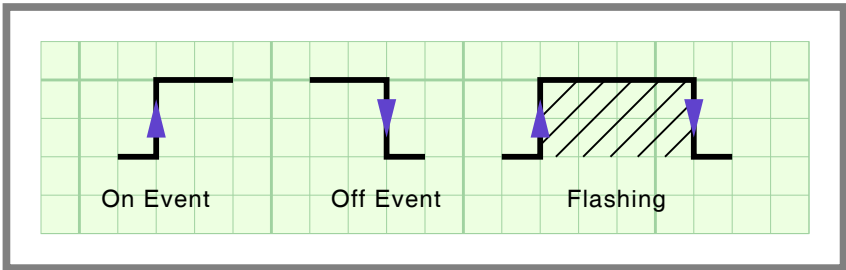


Figure 22: How Events are Plotted

Only an Event Record saved to the memory of the recorder will change the level of a plotted input. This allows you to view Event Record details at the moment when the level changes. This can be done by positioning the mouse within a few pixels of a level transition. Right-click the mouse. From the context menu, select the "Details..." command. A dialog box similar to the following will be displayed.

Event Details

Digital Event Details

Input: D19

Time: 06/22/11 07:26:09.48

Name: GC&R-F

ID: GC&R-F

Event: WARN ON

Analog Event Details

Inp	Name	ID	Value
A01	ELECTRONIC BATTERY	B12-N12	12.4Vdc
A02	CROSSING BATTERY	B14-N14	0.0Vdc
A03	LINE BATTERY	B-N	13.7Vdc
A04	BATTERY EAST	BL-NL/E	25.6Vdc
A05	BATTERY WEST	BL-NL/W	0.0Vdc
A06			25.6Vdc
A07			0.0Vdc
A08	120/240 VAC POWER	AC PWR	1Vac

OK

Event Details Dialog Box

The dialog box will list the Setup Database information for the input. The date and time of the event will be listed along with the voltage levels of each Analog Input. Click the button labeled "OK" to close the dialog box and return to the Plot Window.

SETTING CURSORS AND MAKING TIME MEASUREMENTS

The Plot Window can also be used to calculate time differences between events. This feature requires that you set two cursors. Set the position of the first cursor by positioning the mouse within a few pixels of an event. From the context menu select the "Cursor1 > Set" command. A green vertical line and large "X" will mark the position of the first cursor. Set the position of the second cursor by positioning the mouse within a few pixels of another event. From the context menu select the "Cursor2 > Set" command. A red vertical line and large "X" will mark the position of the second cursor.

From left to right, the Status Bar will indicate the date and time position of both cursors and the time difference between them. The fourth field in the Status Bar shows the date and time of the current mouse position. As you move the mouse the contents of the field will change.

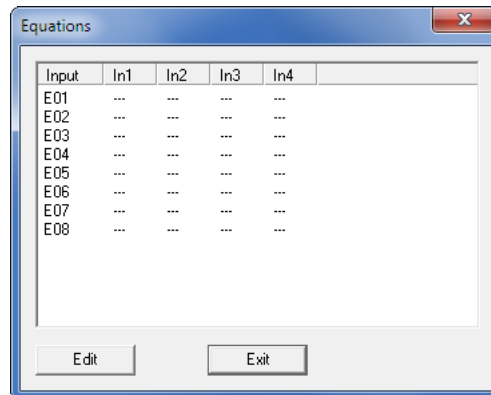
To remove a cursor, position the mouse within a few pixels of its vertical line. Right-click the mouse. From the context menu select the "Cursor1 > Clear" or "Cursor2 > Clear" command.

CREATING EQUATION OUTPUTS

Each record data file that GEA acquires includes information for every input during a specific time span. A common analysis method is to look at the plotted data for the occurrence of one or more relay states. This can be a very time consuming process. The Equation Output feature allows you to define a logical association among several inputs and then plot its results. The Equation Output feature will automatically sift through all of the data and then plot a result based upon the logical association you defined. This can save you a great deal of time and yield an error-free result.

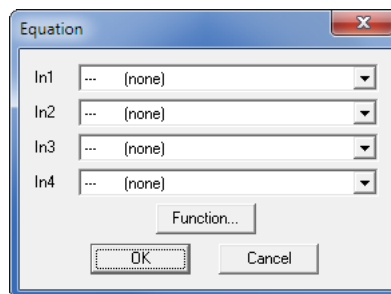
To define an Equation Output perform the steps listed below.

1. From the Menu Bar of the Plot Window click the "Edit > Edit Equations" command. The following dialog box will be displayed.



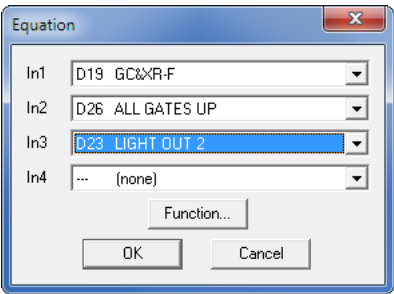
Equations Dialog Box—Shown Empty

2. Click anywhere along the row of one of the eight Equation Outputs labeled "EO1" through "EO8". The selected Equation Output will be highlighted in blue. Click the button labeled "Edit". A dialog box similar to the following will be displayed.



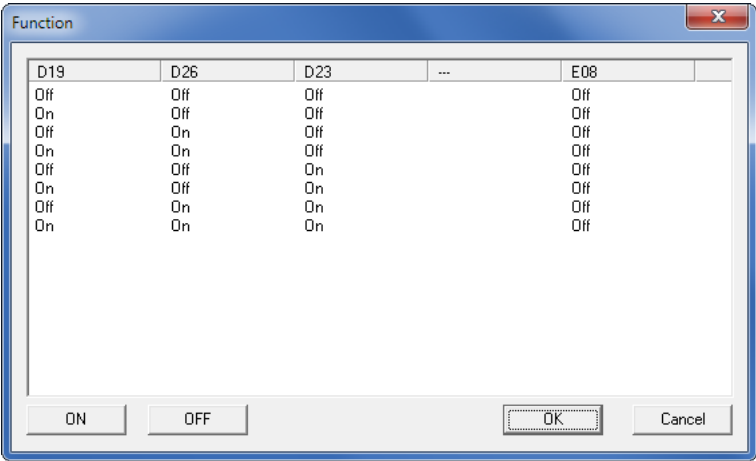
Equation Variables Dialog Box—Shown Empty

3. The selected Equation Output can be a function of one to four inputs. To assign an input as a variable, click any of the four drop-down list boxes. Select an input from the list. Using the same procedure assign additional inputs as required. The following screen depicts a typical assignment using three inputs.



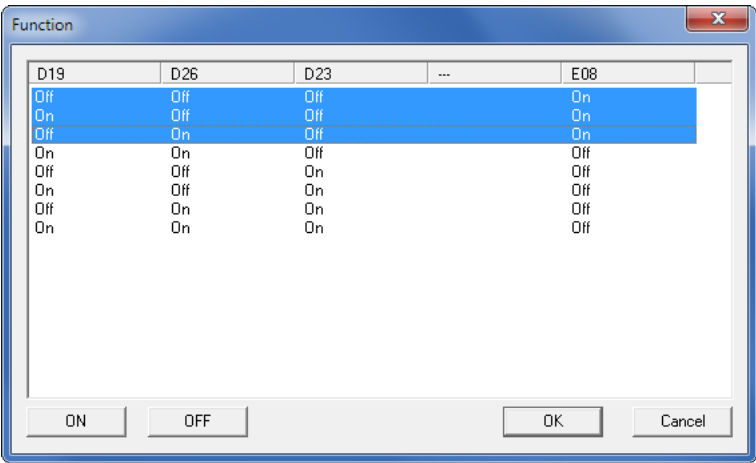
Equation Variables Dialog Box–Typical Example

4. For the example cited, the Equation output will be a function of Digital Inputs D19, D23 and D26. To complete the definition click the button labeled “Function...”. A dialog box similar to the following will be displayed.



Function Dialog Box–Shown Empty

5. With three assigned variables the sample Equation Output function must include eight distinct states. Define the function by first selecting one of the rows. It will be highlighted in blue. Click the button labeled “ON” or “OFF” as required by the definition you are establishing. The following screen highlights in blue the states labeled as “ON”.



Function Dialog Box–Typical Example

6. Close the dialog box named “Function” by clicking its button labeled “OK”. Do the same for the dialog box named “Equation”. Finally, complete the Equation Output definition by closing the dialog box labeled “Equations”. Click the button labeled “Exit”.

For the example cited herein, Equation Output EO8 has been defined. An Equation Output can be assigned to any channel. Refer to the procedure described in the section entitled "Selecting Inputs" on page 145. Equation Outputs are listed at the very end of the Query Select Inputs dialog box.

PRINTING THE PLOT WINDOW

The Plot Window can also be printed just as any other document or image is printed. The "File>Print...", "File>Print Preview" and "File>Print Setup..." commands are used in the regular Windows-defined manner. The following information may assist you in creating a better hardcopy print-out.

- Select the landscape / portrait setting that yields the best print-out.
- The horizontal dimensions of the print-out will include all areas of the Plot Window irrespective of the horizontal scroll bar's position. In other words, if the on-screen Plot Window, is showing 75% of the horizontal area, the printed image will include 100% of the horizontal area that can be scrolled.
- Additional pages will be printed to accommodate the vertical size of the Plot Window. However, channels at the bottom of the Plot Window that are not assigned an input are ignored. Unassigned channels in the middle of the Plot Window are printed. Pages are never added to accommodate the horizontal dimensions of the Plot Window. The printed image is instead scaled as noted in the previous point.
- Channels, cursors and equations will be printed in color as they appear on screen, provided a color printer is used.
- The time scale is printed at the top of each page.
- The recorder's assigned Unit Name is always printed at the bottom of each page.

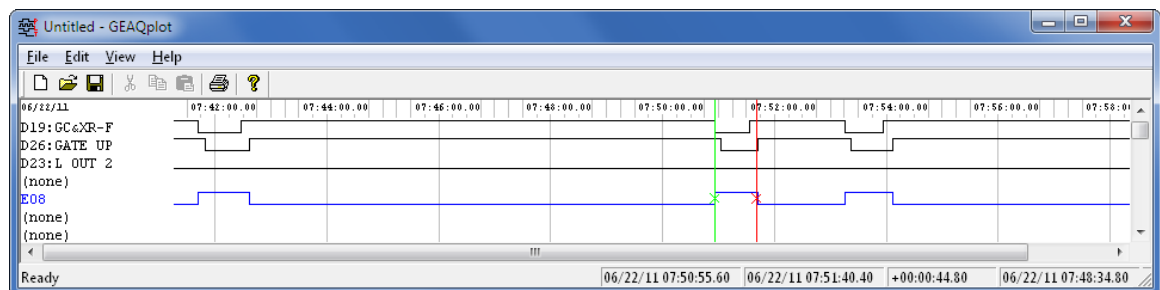
CAPTURING AND ANNOTATING THE PLOT WINDOW

The Plot Window image you have carefully crafted may need to be included in a report to a supervisor or manager for further review. GEA includes another feature that can assist you with this requirement.

Once you have the Plot Window content and appearance properly set, click the "Edit>Capture Window" command. The Windows Paint application will be launched and the Plot Window image will be pasted into a new Paint document. The user can use all of the normal Paint tools to annotate the image. The final image can be saved as a .png, .bmp, .jpeg, .gif or .tif file. The saved image can then be imported into a document accompanied by descriptions and explanations.

ADVANCED PLOTTING EXAMPLE

Some of the advanced plotting techniques are depicted in the following screen. Both cursors have been set at the edges of an Equation Output EO8 pulse. The Status Bar is reporting the cursor dates and times as well as the time difference between cursor positions.

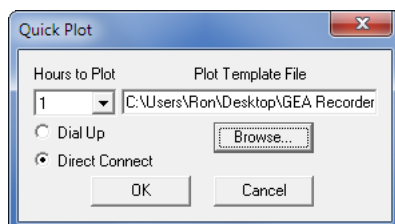


Plot Window Showing Cursors and an Equation Output

QUICK PLOT FEATURE

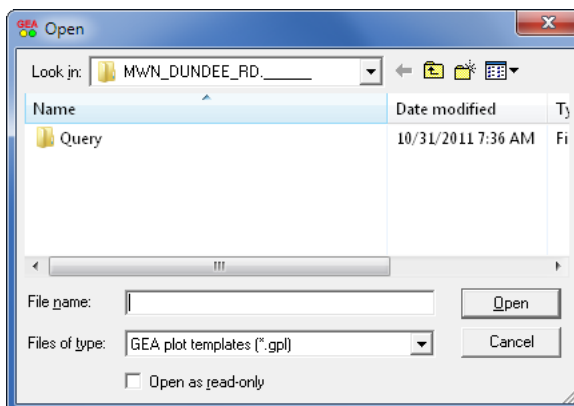
If you are involved in the urgent analysis of a crossing incident, it may be that the Quick Plot feature will be helpful. With just a few clicks of the mouse you can view plotted data that was recently saved. To use this feature perform each of the following steps.

1. In the GEA window, click the list entry of the recorder you wish to access. The entry will be highlighted in blue. Click the button located along the left side labeled "Quick Plot". The following dialog box will be displayed.



Quick Plot Dialog Box

2. Select a Plot Template by clicking the button labeled "Browse...". A dialog box similar to the following will be displayed.



Select a Plot Template Dialog Box

3. Navigate to and select the Plot Template you prefer. If a template has not been saved for the selected recorder, navigate to the GEA Recorder Data folder and select the PlotAll.gpl template. Plot Templates are described in the section entitled ["Saving and Opening a Plot Template" on page 147](#). Click the button labeled "Open". The Quick Plot dialog box shown in step 1 will once again be displayed.
4. In the drop-down list box labeled "Hours to Plot", select a time frame. The setting you select is measured backwards from the present time. As an example, if it is presently 10:15 and you select 2 hours, the plotted data will be from 8:15 through 10:15. Make sure the radio button labeled "Direct" is enabled. Click the button labeled "OK".
5. GEA will proceed to establish communications with the selected recorder. Using the assigned Password, it will log on. GEA will then issue a series of commands allowing it to retrieve the data for the time frame you specified in step 4.
6. Once GEA acquires the record data you have requested, it will plot it in accordance with the Plot Template you selected in step 3. At this point you are free to alter the content and appearance of the Plot Window as previously described.

REAL-TIME PLOTTING

The plotting commands previously described have one thing in common. They plot record data that was previously saved by the recorder. The plotted data is historical in nature. However, the Real-Time Plotting

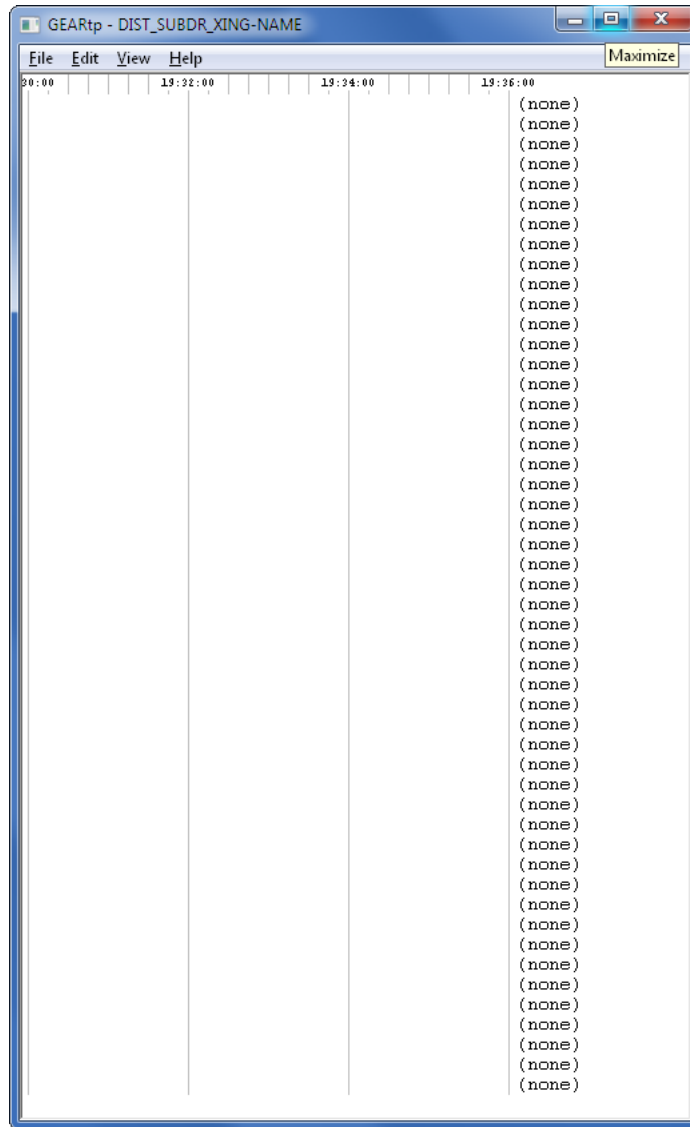
feature can be used to view the status of multiple inputs in real-time. To plot in real-time, perform the steps listed in the following.

1. In the GEA window, click the list entry of the recorder you wish to access. The entry will be highlighted in blue. Click the "Access>Real Time Plot>Direct" command.
2. GEA will proceed to establish communications with the selected recorder. Using the assigned Password, it will log on. GEA will then issue a series of commands allowing it to retrieve the real-time status of inputs for up to 50 channels.



The number of plotted channels depends upon the size and resolution of the monitor being used.

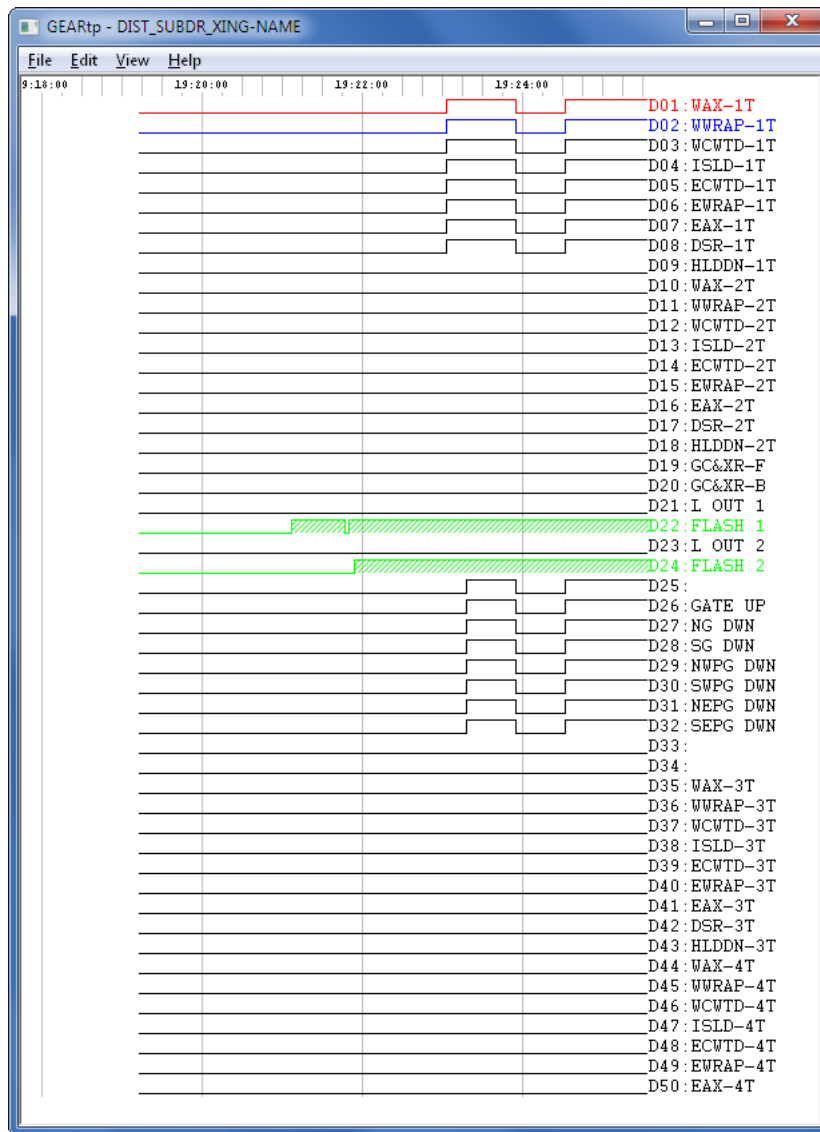
3. After a few seconds a blank plot window similar to the following will be displayed.



Real-Time Plot—Empty

4. The content and appearance of the Real-Time Plot Window can be controlled as described in the following.
 - The Real-Time Plot channels can be assigned inputs as described in the section entitled "[Selecting Inputs](#)" on page 145.

- Color can be added as described in the section entitled "Assigning a Color to a Channel" on page 147.
 - The window can be zoomed by right-clicking in the window and selecting the zoom factor. Zooming has the effect of either speeding up or slowing down the speed with which plot advances from right to left.
5. A sample Real-Time Plot is shown in the following. It represents a test pattern of data. Note the simultaneous level transitions that indicate Event Records are being logged to memory. Also, Digital Inputs 22 and 24 show flashing activity.



Real-Time Plot Test Pattern

USER NOTES

[illegible]

MATERIAL RETURN

In the event the customer identifies a malfunction in any product, call or write MICRO-AIDE and obtain a Return Material Authorization (RMA) number from the customer service department. Return the product to MICRO-AIDE, freight prepaid, with a note (in-warranty repair) or a purchase order (out-of-warranty) for the repair listing the following information:

- RMA number issued by MICRO-AIDE
- Return shipment address
- Name and e-mail address or telephone number of person familiar with the problem
- Brief description of the problem (include any printouts that may have a bearing on the problem)
- Method of payment for repair costs (out-of-warranty)
- Send product to the following address:

MICRO-AIDE CORPORATION

685 Arrow Grand Circle

Covina, CA 91722

Tel: 626-915-5502 Fax: 626-331-9484

E-mail: support@micro-aide.com

LIMITED WARRANTY

MICRO-AIDE warrants its products to be free from defects in material and workmanship for a period of five (5) years from the date of shipment. This warranty is in lieu of any other warranty, expressed or implied. In no event shall MICRO-AIDE be held liable for incidental or consequential damage resulting from (1) the use of any of its products, or (2) any alleged breach of this warranty provision. MICRO-AIDE's liability shall be limited to repairing or replacing, at its sole discretion, any defective product which is returned in accordance with the MICRO-AIDE Material Return Policy.

Product that has been subjected to abuse, misuse, alteration, accident, lightning damage, neglect or unauthorized installation or repair shall not be covered by this warranty. MICRO-AIDE reserves the right to make a final decision as to the existence of any failures and the cause of such failures. No warranty is made with respect to custom equipment or products produced to buyer's specifications except as mutually agreed upon in writing.

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