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Document: PM1400-002  
**FLIGHTLINE 1400 Product Manual Rev B**

# FLIGHTLINE 1400



## ASCB-D Bus Reader EPIC Maintenance Kit

Users Manual

REV B

March 30, 2010

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## SCOPE

This document defines the Setup, Installation, and Use of the FlightLine 1400 EPIC Maintenance Kit, including the electrical, mechanical, and software interface requirements. The FlightLine was developed by Innovative Control Systems, Inc. to provide an easy-to-use tool for reading data on Honeywell's ASCB-D bus. ASCB-D is the data bus currently used in Honeywell's Primus Epic™ avionics system.

### 1.1. *Acronyms*

NIC	Network Interface Card (Honeywell)
PDD	Periodic Device Driver (Honeywell)
PCI	Peripheral Component Interconnect
TCP/IP	Transmission Control Protocol/Internet Protocol
TIU	Test Interface Unit (Honeywell)
UDP	User Datagram Protocol

### 1.2. *Copyrights and Trademarks*

Honeywell	Honeywell International, Business & Commuter Aviation Systems
Microsoft	Microsoft Corporation



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## 2. FLIGHTLINE 1400 QUICKSTART

The minimum steps to get a FL1400 to connect to your bus are listed below, there are a few things you need to know and a few files to get. If you do not understand a particular step, please read the more detailed sections of the manual and/or call ICS for help.

1. Unpack the FL1400 and connect the unit to the charger to top off the batteries on the Panasonic Toughbook the FL1400 software is hosted on.
2. When the batteries have charged, get out one or both of the ASCB-D Bus Interface Adapters included with the FL1400. Connect the Bus Interface Adapter(s) (BIAs) to their enclosed laptop interface cables. This is a cable with a 7-pin circular DIN connector on one end and a "Y" to a USB cable and an RJ-45 cable. They are about 18" long. This cable provides power (USB) to the BIA, and provides ASCB-D data (RJ-45) to the Ethernet port of the host laptop platform.
3. After the BIAs are connected to their Host adapter "Y" cables, connect at least one of the BIAs (both are not required if looking at only one side of the aircraft bus) to the Toughbook platform. Pick any available USB port, and the built-in RJ-45 for the first adapter. If connecting a second BIA, you will need to plug in the provided Airlink 101 USB Ethernet adapter to have a place to plug the second BIA adapters RJ-45.
4. When one or both BIA's are connected to the Toughbook host platform, turn on the unit. The Bus Reader software will NOT start automatically after Windows XP has started.
5. Click on the Desktop FlightLine ICON to start the bus reader software.
6. A window will open showing several selected files. These are the configuration files last used on the FL1400 and will NOT be what are required for successful operation on your bus/aircraft configuration.
7. Before proceeding, you will need three files common to your present software load on your bench or aircraft. There are three (3) software-generated items from the Honeywell ESCAPE tool that are required for the proper execution of the FL1400. These files can be loaded to the FL1400 over a LAN or through the USB keychain device provided with the unit **The files must be loaded to the C:\BUS\_READER\config directory.** The required files are:

ESCAPE file nic.le\_reg for the aircraft configuration being tested  
ESCAPE file consume all Escape.le\_reg (Probably need to Call Honeywell for this one)  
ESCAPE ASCB Configuration Database

8. It is recommended that the files listed above be renamed to a name that matches the configuration before loading them to the FL1400 (e.g. Test\_Bench\_nic.le\_reg, Test\_Bench\_escape.le\_reg, etc.). Renaming the files will help prevent overwriting existing files, because the files are generated from the ESCAPE tool with the names nic.le\_reg and escape.le\_reg. It is important to note that the extension ".le\_reg" must be preserved when renaming the files.

9. Load the files above into the proper directory and select them on the initial FL1400 configuration window (that started after power-up)
10. Connect the FL1400 to your bench or aircraft test connectors and select data for display using the bus tree view down the left hand side of the display screen.
- 11.

### 3. FLIGHTLINE 1400 Bus Interface Hardware

The two ASCB D Bus Interface hardware adapters (BIAs) included with this unit is shown below..



Figure 3-1 FL1400 FL1400 Bus Adapter

The picture above shows the ASCB D extension cable connected to the prototype ASCB D Bus Interface Adapter (BIA). This cable is a 9-pin female to 9-pin female cable that is terminated at the end with the RED or YELLOW protective cover. When using this cable, the terminated end must be connected to the bus interface adapter as show. It will not work correctly if installed the other direction. **This cable is only suitable for use at the end of the ASCB D bus.** Using this cable from a mid bus tap will triple terminate the bus and can cause the entire ASCB D bus to not communicate. The Bus Interface Adaptor may be plugged into any cable connection designed for an ICS TIU using a PCI-NIC, or a Telemetry Interface System using a PCI-NIC. See the section entitled: **FL1400 Bus Interface (ASCB D Interface) Electrical Connections and Requirements** for the electrical connections of the 9-pin D connector.



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Figure 3-2 FL1400 Bus Interface Adapter Main/Backup Bus Switch

The Bus Interface Adapter (BIA) has a switch on the back that can be used to switch between the Main bus and the Backup bus of the connector the adapter is presently connected to. The switch should be placed in the left position (Away from the interface cable as show) in order to see the data on the main bus pins of the 9-bin ASCB D bus connector. Place the switch in the opposite position to see data on the backup bus pins. See the section entitled: **FL1400 Bus Interface (ASCB D Interface) Electrical Connections and Requirements** for the electrical connections of the 9-pin D connector.





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**Figure 3-4 FL1400 Bus Interface Adapter Power Switch (Normally Left ON)**

The FL1400 Main Display Unit is shown at the right. The FL1400 Bus Interface Adapter uses the Ethernet and USB connection of this unit for data transfer and power. The RJ-45 and USB ports are located along the right side of the unit as shown. Care should be exercised when removing the RJ-45 cable as the port is recessed and the data cable locks into place. It can be difficult for users with larger fingers to depress the locking tab to remove the cable.



RJ-45 Ethernet Connection

Dual USB connections

One Adapter should always be plugged into the RJ-45 and USB shown. The FL1400 can be used as a single channel bus reader by connecting only to the built-in RJ-45 shown.





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Shown at the right is the minimum required connection to use the DataTap 1400 on an ASCB-D bus. The FL1400 Bus Interface Adapter uses the Ethernet and USB connection of this unit for data transfer and power. The RJ-45 and USB ports are located along the right side of the unit as shown.

One Adapter should always be plugged into the RJ-45 and USB shown. The FL1400 can be used as a single channel bus reader by connecting only to the built-in RJ-45 shown.



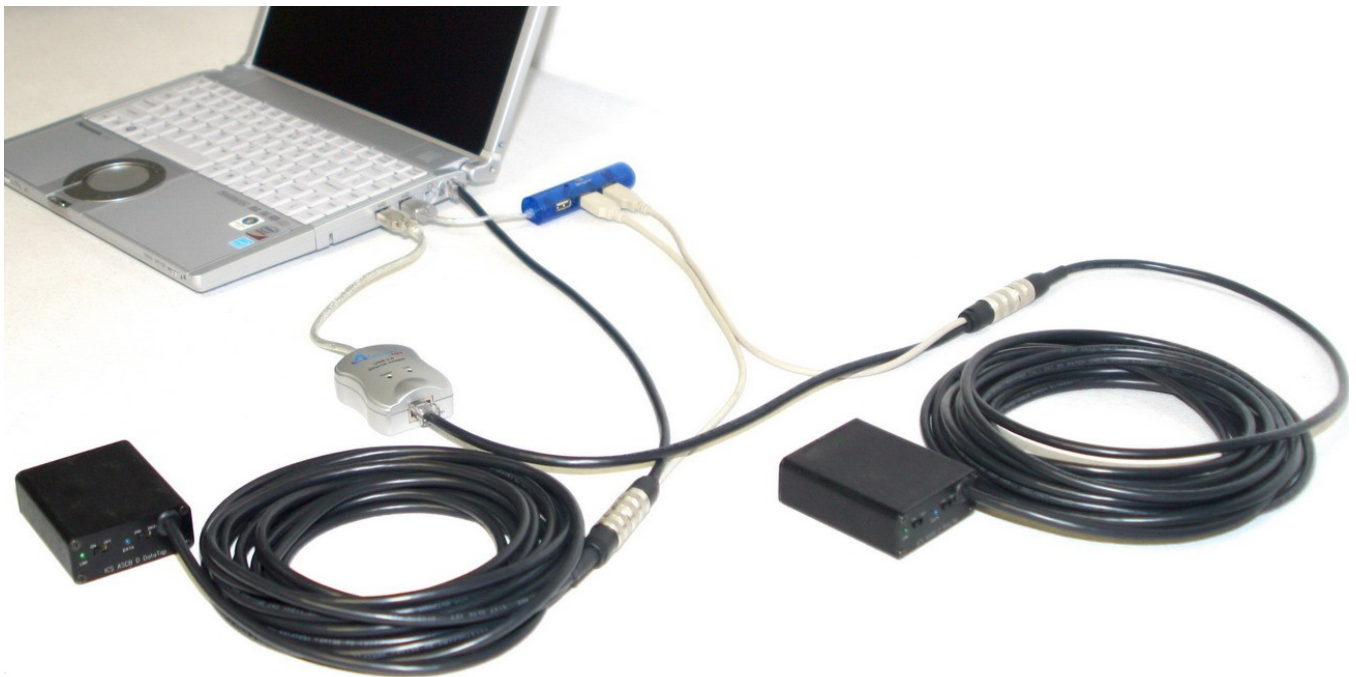


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Shown below are the connections for dual bus use. Both Bus Interface Adapters must be installed. As there are only two USB connections, a supplied USB hub is required (and supplied). The two BIA adapters should be plugged into the USB hub. These adapters only get power over the USB port, no data is exchanged via USB.

The supplied Airlink 101 USB to Ethernet adapter is plugged into one of the USB ports on the Laptop as shown to give the platform a second Ethernet port required for the 2<sup>nd</sup> channel of ASCB-D data.



## 4. FL1400 System Power Up and Shutdown

The FL1400 can simply be turned on for power up operation. The unit will come up running the FL1400 software automatically and will use the last configuration files that were loaded to direct its operation. There is more on the configuration files later in the next section.

There are two ways to shut down the unit:

1. The unit can simply be powered off with the power button by holding the button down for a couple seconds.
2. "Exit" can be selected from the File menu. The Windows "Start" menu can then be used to shut the system down.

## 5. System File and Directory Requirements

### 5.1. ESCAPE Files

There are three (3) software-generated items from the Honeywell ESCAPE tool that are required for the proper execution of the FL1400. These files can be loaded to the FL1400 over a LAN, through an FTP session, or through the USB keychain device provided with the unit (Figure 5-1). The USB keychain device plugs into the unit as shown in **Error! Reference source not found..**

The files must be loaded to the C:\BUS\_READER\config directory. The required files are:

1. ESCAPE file **nic.le\_reg** for the aircraft configuration being tested
2. ESCAPE file consume all **escape.le\_reg**
3. ESCAPE ASCB **Configuration Database**

It is recommended that the files listed above be renamed to a name that matches the configuration before loading them to the FL1400 (e.g. Test\_Bench\_nic.le\_reg, Test\_Bench\_escape.le\_reg, etc.). Renaming the files will help prevent overwriting existing files, because the files are generated from the ESCAPE tool with the names nic.le\_reg and escape.le\_reg. It is important to note that the extension ".le\_reg" must be preserved when renaming the files.



**Figure 5-1** USB Drive

The other files either needed or created by the FL1400 are described in the sections that follow.



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## **5.2. *Map Files***

Map files define what parameters will be displayed in the Data Display Section of the FL1400. These files are user-defined, and are very easy to create (See Section 6.5.1). When a list of parameters to view is decided upon, it is convenient to store the display settings in a Map File so it is easy to bring all those parameters back up for future sessions. Several map files can be created with different names to store different sets of data.

## **5.3. *Recording Files***

The FL1400 offers the ability to record data. The entire bus is recorded, and any selected parameters can be played back later (Note that the FL1400 must have both Bus Interface Adapters connected to record both busses). The recording files become very large (in the order of 7 gigabytes an hour) very quickly, as 24K of data is written to the file every 80 Hz (80 times per second). The recording time is currently limited to available disk space, which should exceed 5 hours of recording.

The FL1400 has two modes: Live and Recorded. In Live mode, a "Recording File" is selected, and this file is used to record the data when "Record Data" is selected from the main display screen. In Recorded mode, a "Playback File" is selected, which is actually a previously recorded file. This file is used to play back data for observation. Note that when playing back a recorded file, any data parameter can be selected for viewing, just as can be done in live mode. The user is not limited to only the parameters viewed during the recording.

## **5.4. *Comma Separated Value (CSV) File***

The user has the option of creating a CSV while playing back taped data (CSV files cannot be created in "live" mode). The CSV file will contain the frame number, the parameter value, the parameter status, and the group status (Note that the options of what to record to the file are configurable – see Figure 6-10). The data will be output to the CSV file at the produced rate of the parameter. So an 80 Hz parameter will have 80 entries in the file every second, and a one hertz parameter will have one entry every second. A sample CSV file is shown in Figure 5-2 (Note that this CSV file was generated with the Frame Number, Parameter Value, and Group Status selected (no parameter status)). The first column is the Frame Number (note the 10 Hz rate. The current version outputs at 80 Hz). The 2<sup>nd</sup> column represents the value of the first parameter. The 3<sup>rd</sup> column represents the Group Status of the first parameter. The 4<sup>th</sup> column represents the value of the 2<sup>nd</sup> parameter, etc. This CSV file was recorded from the display in Figure 6-5.



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8285872 0x 00000000	Good	3508.525	Good	948.8231	Good	1780.78	Good
8285880 0x 00000000	Good	3519.116	Good	951.7116	Good	1774.13	Good
8285888 0x 00000000	Good	3530.189	Good	955.0815	Good	1767.481	Good
8285896 0x 00000000	Good	3540.78	Good	957.97	Good	1760.832	Good
8285904 0x 00000000	Good	3551.853	Good	960.8586	Good	1754.103	Good
8285912 0x 00000000	Good	3562.444	Good	963.7471	Good	1747.454	Good
8285920 0x 00000000	Good	3573.517	Good	967.117	Good	1740.805	Good
8285928 0x 00000000	Good	3584.108	Good	970.0055	Good	1734.156	Good
8285936 0x 00000000	Good	3595.18	Good	972.894	Good	1727.427	Good
8285944 0x 00000000	Good	3605.771	Good	975.7825	Good	1720.778	Good
8285952 0x 00000000	Good	3616.844	Good	978.6711	Good	1714.129	Good

**Figure 5-2 Sample CSV File**

Every time a CSV file is created, a **CSV Map File** is also created. The Map File contains static information about each parameter in the CSV file. The CSV Map File rows map directly to the columns of the CSV file. Figure 5-3 shows a sample CSV Map File (This CSV Map File was captured for the display shown in Figure 6-5). From this CSV Map file we can conclude that the actual CSV file will have 15 columns of data, because the CSV Map file has 15 rows of data (Note that the first column in the CSV file is the frame number, so in actuality, the CSV file will have 16 columns of data. Also note that the CSV file show in Figure 5-2 originally had 16 columns of data but it was truncated for this document).



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Parameter	Min Value	Max Value	Function ID	Instance	Channel	Parameter ID
ADS\Ads1ADA\airData50 msec\baroCorrection2Sta tus	0	0	4	1	0	9
ADS\Ads1ADA\airData50 msec\baroAltitude1	-2100	61000	4	1	0	4
ADS\Ads1ADA\airData50 msec\baroAltitude2	-2100	61000	4	1	0	6
ADS\Ads1ADA\airData50 msec\altitudeRate	-21000	21000	4	1	0	3
ADS\Ads1ADA\airData50 msec\calibratedAirspeed	0	550	4	1	0	27
ADS\Ads1ADA\airData50 msec\dynamicPressure	0	15.5	4	1	0	60
ADS\Ads1ADA\airData50 msec\impactPressure	0	15.5	4	1	0	53
ADS\Ads1ADA\airData50 msec\mach	0	1	4	1	0	38
ADS\Ads1ADA\airData50 msec\staticPressure	0.5	35	4	1	0	32
ADS\Ads1ADA\airData50 msec\totalPressure	0.5	42	4	1	0	46
ADS\Ads1ADA\airData50 msec\totalAirTemperature	-80	105	4	1	0	23
ADS\Ads1ADA\airData50 msec>trueAirspeed	0	650	4	1	0	33
ADS\Ads1ADA\airData50 msec\unitsBaroCorrection 2	0	0	4	1	0	45
CIOCAL\Ciocal1CAL\com 3Data\com38ThirdCapabl eln	0	0	46	1	0	673
CBIT\Cbit12CBIT\cbit_A_ 1Hz\mwsMiscompare	0	0	50	12	0	162

**Figure 5-3 Sample CSV Map File**

### 5.5. Group View Text File

This file is created when a Group View is selected, and the user saves the Group View information to a file. The Group View feature allows a one-button push view of all the Group Status of all the groups on the bus (See Section 6.5.2.1).



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## 5.6. System Directories

There are three directories on the unit for the FL1400 files:

1. **C:\BUS\_READER\CONFIG** contains all configuration files required for the FL1400 operation. It is to this directory where any configuration files loaded to the FL1400 should be placed. The files that reside in this directory are:
  - a) `escape.le_reg` files
  - b) `nic.le_reg` files
  - c) ESCAPE configuration databases
  - d) Map files
  - e) Tape files (binary playback files)
2. **C:\BUS\_READER\INSTALL** contains the FL1400 executable file. Anytime an updated software version is delivered, it should be placed in this directory. The FL1400 executable is named "Config\_Tool.exe".
3. **C:\BUS\_READER\OUTPUT** contains any files output by the FL1400. It is from this directory where any output files that are needed to be extracted from the FL1400 can be obtained. The files that reside in this directory are:
  - a) **Tape files** – The newly-recorded tape files can be found in this directory. If there is a need to take the tape file off the unit, it can be copied from this directory. The files will have the extension ".bin" and the default name is "frame..." where "..." represents the date and time the file was created.
  - b) **CSV file** – A Comma Separated Value (CSV) file can be created that contains the various information tidbits of each data item consumed, including the value and status of the parameter each frame. This file will be named "Selected\_Data.csv." The CSV file will be appended to each time "Create CSV File" is selected from the main display screen. (Note that this directory will also contain a CSV map with the name "Selected\_Data\_Map.csv." This file contains pertinent information about each parameter in the Selected\_Data.csv file.
  - c) **GroupView text file** – This file will be created when the GroupView information is saved to a file. This file will be named GroupView\_Status.txt.





## 6. FL1400 Operation

### 6.1. Bus Reader Initialization

When the FL1400 is started, the Configuration screen shown in Figure 6-1 is presented. Each input parameter is described in detail in Table 6-1. **Note that all the fields on the Configuration screen will be the same as the last time the FL1400 was run. If the same settings are desired as the last time, the “OK” button can be selected immediately as there is no need to reenter the data.**

[ASCB-D Bus Reader] Configuration

Options

Save Settings  
Load Saved Settings

TWO\_BUS\_Planeview\_Configuration\_Data.mdb Change

Configuration GV Planeview

Mapping File DEMO.map Change

Data Source  ASCB-D Bus [Live]  Playback [Recorded]

Recording File newtst Change

Playback File newtst05\_08\_15\_43.bin Change

NIC Registry TWO\_BUS\_NIC.le\_reg Change

Escape Registry TWO\_BUS\_Escape.le\_reg Change

Font Size  Small  Medium  Large

OK

Figure 6-1 Configuration Initialization Screen



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Description of Configuration Screen Input Parameters	
Input Parameter	Description
<b>Database</b>	This is the <b>ASCB Configuration Database (NOT the ASCB Data Database)</b> for the aircraft. The “Change” button allows any database in the C:\BUS_READER\Config directory to be selected.
<b>Configuration</b>	The drop-down box will display all configurations defined in the Configuration DB. The appropriate configuration for the aircraft must be selected.
<b>Mapping File</b>	The Mapping File contains saved display information. When data parameters are selected for viewing, those parameters can be saved to a “Map File.” Those map files can be selected here.
<b>Data Source</b>	There are two options: 1. ASCB-D Bus [Live] requires the FL1400 to be plugged into an ASCB-D connector, and requires “live” data on the bus. In this scenario the data displayed is the actual data being sent on ASCB-D in the aircraft. 2. Playback [Recorded] requires a “playback file” to be selected. In this scenario, the FL1400 is playing back a previously recorded tape file.
<b>Recording File</b>	This is the name of the file where data is recorded. The data and time will be appended to any name entered here. The default name is “frame” so a sample recording file will have the name “frame05_07_22_38,” where “05” is the month, “07” is the day, “22” is the minute, and “38” is the second when the file was created. The “Change” button allows a new name to be entered. The file named here will be created when the “Start Recording” button is selected on the main display screen.
<b>Playback File</b>	If “Playback [Recorded]” was selected for the Data Source, a Playback File must be selected. Any file previously recorded (and named via the Recording File box) will be displayed when the “Change” button is selected. Note that the Playback File field is disabled in “Live” mode.
<b>NIC Registry</b>	This is the NIC registry file for the selected configuration. It is imperative that the correct file is selected here. This file should be in the “NICs” directory of the ESCAPE generation directory structure.
<b>Escape Registry</b>	This is the “consume all” ESCAPE registry generated for the aircraft configuration. This file should be in the TIS directory of the ESCAPE file generation directory structure.
<b>Font Size</b>	Allows for the selection of different font sizes used in the tool. Note that the Data Display Section of the screen will only change between small and medium font (selecting “Large” font will result in medium font for the Data Display Section. The Data Selection Section will change between small, medium, and large. (For descriptions of the Data Display Section and the Data Selection Section, please see Figure 6-2).
<b>OK</b>	When all fields are entered correctly, the selection of the OK button will cause the FL1400 to begin execution.
<b>Options – Save Settings</b>	Allows the current settings to be saved and given a configuration name. This configuration can then be retrieved at a later time.
<b>Options – Load Saved Settings</b>	Allows for a previously saved set of configuration data to be retrieved for use.

**Table 6-1 Description of Configuration Screen Input Parameters**

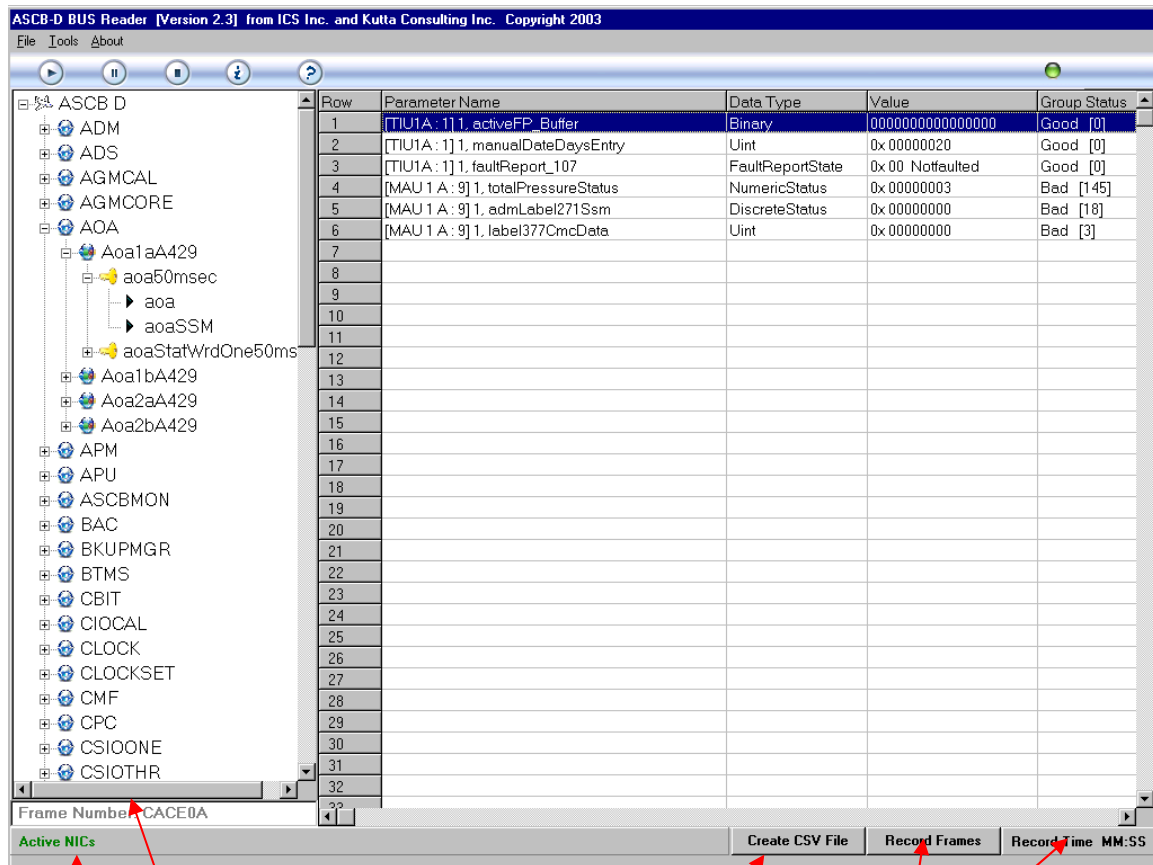


## 6.2. FL1400 Main Page

After “OK” is selected on the Configuration Page, the ASCB-D FL1400 main screen will appear, as shown in Figure 6-2. The screen is divided into two primary sections, a *Data Selection Section*, and a *Data Display Section*. Note that the parameters shown in the data display section will initially be whatever parameters were present in the map file (selected in the configuration screen). These parameters can be added to and deleted, and the changes saved, but the initial parameters are whatever is present in the map file.

**Play Tape Data      Pause/Resume Display      Stop Display      Change Config Info      About**

Row	Parameter Name	Data Type	Value	Group Status
1	[TIU1A : 1] 1, activeFP_Buffer	Binary	0000000000000000	Good [0]
2	[TIU1A : 1] 1, manualDateDaysEntry	Uint	0x00000020	Good [0]
3	[TIU1A : 1] 1, faultReport_107	FaultReportState	0x00 Notfaulted	Good [0]
4	[MAU 1 A : 9] 1, totalPressureStatus	NumericStatus	0x00000003	Bad [145]
5	[MAU 1 A : 9] 1, admLabel271Ssm	DiscreteStatus	0x00000000	Bad [18]
6	[MAU 1 A : 9] 1, label377CmcData	Uint	0x00000000	Bad [3]



**Figure 6-2 ASCB-D FL1400 Main Screen**

A description of some other fields on the main screen is:

**Frame Number:** Displays the current ASCB frame number

**Active NICs:** Shows the NIC ID's of the NIC's that are currently active (note that this screen shot is of taped data, so no NICs are currently active).

**Create CSV File:** Allows for the creation of a comma separated value file

**Record Frames:** Allows for the recording of data to the file named in the "Recording File" field on the Configuration Screen

**Record Time:** Displays the record time remaining (limited by available disk space).

The **Data Display Section** of the main screen contains the real-time information about the data.

**Parameter Name** is the name of the parameter. The details of the displayed name can be changed from the Tools/AdminTools/View Settings option (See Figure 6-11).



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**Data Type** is the data type listed in the ESCAPE Configuration Database for the parameter.

**Units (not shown)** are the engineering units of the parameter listed in the ESCAPE Configuration Database.

**Value** is the latest value consumed of ASCB-D for this parameter. The display is updated at 10 Hz.

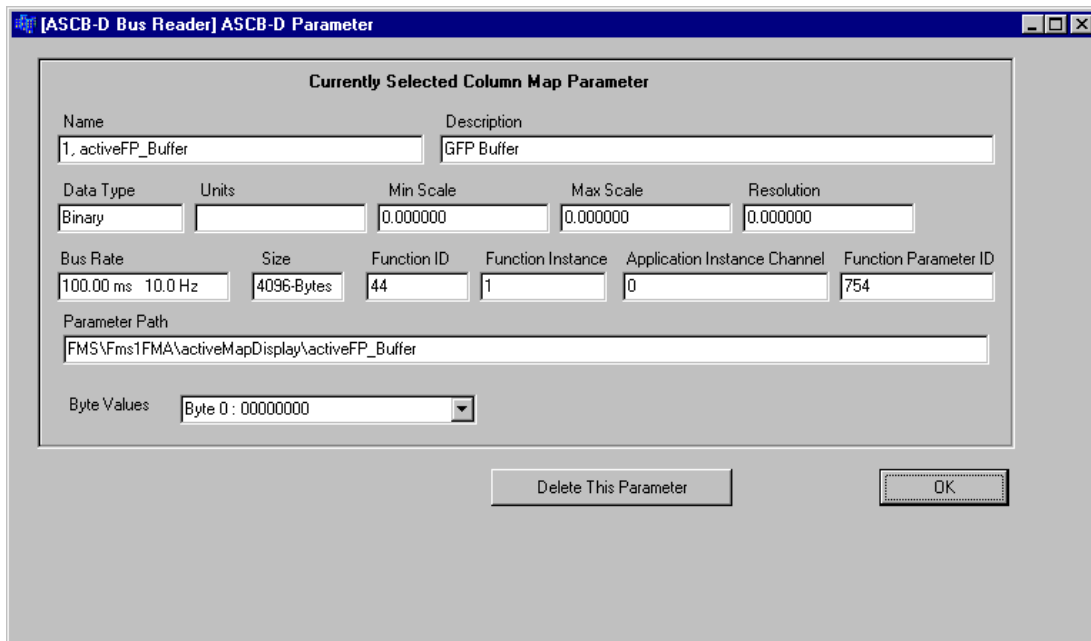
**Status (not shown)** is the *parameter* status for this parameter. This status is set by the producer of the data.

**Group Status** is the group status for the group to which this parameter belongs. This status is calculated by the FL1400 Periodic Device Driver (PDD) by comparing the freshness counter and CRC or Checksum sent by the producer.

Note that the parameter display information is configurable. See Figure 6-11 for details.

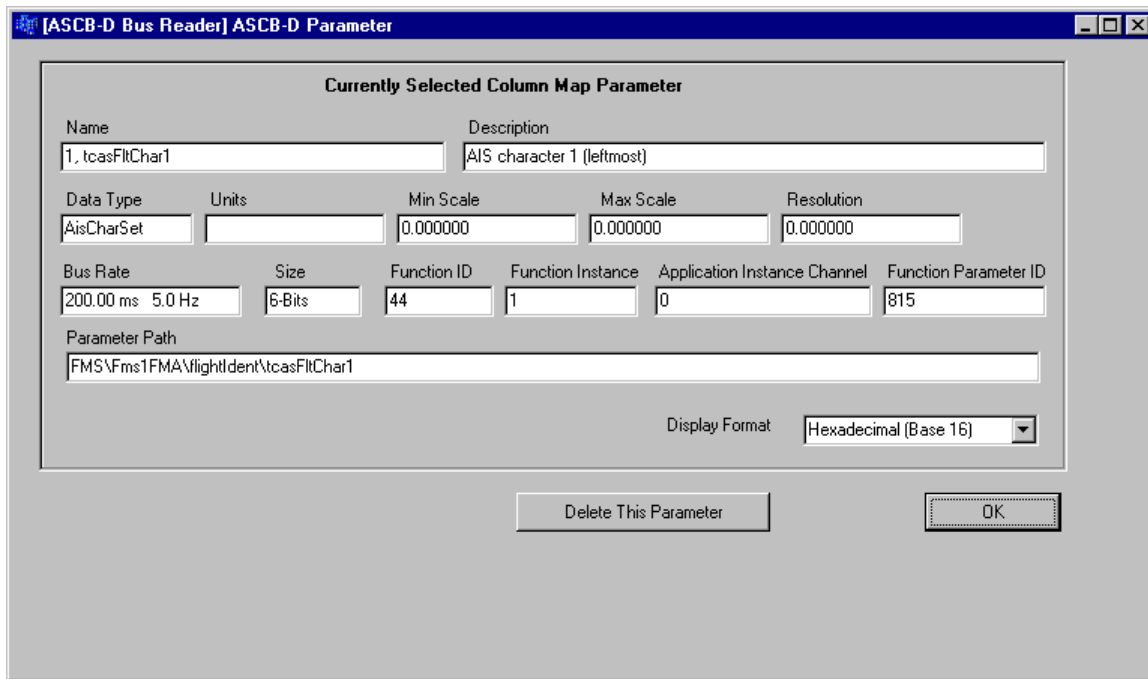
### 6.3. Viewing Parameter Details

Right clicking on any of the parameters in the Data Display Section brings up one of the dialog boxes shown in Figure 6-3 and Figure 6-4. The values shown in the dialog box are directly out of the ESCAPE configuration database. For more information on these fields, please refer to Honeywell Primus Epic™ documentation. The “Binary View” drop down box is used for binary and text parameters. It provides for the viewing of each byte in a binary or text parameter on a bit-by-bit basis.



**Figure 6-3 Parameter Details (Binary and Text)**

Figure 6-4 illustrates the dialog box displayed for all datatypes except binary and text. The Display Format options allows for the viewing of the specific parameter in hex, binary, or decimal. Note that Float parameters do not have this option.



**Figure 6-4 Parameter Details**



## 6.5. Menu Item Options

### 6.5.1. File Menu

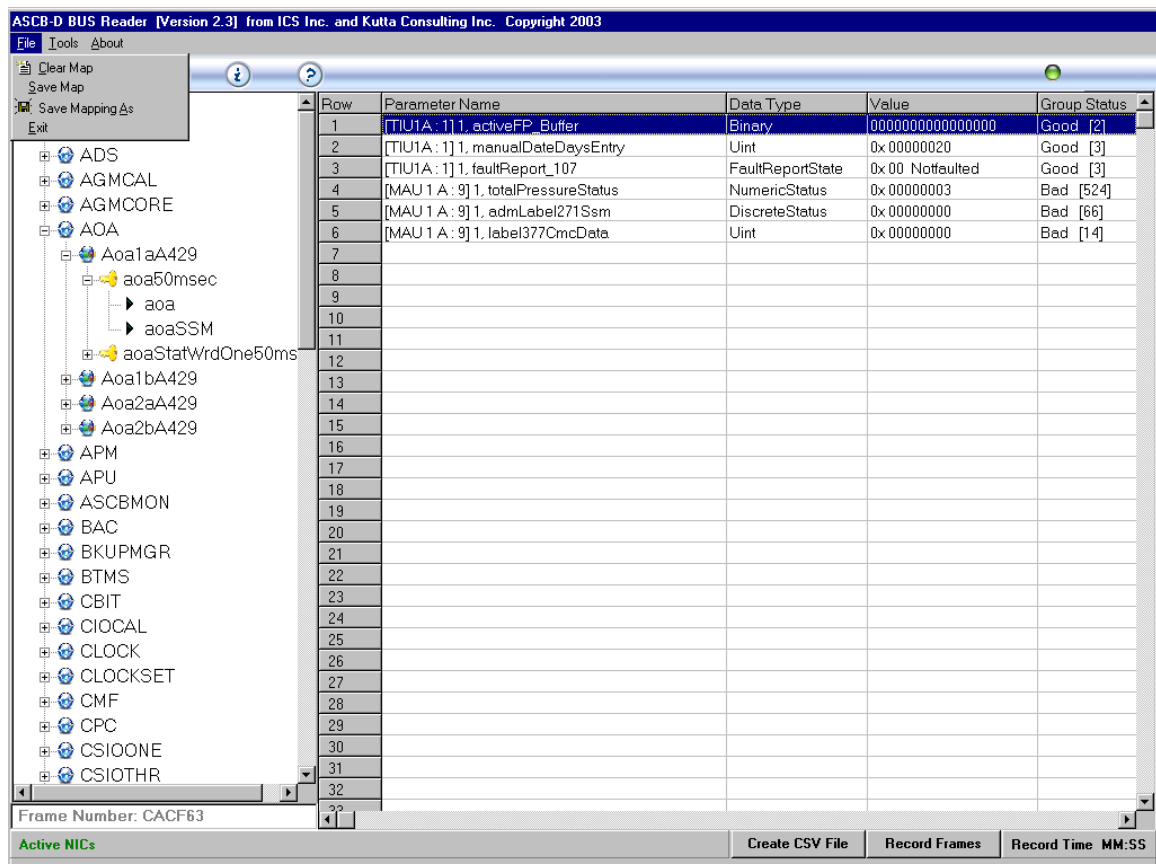
When **“File”** is selected, the menu options shown in Figure 6-6 appear.

**“Clear Map”** causes all the parameters on the screen to be cleared and a new map file is created.

**“Save Map”** allows the current map file to be saved using the same name it currently has.

**“Save Mapping As”** allows the current map file to be saved using a new name.

**“Exit”** causes the tool to exit.



**Figure 6-6 File Menu**



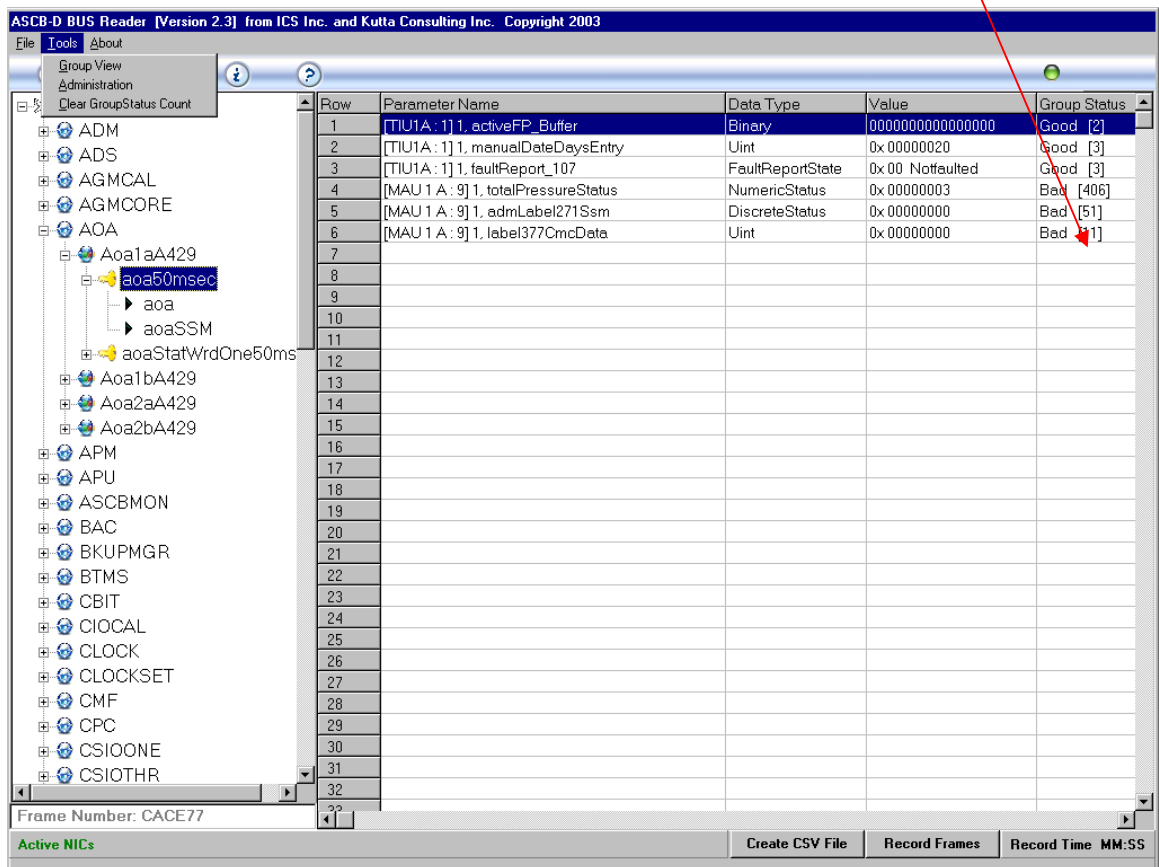
### 6.5.2. Tools Menu

When “**Tools**” is selected, the menu options shown in Figure 6-7 appear.

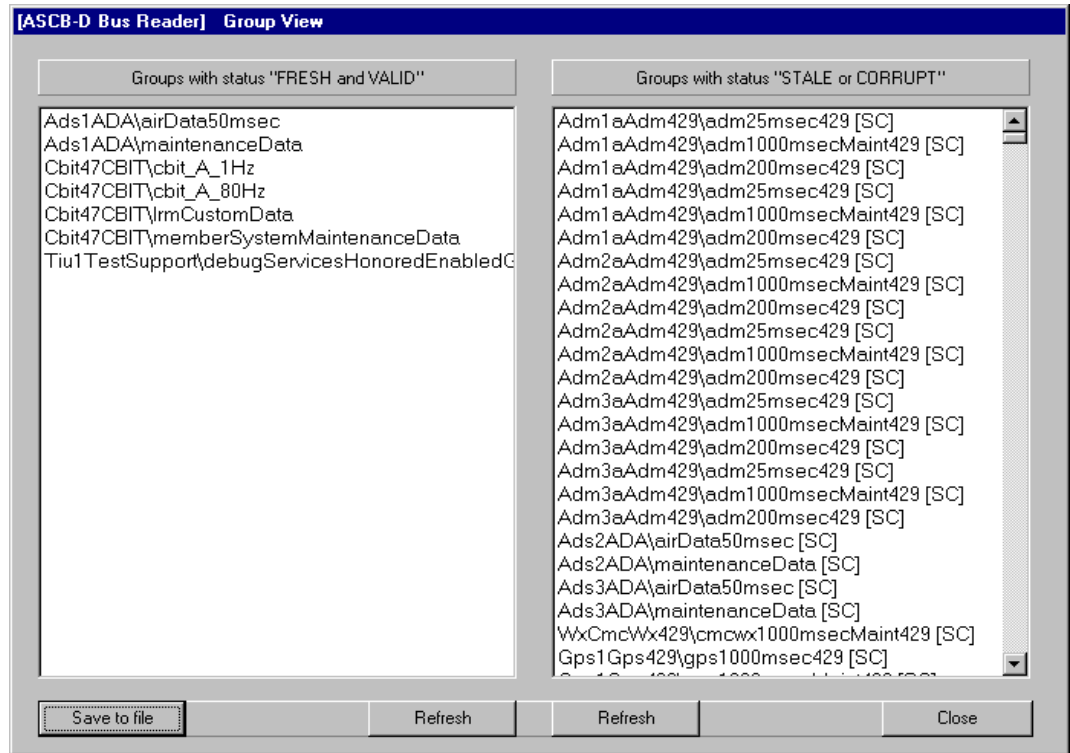
“**Group View**” presents a dialog box showing all the groups with “good” status and all the groups with “bad” status on the bus. A view of this dialog box is shown in **Error! Reference source not found.**

“**Administration**” allows for the management of system files, and allows for the selection of various display options. A view of this dialog box is shown in Figure 6-8.

“**Clear Group Status**” causes the counter in square brackets in the Group Status column of the display to be cleared. The counter represents how many “bad” groups have been received.



**Figure 6-7 Tools Option**



### 6.5.2.1.Group View

When “**Group View**” is selected from the “**Tools**” menu, the dialog box shown in **Error! Reference source not found.** appears. Note that it will take several seconds for this dialog box to appear.

The column entitled “**Groups with status ‘FRESH and VALID’**” shows all the groups on the bus that the FL1400 detects have “good” freshness and validity (i.e. Fresh and Valid).

The column entitled “**Groups with status ‘STALE and CORRUPT’**” shows all the groups on the bus that the FL1400 detects have “bad” freshness and validity (i.e. Stale and Corrupt).

The “**Save to file**” button at the bottom of the screen will save the information displayed on this screen to a file named C:\BUS\_READER\Output\GroupView\_Status.txt. It should be noted that this file will be appended to each time it is written. A new file is NOT created for each save.

The two “**Refresh**” buttons allow either the “good” groups or the “bad” groups to be refreshed.

The “**Close**” button will close this dialog box and return control to the main display screen.

### 6.5.2.2. Administration

When “**Administration**” is selected from the “**Tools**” menu, the dialog box shown in Figure 6-8 appears.

“**ASCB-D FL1400 Files**” allows for the deletion of system files. This option is shown in more detail in Figure 6-9.

“**CSV File Fields**” allows for the selection of fields for the Comma Separated Values (CSV) file. This option is shown in more detail in Figure 6-10

“**View Settings**” allows for the selection of various viewing options. This option is shown in more detail in Figure 6-11

The “**Exit**” button will cause the Admin Tool to exit and return control to the main screen.



**Figure 6-8 Admin Tool**

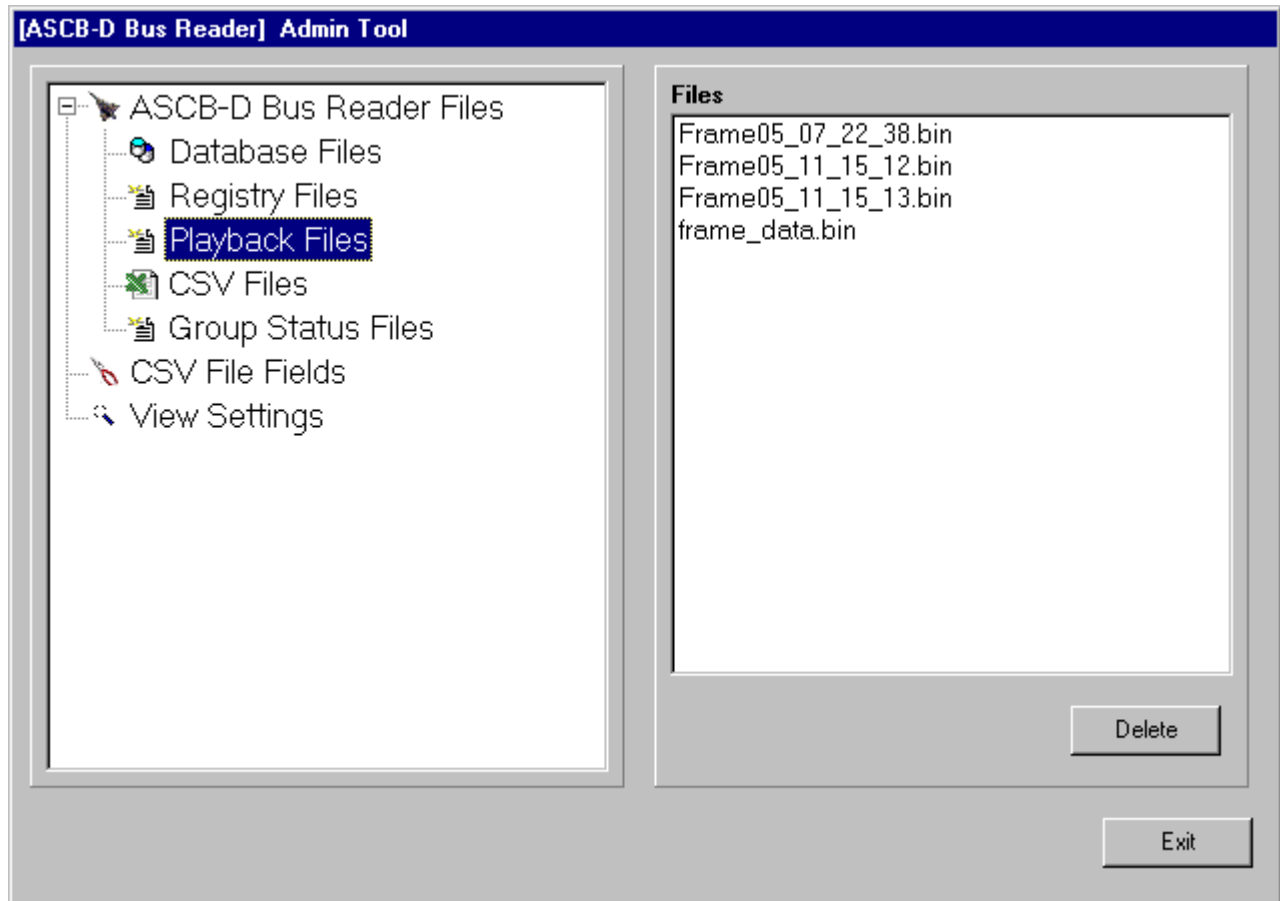
The “**ASCB-D Bus Reader Files**” option in the Admin Tool can be expanded by clicking on the “+” sign to the left of the tree-view item. When the option is expanded, a dialog box as shown in Figure 6-9 is presented. Note that the figure shows the **Playback Files** selected, and all playback files available in the system are shown. By selecting one of the files in the “**Files**” column and pushing the “**Delete**” button, the selected file will be deleted from the system.

**Database Files** will show all .mdb files in the system. These files are the ESCAPE Configuration Databases.

**Registry Files** will show all the NIC.le\_reg and ESCAPE.le\_reg files in the system.

**Playback Files** will show all the .bin files in the system. These are the files created when “**Record Frames**” is selected from the main screen.

**Group Status Files** will show all .txt files in the system. These are the files created when the Group Status information (**Error! Reference source not found.**) is saved to a file. Note that currently, only one Group Status File is created by the system.



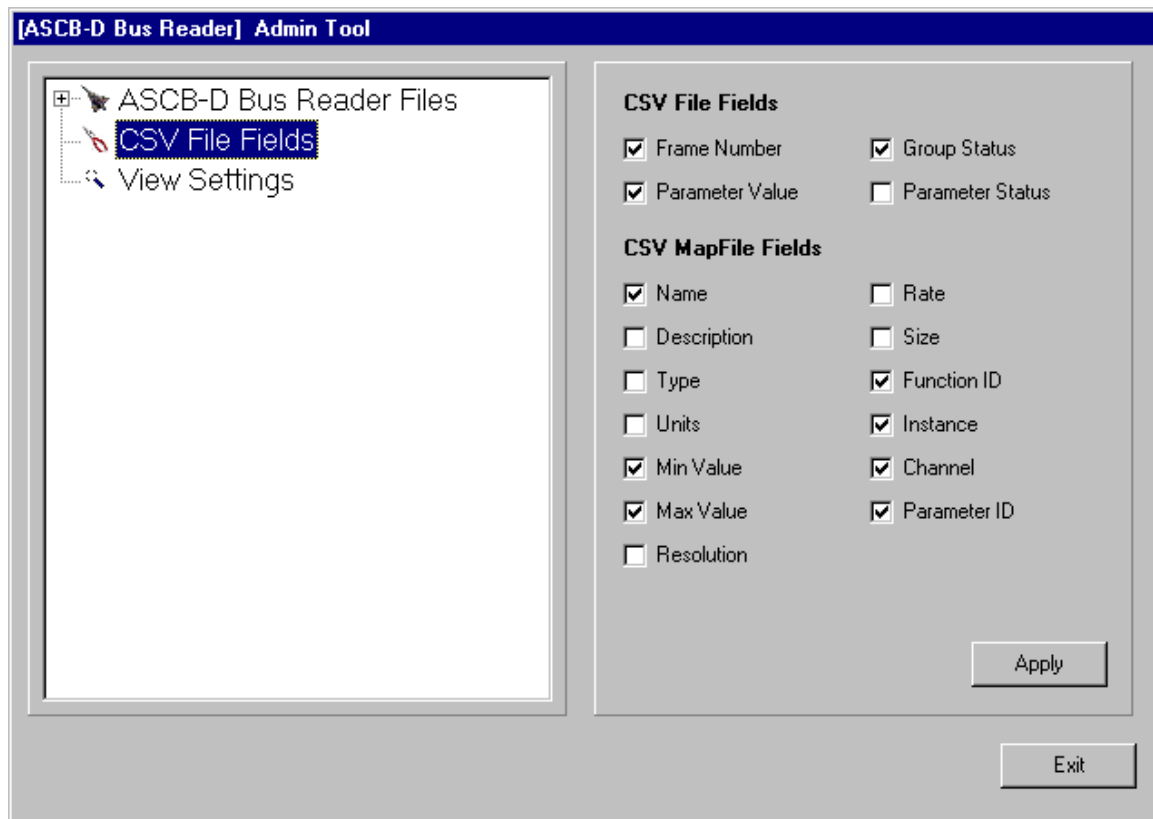
**Figure 6-9 Admin Tool – FL1400 Files**

When the “**CSV File Fields**” option is selected from the Admin Tool, the dialog box shown in Figure 6-10 is presented. This option is used to select the fields for a Comma Separated Values (CSV) file. The CSV file is created when “Create CSV File” is selected from the main screen.

The “**CSV File Fields**” on the right side of the display allow up to four relevant data descriptors for each data item to be selected. The four options are: **Frame Number, Parameter Value, Group Status, and Parameter Status**. Whichever items are checked are the options that will be stored for each parameter when the CSV file is created. It should be noted that every data item on the display on the main screen will be saved to the CSV file at the data items’ produced rates. So if a data item is produced at 80 Hz, there will be 80 entries every second for that data item in the CSV file. If a data item is produced at 1 Hz, there will be 1 entry every second for that data item.

The “**CSV MapFile Fields**” allows for the selection of various CSV Map File entries. The CSV Map File is used to decode which parameters are actually saved to the CSV file. It is very CPU intensive to write to files, and having a MapFile allows descriptors such as Name, Type, etc. to only be written to a file once.

The “**Apply**” button will cause the selected changes to take affect.



**Figure 6-10 Admin Tool – CSV File Fields**

When the “**View Settings**” option is selected from the Admin Tool, the dialog box shown in Figure 6-11 is presented. The View Settings option allows for the selection of various display options.

The “**Select Display Columns**” options allow for the selection of the various items shown in the data display section of the main screen. Checking a box will result in that item being shown on the display screen. Leaving a box unchecked will result in that item not being shown on the display screen. “**Parameter Name**” is always selected. It is recommended that “**Value**” and “**Group Status**” be selected. “**Data Type**” and “**Units,**” are more for information purposes and do not change dynamically based on the data.

The “**Parameter Name Display Format**” allows for the selection of the presentation of the parameter name. Examples of each option are:

**Name:** 1, altitudeRate (where “1” represents the application instance).

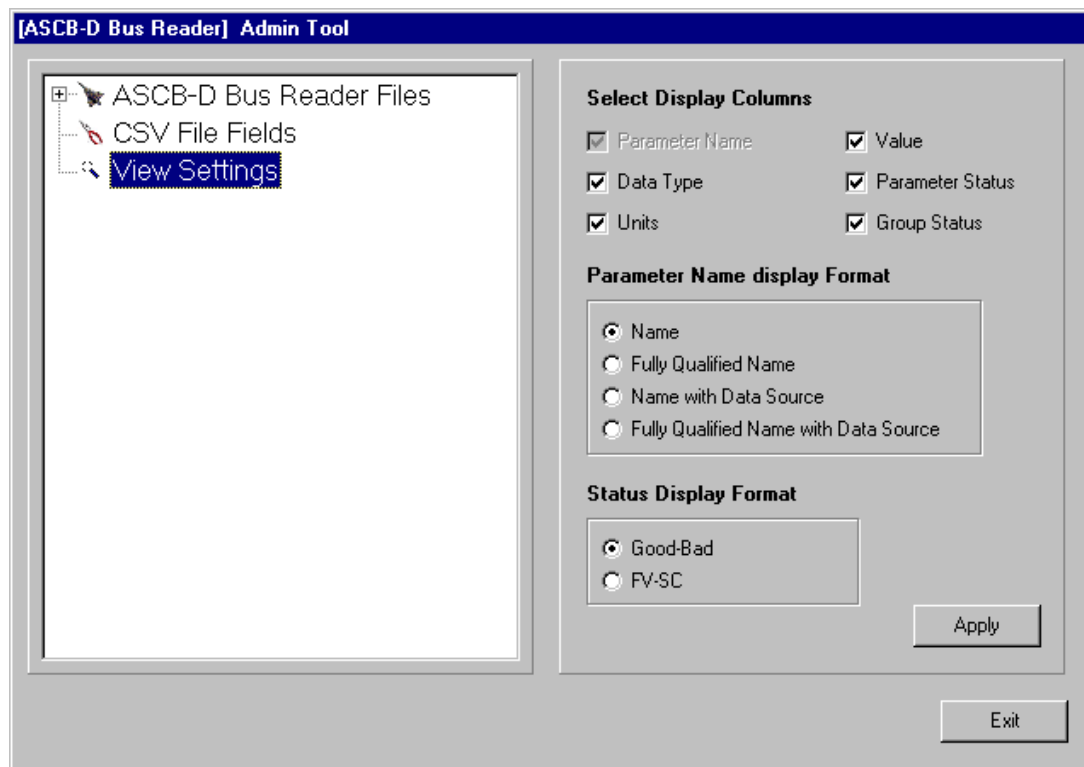
**Fully Qualified Name:** ADS\ads1\ADA\airData50msec\altitudeRate

**Name with Data Source:** [MAU 1 A : 2] 1, altitudeRate (where MAU 1 A represents the MAU, and 2 is the slot where the producer is located).

**Fully Qualified Name with Data Source:** [MAU 1 A : 2] ADS\ads1\ADA\airData50msec\altitudeRate

The “**Status Display Format**” allows for the selection of how Group Status is displayed on the main screen. The “**Good-Bad**” option will state the status as either Good or Bad. The “**FV-SC**” option will state the status more specifically, where “F” is Fresh, “V” is Valid, “S” is Stale, and “C” is Corrupt.

**Figure 6-11 Admin Tool – View Settings**





## 6.6. ASCB-D Data Types

All the data types that are read from the ASCB Data Bus and displayed by the FL1400 is are shown in Table 6-2.

Datatype	Application Representation	Typical C++ Type
Int	32-bit signed integer number. Numbers in the range of – 2,147,483,648 to 2,147,483,647 that have no fractional component (i.e., have a resolution of 1).	int
Uint	32-bit unsigned integer number. Numbers in the range of 0 to 4,294,967,295 that have no fractional component (i.e., have a resolution of 1)	unsigned int
Float	Single precision (32-bit) IEEE 754 floating point number	float
Enum	32-bit unsigned integer representing a state of a multi-state parameter. The list of valid states must be specified for each parameter. In the ESCAPE ASCB database, a text string is associated with each value state. (only LS 8-bits are used).	unsigned char or enum
Text	32-bit unsigned integer(s) representing a fixed size array of ASCII characters. The maximum length is fixed. If a string is less that the maximum length, it must be Null terminated. There are 4 characters per 32-bit word.	char[n]
Binary	32-bit unsigned integer(s) representing A fixed size array of bytes, the encoding of which is unknown and will not be interpreted by the ASCB-D encoding/decoding software. There are 4 bytes per 32-bit word.	unsigned char[n]
Bitfield	A packed structure of 32-bit unsigned integers of varying bit widths. The software developer must provide code to locate and extract the individual elements, or use PDD functions to do this.	unsigned char[ ] or struct

**Table 6-2 ASCB-D Datatypes**



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## 7. FL1400 Bus Interface (ASCB D Interface) Electrical Connections and Requirements

The Bus Interface Adapter of the FL1400 bus reader connects electrically to the ASCB Version D bus using the same connector and pin connections as an ICS PCI-NIC board. Therefore, the FL1400 Bus Interface Adapter (BIA) can be connected to the ASCB Bus in place of a PCI-NIC board. The electrical connections and mating connector information are described in this section.

### 7.1. BIA ASCB Bus Connector Wiring

The 9-pin D-sub connector at the end of the FL1400 Bus Interface Adapter (BIA) is the electrical connection to the ASCB D Bus. This connector is a standard 9-pin Male D-sub connector and has the following pin out/ electrical definition. The mating connector required at the users equipment is a DB-9 Female with metal back shell.

The signals that are indicated in blue are those used and connected to by the FL1400 BIA. Other Pins are used in PCI-NIC applications, but are N.C. or No Connection in the FL1400 BIA.

Pin #	Signal Name	Description
1	PRI+	Primary ASCB-D bus, non-inverting wire
2	N.C.	Not Connected in the FL1400 BIA
3	N.C.	Not Connected in the FL1400 BIA
4	PRIBKP+	Primary Backup ASCB-D bus, non-inverting wire
5	N.C.	Not Connected in the FL1400 BIA
6	PRI-	Primary ASCB-D bus, inverting wire
7	GND	Signal Ground
8	PRIBKP-	Primary Backup ASCB-D bus, inverting wire
9	GND	Signal Ground





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## 7.2. FL1400 Bus Interface Adapter (BIA) Mating Connector Information

The BIA is connected to the ASCB-D bus using a 9-pin D sub connector. The connector on the BIA is male. The following part numbers reflect only a couple of suitable connector types. These are by no means the only acceptable connectors and are provided for information only.

Option 1 - Solder cup, snap in pins (for soldering wires to pins) Quantities shown are for 1 PCI-NIC card (2 Connectors)

<b>Qty</b>	<b>Amp Part No.</b>	<b>Digi-Key Part No.</b>	<b>Description</b>
1	205204-1	A1000-ND	9-Pin Male Connector Housing
9	66570-3	A1028-ND	Male Solder Cup Pins
1	748676-1	A2061-ND	Die Cast Shield

Option 2 - Crimp on, snap in pins (for crimping wires to pins) Quantities shown are for 1 PCI-NIC card (2 Connectors)

<b>Qty</b>	<b>Amp Part No.</b>	<b>Digi-Key Part No.</b>	<b>Description</b>
1	205204-1	A1000-ND	9-Pin Male Connector Housing
9	1-66506-0	A1008-ND	Male Crimp on Pins
1	748676-1	A2061-ND	Die Cast Shield

Optionally you may need to order one or more of the following if your technicians do not have the tooling for these. (Most will have so you may want to ask).

<b>Qty</b>	<b>Amp Part No.</b>	<b>Digi-Key Part No.</b>	<b>Description</b>
1	91067-2	A1010-ND	Snap In Pin Insertion/Extraction Tool
1	58448-2	A9990-ND	Pro-Crimper II tool with Dies (For Crimp on Pins Only)



## 8. Operating the Escape Tool to Generate “Consume All” Registries

**It is not normally necessary to do this as the end user. The Consul all registry or “Escape.le\_reg” file for the bus reader is normally available from Honeywell. This section is included for references purposes only.**

### 8.1. Registry generation

The FL1400 requires the generation of an ESCAPE tool “consume all” registry. This registry may be provided by Honeywell. If the registry is not provided, it must be generated. Note that the ESCAPE tool will generate a “Consume All” registry for the Telemetry Interface System (TIS), so we use the TIS in the database to generate our registry.

#### 8.1.1. “Consume All” Registry Generation Requirements

You will need the following in order to create sub set registries for the FL1400.

- A working copy of the latest ESCAPE database files for the aircraft you will be using the equipment on. The same databases used to create the registries for the flight configuration must be used to create the sub set registries or the FL1400 may decode garbage data. It is imperative that the sub set registry be produced from the same ASCB-D bus schedule as the flight registries.
- The same version of the Honeywell ESCAPE tool used to produce the aircraft equipment registries.
- A Windows NT based computer capable of running the ESCAPE tool software along with Microsoft Access 97 (required by the Honeywell ESCAPE tool.)

Once the Computer is running the proper version of the ESCAPE tool and is pointing to the copies of the ASCB Data and Configuration Data databases, you can begin the following steps to produce your Consume All registry.

#### 8.1.2. ESCAPE tool operation and database modification

It is important to remember that you are working with a copy of the ESCAPE databases that was used to create the registries in the aircraft. You are not changing anything on the aircraft. The most you can do is to render the copy unusable and have to retrieve another copy.

It is equally important to remember that any changes made to the databases that would change produced data will cause the resulting generated registries (including the one for your FL1400) to not match the ASCB-D bus transmission schedule of the actual equipment on the



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aircraft. The worst that happens is that the FL1400 does not work. The TIS platform cannot physically transmit on the ASCB-D bus, and as such, it cannot corrupt the ASCB-D bus on the aircraft.

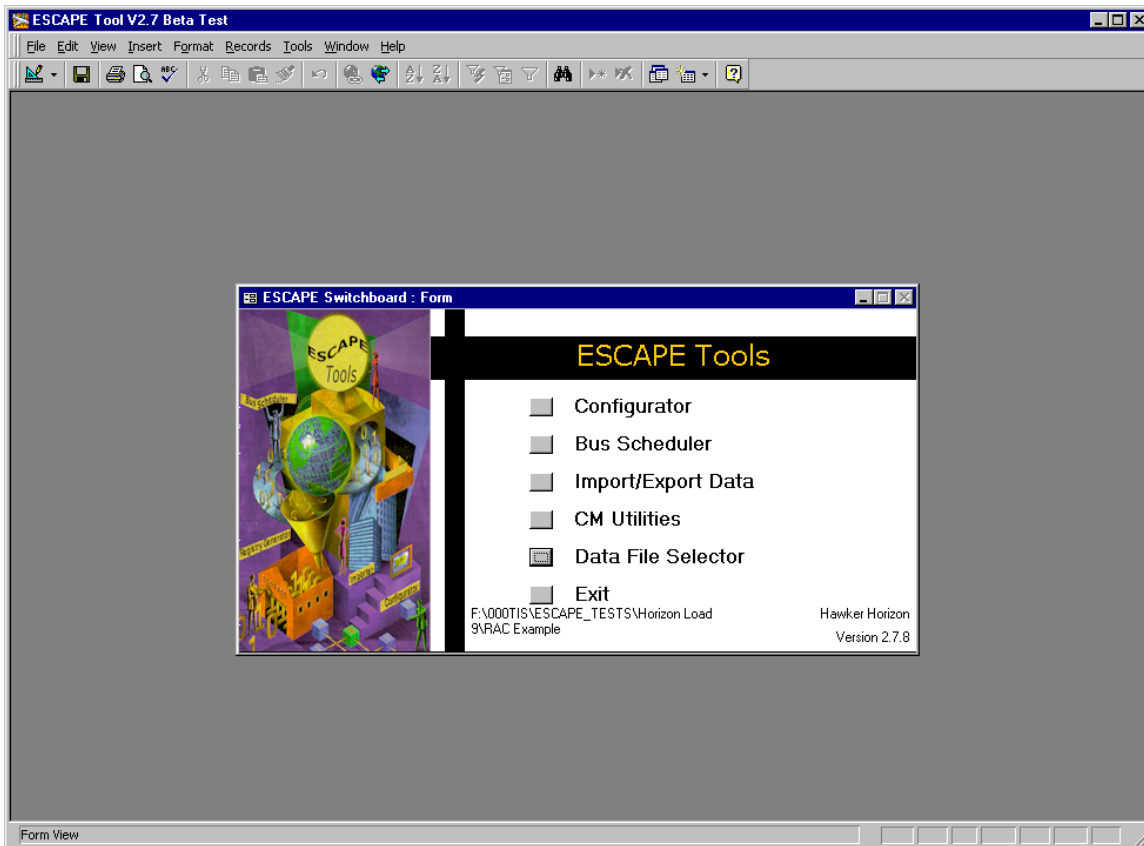
It is very easy however to make a mistake modifying the databases that will cause the FL1400 to not function properly, so please check your changes carefully and follow the directions carefully.



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Let's Begin:

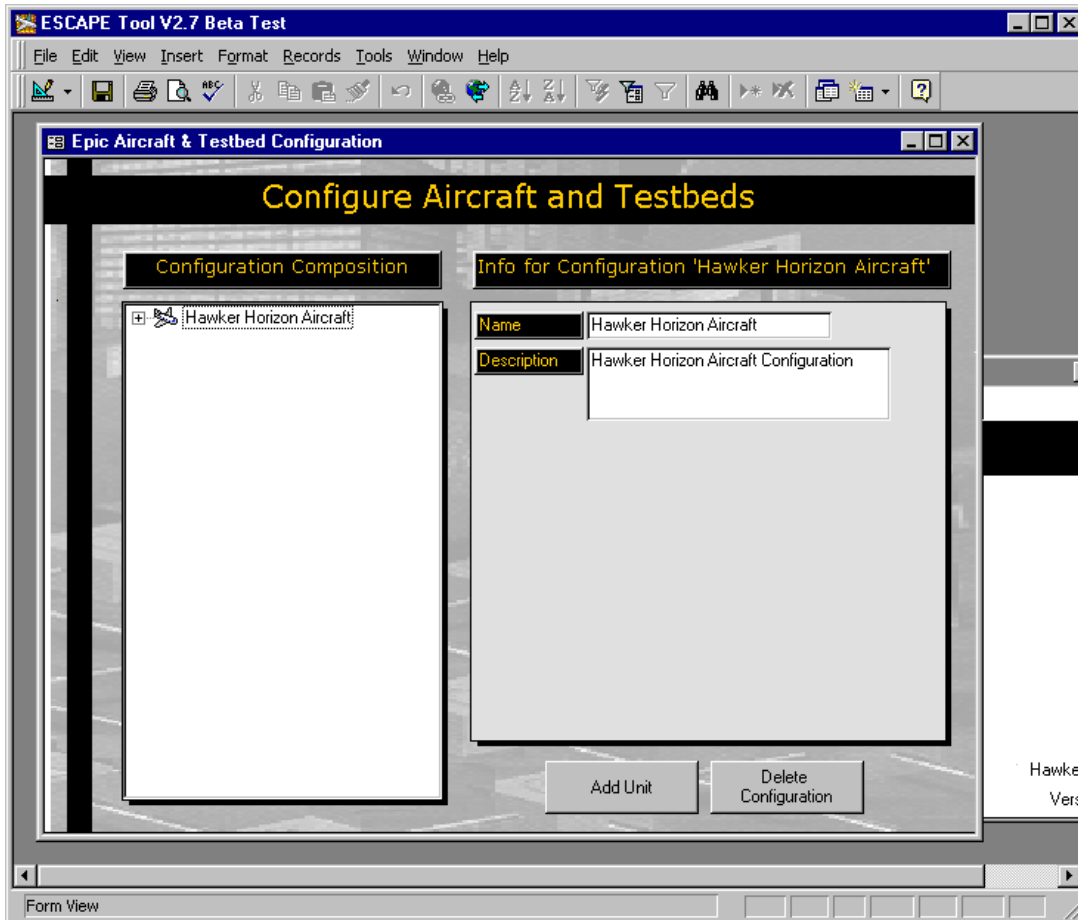
First, start the ESCAPE tool and select Configurator from the ESCAPE TOOLS menu.



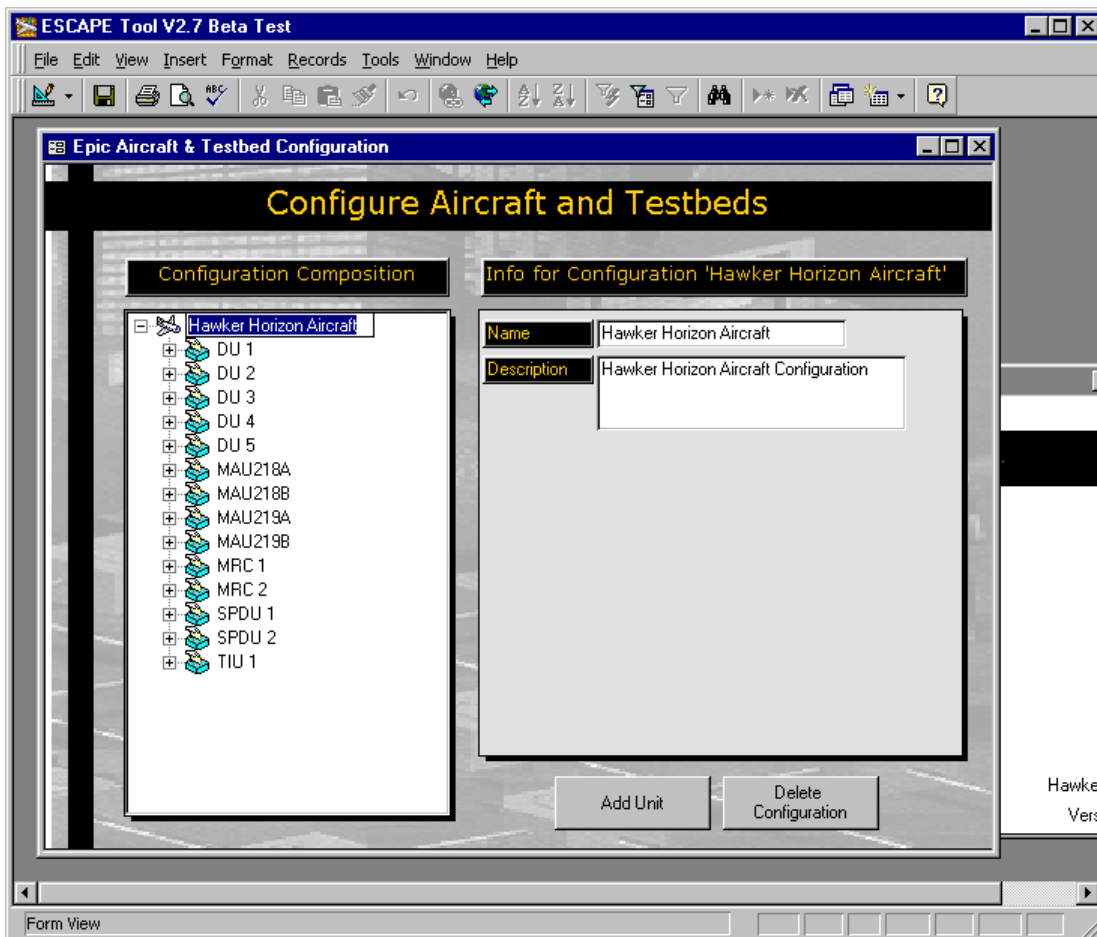


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Open the “Configure Aircraft and Testbeds” window



Expand the configuration for the aircraft by clicking the “+” sign next to the aircraft symbol. After doing this, highlight the aircraft description by clicking the text to the right of the aircraft symbol. Once it is properly selected, you will see the “Add Unit” button appear. It will not appear unless the text is highlighted.



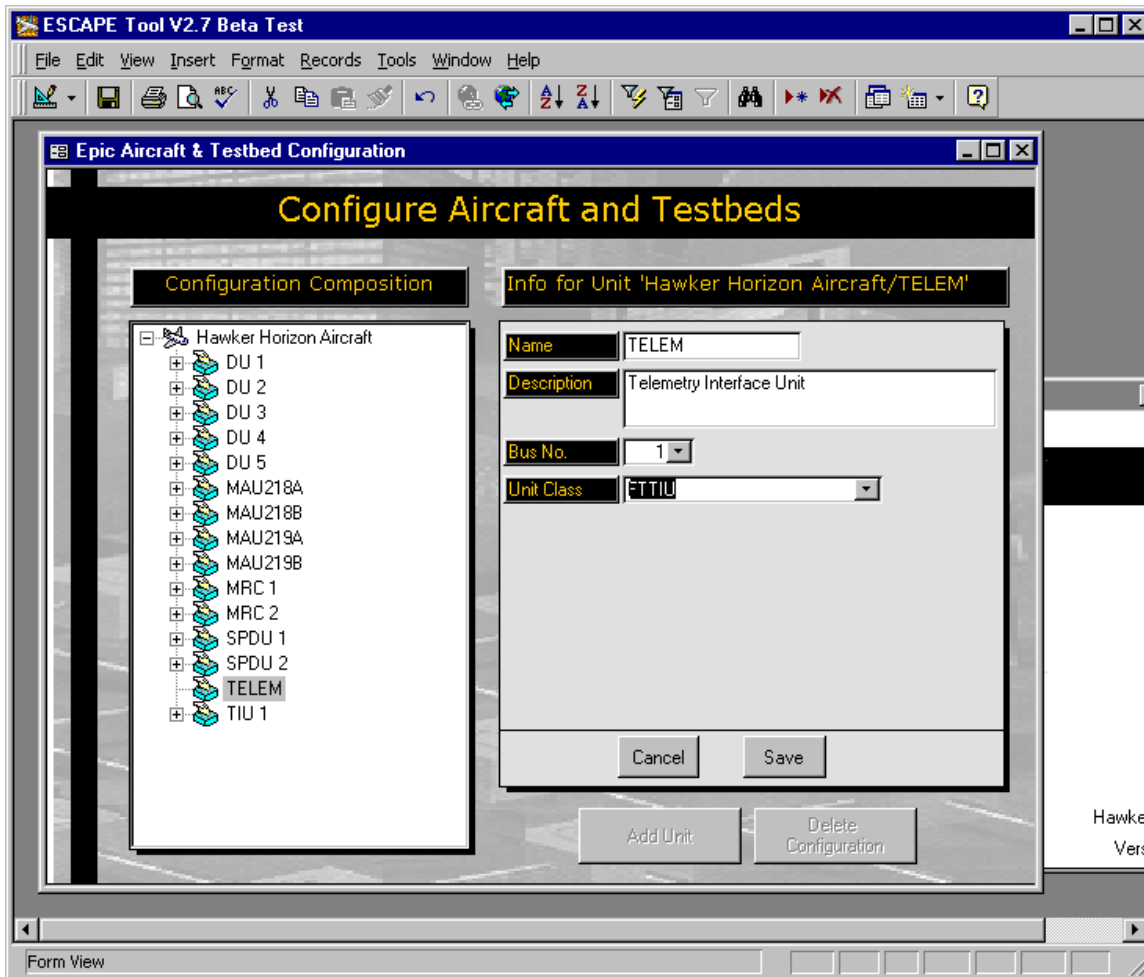


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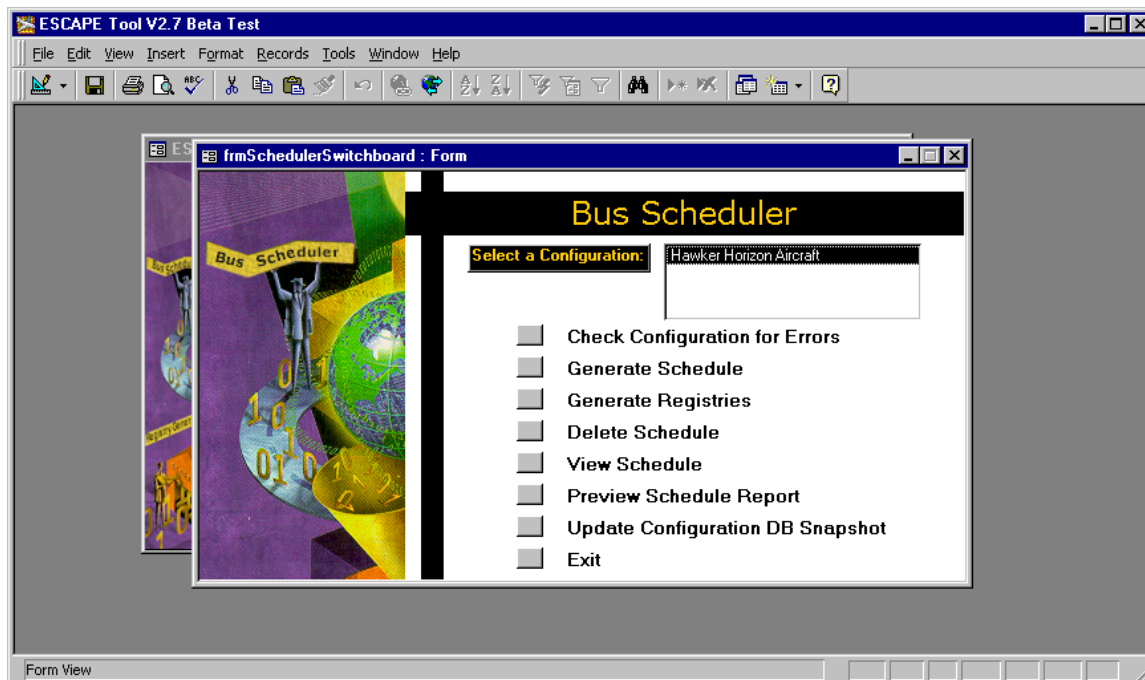
Select "Add Unit" and enter the following information for the unit.

Name "TELEM", Description "Telemetry Interface Unit", Bus Number "1", and Unit Class "FTTIU"

Select save when completed.



It is now time to produce our registry for the FL1400. Select “Bus Scheduler” and the following window will appear.



Click the “Generate Schedule” Button sit back and wait. This process will take from 10 minutes to multiple hours depending on the complexity of the bus schedule and the speed of your machine.

You will see a progress indicator at the bottom of your screen during this process.

When the schedule is complete, you must select “Generate Registries” this will take a few minutes or more, but not nearly as long as the “Generate Schedule”. You will be prompted on where to place the registries. Also be prepared for the size of the files. The location that you select will need 50 MB or more free. You are only interested in one registry file, but it is not possible to produce only the one you are interested in. You will get an entire directory structure produced that will contain registries for everything in the aircraft.

When all of this is done, there will be a directory called \TELEM\PROCESSOR1 under the directory that you specified for the registry files.

That will contain the TIS registry file. This file will be named Escape.le\_reg. This file is your Escape.le\_reg file that must be copied via FTP or other means to the FL1400 home directory for the user ????. This was described earlier in the System Files section.