MODEL 635, 540 AMBIENT ANALYSIS SYSTEM SOFTWARE

Version 1.9.0 6/30/05

Welcome to the IED540 Ambient Analysis System Program. This help file will assist in answering questions that arise from using this program.

IED540 AMBIENT ANALYSIS SYSTEM PROGRAM

- This program is installed on an IED 590-computer (also called “590-computer”).
- This program controls one or more IED Model 540M Ambient Analysis System Mainframe (called “540-frame” for the rest of this help file) and is used as a project creator/editor, a frame analyzer/troubleshooter, a channel feedback constant calibrator, an attenuation scheduler and an output attenuation monitor.
- This program will run on any 32-bit Windows operating system platform (95/98/ME/NT/2000/XP). This program will not run on 16-bit Windows operation system platforms.
- This program is fully accessible for both keyboard actions and mouse actions unless otherwise noted.
- This program can be started, controlled and stopped from an external program such as the ACS Toolset Program version 6.0 or higher (called “Toolset” for the rest of this help file) that controls the 500 Series Audio Control System (called “ACS” for the rest of this help file) through Windows message handling and/or IEDNet network messages.
- This program communicates with the 540-frame (by either receiving data from a 540-frame or sending data to a 540-frame) by two different communication types:
  - **Network communication** through a 422LAN Module using IEDNet network messages.
  - **Serial communication** through the 590-computer:
    - **COM Port** (also called “590COM”) (RS232) to a converter (e.g., B & B RS-232/RS-422 Converter, Model 422CFC) to the 540-frame port (RS422).
    - **590I Card** (also called “590I Card”) (RS422) to the 540-frame port (RS422). This card will not work with Windows 2000/XP.

IED MODEL 540M AMBIENT ANALYSIS SYSTEM MAINFRAME

- The **IED Model 540 Ambient Analysis System** is a subsystem of the ACS. It controls sound system channel levels in response to ambient or background noise levels. The 540-frame houses and interconnects the 540P Power Supply, the 540CPU Central Processor Card and the 540IAC/540I/540C Attenuator Card(s) that makes up the system. Compression-type screw terminal connectors for the audio signal in and out as well as for the Model 540S Remote Sensors are located on the rear of 540-frame.
- 540P Power Supply has a 540PSL (input voltage 105V - 130V) Switching Power Supply Card or a 540PSH (input voltage 210V - 260V) Switching Power Supply Card that provides +15V at 3A, -15V at 3A, and +27V at 1A. Frame Views monitors these voltages.

540CPU Central Processor Card handles processing of data received from this program and data sent to this program.

540IAC/540I/540C Attenuator Cards have 4 channels per card. There are 11 attenuator card slots for a total of 44 channels per 540-frame.

540S Remote Sensor measures ambient or background noise levels.

See Attenuator Cards and Sensor for more information about these attenuator cards and remote sensors.

The 540-frame has two RS422 serial communications ports. The top port processes information received from this program or sends information to this program. The bottom port passes information to another 540-frame.

Please read the Hardware Check section that has some very important information.

MAIN

The Main form controls this program that includes open/close a project, create/edit a project, view/analyze/print a project and place the project online/offline, change default parameters and manage the password server.

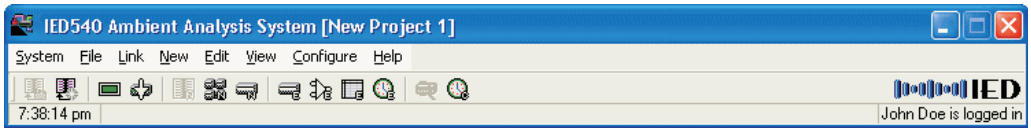


Figure 1 - New Project 1

NAVIGATION

System Section Menu Items

- **Login** is the password server login that grants permission to restricted areas of this program.
- **Logout** is the password server logout. When logout is executed, the user name will disappear from the Main form. If logout was initiated by another program, any editable form will be closed.
- **Hide** is shown if this program is externally started and controlled from an external program such as the Toolset. The user does not have to have password permission to hide this program. The project can remain open and either online or offline. This program will not appear in the Windows Start Bar. The external program will stop this program.
- **Exit** is shown if this program is not externally started. This item will close this program. A notice will appear if the user does not have permission. Another notice will appear if the project is online and there is an active attenuation schedule.

File Section Menu Items

- **Open Project** is used to open an existing project file (e.g., “MyProject.540"), that will be loaded into the Project Manager that will build and display the project.
- **Reopen** is used to open an existing project file (e.g., “MyProject.540") from a list of recently opened projects that will be loaded (process uses a progress bar) into the Project Manager that will build and display the project.

- **Close Project** is used to close the project. When the project is closed, the project file is removed from the Project Manager.
- **Print Project Data** allows for the display of the current project's contents for document previewing and printing.
- **Convert DOS Project** calls the project creation wizard that will convert an existing DOS project ("540cnfr.dat") step-by-step into a new Windows project.

Link Section Menu Items

- **Go Online** places the project online (process uses a progress bar). Process uses a progress bar. Online means that any changes made to the project will immediately be written into the selected frame. In this condition both the project and frames are synchronized.
    - A notice will appear if the user does not have password permission to place the project online. When a user chooses to go online, the Project Manager will start to cycle through each project frame by first linking to that 540-frame, then receiving data from that 540-frame. If there is any difference in the data of that 540-frame and the project data, then the discrepancy will have to be resolved in the Frame Compare form before going online. Any problems that develop in the communication's link will be noted in that frame's image. There is a special condition when this program is linked to the Toolset. The program will perform link status, attenuation scheduling and monitor/testing whether online or offline.
- **Go Offline** places the project offline. Offline means that any changes made to the project will not immediately be written into the selected frame. In this condition both the project and frames are not synchronized. One aid that will help the user determine if the project and frames are not synchronized is the Main form Send Data toolbar button.
    - A notice will appear if the user does not password permission to place the project offline. Conditions that can cause automatic offline triggering are emergency shutdown and deleted project file. Another condition occurs when this program is linked to the Toolset. The program will perform link status, attenuation scheduling and monitor/testing whether online or offline.
- **Send Data** performs sending data (process uses a progress bar) to the frames. If this option is flashing (Send Data toolbar button), then offline changes have been made and those changes have not been sent to the frames. In this condition both the project and the 540-frames are not synchronized. A notice will appear.

New Section Menu Items

- **New Project** calls the project creation wizard form that will create a new project step-by-step.
- **New Group** creates a new group that is a collection of frames. This input box will appear.
- **New Frame** calls the new frame creation wizard form that will add a new 540-frame to the project step-by-step.

Edit Section Menu Items

- **Edit Project** calls the edit project form that allows editing of project information.

- **Edit Frame** calls the edit frame form that allows editing of frame information.
- **Edit Channel** calls the edit channel form that allows editing of individual channel information, assigning sensors to channels and channel feedback constant calibration.
- **Edit Channels** calls the edit channels form that allows editing of all channel's information including assigning zones, assigning sensors to channels, and editing sensor name information.
- **Edit Attenuation Schedule** calls the edit attenuation schedule form that allows editing of channels that have attenuation schedules.

View Section Menu Items

- **Frame Views** calls the Frame Views form that contains section titled Frame Status and Frame VU Metering for a selected 540-frame.
- **ACS Information** calls the ACS information form that is a listing of information obtained from and/or given to the Toolset. This information is the ACS IP Addresses ("ACS.ini"), the ACS zones database ("Zones.db"), and project channel information database ("Win540.db").
- **Attenuation Schedule Chart** charts the attenuation schedule for all channels that have an attenuation schedule.

Configure Section Menu Items

- **Preferences** calls the Preferences form that sets program and project defaults.
- **Password Configuration** is the password server that includes Edit Password Accounts, Change Passwod, Configure Password Server and View Password Log.

Help Section Menu Items

- **Contents** are used to call help for this program.
- **About** calls the About form that contains miscellaneous information about this program.

Popup Menu Items

- The following items are same items that are located in the Menu: Open Project, Reopen, Close Project, Go Online, Go Offline, Send Data, New Project, New Group, New Frame, Edit Project Edit Frame, Edit Channel, Edit Channels, Edit Attenuation Schedule, Frame Views and Attenuation Schedule Chart.

Status bar Information

- **Company Logo** is Innovative Electronic Designs, Inc. logo. Double-clicking on the logo calls the About form.
- **Current Time** is a continuous time clock with display of the current time. Today's date and day is supplied as a mouse-fly-over hint.
- **Information Panel** supplies monitor/test information when monitor/testing is in **progress.**
- **Login User Name** is the name of the user that is logged in. There is a balloon popup over this label that shows the user's permissions.

STARTUP PROBLEMS/CONDITIONS

Problem Notices - IED needs to be contacted if any of these notices occur.

- A notice will appear if the program's support library ("ied540dll.dll") is missing.
- A notice will appear if the program's support library ("ied540dll.dll") is the wrong version.
- A notice will appear if the password server ("pwdsrv32.exe") or password support library ("pwdflt32.dll") is missing.
- A notice will appear if the password support library ("pwddll32.dll") is missing.
- A notice will appear if the IEDNet support library ("ibase32.dll") is missing.
- A notice will appear if the IEDNet support library ("iednet32.dll") is missing.

Condition Notices

- A notice will appear if this program was started remotely (e.g., Toolset) and there was no project loaded. Follow instructions.
- A notice will appear if the screen size is less than 800x600. Adjust screen size to a minimum of 800x600.

Login

This is the Password Server Login form. There must be a valid combination of User Name and Password to have a successful login. Permissions will determine how much access the user has to this program. Note: This form is not fully accessible for keyboard actions.

Figure 2 - Login Entry Screen

NAVIGATION

- Type the name assigned to the user in the User Name edit box.
- Type the security word that the user used to log onto the password server in the Password edit box.
- Pressing the OK button will proceed with login. A notice will appear if login was unsuccessful.

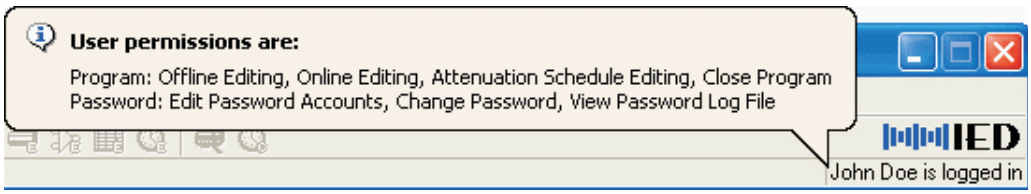


Figure 3 - Popup Tool Tip
User Permissions

Figure 3 is a tool tip balloon popup that appears when the mouse is moved directly over the User Login Name on the Main form. The listing of permissions is stated below. This program's permissions are:

Program

- **All** means that every program permission is granted.
- **Offline Editing** is required for editing the following while offline: Open Project, Convert DOS Project, Go Online/Offline, Send Data, New Project, New Group, New Frame, Edit Frame, Edit Channel, Edit Channels, Delete, Rename and Preferences.
- **Online Editing** is required for editing the following while online: Go Online/Offline, Edit Channel, Edit Channels and Preferences.
- **Feedback Constant Calibration** is required for performing feedback constant calibration along with Online Editing Permission: Edit Channel.
- **Attenuation Schedule Edit** is required for editing the attenuation schedule: Edit Attenuation Schedule.
- **Close Program** is required to close this program.
- **None** means that no program permissions have been granted.

Password

- **All** means that every password permission is granted.
- **Edit Password Accounts** is required to gain access to add, edit and delete user password accounts.
- **Change Password** is required to change a user's password.
- **Configure Password Server** is required to configure the password server.
- **View Password Log File** is required to view the password log file.
- **None** means that no password permissions have been granted.
- Pressing the **Cancel** button will cancel login.

Open Project

This option is used to open an existing project file and load that project into the Project Manager. Note: This form is a standard Windows form and may not be fully accessible for keyboard actions.

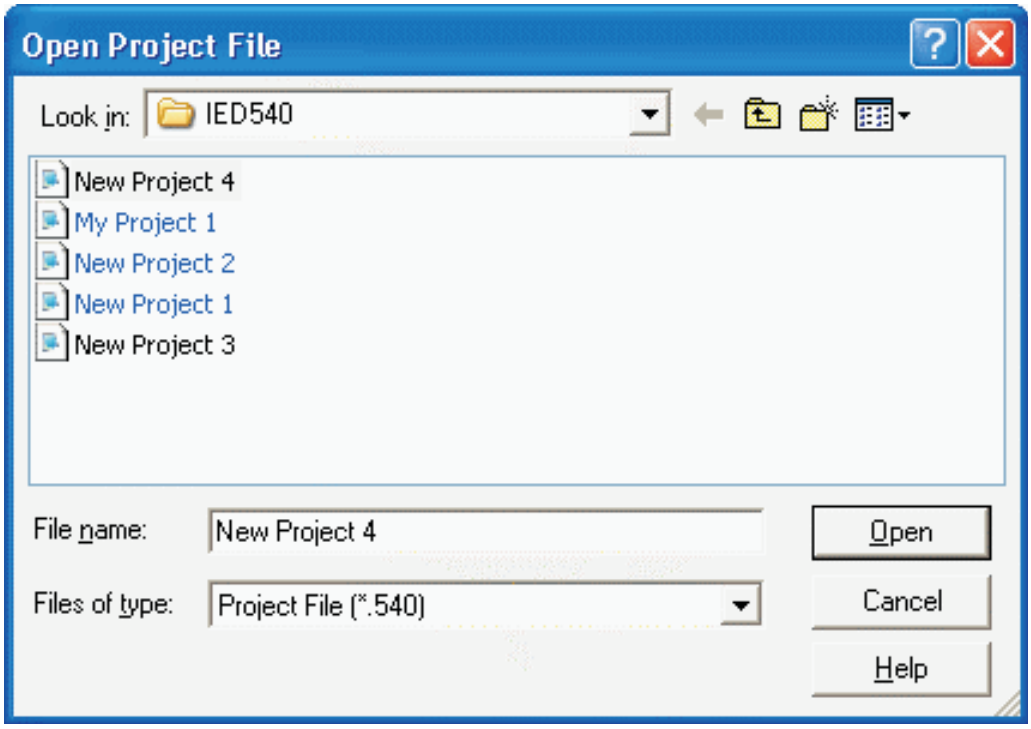


Figure 4 - Open Project File Dialogue Box

Figure 4 shows the Open Project dialog box that is used to find a project file.

- By default, project files are located in the program's folder (e.g., c:\ied\ied540\). However, project files can be located in any folder. Select an existing project and either double-clicking on the project file or pressing the Open button. The project file will be loaded (process uses a progress bar) into the Project Manager that will build and display the project.
- Pressing the Cancel button will cancel opening a project.
- Pressing the Help button will open this help page.

Print

This is a WYSIWYG (What You See Is What You Get) type of document preview that takes the settings of the default printer and builds the preview document. This form will only appear is there are printers configured for this computer. There are two document types: Project and System Information.

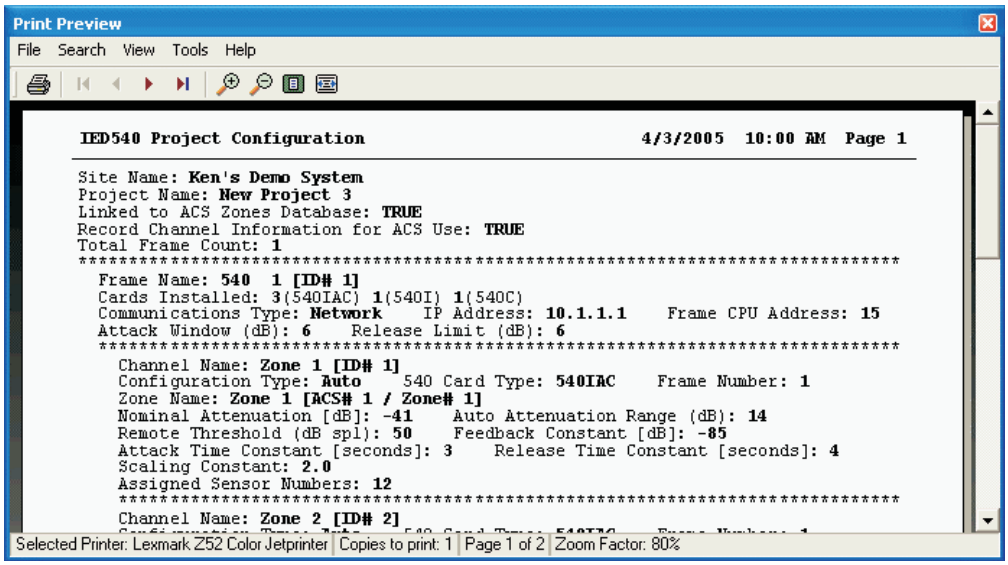


Figure 5 - Print Preview, Current Project Data

Figure 5 displays the contents of the current project data. Figure 6 displays the system information.

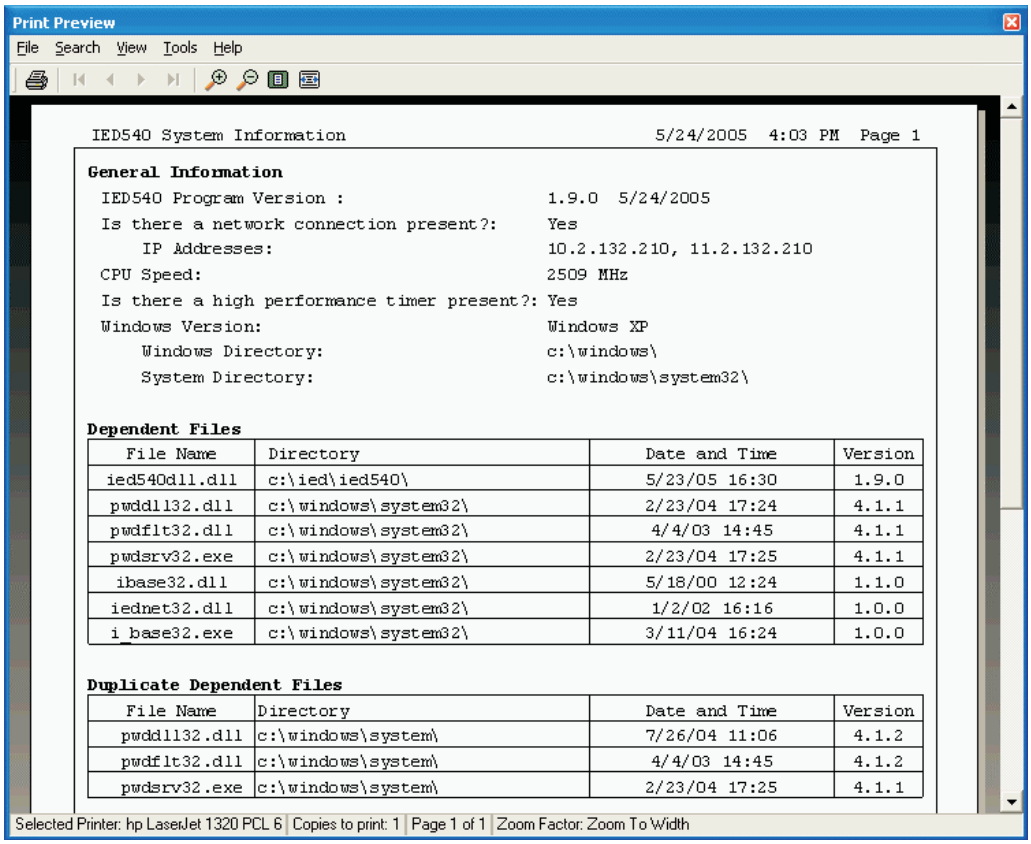


Figure 6 - Print Preview, System Information

NAVIGATION

Menu Items

File Section

- Print sends the contents of the document to the selected printer.
- Close will close this form.

Search Section - current page selection can be viewed in the status bar.

- First Page changes the viewing page to the first page of the document.
- Previous Page changes the viewing page to the previous page of the document.
- Next Page changes the viewing page to the next page of the document.
- Last Page changes the viewing page to the last page of the document.

View Section

- Zoom Increase changes the size of the document by an increase of 10% up to 150%.
- Zoom Decrease changes the size of the document by a decrease of 10% down to 50%.
- Zoom to Fit changes the size of the document to fit the width and height of the viewing screen.
- Zoom to Width changes the size of the document to fit the width of the viewing screen.

Tools Section - current number of copies to print can be viewed in the status bar.

- Increase Print Copies increases the number of copies to print by a factor of one up to a maximum of 9 copies.
- Decrease Print Copies decreases the number of copies to print by a factor of one up to a minimum of 1 copy.

Help Section

- **Contents** - open this help page.

Popup Menu Items

- The following items are same items that are located in the Menu: Print, First Page, Previous Page, Next Page, Last Page, Zoom Increase, Zoom Decrease, Zoom To Fit and Zoom To Width.

INFORMATION

Status bar

- **Selected Printer** is the 590-computers default printer.
- **Copies to print** is the number of copies to print.
- **Page # of #** is the current page of a total number of pages.
- **Zoom Factor** is the relative size of the preview screen in relationship (in percentage) to a 8-1/2x11 document.

Convert DOS Project

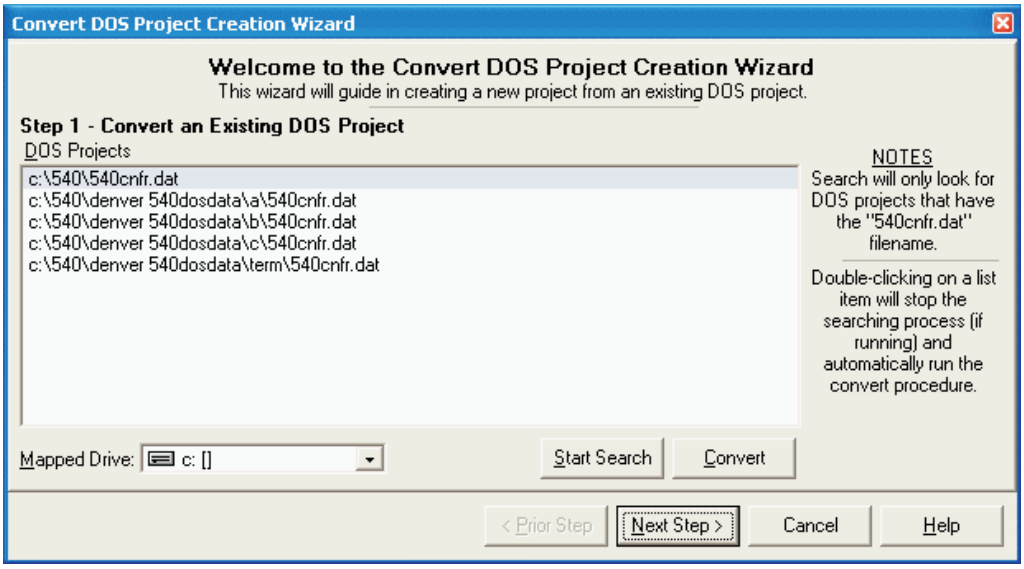


Figure 7 - Convert DOS Project Creation Wizard

This option creates a new project (example: “MyProject.540") with groups, frames, channels and sensors from an existing DOS project (”540cnfr.dat").

NAVIGATION

Step 1 - Convert an Existing DOS Project (See Figure)

- Decide which drive location to search through using the **Mapped Drive** combo box.
- Pressing the **Start Search** button will start the searching process in the Selected Mapped Drive for all **DOS projects** (“540cnfr.dat”). All DOS projects will be listed in the DOS Projects list box. The progression of locating DOS projects will be shown just above the list box.
- Pressing the **Stop Search** button will stop the searching process.
- Select the DOS project from the list and press the **Convert** button. A new project will be built (process uses a progress bar) from the DOS project data. A notice will appear if there was a problem converting the DOS project.
- Tip: Double-clicking on a list item will stop the searching process (if running) and automatically run the convert procedure.
- Press the **Next Step** button to proceed.

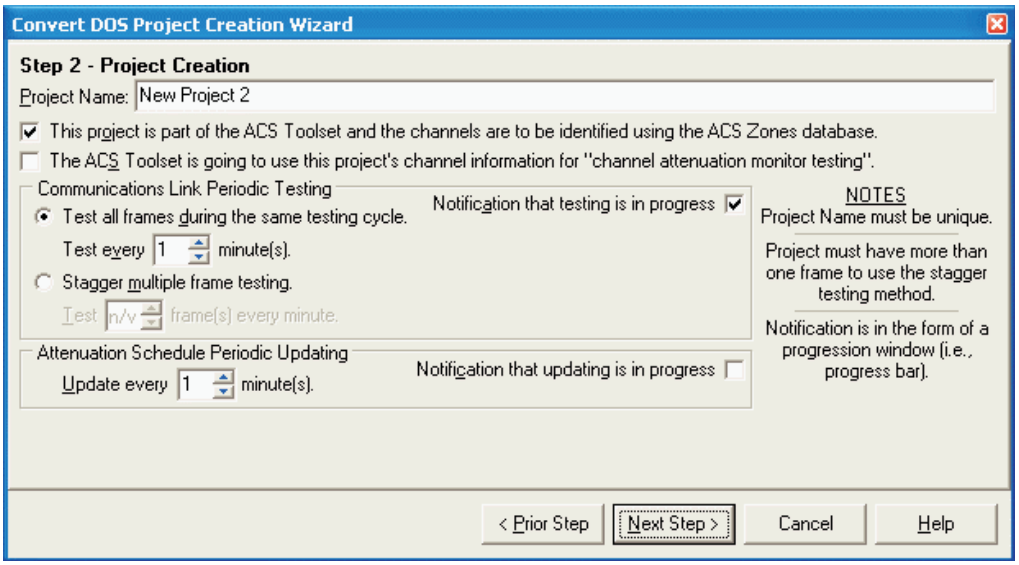


Figure 8 - Convert DOS Project Creation Wizard
Project Creation

Step 2 - Project Creation (See Figure 8)

- The **Project Name** has been supplied in the edit box. This name can be changed; however, a notice will appear if the Project Name is already used by another project in the project folder.
- If this project is to use ACS Zones database ("Zones.db") for zoning channels, then check **This project is part of the ACS Toolset and the channels are to be identified using the ACS Zones database** check box.
- If this project is to have "channel attenuation monitor testing", then check **The ACS Toolset is going to use this project's channel information for "channel attenuation monitor testing"** check box.
- This project will be tested on a periodic basis to see if there is a communications link to the frames. **Notification** is used to notify the user (using a progress bar) that this program is checking the connectivity between the 590-computer and the 540-frame.
- **Test all frames during the same testing cycle.** If selected, then decide how often the testing cycle is to be performed.
- **Stagger multiple frame testing**. If selected, then decide how many frames are to be tested per minute. This is highly recommended if the project has many 540-frames.
- This project will update those frames that have an attenuation schedule in effect. **Notification** is used to notify the user (using a progress bar) that this program is checking the attenuation schedule to see if the scheduled attenuation has been applied to the 540-frame. Decide how often the attenuation schedule is to be updated.
- Press the **Next Step** button to proceed or press the **Prior Step** button to go to the previous step. Note: Pressing the **Prior Step** button will cancel the DOS project conversion. Step 1 will have to be performed again.

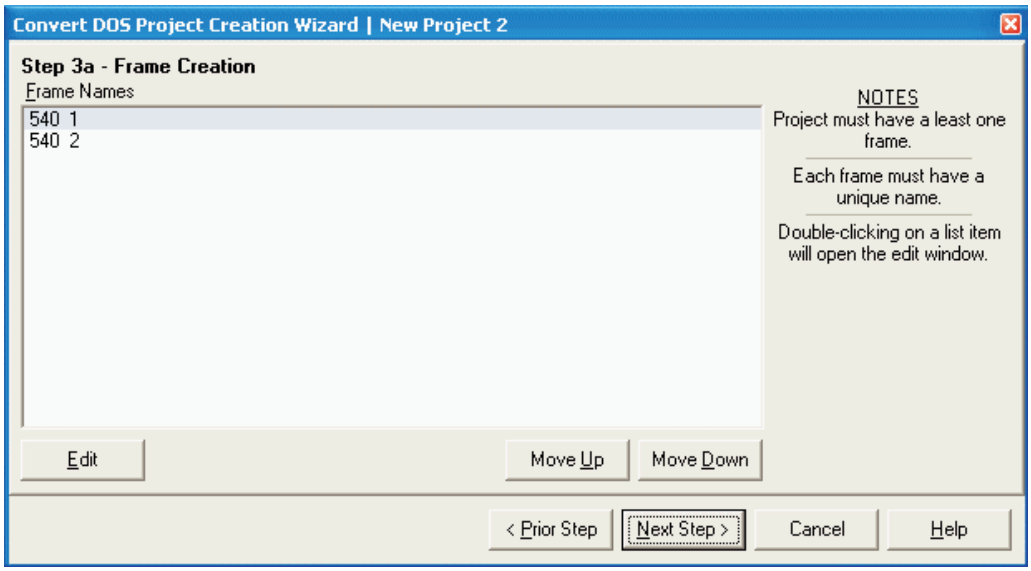


Figure 9 - Convert DOS Project Creation Wizard
Frame Creation

Step 3a - Frame Creation(See Figure 9)

- Pressing the Edit button will edit the selected frame name from the Frames list. This input box will appear. Double-clicking on a list item will open the edit window, too.
- If this project has been set to use the Stagger multiple frame testing method and there are less than two frames listed, then if this condition persists, then the Test all frames during the same testing cycle testing method will be used.
- Pressing the Move Up button or Move Down button will reposition the selected frame name in the Frames list.
- Press the Next Step button to proceed or press the Prior Step button to go to the previous step.

Step 3b - Frame Creation - Communications Type (See Figure 10) (All frames must be completed before proceeding to the next step.)

Select a frame to edit the information from the **Listed Frames** list box. The frame's information will be placed into the **Selected Frame Communication Settings** section.

Select from the **Communication Type** combo box which communication type will be used for this 540-frame.

Network is a communications type that uses IEDNet to communicate from this program to a 422LAN module that then communicates with the 540-frame.

Type the **IP Address** (a unique network string identifier that communicates to a device that recognizes that IP Address and establishes communication) in the ip edit box. Press the **Test** button to attempt to communicate using the listed **IP Address** to see if the LAN590I module responds.

- A notice will appear if the test was successful and the IED LAN590I module's firmware is installed.

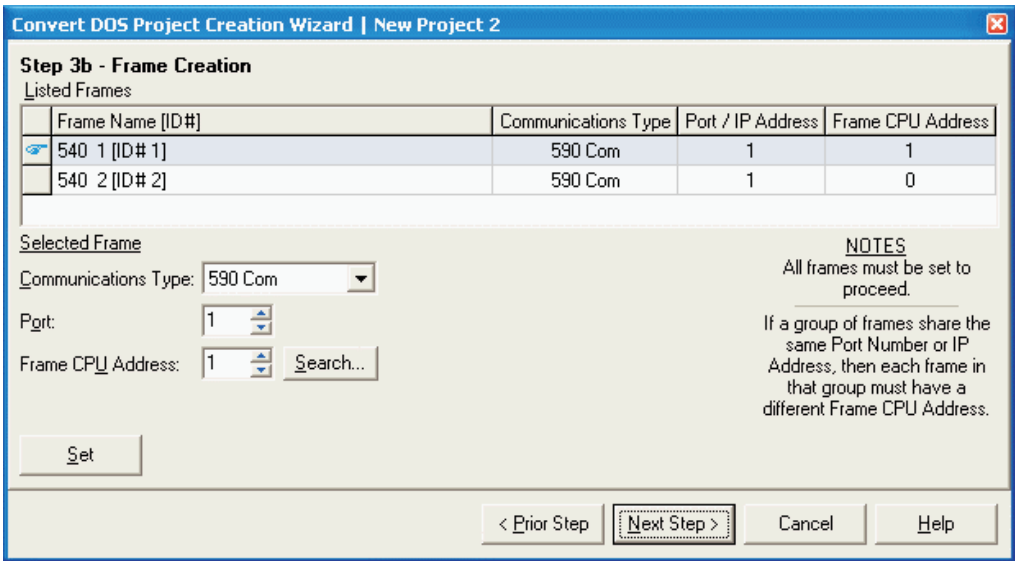


Figure 10 - Convert DOS Project Creation Wizard
Frame Creation - Communications Type

  - A notice will appear if the test was successful; however, could not detect IED LAN590I firmware. See ARP and Telnet for instructions.
  - A notice will appear if the test failed due to an invalid IP Address.
  - A notice will appear if the test failed due to an IEDNet Registration Error.

- **590COM** is a communications type that provides serial communications from the 590-computer to the 540-frame port (RS422 configuration). Since both configurations are different a converter (e.g., B & B RS-232/RS-422 Converter, Model 422CFC) must be used to allow communications between both configurations. Select the COM serial port on a 590-computer from the **Port** spin edit box.
- **590I Card** is a communications type that provides serial communications from the 590-computer to the 540-frame port (RS422 configuration). Since both configurations are the same no conversion is needed. Not available with Windows 2000 or Windows XP operating systems. There are 2 ports per card with the numbering starting at 0 and 1. If another card is added, then its port numbering is 2 and 3. Select the 590I Card port from the **Port** spin edit box.
- Select the 540-frame address using the **Frame CPU Address** spin edit box. Pressing the **Search** button can aid in finding what addresses are located on the selected communications type.
- Pressing the **Set** button places the selected frame edited information into the **Listed Frames** list box.
  - A notice will appear if using Network communications type and the IP Address is an empty string.
  - A notice will appear if using Network communications type and there is a conflict in setting up IP Address and Frame CPU Address.

- A notice will appear if using 590COM or 590I Card communications type and there is a conflict in setting up the Port and the Frame CPU Address.

- Press the **Next Step** button to proceed or press the **Prior Step** button to go to the previous step.

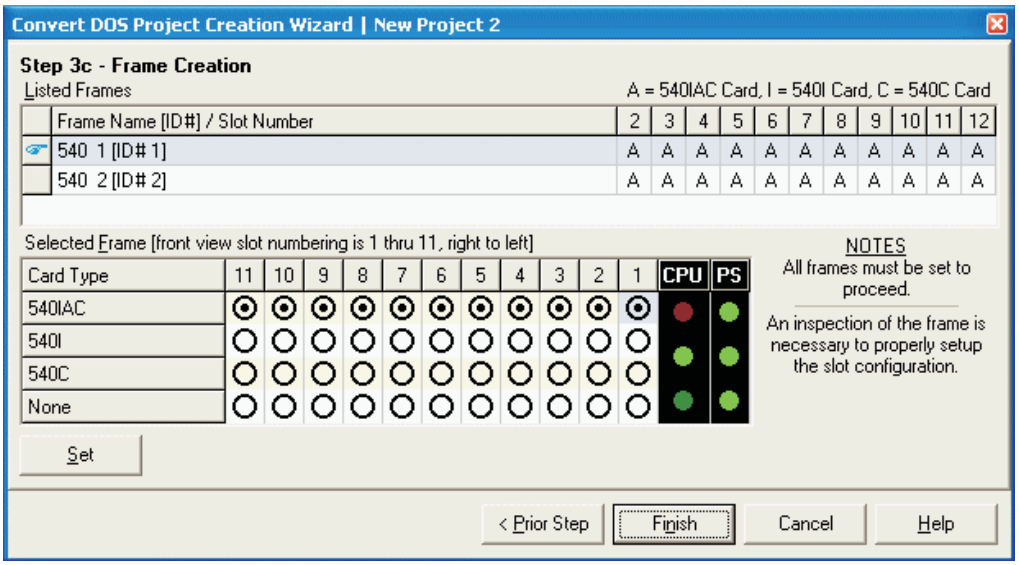


Figure 11 - Frame Creation
Slots Configuration

Step 3c - Frame Creation - Slots Configuration (See Figure 11)

- Check each radio button in the radio button grid for the appropriate card types (540IAC, 540I or 540C). Each card will control its corresponding channel numbers (i.e., Slot 1 contains channels 1 - 4; Slot 2 contains channels 5 - 8, etc.). Power Supply and CPU are laid out to help in the physical numbering of the slots. Each image has a mouse-fly-over hint. Note: All frames must have at least one slot configured as a 540AIC or 540I card type. See Attenuator Cards and Sensor for images of these cards. You call also see images of the attenuator cards double click on the upper left cell (the cursor will change to a hand point) called “Card Type”.

- Pressing the **Set** button places the selected frame edited information into the **Listed Frames** list box. A notice will appear if no slots have been configured for use.

- Pressing the **Finish** button will create the new project or press the **Prior Step** button to go to the previous step. If the project was successfully built, the following notice will appear.

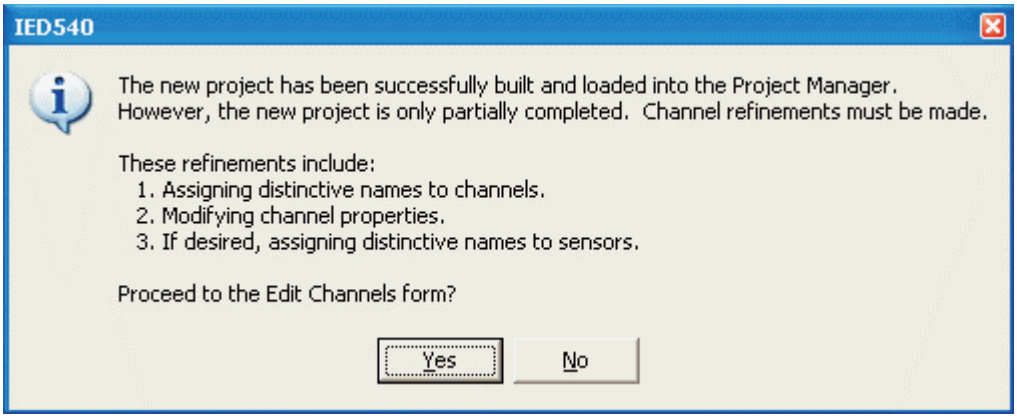


Figure 12 - Project Successful Notice

- Pressing the Cancel button will cause a notice to appear.
- Pressing the Help button will open this help page.

Frame Compare

This form appears if there was a discrepancy between the file data and the 540-frame data in any 540-frame configured for this project while attempting to go online.

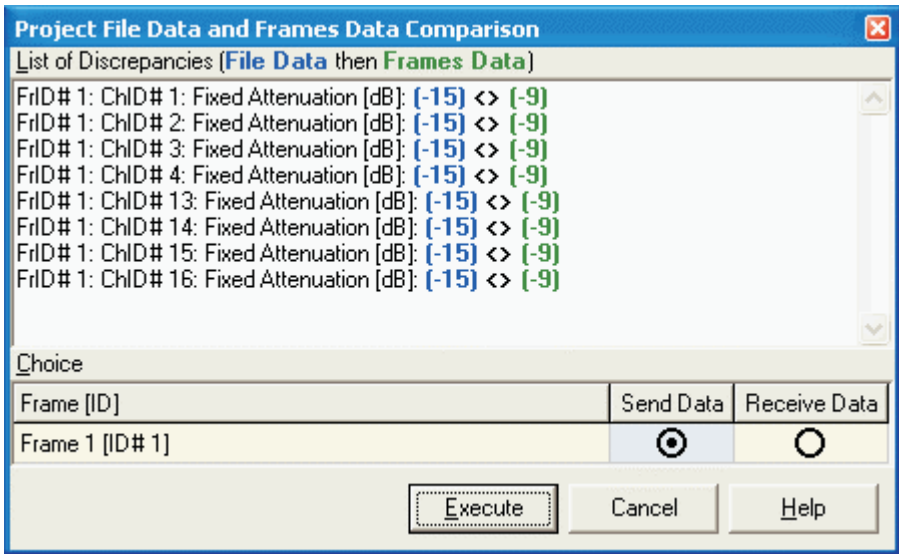


Figure 13 - Frame Compare
Project File Data and Frames Data Comparison

NAVIGATION

- All discrepancies in the file data versus frames data will show in the List of Discrepancies (File Data then Frames Data) list box.
- Frame discrepancies are listed as Frame ID#, then File Data, then Frame Data.
- Channel discrepancies are listed as Frame ID#, then Channel ID#, then File Data, then Frame Data.
- Sensor discrepancies are listed as Frame ID#, then Sensor ID#, then File Data, then Frame Data.
- Select from the Choice grid the Send Data radio button (file data sent to the 540-frame) or the Receive Data radio button (540-frame data sent to the file) for each listed 540-frame.
- How to determine if the frame's data received is not valid? The 540-frame has never been used before and its initialization settings are in place. The 540-frame Nonvolatile SRAM battery is dead. A dead battery has insufficient reserve voltage to maintain the stored data when power is turned off. When power is restored, then the stored data will be reset to the initialized settings. In either case, Receive Data option is disabled to prevent out-of-range and/or undesirable data settings.
- Pressing the Execute button will start the operation that will result in going online. Only those items that showed up in the List of Discrepancies will have to be synchronized (i.e., file data = 540-frame data). Note: If Receiving Data is chosen for any of the listed frames, then a backup copy of the project (i.e., same project name with a different extension "MyProject.rbu") will be made. This process uses a progress bar.
- Pressing the Cancel button will result in the project staying offline.
- Pressing the Help button will open this help page.

New Project

This option creates a new project with groups, frames, channels and sensors.

NAVIGATION

(See Figure 14)

Step 1 - Project Creation

- The **Project Name** has been supplied in the edit box. This name can be changed; however, a notice will appear if the Project Name is already used by another project in the project folder.
- If this project is to use ACS Zones database ("Zones.db") for zoning channels, then check **This project is part of the ACS Toolset and the channels are to be identified using the ACS Zones database** check box.
- If this project is to have "channel attenuation monitor testing", then check **The ACS Toolset is going to use this project's channel information for "channel attenuation monitor testing"** check box.
- This project will be tested on a periodic basis to see if there is a communications link to the frames. **Notification** is used to notify the user (using a progress bar) that this program is checking the connectivity between the 590-computer and the 540-frame.

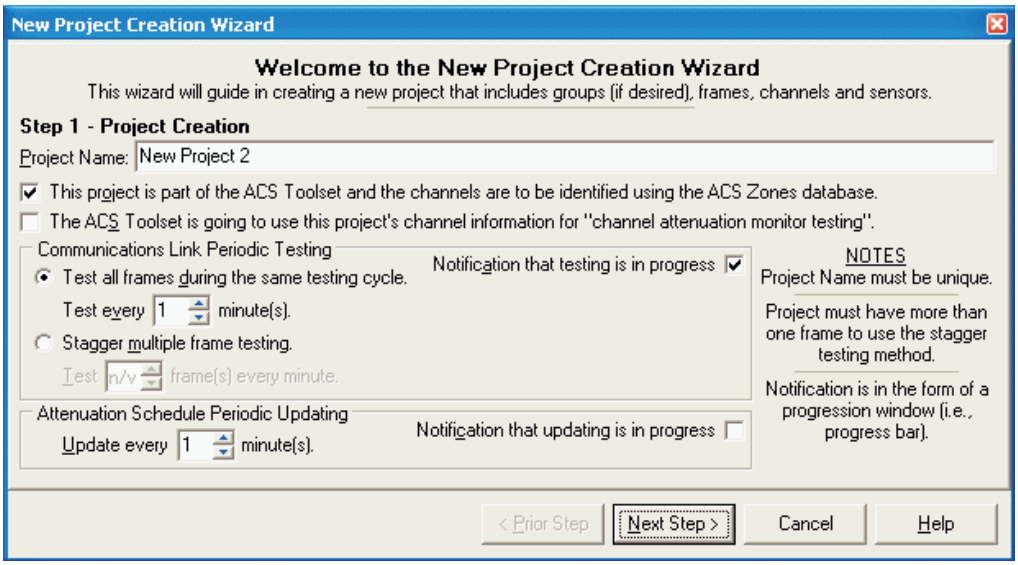


Figure 14 - New Project Creation Wizard

- **Test all frames during the same testing cycle**. If selected, then decide how often the testing cycle is to be performed.
- **Stagger multiple frame testing.** If selected, then decide how many frames are to be tested per minute. This is highly recommended if the project has many 540-frames.
- This project will update those frames that have an attenuation schedule in effect. **Notification** is used to notify the user (using a progress bar) that this program is checking the attenuation schedule to see if the scheduled attenuation has been applied to the 540-frame. Decide how often the attenuation schedule is to be updated.
- Press the **Next Step** button to proceed.

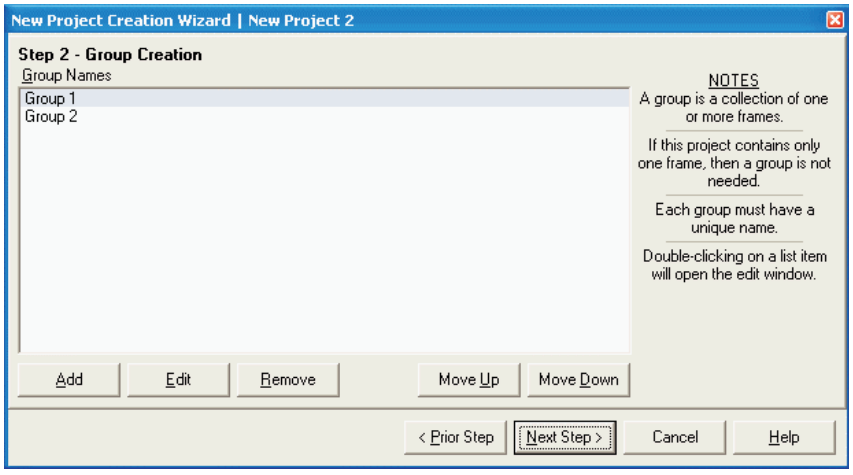


Figure 15 - New Project Wizard, Group Creation

Step 2 - Group Creation (See Figure 15)

- Pressing the **Add** button will add a group to the **Groups** list. This input box will appear.
- Pressing the **Edit** button will edit the selected group name from the **Groups** list. This input box will appear. Double-clicking on a list item will open the edit window, too.
- Pressing the **Remove** button will delete the selected group name from the **Groups** list.
- Pressing the **Move Up** button or **Move Down** button will reposition the selected group name in the **Groups** list.
- Press the **Next Step** button to proceed or press the **Prior Step** button to go to the previous step.

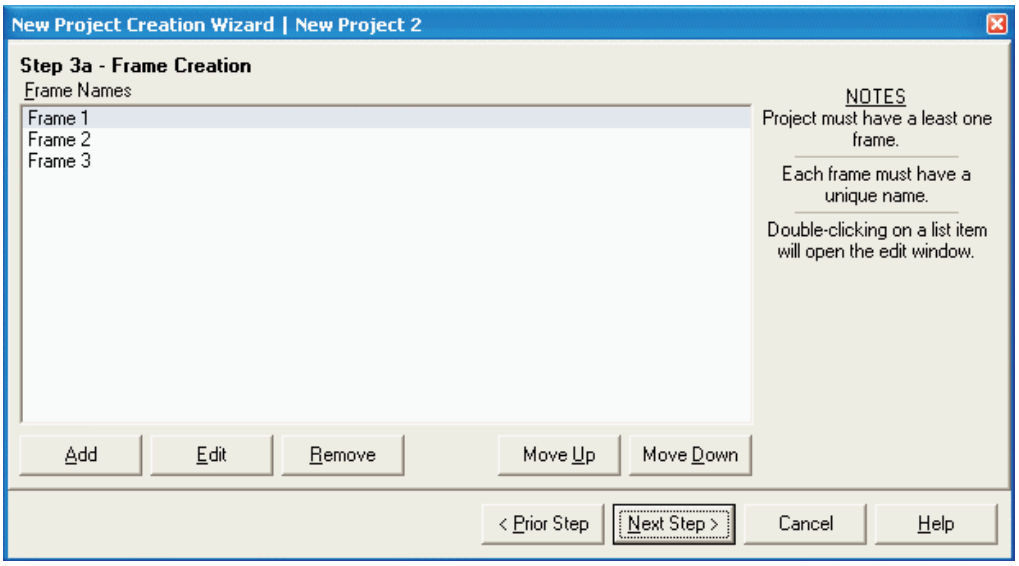


Figure 16 - New Project Creation Wizard
Frame Creation

Step 3a - Frame Creation (Project must have a least one 540-frame.) (See Figure 16)

- Pressing the **Add** button will add a frame to the **Frames** list. This input box will appear.
- Pressing the **Edit** button will edit the selected frame name from the **Frames** list. This input box will appear. Double-clicking on a list item will open the edit window, too.
- Pressing the **Remove** button will delete the selected frame name from the **Frames** list.
- If this project has been set to use the **Stagger multiple frame testing** method and there are less than two frames listed, then if this condition persists, then the **Test all frames during the same testing cycle** testing method will be used.

- Pressing the **Move Up** button or **Move Down** button will reposition the selected frame name in the **Frames** list.
- Press the **Next Step** button to proceed or press the **Prior Step** button to go to the previous step.

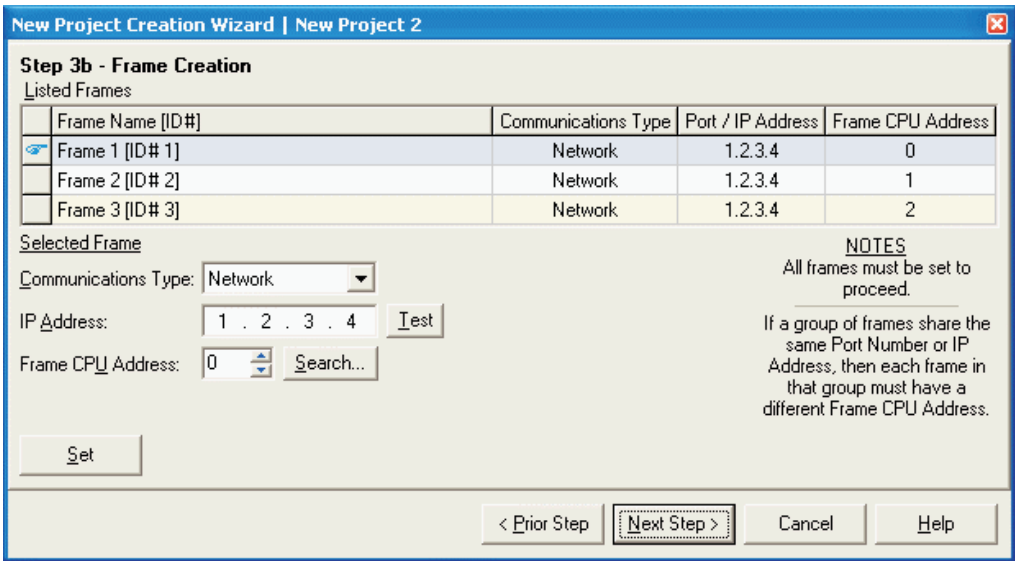
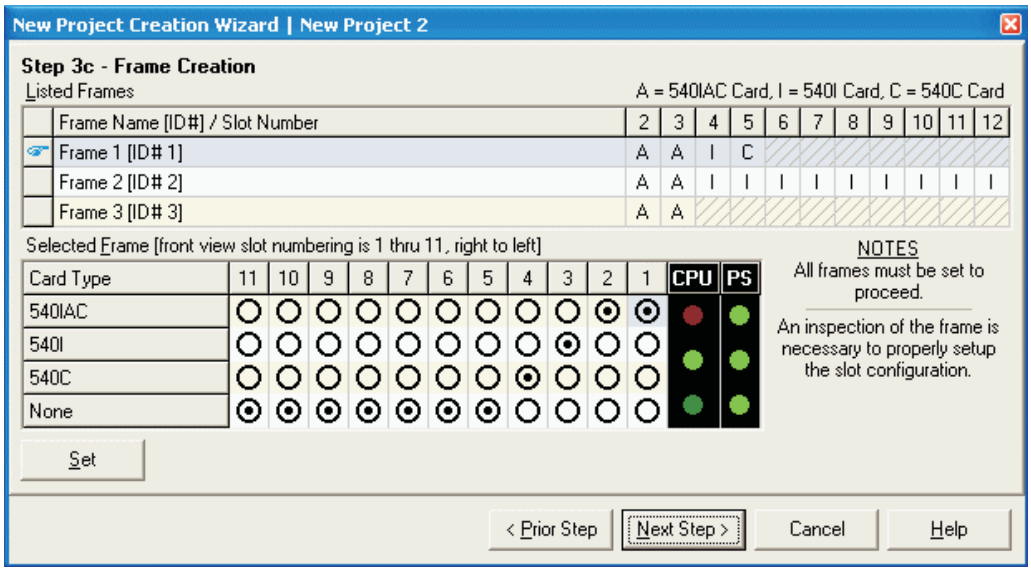


Figure 17 - New Project Creation Wizard
Frame Creation, Communication Type

Step 3b - Frame Creation - Communications Type (See Figure 17)

- Select a frame to edit the information from the **Listed Frames** list box. The frame's information will be placed into the **Selected Frame Communication Settings** section.
- Select from the **Communication Type** combo box which communication type will be used for this 540-frame.
- **Network** is a communications type that uses IEDNet to communicate from this program to a 422LAN module that then communicates with the 540-frame.
  - Type the **IP Address** (a unique network string identifier that communicates to a device that recognizes that IP Address and establishes communication) in the ip edit box. Press the **Test** button to attempt to communicate using the listed **IP Address** to see if the LAN590I module responds.
    - A notice will appear if the test was successful and the IED LAN590I module's firmware is installed.
    - A notice will appear if the test was successful; however, could not detect IED LAN590I firmware. See ARP and Telnet for instructions.
    - A notice will appear if the test failed due to an invalid IP Address.
    - A notice will appear if the test failed due to an IEDNet Registration Error.



- **590COM** is a communications type that provides serial communications from the 590-computer to the 540-frame port (RS422 configuration). Since both configurations are different a converter (e.g., B & B RS-232/RS-422 Converter, Model 422CFC) must be used to allow communications between both configurations. Select the COM serial port on a 590-computer from the **Port** spin edit box.
- 590I Card is a communications type that provides serial communications from the 590-computer to the 540-frame port (RS422 configuration). Since both configurations are the same no conversion is needed. Not available with Windows 2000 or Windows XP operating systems. There are 2 ports per card with the numbering starting at 0 and 1. If another card is added, then its port numbering is 2 and 3. Select the 590I Card port from the Port spin edit box.
- Select the 540-frame address using the Frame CPU Address spin edit box. Pressing the Search button can aid in finding what addresses are located on the selected communications type.
- Pressing the Set button places the selected frame edited information into the Listed Frames list box.
  - A notice will appear if using Network communications type and the IP Address is an empty string.
  - A notice will appear if using Network communications type and there is a conflict in setting up IP Address and Frame CPU Address.
  - A notice will appear if using 590COM or 590I Card communications type and there is a conflict in setting up the Port and the Frame CPU Address.
- Press the **Next Step** button to proceed or press the **Prior Step** button to go to the previous step.

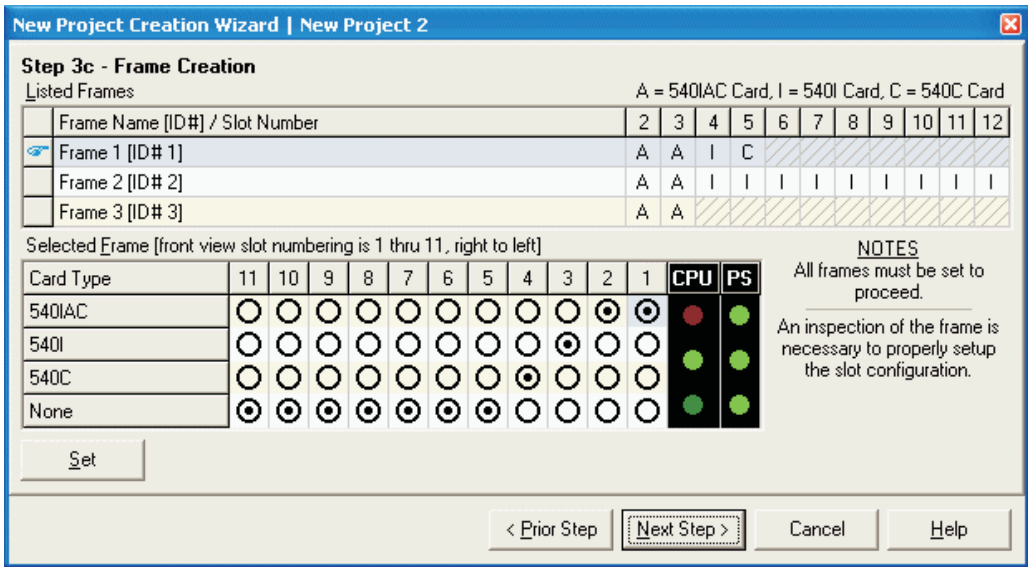


Figure 18 - New Project Creation Wizard
Frame Creation - Slots Configuration

Step 3c - Frame Creation - Slots Configuration (See Figure 18)

- Check each radio button in the radio button grid for the appropriate card types (540IAC, 540I or 540C). Each card will control its corresponding channel numbers (i.e., Slot 1 contains channels 1 - 4; Slot 2 contains channels 5 - 8, etc.). Power Supply and CPU are laid out to help in the physical numbering of the slots. Each image has a mouse-fly-over hint. Note: All frames must have at least one slot configured as a 540AIC or 540I card type. See Attenuator Cards and Sensor for images of these cards. You call also see images of the attenuator cards double click on the upper left cell (the cursor will change to a hand point) called “Card Type”.
- Pressing the **Set** button places the selected frame edited information into the **Listed Frames** list box. A notice will appear if no slots have been configured for use.
- Press the **Next Step** button to proceed or press the **Prior Step** button to go to the previous step.

Step 3d - Frame Creation - Channels and Sensors Configuration

- Select the **Configuration Type** from one of the two radio buttons:
- **Auto** mode means all 590IAC slot channels will have their configuration set to “auto” mode, 590I slot channels will have their configuration set to “fixed” mode.
- **Fixed** mode means all 590IAC slot channels and 590I slot channels will have their configuration set to “fixed” mode.
- **Nominal Attenuation** is the maximum attenuation. It can be changed using the spin edit. Valid in “auto” mode. Note: The absolute value must always be greater than or equal to the Range value.

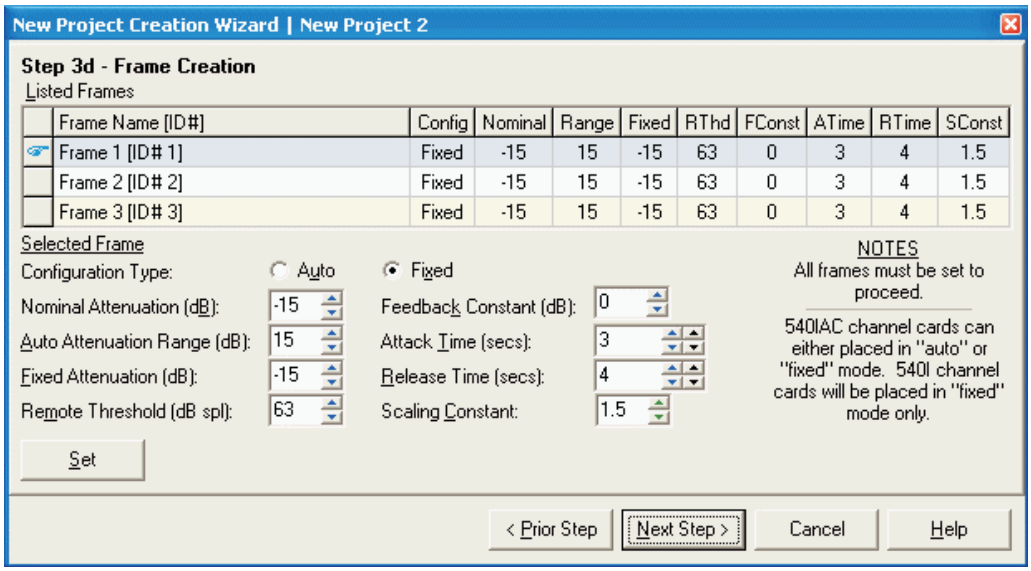


Figure 19 - New Projrct Creation Wizard
Frame Creation - Channels and Sensors Configuration

- **Range** is the delta or span of attenuation values from the maximum attenuation (Nominal) value to the minimum attenuation value. It can be changed using the spin edit. Valid in “auto” mode. The value must always be less than or equal to the absolute Nominal value.
- **Fixed Attenuation** is the minimum attenuation. It can be changed using the spin edit. Valid in “fixed” mode only.
- **Remote Threshold** is the signal level from a remote sensor, above that the system begins to increase the output signal for its associated channels. It can be changed using the spin edit. Valid in “auto” mode only.
- **Feedback Constant** is the correction factor that allows the system to compensate for program signal that is detected by the sensors in combination with the ambient noise. It can be changed using the spin edit. Valid in “auto” mode only.
- **Attack Time** is the time constant used by the system to respond to sudden large increases in ambient noise. Attack Window defines the magnitude of a large increase. It can be changed using the spin edit. Valid in “auto” mode only.
- **Release Time** is the time constant used for smoothing small changes in the average signal level. It can be changed using the spin edit. Valid in “auto” mode only.
- **Scaling Constant** is the ratio of the change in noise level to the resultant change in program level. It can be changed using the spin edit. Valid in “auto” mode only.
- Pressing the **Set** button places the selected frame edited information into the **Listed Frames** list box.
- If there are no groups configured, pressing the **Finish** button will create the new project (a notice will appear if there was a problem creating the project file). If there are groups configured, press the **Next Step** button to proceed. Press the **Prior Step** button to go to the previous step.

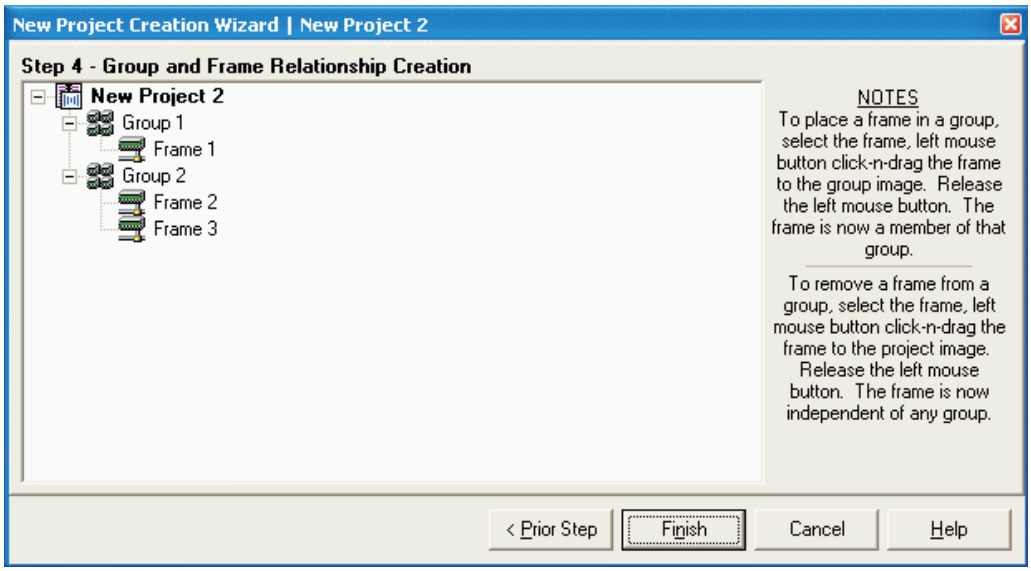


Figure 20 - New Projrct Creation Wizard
Group and Frame Relationship Creation

Step 4 - Groups and Frames Relationship (See Figure 20) (This is a relationship view of the configured project, groups and frames. Follow the instructions on how to change the relationships.)

- To place a frame in a group, press the left button of the mouse and drag the frame to the group and release the left button. The frame is now a member of that group.
- To remove a frame from a group, press the left button of the mouse and drag the frame to the project and release the left button. The frame is now independent of any group.
- Pressing the Finish button will create (process uses a progress bar) the new project (a notice will appear if there was a problem creating the project file) or press the Prior Step button to go to the previous step. If the project was successfully built, the following notice will appear.

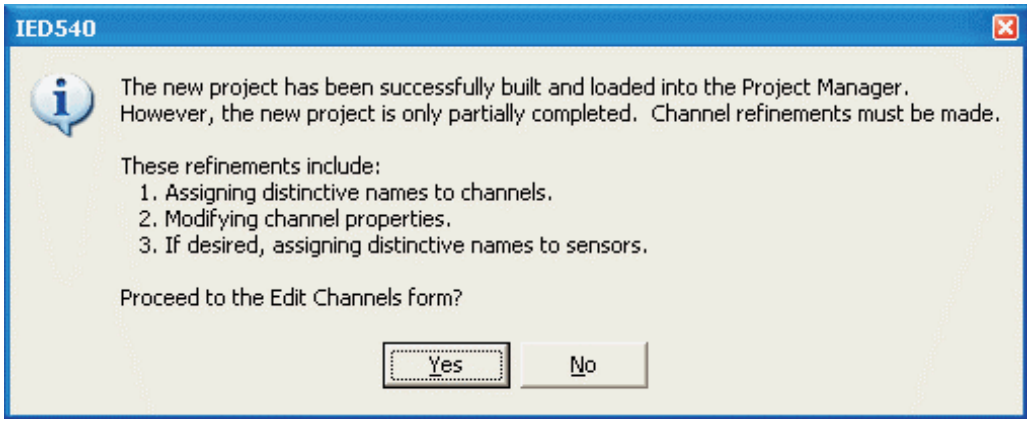


Figure 21 - Notice of Successful Project Assembly and Loading

- Pressing the Cancel button will cause a notice will appear.
- Pressing the Help button will open this help page.

New Frame

This option creates a new frame that includes setting the name, communications type, Frame CPU Address and 540-frame slot's configuration.

NAVIGATION

(Figure 1)

Figure 22 - New Frame Creation Wizard

Step 1a - Frame Creation(See Figure 22)

- The **Frame Name** has been supplied in the edit box. This name can be changed; however, a notice will appear if the Frame Name is not unique.
- Press the **Next Step** button to proceed.

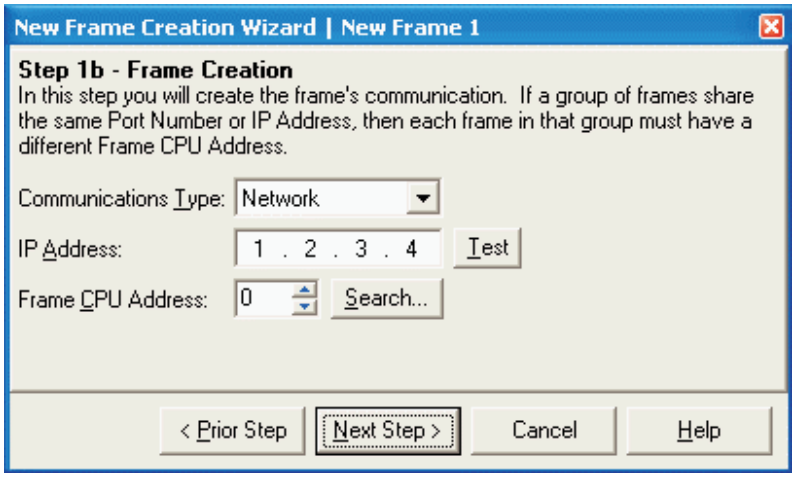


Figure 23 - Frame Creation - Communications Type

Step 1b - Frame Creation - Communications Type

- Select from the **Communication Type** combo box which communication type will be used for this 540-frame.
- **Network** is a communications type that uses IEDNet to communicate from this program to a 422LAN module that then communicates with the 540-frame.
  - Type the **IP Address** (a unique network string identifier that communicates to a device that recognizes that IP Address and establishes communication) in the ip edit box. Press the **Test** button to attempt to communicate using the listed **IP Address** to see if the LAN590I module responds.
    - A notice will appear if the test was successful and the IED LAN590I module's firmware is installed.
    - A notice will appear if the test was successful; however, could not detect IED LAN590I firmware. See ARP and Telnet for instructions.
    - A notice will appear if the test failed due to an invalid IP Address.
    - A notice will appear if the test failed due to an IEDNet Registration Error.
- **590COM** is a communications type that provides serial communications from the 590-computer to the 540-frame port (RS422 configuration). Since both configurations are different a converter (e.g., B & B RS-232/RS-422 Converter, Model 422CFC) must be used to allow communications between both configurations. Select the COM serial port on a 590-computer from the Port spin edit box.
- **590I Card** is a communications type that provides serial communications from the 590-computer to the 540-frame port (RS422 configuration). Since both configurations are the same no conversion is needed. Not available with Windows 2000 or Windows XP operating systems. There are 2 ports per card with the numbering starting at 0 and 1. If another card is added, then its port numbering is 2 and 3. Select the 590I Card port from the **Port** spin edit box.
- Select the 540-frame address using the **Frame CPU Address** spin edit box. Pressing the **Search** button can aid in finding what addresses are located on the selected communications type.
- Press the **Next Step** button to proceed:
- A notice will appear if using Network communications type and there is a conflict in setting up IP Address and Frame CPU Address.
- A notice will appear if using 590COM or 590I Card communications type and there is a conflict in setting up the Port and the Frame CPU Address.
- Or press the **Prior Step** button to go to the previous step.

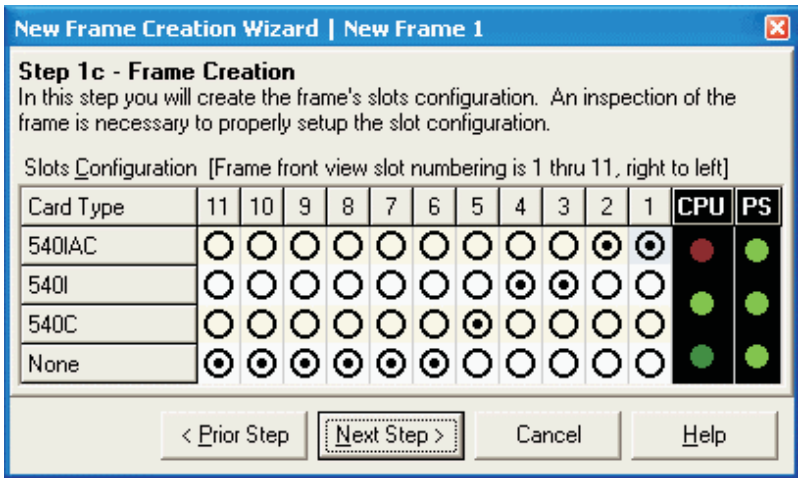


Figure 24 - New Frame Creation Wizard - Slots Configuration

Step 1c - Frame Creation - Slots Configuration (See Figure 24)

- Check each radio button in the radio button grid for the appropriate card types (540IAC, 540I or 540C). Each card will control its corresponding channel numbers (i.e., Slot 1 contains channels 1 - 4; Slot 2 contains channels 5 - 8, etc.). Power Supply and CPU are laid out to help in the physical numbering of the slots. Each image has a mouse-fly-over hint. Note: All frames must have at least one slot configured as a 540IAC or 540I card type. See Attenuator Cards and Sensor for images of these cards. You call also see images of the attenuator cards double click on the upper left cell (the cursor will change to a hand point) called “Card Type”.
- If there are not 540IAC card types selected, then pressing the Finish button will create (process uses a progress bar) the new frame. If there is at least one 540IAC card type selected, then press the Next Step button to proceed. Press the Prior Step button to go to the previous step.

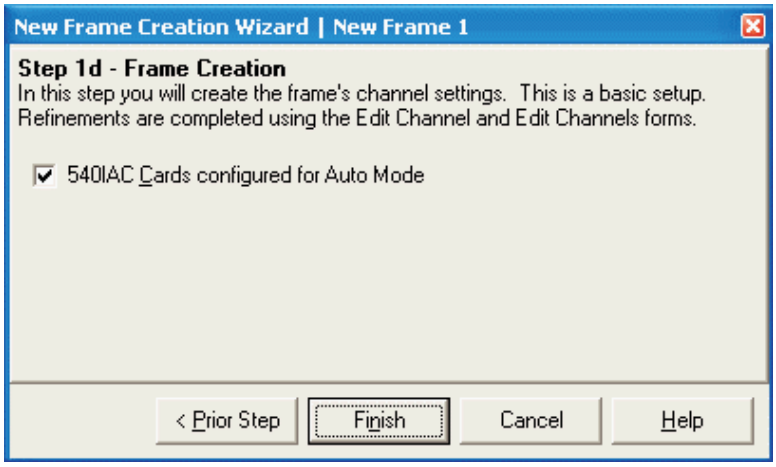


Figure 25 - New Frame Creation Wizard - Channel Settings

Step 1d - Frame Creation - Channels and Sensors Configuration

By checking the 540IAC configured for auto mode check box 540IAC card types will have their channels configured for “auto” mode with a sensor assigned to the channel. Those slots that are selected as 540I card types will have all of their channels configured for “fixed” mode.

Pressing the Finish button will create (process uses a progress bar) the new project or press the Prior Step button to go to the previous step. If the frame was successfully built, the following notice will appear.

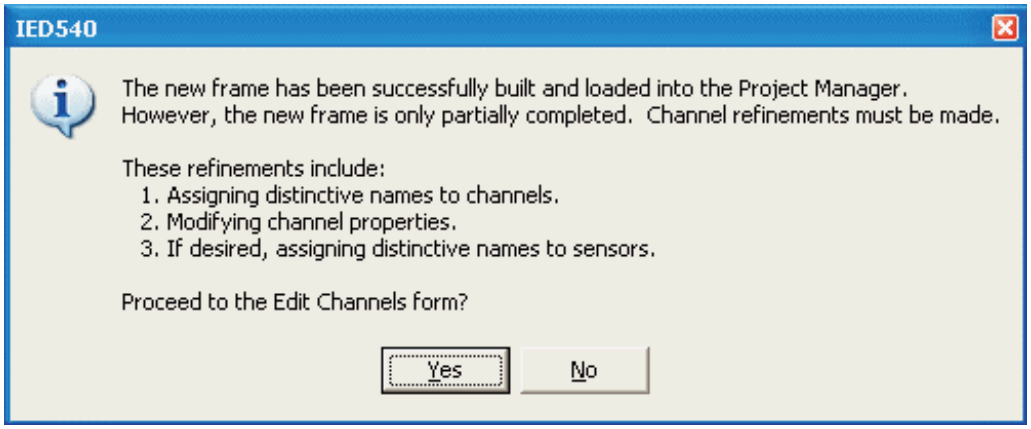


Figure 26 - Notice of Successfully Built and Loaded Frame

- Pressing the **Cancel** button will cause a notice will appear.
- Pressing the **Help** button will open this help page.

Edit Project

This option shows the editing of project information that includes changing the project name, linking to ACS information, recording channel information for the ACS, checking link status, and updating attenuation schedule.

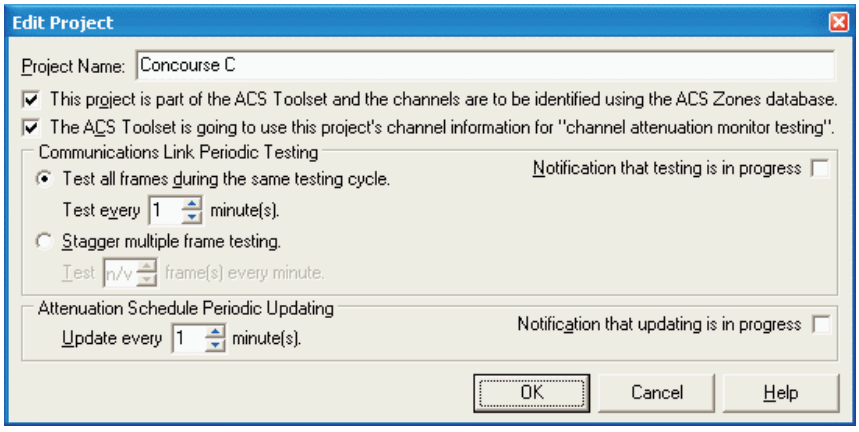


Figure 27 - Edit Project Information

NAVIGATION

- The **Project Name** has been supplied in the edit box. This name can be changed; however, a notice will appear if the Project Name is already used by another project in the project folder.
- If this project is to use ACS Zones database ("Zones.db") for zoning channels, then check **This project is part of the ACS Toolset and the channels are to be identified using the ACS Zones database** check box. If this project originally was linked to the ACS information and it has been decided to remove that link a notice will appear.
- If this project is to have "channel attenuation monitor testing", then check **The ACS Toolset is going to use this project's channel information for "channel attenuation monitor testing"** check box.
- This project will be tested on a periodic basis to see if there is a communications link to the frames. **Notification** is used to notify the user (using a progress bar) that this program is checking the connectivity between the 590-computer and the 540-frame.
- **Test all frames during the same testing cycle**. If selected, then decide how often the testing cycle is to be performed.
- **Stagger multiple frame testing**. If selected, then decide how many frames are to be tested per minute. This is highly recommended if the project has many 540-frames.
- This project will update those frames that have an attenuation schedule in effect. **Notification** is used to notify the user (using a progress bar) that this program is checking the attenuation schedule to see if the scheduled attenuation has been applied to the 540-frame. Decide how often the attenuation schedule is to be updated.
- Pressing the **OK** button will save the current frame information. A notice will appear if the Project Name is already used by another project in the project folder.
- Pressing the **Cancel** button will cancel this operation. A notice will appear if data changes have been made and those changes have not been saved.
- Pressing the **Help** button will open this help page.

Edit Frame

This option shows the editing of frame information that includes setting the name, communications type, Frame CPU Address and frame slots configuration. Refer to Figure 28.

NAVIGATION

- Select the frame (If there is already a frame loaded, a notice will appear if data changes have been made and those changes have not been saved in the current frame.) from the **Show Frame** combo box that contains a list of all frames (with the frame number in brackets) in this project.
- The name of the frame is listed in the **Frame Name** edit box.
- Select from the **Communication Type** combo box which communication type will be used for this 540-frame.

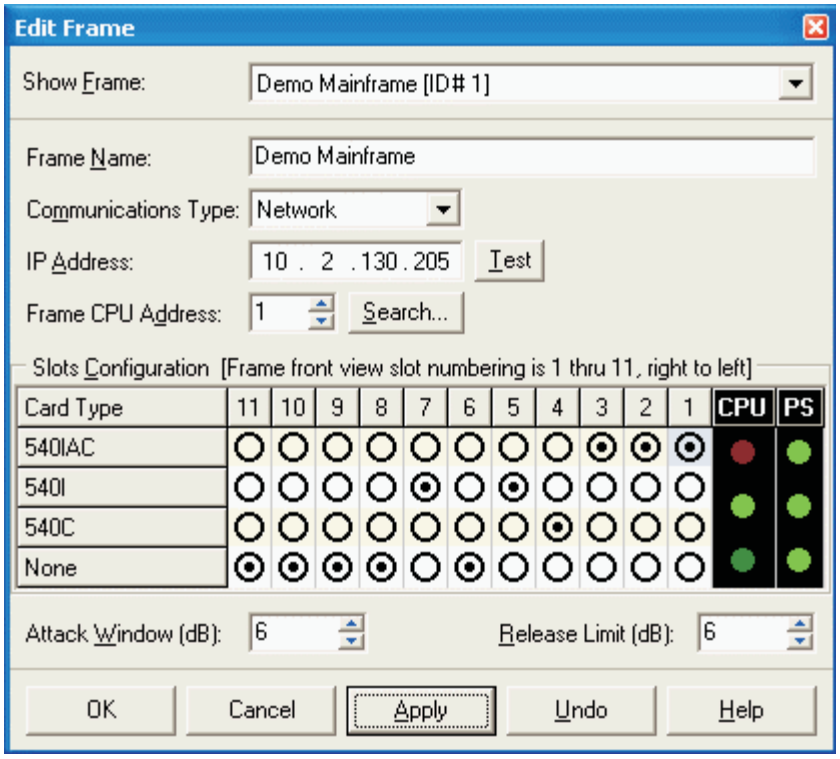


Figure 28 - Edit Frame

- Network is a communications type that uses IEDNet to communicate from this program to a 422LAN module that then communicates with the 540-frame.
  - Type the IP Address (a unique network string identifier that communicates to a device that recognizes that IP Address and establishes communication) in the ip edit box. Press the Test button to attempt to communicate using the listed IP Address to see if the LAN590I module responds.
    - A notice will appear if the test was successful and the IED LAN590I module's firmware is installed.
    - A notice will appear if the test was successful; however, could not detect IED LAN590I firmware. See ARP and Telnet for instructions.
    - A notice will appear if the test failed due to an invalid IP Address.
    - A notice will appear if the test failed due to an IEDNet Registration Error.
- 590COM is a communications type that provides serial communications from the 590-computer to the 540-frame port (RS422 configuration). Since both configurations are different a converter (e.g., B & B RS-232/RS-422 Converter, Model 422CFC) must be used to allow communications between both configurations. Select the COM serial port on a 590-computer from the Port spin edit box.

  - 590I Card is a communications type that provides serial communications from the 590-computer to the 540-frame port (RS422 configuration). Since both configurations are the same no conversion is needed. Not available with Windows 2000 or Windows XP operating systems. There are 2 ports per card with the numbering starting at 0 and 1. If another card is added, then its port numbering is 2 and 3. Select the 590I Card port from the Port spin edit box.

- Select the 540-frame address using the **Frame CPU Address** spin edit box. Pressing the **Search** button can aid in finding what addresses are located on the selected communications type.
- **Slots Configuration** is the current configuration of the slots. Check each radio button in the radio button grid for the appropriate card types (540IAC, 540I or 540C). Each card will control its corresponding channel numbers (i.e., Slot 1 contains channels 1 - 4; Slot 2 contains channels 5 - 8, etc.). Power Supply and CPU are laid out to help in the physical numbering of the slots. Each image has a mouse-fly-over hint. Note: All frames must have at least one slot configured as a 540IAC or 540I card type. See Attenuator Cards and Sensor for images of these cards. You call also see images of the attenuator cards double click on the upper left cell (the cursor will change to a hand point) called “Card Type”.
- Pressing the **OK** button will save (process uses a progress bar) the current frame information.
  - A notice will appear if the frame name is not unique.
  - A notice will appear if using Network communications type and the IP Address is an empty string.
  - A notice will appear if using Network communications type and there is a conflict in setting up IP Address and Frame CPU Address.
  - A notice will appear if using 590COM or 590I Card communications type and there is a conflict in setting up the Port and the Frame CPU Address.
  - A notice will appear if no slots have been configured for use.
- Pressing the **Cancel** button will cancel this operation. A notice will appear if data changes have been made and those changes have not been saved.
- Pressing the **Apply** button saves (process uses a progress bar) the frame information and allows the user to continue to work in the form.
- Pressing the **Undo** button discards all changes and reloads the original frame information.
- Pressing the **Help** button will open this help page.

Edit Channel

This option shows the editing of channel information for the selected frame and feedback constant calibration for “auto” mode channels.

NAVIGATION

- Select the frame from the **Frames** combo box that contains a list of all frames (with the frame number in brackets) in this project. When selecting between frames, the **Zones** list, the Channels list and the Sensors list will be updated.

- Select the zone from the **Zones** list box that includes:
- *ALL ZONES* lists all 540IAC and 540I channels in the **Channels** list box.
- Individual zones (with the ACS number, then zone number in brackets) lists all 540IAC and 540I channels in the **Channels** list box assigned to that zone.
- Select the channel from the **Channels** list box that contains a list of 540IAC and 540I channels (with the channel number in brackets) in the selected frame and the selected zone. When a channel is selected, the information about that channel will be loaded and depending on its configuration type ("auto", "fixed" or "slaved"), the controls will reflect the current settings for that channel. If an image appears after the channel name, then this channel has an active attenuation schedule (double-click on the image to see the channel's attenuation schedule).
- If the channel's configuration type is "auto" mode, then a list of assigned sensors (with the sensor number in brackets) is listed in the **Sensors** list box. The associated button with the three ellipsis ("...") will open the Available Sensors form that will have the assigned sensors for this channel and all available sensors. Note: For a channel to remain in "auto" mode there must be at least one sensor assigned.
- There are three **Attenuation Types** ("auto" mode has two scenarios) to select from:

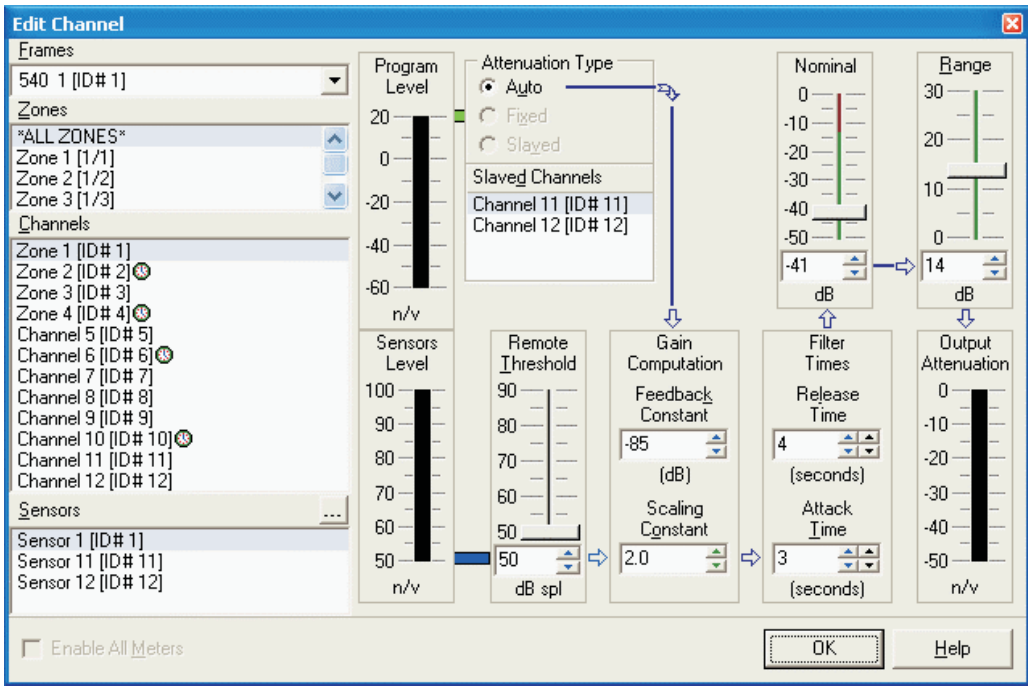


Figure 29 - Edit Channel, Offline
Auto Mode with Slaved Channels

- **Auto mode with slaved channels** accepts an input from one or more ambient noise sensors and compensates the signal level accordingly. See Figure 29. Note: While on the same channel, if the type was "auto" mode, then this program will remember the last assigned sensors. If the user has not moved off of the same channel and decides to go back to "auto" mode, then those last assigned sensors will automatically be reloaded.

- All slaved or controlled channels (with the channel number in brackets) are listed in the Slaved Channels list box. Double-clicking or pressing the Enter key on an item will select that channel from the Channels list box for viewing/editing.
- Nominal or maximum attenuation is controlled using a slider. Note: The absolute value (i.e., the attenuation less the minus sign) must always be greater than or equal to the Range value. Any change will possibly reflect a change in any slaved channel's Nominal value and any change will reflect a change in the slaved channel's Offset value.
- Range is controlled using a slider. It is the delta or span of attenuation values from the Nominal or maximum attenuation value to the minimum attenuation value. The value must always be less than or equal to the absolute Nominal value (i.e., the attenuation less the minus sign). Any change will possibly reflect a change in any slaved channel's Range value.
- Remote Threshold is controlled using a slider. If the ambient noise level rises above this setting, then the 540-frame begins to increase the output signal for its associated channels.
- Feedback Constant is controlled using a spin edit It is the correction factor that allows the system to compensate for program signal that is detected by the sensors in combination with the ambient noise.
- Attack Time is controlled using a spin edit and is the time constant used by the system to respond to sudden large increases in ambient noise. Attack Window defines the magnitude of a large increase.
- Release Time is controlled using a spin edit and is the time constant used for smoothing small changes in the average signal level.
- Scaling Constant is controlled using a spin edited and is the ratio of the change in noise level to the resultant change in program level.

- **Auto mode (No slaved Channels)** accepts an input from one or more ambient noise sensors and compensates the signal level accordingly. Note: While on the same channel, if the type was "auto" mode, then this program will remember the last assigned sensors. If the user has not moved off of the same channel and decides to go back to "auto" mode, then those last assigned sensors will automatically be reloaded.
  - Nominal or maximum attenuation is controlled using a slider. Note: The absolute value (i.e., the attenuation less the minus sign) must always be greater than or equal to the Range value.
  - Range is controlled using a slider. It is the delta or span of attenuation values from the Nominal or maximum attenuation value to the minimum attenuation value. The value must always be less than or equal to the absolute Nominal value (i.e., the attenuation less the minus sign).
  - Remote Threshold is controlled using a slider. If the ambient noise level rises above this setting, then the 540-frame begins to increase the output signal for its associated channels.
  - Feedback Constant is controlled using a spin edit It is the correction factor that allows the system to compensate for program signal that is detected by the sensors in combination with the ambient noise.

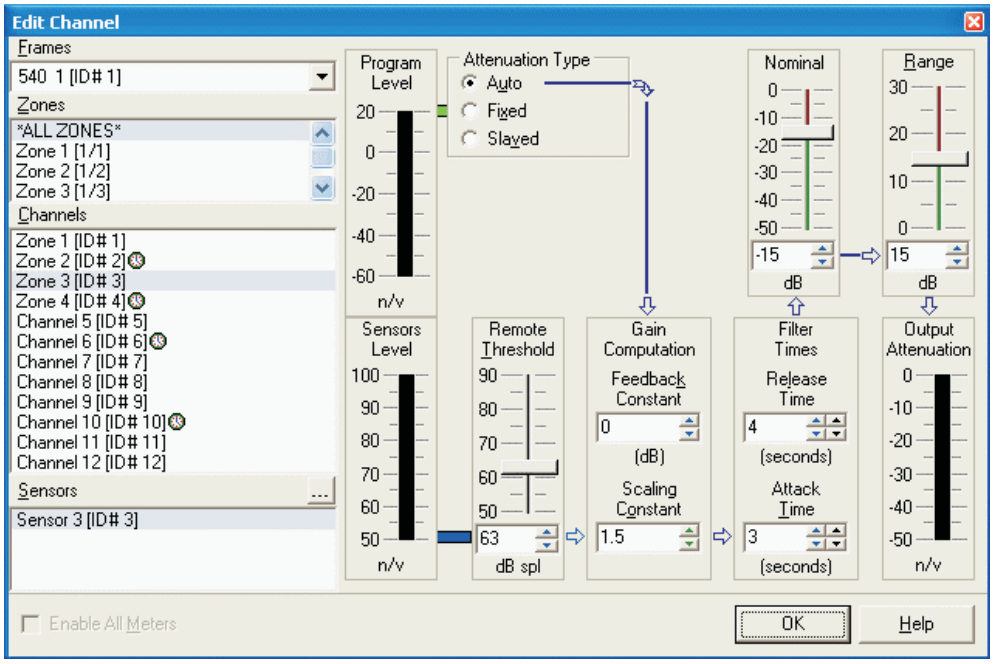


Figure 30 - Edit Channel, Offline
Auto Mode, No Slaved Channels

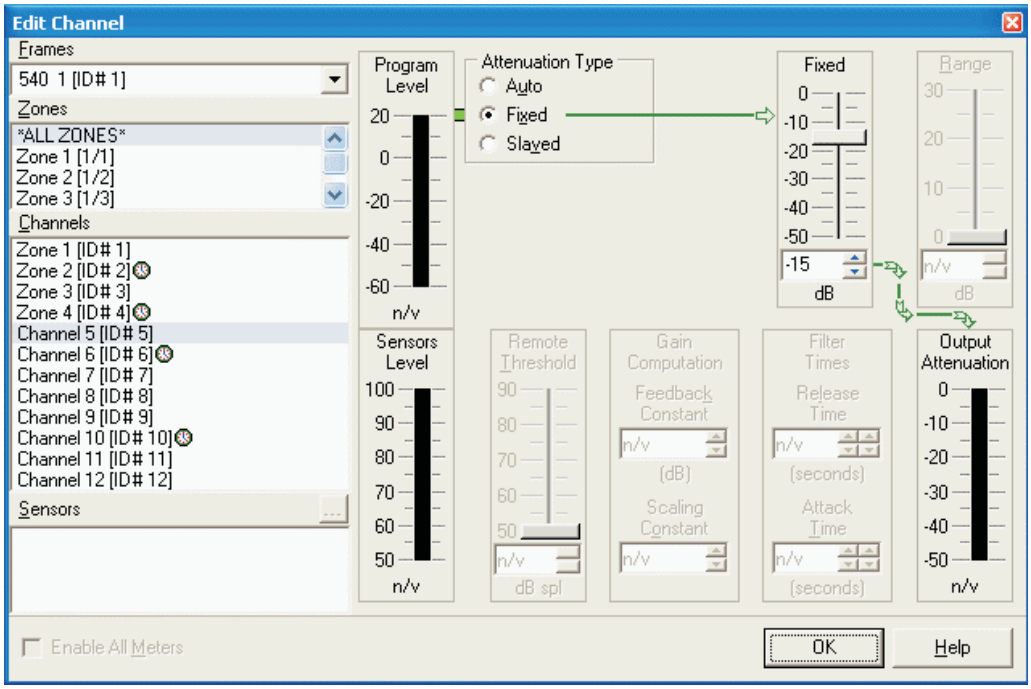


Figure 31 - Edit Channel, Offline, Fixed Mode

- Attack Time is controlled using a spin edit and is the time constant used by the system to respond to sudden large increases in ambient noise. Attack Window defines the magnitude of a large increase.

- Release Time is controlled using a spin edit and is the time constant used for smoothing small changes in the average signal level.
- Scaling Constant is controlled using a spin edited and is the ratio of the change in noise level to the resultant change in program level.

- **Fixed mode** is the non-varying value of attenuation. See Figure 31.
  - Fixed is controlled using a slider. It is minimum or non-varying attenuation. In a way, using "fixed" mode is like using a volume control knob that changes the sound level manually.
- **Slaved mode** (See Figure 32) means that the channel is slaved to an "auto" mode channel and changes attenuation as the "auto" mode channel changes, with or without an offset and not exceeding its minimum and maximum attenuation limits. Note: While on the same channel, if the type was "slaved" mode, then this program will remember the last controlling channel. If the user has not moved off of the same channel and decides to go back to "slaved" mode, then the last assigned controlling channel will be automatically reloaded.

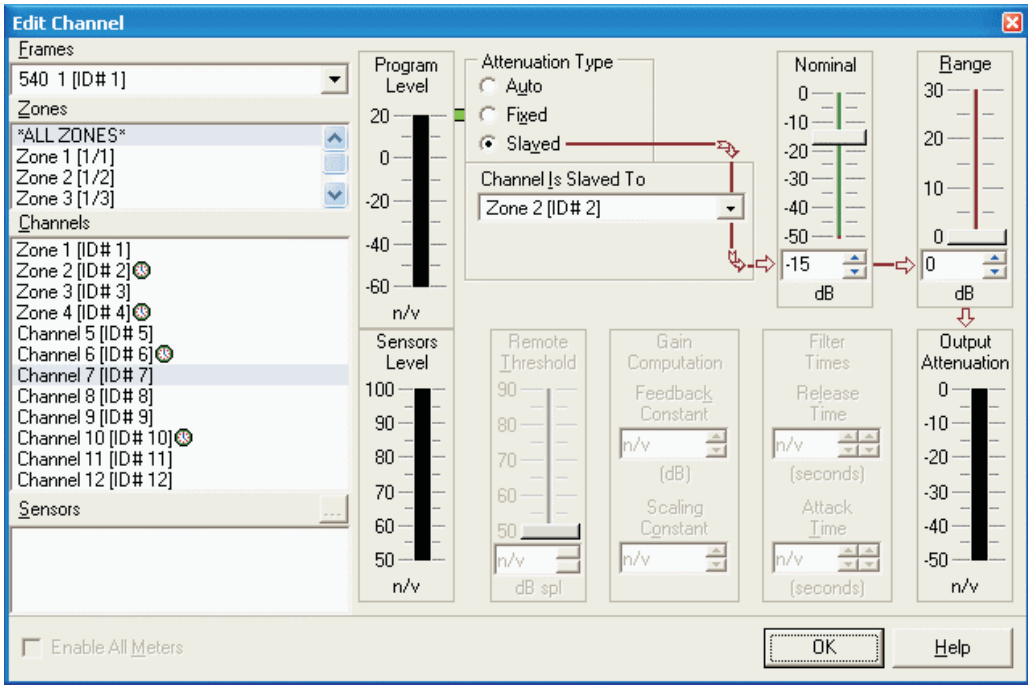


Figure 32 - Edit Channel Offline, Slaved Mode

- Select the controlling channel (with the channel number in brackets) from the **Channel Is Slaved To** combo box. If no controlling channel is selected (i.e.,<NONE>), then the channel will be changed to the "fixed" mode. Changing controlling channels will enable the Set As Controlling Channel button. Pressing the Apply button will save this change. Pressing the Cancel button will cancel this change.
- Nominal or maximum attenuation is controlled using a slider. Note: The absolute value (i.e., the attenuation less the minus sign) must always be greater than or equal to the Range value.

- Range is controlled using a slider. It is the delta or span of attenuation values from the Nominal or maximum attenuation value to the minimum attenuation value. The value must always be less than or equal to the absolute Nominal value (i.e., the attenuation less the minus sign).
- If online, then checking the Enable All Meters check box will start the meters. These meters are:
- Program Level is the level of the audio from an announcement or message that is received by the 540-frame and is monitored using is a meter.
- Sensors Level is the level of the ambient noise from the assigned sensors and is monitored using a meter. If there is more than one sensor assigned to this channel, then the ambient noise levels from all assigned sensors is averaged and this average will be the level.
- Output Gain is the level of the output gain that has been determined by comparing input level and ambient noise level and then making the necessary calculations for adjusting the “auto” mode channel’s output attenuation. “Fixed” mode channels will have a constant level of output gain. This gain is monitored using a meter.

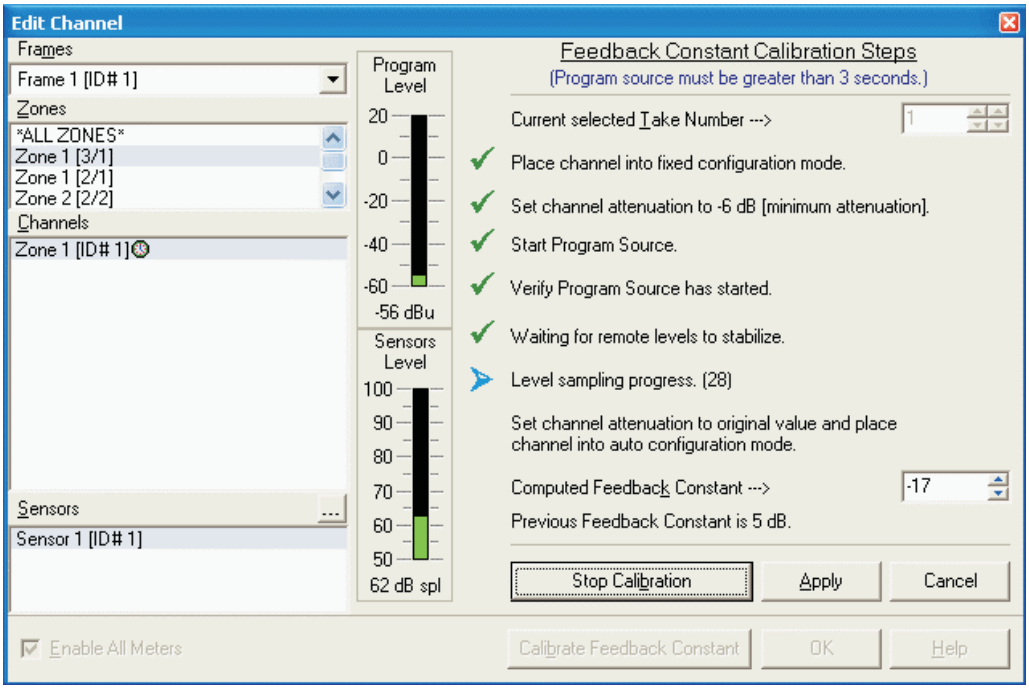


Figure 33 - Calibrate Feedback Constant (Online)

- Calibrate Feedback Constant performs automatic measurements that determine the proper value of the feedback constant. A notice will appear if Monitor/Test is in progress. A notice will appear if select frame has communications problems.
  - Pressing the **Start Calibration** button will start the feedback constant calibration for the selected channel.

- Pressing the **Stop Calibration** button will stop the feedback constant calibration process.
- Order of Calibration Steps
  - If the channel is zoned, accept the default or change the Take Number and press the **Start Calibration** button (Pressing the **Stop Calibration** button at any time will stop the calibration). The selected channel is placed into "fixed" mode and the channel attenuation is set to its minimum attenuation (nominal plus range equal minimum attenuation). The program source (a wav file that is loaded from the ACS using the Take Number supplied) is started. After verification that the program source has started, a three second wait will occur after the program source is started to allow for signal level to stabilize. Level sampling is then started and the **Feedback Constant** is being computed during each sampling. When sampling is complete, channel attenuation will be reset to the original value and the channel will be placed into "auto" mode.
  - If the channel is zoned, accept the default or change the Take Number and press the **Start Calibration** button (Pressing the **Stop Calibration** button at any time will stop the calibration). The selected channel is placed into "fixed" mode and the channel attenuation is set to its minimum attenuation (nominal plus range equal minimum attenuation). The program source (a wav file that is loaded from the ACS using the Take Number supplied) is started. If the program source has failed verification after a timeout period, then a notice will appear. After manually starting the program source, press the **Proceed** button. A three second wait will occur after the program source is started to allow for signal level to stabilize. Level sampling is then started and the **Feedback Constant** is being computed during each sampling. When sampling is complete, channel attenuation will be reset to the original value and the channel will be placed into "auto" mode.
  - If the channel is not zoned, a notice will appear. Press the **Start Calibration** button (Pressing the **Stop Calibration** button at any time will stop the calibration). The selected channel is placed into "fixed" mode and the channel attenuation is set to its minimum attenuation (nominal plus range equal minimum attenuation). When the source has been manually started, press the **Proceed** button. A three second wait will occur after the program source is started to allow for signal level to stabilize. Level sampling is then started and the **Feedback Constant** is being computed during each sampling. When sampling is complete, channel attenuation will be reset to the original value and the channel will be placed into "auto" mode.
  - When the process is complete, pressing the **Apply** button will accept the Computed Feedback Constant and update Feedback Constant channel data or pressing the **Cancel** button will cancel this operation.
  - A notice will appear if the Take Number has changed.
- Pressing the **OK** button will close this form.
- Pressing the **Help** button will open this help page.

Assigned Sensors

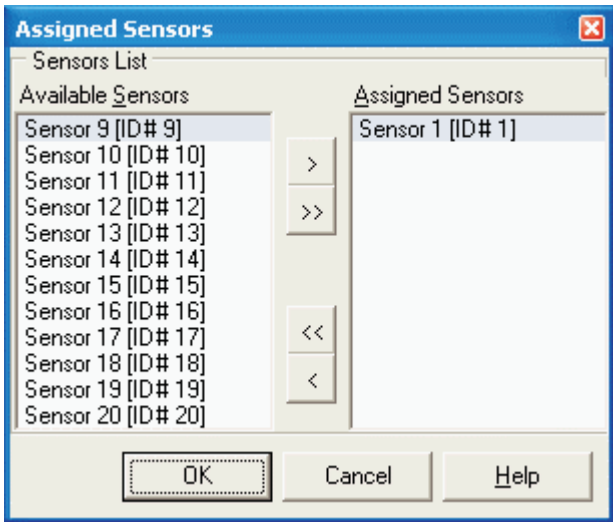


Figure 34 - Assigned Sensors

Figure 1 shows the adding, changing or deleting of sensor information for the selected channel and is called from the Edit Channel Sensors list button.

NAVIGATION (see dual list boxes for instructions on how to use these set of controls.)

- The list of all available sensors for the 540-frame are listed in the Available Sensors list box. The list of all assigned sensors to the selected channel are listed in the Assigned Sensors list box.
- Pressing the button will add the selected Available Sensors list item to the Assigned Sensors list and remove item from the Available Sensors list.
- Pressing the > button will add all Available Sensors list items to the Assigned Sensors list and remove all items from the Available Sensors list.
- Pressing the button will remove the selected Assigned Sensors list item and add item to the Available Sensors list.
- Pressing the < button will remove all items from Assigned Sensors list and add them to the Available Sensors list.
- Pressing the OK button will save changes to Edit Channel Sensors list.
- Pressing the Cancel button will cancel this operation.
- Pressing the Help button will open this help page.

Edit Channels

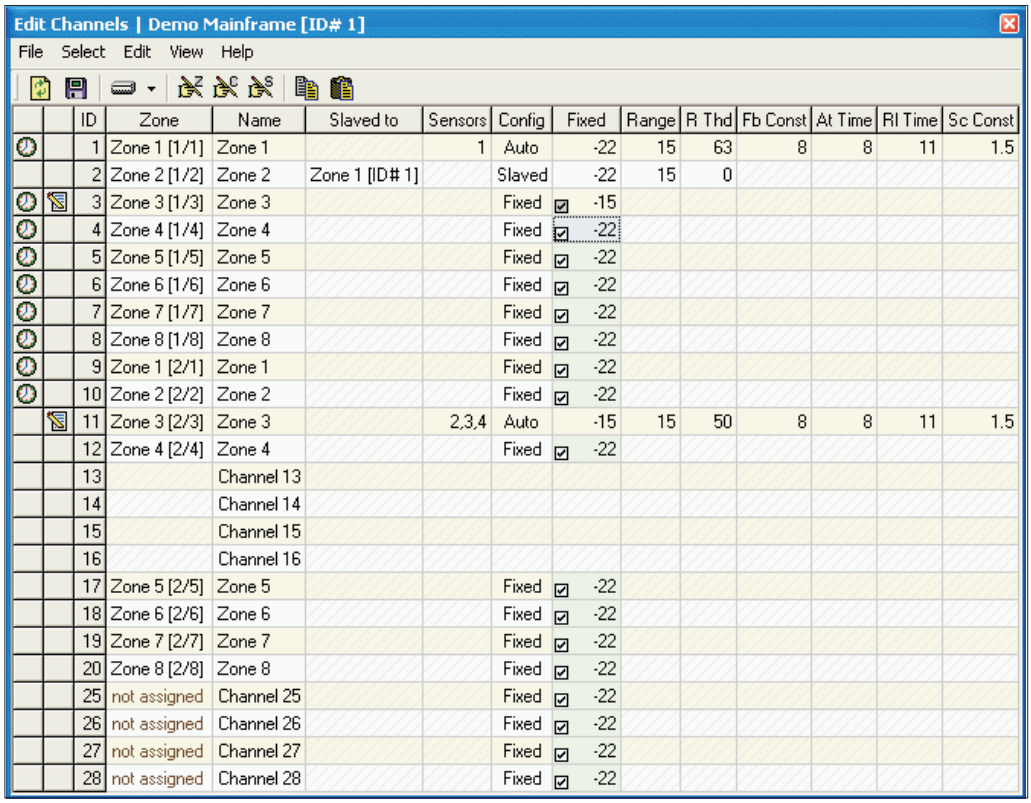
This option shows the editing of all channels information for the selected frame. To the right of the caption after the pipe "|" is the name of the selected frame.

NAVIGATION

Menu Items

File Section

- **Reload** will refresh the selected frame's channel and sensor data from the project file. A notice will appear if changes to the selected frame have been made and not saved.
- **Save** will write (process uses a progress bar) all changes made to the frame's data to the project file. If online, all changes will be sent (process uses a progress bar) to the selected 540-frame.
- **Close** will close this form. A notice will appear if changes to the selected frame have been made and not saved.



		ID	Zone	Name	Slaved to	Sensors	Config	Fixed	Range	R Thd	Fb Const	At Time	Rl Time	Sc Const
		1	Zone 1 [1/1]	Zone 1		1	Auto	-22	15	63	8	8	11	1.5
		2	Zone 2 [1/2]	Zone 2	Zone 1 [ID# 1]		Slaved	-22	15	0				
		3	Zone 3 [1/3]	Zone 3			Fixed	-15						
		4	Zone 4 [1/4]	Zone 4			Fixed	-22						
		5	Zone 5 [1/5]	Zone 5			Fixed	-22						
		6	Zone 6 [1/6]	Zone 6			Fixed	-22						
		7	Zone 7 [1/7]	Zone 7			Fixed	-22						
		8	Zone 8 [1/8]	Zone 8			Fixed	-22						
		9	Zone 1 [2/1]	Zone 1			Fixed	-22						
		10	Zone 2 [2/2]	Zone 2			Fixed	-22						
		11	Zone 3 [2/3]	Zone 3		2,3,4	Auto	-15	15	50	8	8	11	1.5
		12	Zone 4 [2/4]	Zone 4			Fixed	-22						
		13		Channel 13										
		14		Channel 14										
		15		Channel 15										
		16		Channel 16										
		17	Zone 5 [2/5]	Zone 5			Fixed	-22						
		18	Zone 6 [2/6]	Zone 6			Fixed	-22						
		19	Zone 7 [2/7]	Zone 7			Fixed	-22						
		20	Zone 8 [2/8]	Zone 8			Fixed	-22						
		25	not assigned	Channel 25			Fixed	-22						
		26	not assigned	Channel 26			Fixed	-22						
		27	not assigned	Channel 27			Fixed	-22						
		28	not assigned	Channel 28			Fixed	-22						

Figure 35 - Edit Channels, Demo Mainframe

- **Select** is visible only when there are two or more frames in the project.
- A list of frames (frame number in brackets) is obtained from **Frame** menu item. Select the desired frame. The frame's data will be loaded in this form. A notice will appear if changes to the previous selected frame have been made and not saved.

Edit Section

- Diagonal lines through a cell means that this cell is not selectable and not editable.
- Channel zone information is edited using **Edit Zones**. If the Zone column cell can be selected, then double-clicking or pressing the **Enter** key in this column will call up the Edit Zones form.
- All other channel information is edited using **Edit Channel**. If any column cell except the Zone column can be selected, then double-clicking or pressing the **Enter** key in this column will call up the Edit Channel form.
- Sensor Name information is edited using **Edit Sensor Names**.
- **Copy and Paste** is limited to per column basis and channels must have same configuration type.
    - To copy a cell's text, first select a cell that allows copying (Copy image is enabled). Then select **Copy**. The copied cell will have a grayed-out check box. The other available cells will have a check box in them. To toggle the check box, double-click the check box or press the ***space bar*** key. Also available are:
    - **Select All** will check all available cells with checkboxes.
    - **Clear All** will uncheck all available cells with checkboxes.
    - To paste the cell's text into the selected (checked) cells select **Paste**. The selected cells value the same as the copied cell.

View Section

- **Attenuation Schedule Chart** charts the attenuation schedule for all channels that have an attenuation schedule.

Help Section

- **Contents** will open this help page.

Popup Menu Items

- The following items are same items that are located in the Menu: Reload, Save, Edit Zones, Edit Channel, Edit Sensor Names, Copy, Paste, Select Call, Clear All and Attenuation Schedule Chart.

Grid Channel Columns

- **Attenuation Schedule Chart** appears when this channel has an attenuation schedule (double-click to see the channel's attenuation schedule).
- Channel not saved appears when this channel's data has changed.
- ID is the channel identification number. This is a unique identifier.
- Zone is the zone name (with the ACS number, then zone number in brackets) if this channel is assigned a zone.
- Name is the channel name and it is not unique.
- Slaved To is the controlling channel name (with the channel number in brackets).
- Sensors is the list of assigned sensors as identified by the Sensor Number.
- Config or Configuration Type

  - **Auto** mode accepts an input from one or more ambient noise sensors and compensates the signal level accordingly.
  - **Fixed** mode is non-varying value of attenuation.
  - **Slaved** mode mean that the channel is slaved to an “auto” mode channel and changes attenuation as the “auto” mode channel changes, with or without an offset and not exceeding its minimum and maximum attenuation limits. See Definitions for more information.
- **Nominal** is the maximum attenuation set for this channel. Valid in “auto” mode and “slaved” mode.
- **Fixed** is the fixed attenuation set for this channel. Valid in “fixed” mode.
- **Range** is the delta or span of attenuation values from the maximum attenuation (Nominal) value to the minimum attenuation value. Valid in “auto” mode and “slaved” mode.
- **R Thd** or Remote Threshold is the signal level from a remote sensor, above that the system begins to increase the output signal for its associated channels. Valid in “auto” mode only.
- **Offset** is the value by that the attenuation of a slaved channel is offset from the attenuation of its controlling channel. Its value may be positive or negative. Valid in “slaved” mode only.
- **Fb Const** or Feedback Constant is the correction factor that allows the system to compensate for program signal that is detected by the sensors in combination with the ambient noise. Valid in “auto” mode only.
- **Attack Time** is the time constant used by the system to respond to sudden large increases in ambient noise. Attack Window defines the magnitude of a large increase. Valid in “auto” mode only.
- **Release Time** is the time constant used for smoothing small changes in the average signal level. Valid in “auto” mode only.
- **Sc Const** or Scaling Constant is the ratio of the change in noise level to the resultant change in program level. Valid in “auto” mode only.

Edit Zones

This option list channel zone assignments. To the right of the caption after the pipe “ | ” is the name of the selected frame. See Figure 36.

NAVIGATION

- Channels is a list of channels (540IAC and 540I attenuator card types only) for the selected frame. There are three type of possible images.
  -  Channel has a Zone assignment.
  -  Channel has no Zone assignment.
  -  Assigned Zone.

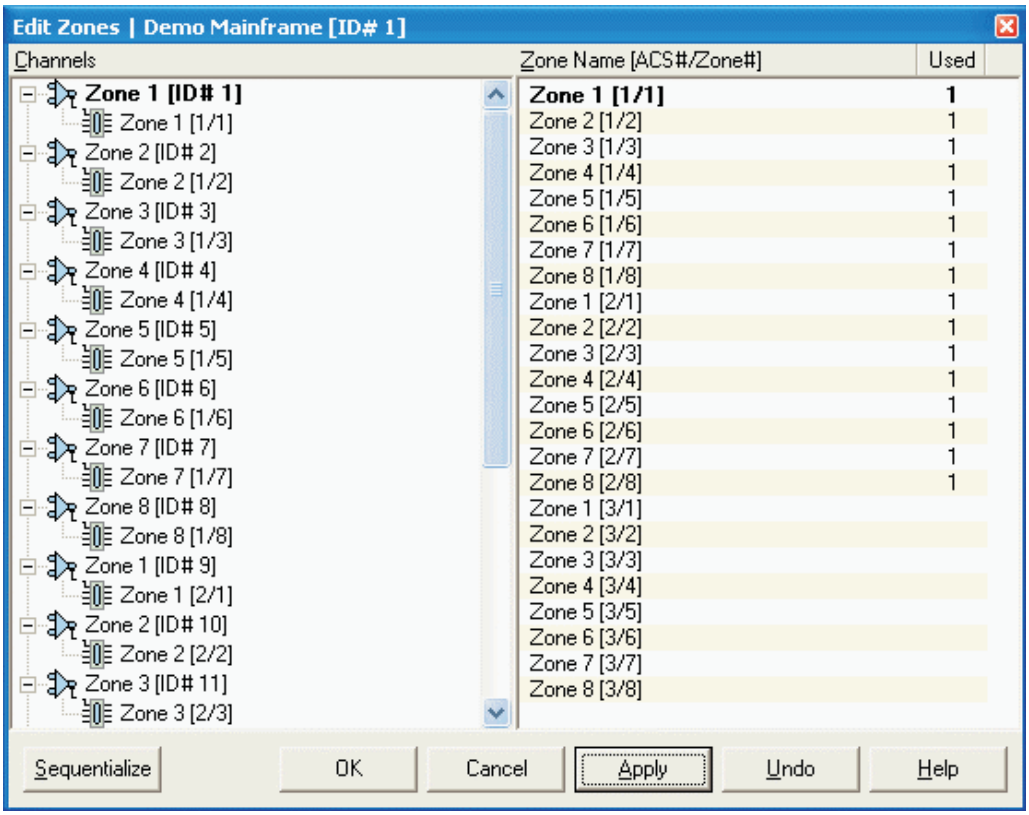


Figure 36 - Edit Zones
Demo Mainframe, ID# 1

- Zones is a list of the Zones that was obtained from the Zones database “Zone.db”. Also full listing of the zones can be seen in the ACS Information form. Columns are:
  - Zone Name [ACS# / Zone#] is the name of the Zone with the ACS number and Zone number in brackets.
  - Used is how many times are the channels using this zone.
- Pressing the **Sequentialize** button allows for setting the zone assignments in a sequential or chronological order. (Example: Zone 1 is assigned to Channel 1, Zone 2 is assigned to Channel 2, and so on.) This button will be visible if the number of zones is equal or greater than the number of channels.
- Pressing the **OK** button will save changes to Edit Channels grid data.
- Pressing the **Cancel** button will cancel this operation.
- Pressing the **Apply** button will save changes to Edit Channels grid data and continue to work.
- Pressing the **Undo** button will reload without saving changes.
- Pressing the **Help** button will open this help page.

Popup Menu Items

- **Expand/Collapse**
- **Collapse All** will collapse all branches or nodes.
- **Expand All** will expand all branches or nodes.

SETTING ZONES

- **Add** - If a Channel has no Zone assignment, then to add a Zone assignment to a Channel is as follows:
  - Select the Channel to assign a Zone to. Then select the Zone and do one of the following:
  - Double-click or press the Enter key. The Zone is now assigned to the selected Channel.
  - Drag the selected Zone and drop it on the selected Channel.
- **Change** - If a Channel has a Zone assignment, then to change the Zone assignment to a Channel is as follows:
  - Select the Channel to change the Zone assignment to. Then select the Zone and do one of the following:
  - Double-click or press the Enter key. The Zone is now assigned to the selected Channel.
  - Drag the selected Zone and drop it on the selected Channel.
- **Moving** - Also available is the ability to move a Zone assignment from on Channel to another Channel.
  - Select the Channel to move the Zone assignment from: There is no keyboard functions for this function.
  - Drag the selected Zone to the new Channel.
  - If the new Channel had no Zone assignment, then its image will change.
  - If the new Channel already had a Zone assignment, then this Zone will replace the other Zone. The Channel's image will stay the same.
  - The old or former Channel will now have no Zone assignment and its image will change.
- **Deleting** can happen if a Channel has a Zone assignment. There is no drag-n-drop for this function.
  - With focus on the Channels list, delete the Zone by either selecting the Channel or its assigned Zone in the Channels list and pressing the Del key. It will remove the assigned Zone from the Channel and will reset the Zones Used counter.
  - With focus on the Zones list, delete the selected Zone in each Channel that has that assigned Zone. Just press the Del key. It will remove the assigned Zone from each Channel that had that Zone.

- **Drag-n-Drop and Special Use of Arrow Keys**
  - When drag-n-drop is being used the drag cursor's image is ⃠. The drop cursor's image is . The no drop cursor's image is the same as the drag cursor.
  - Also available are the arrow keys to navigate both the Channels list and the Zones list while having focus in the Zones list. Use the ? and ? keys to move up and down the Zones list. Use the ? and ? keys to move up and down the Channels list.

Edit Channel

This option list editable channels. There are three mode types that have seven possible configurations. Only those channel properties that apply to the specific configuration are editable. To the right of the caption after the pipe "|" is the name of the selected frame.

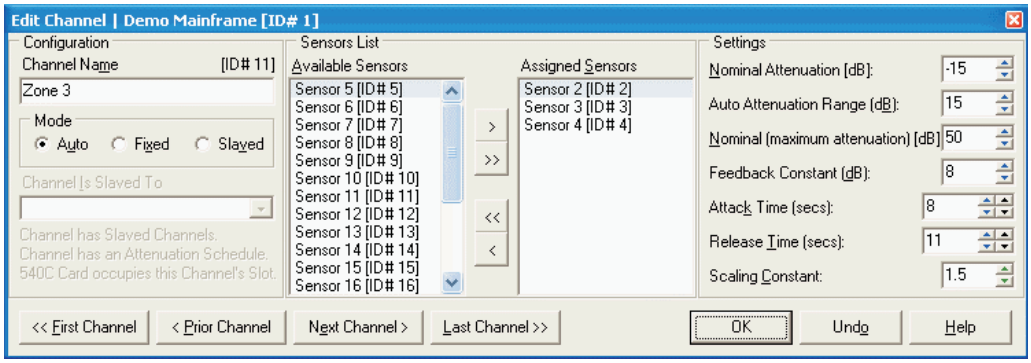


Figure 37 - Edit Channel, Demo Mainframe
ID #1

NAVIGATION

- The name of the channel is listed in the **Channel Name** edit box. To change, type the new name of the channel. Applies to all modes. Note: Channel names are not unique so care should be taken when changing the name of a channel.
- **Mode**
  - Applies to 540IAC Card, auto mode with controlled channels - There is one selectable configuration type because this channel has slaved channels: "auto".
  - Applies to 540IAC Card, auto mode without controlled channels, fixed mode or slaved mode - There are three selectable configuration types: "auto", "fixed" and "slaved".
  - Applies to 540I Card, fixed mode or slaved mode - There is two selectable configuration types: "fixed" and "slaved".
  - Applies to 540C Card - There are no selectable configuration types.
- **Controlling Channel** is the controlling channel name that is obtained from a list of controlling channels. If the controlling channel name is changed then the name will be changed. The number in brackets is the controlling channel number. Applies to 540IAC Card and 540I Card, slaved mode.

- Sensors - Applies to 540IAC Card, auto mode with or without controlled channels. Controls are dual list boxes.
  - The list of all available sensors for the 540-frame are listed in the **Available Sensors** list box. The list of all assigned sensors to the selected channel are listed in the **Assigned Sensors** list box.
  - Pressing the > button will add the selected **Available Sensors** list item to the **Assigned Sensors** list and remove item from the **Available Sensors** list.
  - Pressing the >>button will add all **Available Sensors** list items to the Assigned Sensors list and remove all items from the Available Sensors list.
  - Pressing the< button will remove the selected **Assigned Sensors** list item and add item to the **Available Sensors** list.
  - Pressing the << button will remove all items from **Assigned Sensors** list and add them to the **Available Sensors** list.
- **Nominal Attenuation** is the maximum attenuation. It can be changed using the spin edit.
  - Applies to 540IAC Card, auto mode with controlled channels - The absolute value must always be greater than or equal to the Range value. Any change will possibly reflect a change in any slaved channel's Nominal attenuation and any change will reflect a change in the slaved channel's Offset value.
  - Applies to 540IAC Card, auto mode without controlled channels - The absolute value must always be greater than or equal to the Range value.
  - Applies to 540IAC Card and 540I Card, slaved mode - The absolute value must always be greater than or equal to Range value. Value can be controlling channel's Nominal attenuation + 20 dB or 0 dB (whichever is lowest) to controlling channel's Nominal attenuation - 30 db or -50 dB (whichever is highest) with 1 dB increment change.
- **Range** is the delta or span of attenuation values from the maximum attenuation (Nominal) value to the minimum attenuation value. It can be changed using the spin edit. Valid in "auto" mode.
  - Applies to 540IAC Card, auto mode with or without controlled channels - the value must always be less than or equal to the absolute Nominal value. If there are controlled channels, then any change will possibly reflect a change in any slaved channel's Range.
  - Applies to 540IAC Card, auto mode without controlled channel and 540IAC Card and 540I Card, slaved mode - the value must always be less than or equal to the absolute Nominal value.
- **Fixed Attenuation** is the minimum attenuation. It can be changed using the spin edit. Valid in "fixed" mode only. Applies to 540IAC Card and 540I Card.
- **Remote Threshold** is the signal level from a remote sensor, above that the system begins to increase the output signal for its associated channels. It can be changed using the spin edit. Valid in "auto" mode only. Applies to 540IAC Card, auto mode with or without controlled channels.

- **Attenuation Offset** is the value of attenuation by that a slaved channel is offset from its controlling channel. Read only spin edit. Applies to 540IAC Card and 540I Card, slaved mode.
- **Feedback Constant** is the correction factor that allows the system to compensate for program signal that is detected by the sensors in combination with the ambient noise. It can be changed using the spin edit. Valid in “auto” mode only. Applies to 540IAC Card, auto mode with or without controlled channels.
- **Attack Time** is the time constant used by the system to respond to sudden large increases in ambient noise. Attack Window defines the magnitude of a large increase. It can be changed using the spin edit. Valid in “auto” mode only. Applies to 540IAC Card, auto mode with or without controlled channels.
- **Release Time** is the time constant used for smoothing small changes in the average signal level. It can be changed using the spin edit. Valid in “auto” mode only. Applies to 540IAC Card, auto mode with or without controlled channels.
- **Scaling Constant** is the ratio of the change in noise level to the resultant change in program level. It can be changed using the spin edit. Valid in “auto” mode only. Applies to 540IAC Card, auto mode with or without controlled channels.
- Pressing the << **First Channel** button will go to first grid row data. Any changes made to the previous loaded grid row will be written to that grid row.
- Pressing the < **Previous Channel** button will go to previous grid row data. Any changes made to the previous loaded grid row will be written to that grid row.
- Pressing the **Next Channel** > button will go to next grid row data. Any changes made to the previous loaded grid row will be written to that grid row.
- Pressing the **Last Channel** >> button will go to last grid row data. Any changes made to the previous loaded grid row will be written to that grid row.
- Pressing the **OK** will close this form.

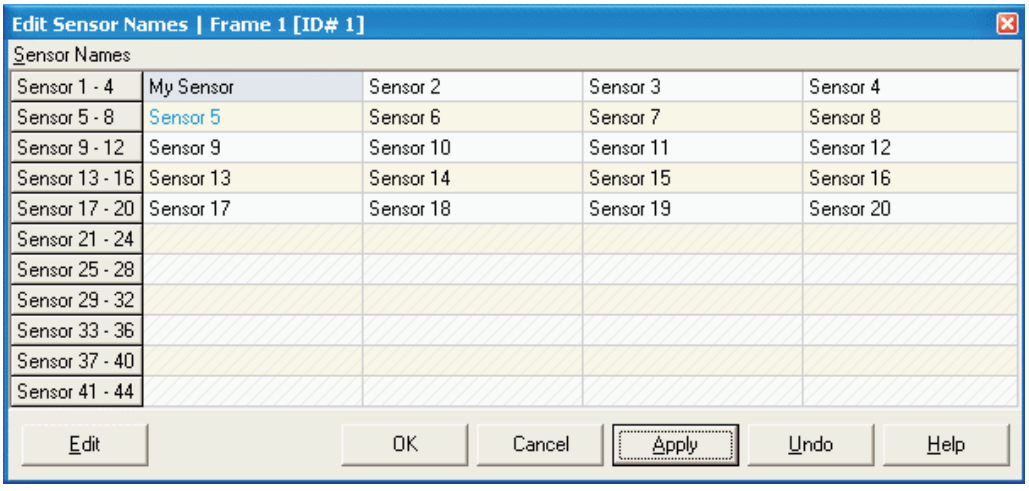


Figure 38 - Edit Sensor Names

- Pressing the **Undo** will reload grid row data without saving changes.
- Pressing the **Help** will open this help page.

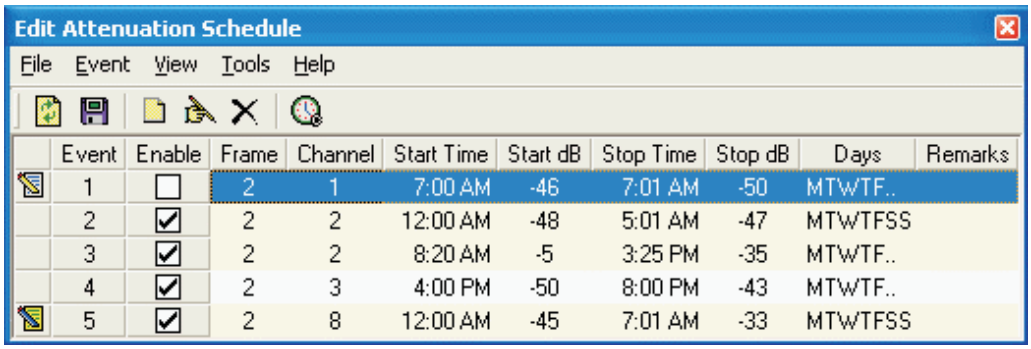
Edit Sensor Names

This option lists all 44 channel sensors. Any changes made will not be saved until they are applied in the Edit Channels form. To the right of the caption after the pipe "|" is the name of the selected frame.

NAVIGATION

Refer to Figure 38.

- Diagonal lines through a cell means that this cell is not selectable and not editable. Those sensors that are assigned to an "auto" mode channel are listed in blue letters. Those sensors that are available are listed in black letters. There are mouse-fly-over hints for each sensor cell. This list is read only.
- To edit a sensor's name, select a sensor (i.e., grid cell) and double-click or press the Enter key. This will open an Edit form. This input box will appear. Note: Sensor names are not unique so care should be taken when naming the sensors.
- Pressing the **OK** will save changes to the Edit Channels grid data.



	Event	Enable	Frame	Channel	Start Time	Start dB	Stop Time	Stop dB	Days	Remarks
	1	☐	2	1	7:00 AM	-46	7:01 AM	-50	MTWTF..	
	2	☑	2	2	12:00 AM	-48	5:01 AM	-47	MTWTFSS	
	3	☑	2	2	8:20 AM	-5	3:25 PM	-35	MTWTF..	
	4	☑	2	3	4:00 PM	-50	8:00 PM	-43	MTWTF..	
	5	☑	2	8	12:00 AM	-45	7:01 AM	-33	MTWTFSS	

Figure 39 - Edit Attenuation Schedule

- Pressing the **Cancel** will cancel this operation.
- Pressing the **Apply** will save changes to the Edit Channels grid data and continue to work.
- Pressing the **Help** will open this help page.

Edit Attenuation Schedule

This option shows attenuation schedule that allows creating, editing and deleting of events. Refer to Figure 39.

NAVIGATION

- **Events** is a list of channel attenuation schedules for this project. This list is ready only. There are mouse-fly-over hints for each grid cell. Creating and editing events occurs in the New Event/Edit Event form. To activate this form, double-click on the event. If the selected event row has data, then that event will be edited. Row coloring

is determined by the matching of the same frame and the same channel (e.g., two events have the same frame and the same channel will have the same row coloring). If the selected event row does not have data, then the event will be created. A newly created event will have its row colored light blue-green. When saved, its color will change to normal.

- **List columns definitions:**
  - **Event not saved** appears when a new event has been added or an existing event's data has changed. When the schedule is saved, then this image will disappear.
  - **Event** is the Number in sequential order based on frame number first, then channel number.
  - **Enable** determines whether this event will occur on the selected days. Ttoggle an event, select the event and double-click or press the space bar.
  - **Frame** is the Frame number and it is required.
  - **Channel** is the Channel number and it is required.
    - If a channels has this image,  it indicates that this "auto" mode channel has slaved channels. Caution should be taken because "slaved" mode channels may not fit into an attenuation schedule scheme.
  - **Start Time** is the time when this event is tproceed and it is required.
  - **Start dB** is the attenuation amount when this event is to proceed and it is required.
  - **Stop Time** is the time when this event is to quit and it is required.
  - **Stop dB** is the attenuation amount when this event is to quit and it is required.
  - **Day**s is the days when this event will occur. A "period" in place of a day indicates that the day is not included and it is required.
  - **Remarks** are the comments concerning the event; however, it is not required.

Menu Items

File Section

- Reload Schedule will refresh the grid with the records in the schedule. A notice will appear if changes have been made.
- Save Schedule to save changes (process uses a progress bar) and reload schedule.
- Close will close this form. A notice will appear if changes have been made.

Event Section

- **New Event** creates a new event by using the New Event/Edit Event form. If a new event is created then it will show as the last grid row. However, this new event has not been saved. Pressing the Save Schedule button will save (process uses a progress bar) this new event.
- **Edit Event** will edit an existing event by using the New Event/Edit Event form. The existing event will show on the grid with the changes that were made. However,

these changes have not been saved. Pressing the Save Schedule button will save (process uses a progress bar) these changes.

- **Delete Event** will delete an event from the project file. A notice will appear

View Section

- **Attenuation Schedule Chart** charts the attenuation schedule for all channels that have an attenuation schedule.

Tools Section (These to actions are also available as grid popup menu items.)

- **Enable All Events** checks all **Enable** checkboxes in the grid. However, these changes have not been saved. Pressing the **Save Schedule** button will save (process uses a progress bar) these changes.
- **Disable All Events** will uncheck all **Enable** checkboxes in the grid. However, these changes have not been saved. Pressing the **Save Schedule** button will save (process uses a progress bar) these changes.

Help Section

- **Contents** will open this help page.

Popup Menu Items

- The following items are same items that are located in the Menu: Reload Schedule, Save Schedule, New Event, Edit Event, Delete Event, Attenuation Schedule Chart, Enable All Events and Disable All Events.

New Event/Edit Event

One option creates a new attenuation schedule event in the Edit Attenuation Schedule. The other option edits an existing attenuation schedule event in the Edit Attenuation Schedule. Both event types use the same form.

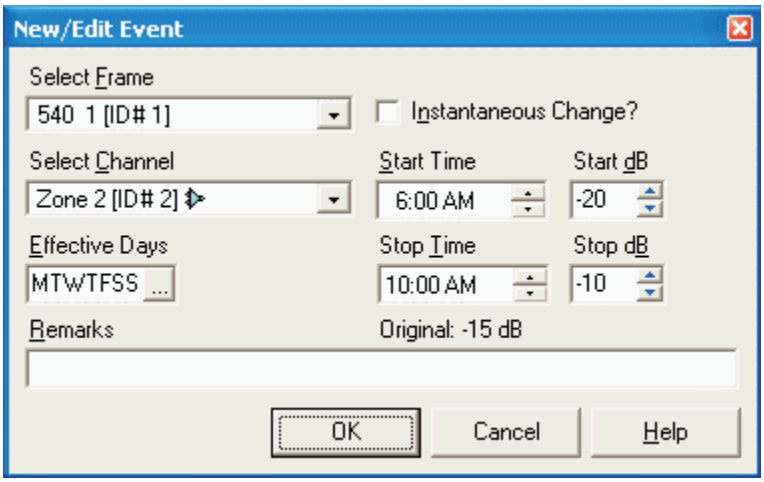


Figure 40 - New Event/Edit Event

NAVIGATION

- **Frame** is the list of frames (with the frame number in brackets) in this project. Selecting the frame will refresh the channel list.

- **Channel** is the list of channels (with the channel number in brackets) in that frame that are of the following:
  - 540IAC Card “auto” mode or “fixed” mode type only.
  - 540I Card “fixed” mode type only.
  - Channels that have an image at the end indicate that this “auto” mode channel has slaved channels. Caution should be taken because “slaved” mode channels may not fit into an attenuation schedule scheme.
- **Original Attenuation** is the original attenuation for the selected channel.
- **Days** is the days of the week is this event scheduled for? Either pressing the ... button or pressing the F4 key can open the dropdown list. Control is a day combo box.
- **Instantaneous Change?** will determine if this event is to have an instantaneous (actually 1 minute) change (e.g., if the Start Time is 2:00 PM, then Stop Time will be 2:01 PM.)? If checked, Stop Time is disabled.
- **Start Time** is the time that the event’s attenuation will start to change. This time is in hours and minutes only.
- **Start dB** is the attenuation level in dB when the Start Time event occurs. Control is a spin edit.
- **Stop Time** is the time that the event’s attenuation will stop changing. This time is in hours and minutes only. If Instantaneous Change? is checked, then Stop Time is disabled.
- **Stop dB** is the attenuation level in dB when the stop time event occurs. Control is a spin edit.
- **Remarks** is the comments or remarks that can identify this event. Not required.
- Pressing the **OK** will save event. A notice will appear if there are no days checked. A notice will appear if a channel has more than one event for the day and the Stop Time for the first one and the Start Time for the second one overlap. A notice will appear if Start dB and Stop dB are the same value.
- Pressing the **Cancel** will cancel this operation.
- Pressing the **Help** will open this help page.

Frame Views

This option shows various frame information when the project is online. See Figure 41.

NAVIGATION

- **Select Frame To View** shows a list of frames (with the frame number in brackets) in this project.
  - **Status** shows the selected frame installed slots, status of the power supply, status of the CPU, and link status.
  - **Slots** is the slot type is included at the bottom of the slot panel.
    - If slot panel color is:

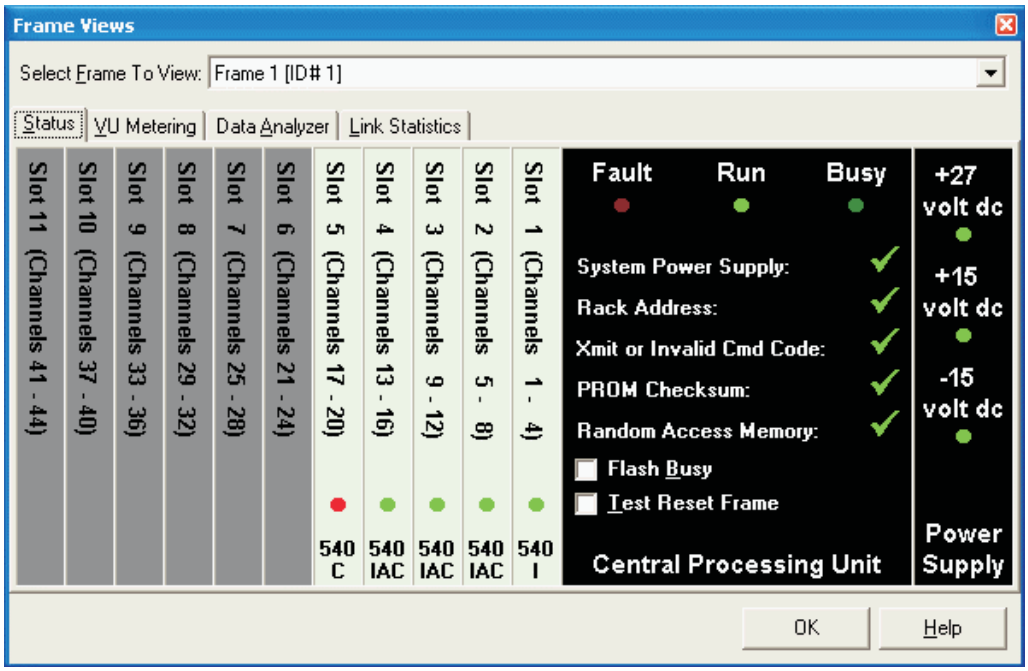


Figure 41 - Frame Views

- pale-green then slot configuration is okay and the 540-frame has a card and the file is configured for a card.
- pale-red then slot configuration has a conflict and either the 540-frame has no card and the file is configured for a card or the 540-frame has a card and the file is configured for no card. This needs to be corrected.
- gray means the slot is not installed.

- 540IAC and 540I cards have a green LED when power is on and a dark green LED when power is off.
- 540C card has a red LED when power is on and a dark red LED when power is off.

- **Central Processor Unit** items of importance are:
  - **Fault** red LED means there is a fault in the CPU card (corrective action is necessary), dark red LED means there is no fault in the CPU card.
  - **Run** green LED means that power is on, a dark green LED means that power is off.
  - **Busy** green LED means that the 540-frame is cycling to identify itself.
  - **Status** is a list of important 540-frame checkpoints that are obtained during a status check:
  - **System Power Supply, Rack Address, Transmit or Command Code, PROM Checksum, Random Access Memory** are checkpoints. If any of these checkpoints fail, then there is a high degree of probability that the data

cannot be read from the affected 540-frame or written to the affected 540-frame. Image meanings are:

- Satisfactory condition is shown by ?.
- Error condition is shown by ?. If any of these checkpoints have an error, then immediate action is needed to correct this problem.
- Unknown condition is shown by ?. This can mean that power is off, or the Test Frame Reset is currently being run.

- Flash Busy is used to find the 540-frame in a room of frames.

- **Power Supply**
  - **+27 VDC** green LED can be lost and the 540-frame will still operate; however, the sensors will not work because they require the +27V to work. If the LED is dark green LED, then this voltage is not present.
  - **+15 VDC** green LED becomes lost, then the 540-frame cannot operate properly. If the LED is dark green LED, then this voltage is not present.
  - **–15 VDC** green LED becomes lost, then the 540-frame cannot operate properly. If the LED is dark green LED, then this voltage is not present.
- **VU Metering** shows the selected frame's channel online metering. There are 44 meters and their measurements are real time. Refer to Figure 42
  - **Show** is a list of VU Metering views - Program Level, Output Attenuation, Sensor Level and Channel Sensors Level. When selecting between views, the channel metering will automatically update.
  - **Program Level** is the channel's program level. See Figure 42. Default meter levels (no measured signal) are:
    - 540IAC card = -56 dB.
    - 540I card = -44 dB (set to -60 dB).
    - 540C card = -56 dB (set to -60 dB).
    - No card = -56 dB (set to -60 dB).
  - **Output Attenuation** is the channel's output attenuation. See Figure 43.
    - If the channel is in "auto" or "slaved" mode, then the output attenuation will fluctuate automatically dependent upon the ambient noise level measurements.
    - If the channel is in "fixed" mode, then the output attenuation will be at a fixed value.
  - **Sensor Level** is the individual sensor's ambient noise level. Refer to Figure 44. Default meter levels (no measured signal) are:
    - 540IAC card = 61/62 dB spl. However, if a sensor is not assigned then its signal level is masked out.
    - 540I card = 62 dB spl. However, if a sensor is not assigned then its signal level is masked out.

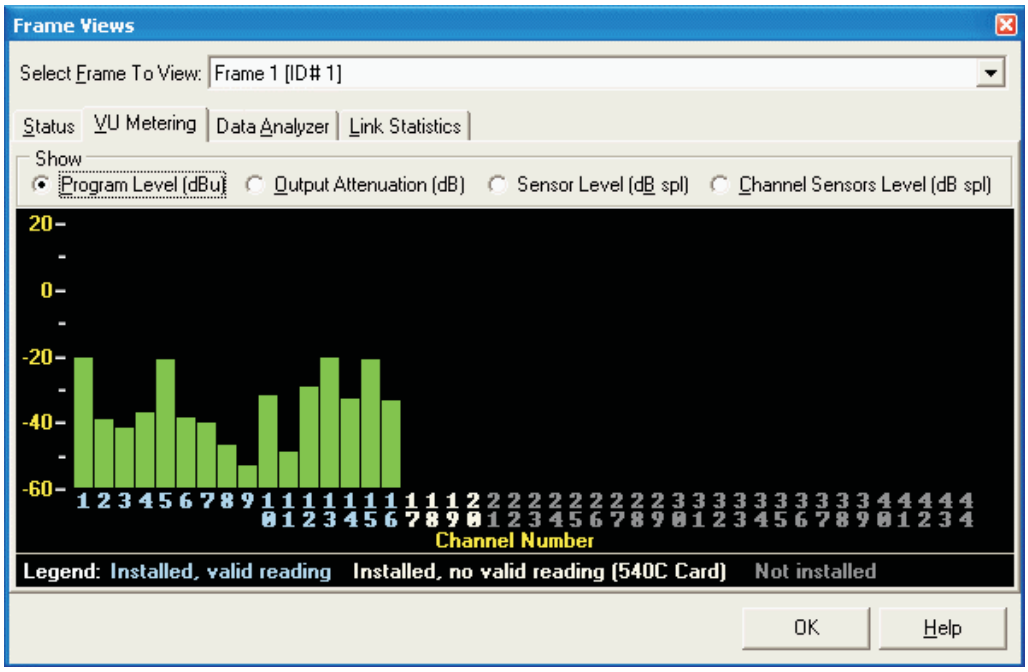


Figure 42 - Frame Views 2
Program Level

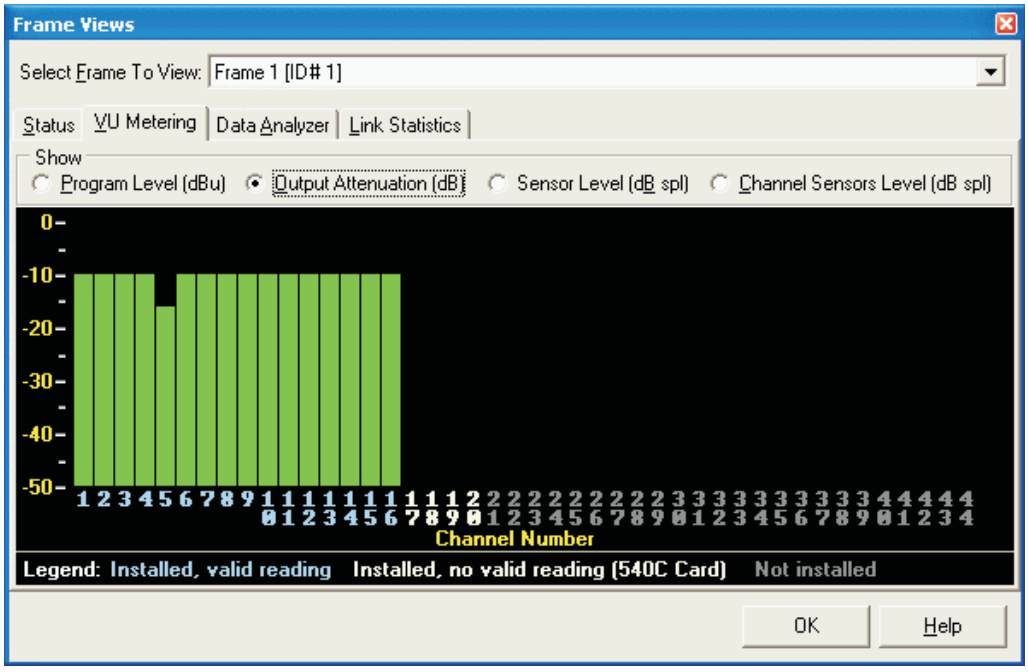


Figure 43 - Frame Views 3
Output Attenuation

- 540C card = 55/56 dB spl. However, if a sensor is not assigned then its signal level is masked out.
- No card = 50 dB spl.

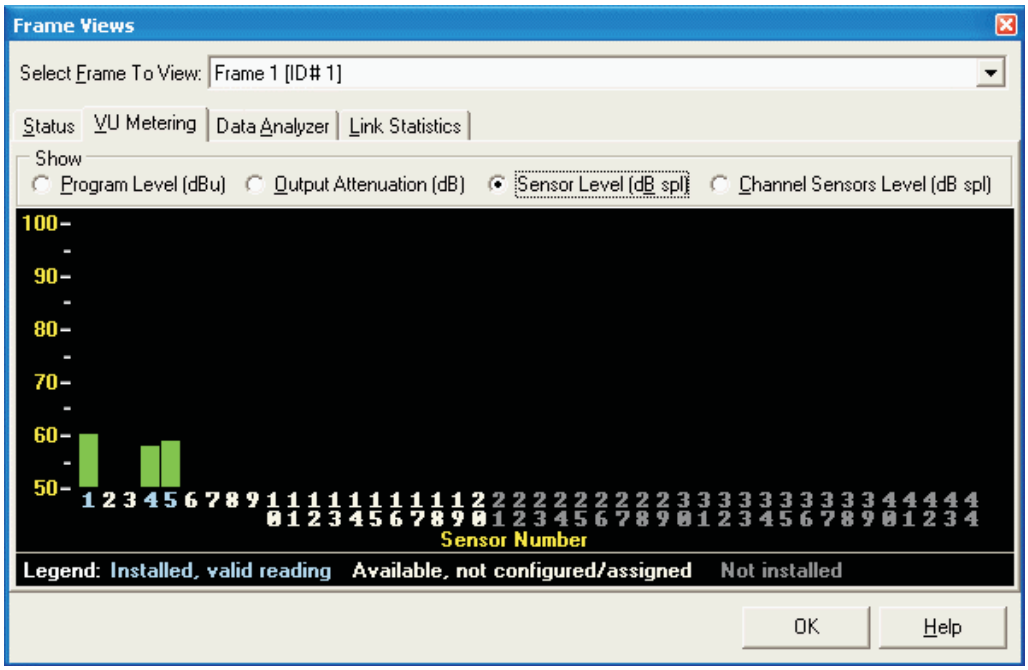


Figure 44 - Frame views 4
Sensor Level

- **Channel Sensors Level** is all of sensors assigned to an "auto" configured channel will have their ambient noise levels averaged.
  - Pressing the OK will close this form.
  - Pressing the Help will open this help page.

Search for Frame CPU Address

Allow the user to search through all configured on this particular network IP Address, 590COM or 590I Card.

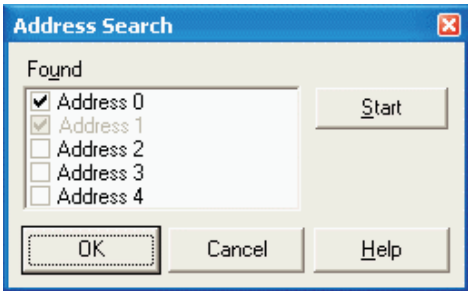


Figure 45 - Search for Frame CPU Address

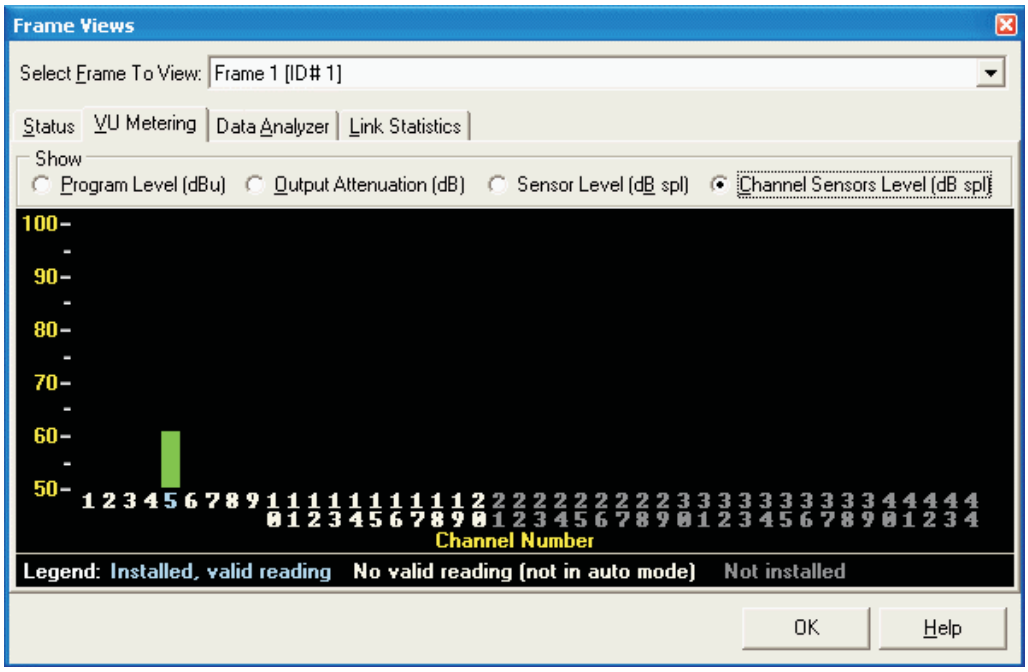


Figure 46 - Frame Views 5
Channel Sensors Level

NAVIGATION

- Pressing the **Start** button will start the search for addresses (0 - 255). The first address searched is 255. The reason that the search starts with 255 is because it is the default Frame CPU Address (due to a loss of power) of a variable-address-set EPROM. Fixed-address-set EPROM will retain their Frame CPU Address even with a loss of power. Any address found will be listed in the **Found** list box.
  - ☑ Indicates that this Frame CPU Address is available for selection.
  - ☐ Indidicates that this Frame CPU Address is currently being used by this 540-frame.
  - ☑ Incates that this Frame CPU Address has already been used by another 540-frame.
- **Searching for** is a search counter that lists the current Frame CPU Address that is being searched.
- Pressing the **Stop** button will stop the search.
- Pressing the **OK** button will update the 540-frame with the selected Frame CPU Address.
- Pressing **Cancel** button will cancel this operation.
- Pressing the **Help** button will open this help page.

ACS Information

This option as seen in Figure 1 (visible if Zones is configured) shows a listing of information that is obtained from and/or given to the ACS. Note: Toolset configuration file ("ACS.ini") will be referred to as TCF.

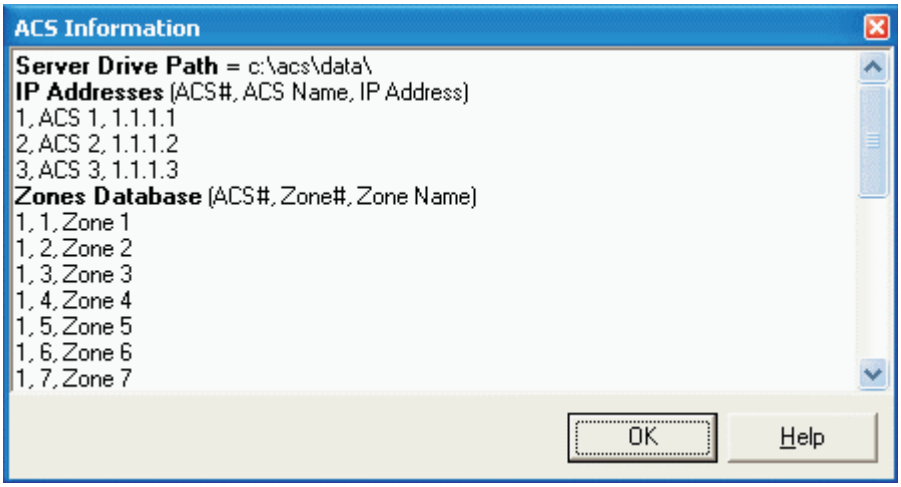


Figure 47 - ACS Information

NAVIGATION

- **Information**
  - **Server Driver Path** is the location of the TCF to be used.
  - **IP Addresses** is a list obtained from the TCF for use by this program to send information to the ACS to perform Feedback Constant Calibration. The items are: **ACS** is the number assigned in the TCF for an ACS. **IPAddress** is a string identifier (example: 1.2.3.4) for the ACS on the IEDNet network. **ACSName** is an Identification assigned in the TCF for an ACS.
  - **Zones Database** is the database ("Zones.db") list of all zones in the ACS. This database supplies zone information that this program uses to set up channels into zones. The items are: **ACS** is the number assigned in the TCF for an ACS. **Zone** is the number assigned in the "Zones.db" for an ACS zone. **ZoneName** is the identification assigned in the "Zones.db" for an ACS zone.
  - **Project Database** is the database ("Win540.db") list of all channels in this project. This database supplies zone configuration to the Toolset. Not available if the **Record for ACS Use** is not checked. Used in Toolset Monitor Testing for reading channel attenuation. The items are: **Frame** is the number assigned to a 540-frame by this program. **Channel** is the number assigned to a 540-frame channel. **ChannelName** is the identification assigned to a 540-frame channel. **ACS** is the number assigned in the TCF for an ACS. **Zone** is the number assigned in the "Zones.db" for an ACS zone.
- Pressing the **OK** button will close this form.
- Pressing the **Help** button will open this help page.

Attenuation Schedule Chart

This option shows the scheduled attenuation for the selected frame, selected channel and on a selected day. This option is available when at least one attenuation schedule record exists in the project.

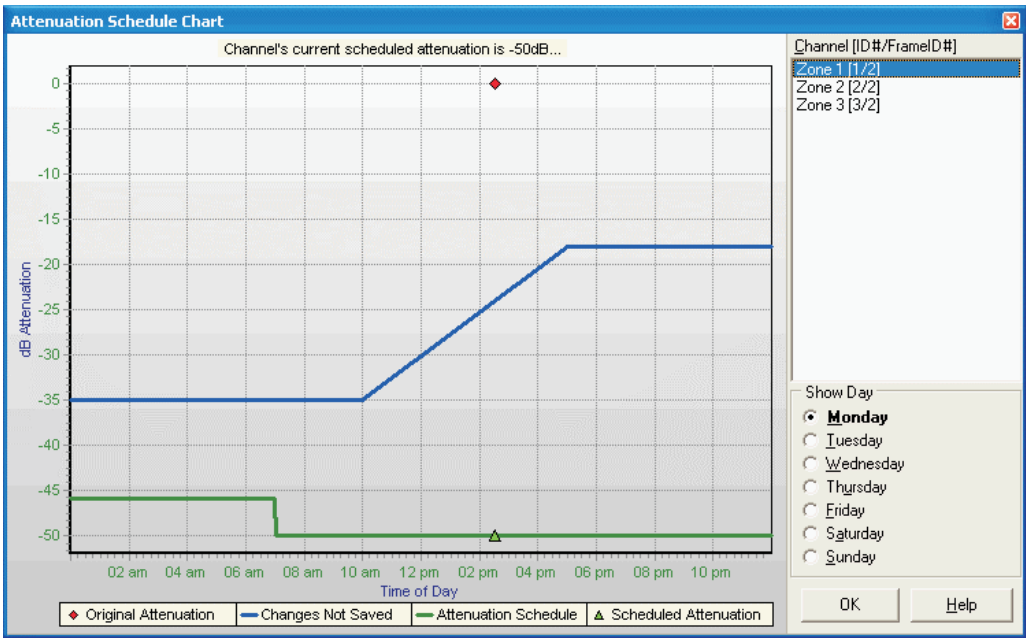


Figure 48 - Attenuation Schedule Chart

NAVIGATION

- **Chart** plots the original attenuation, changes not saved, attenuation schedule, and scheduled attenuation for the selected channel.
- Original Attenuation is a red/maroon flashing diamond. Changes Not Saved is a blue line that shows any channel changes that have not been saved. See Edit Attenuation Schedule. Attenuation Schedule is a green line that shows the channel attenuation schedule for the selected day.
- Scheduled Attenuation is a bright green/dark green flashing triangle. Scheduled Attenuation Amount - located over the chart in the middle as shown in Figure 1.
  - If amount shows “Channel’s current scheduled attenuation is -35dB...” then this is today, the Original Attenuation and Attenuation Schedule is visible and Scheduled Attenuation’s flashing triangle is visible.
  - If amount shows “Channel has an attenuation schedule for Friday...” then this is not today, the Original Attenuation and Attenuation Schedule is visible and Scheduled Attenuation’s flashing triangle is not visible.
  - If amount shows “Channel has no attenuation schedule for Saturday...” then this is not today, the Original Attenuation and Attenuation Schedule is not visible and Scheduled Attenuation’s flashing triangle is not visible.

- **Channel [ID#/FrameID#]** is the list of channels (with the channel number and frame number in brackets) in this project that have attenuation schedules. The chart is automatically updated with the attenuation schedule for that channel that is selected. An image indicates that this is an “auto” mode channel and it has slaved channels,
- **Show Day** is the seven-day selector. The current day is shown in bold.
- Pressing the **OK** will close this form.
- Pressing the **Help** will open this help page.

Preferences

This option contains all of the program’s default that can be editable. Any changes made will not be saved until they are applied.

NAVIGATION

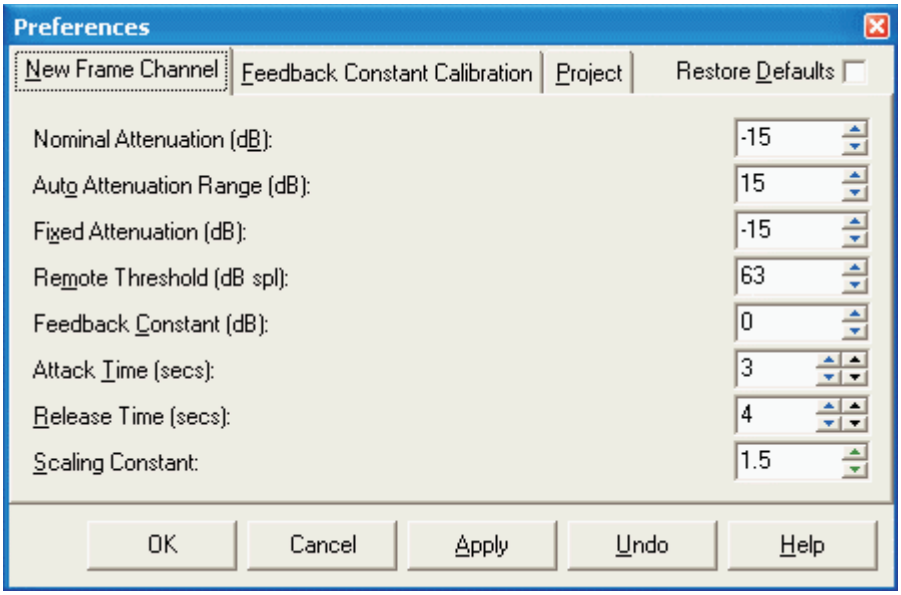


Figure 49 - Preferences
New Frame Channel

New Frame Channel Settings is used in New Project, Convert DOS Project and New Frame.

- **Nominal Attenuation** [default = -15 dB] is the maximum attenuation. Valid only in “auto” mode and “slaved” mode. Control is a spin edit.
- **Range** [default = 15 dB] is the delta or span of attenuation values from the maximum attenuation (Nominal) value to the minimum attenuation value. Valid only in “auto” mode and “slaved” mode. Control is a spin edit.
- **Fixed Attenuation** [default = -15 dB] is the minimum attenuation. Valid only in “fixed” mode. Control is a spin edit.

- **Remote Threshold** [default = 63 dB spl] is the signal level from a remote sensor above that the system begins to increase the output signal for its associated channels. Valid only in “auto” mode. Control is a spin edit.
- **Feedback Constant** [default = 0 dB] is the correction factor that allows the system to compensate for program signal that is detected by the sensors in combination with the ambient noise. Valid only in “auto” mode. Control is a spin edit.
- **Attack Time** [default = 3 seconds] is the time constant used by the system to respond to sudden large increases in ambient noise. Attack Window is defines the magnitude of a large increase. Valid only in “auto” mode. Control is a spin edit.
- **Release Time** [default = 4 seconds] is the time constant used for smoothing small changes in the average signal level. Valid only in “auto” mode. Control is a spin edit.
- **Scaling Constant** [default = 1.5] is the ratio of the change in noise level to the resultant change in program level. Valid only in “auto” mode. Control is a spin edit.

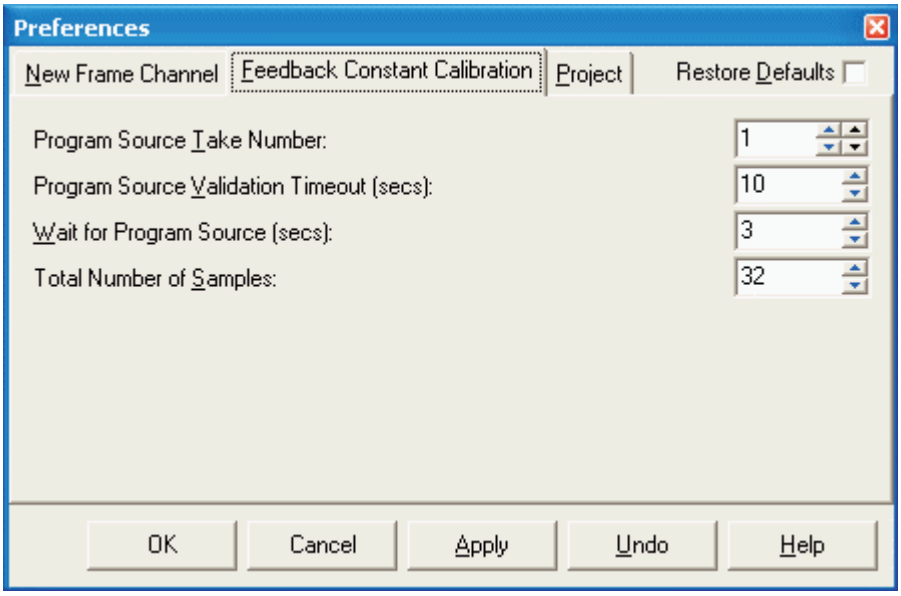


Figure 50 - Preferences
Feedback Constant Calibration

Feedback Constant Calibration Settings is used in Edit Channel.

- **Program Source Take Number** [default = 1] is the ACS Permanent Digital Record and Playback (PDRP) message number. Control is a spin edit.
- **Program Source Validation Timeout** [default = 5] is the time to wait before deciding that the message has not started and if so to manually start the message. Control is a spin edit.
- **Wait for Program Source** [default = 3 seconds] is the amount of time to wait before starting to take samples. Reason is to minimize the amount of reverberation when starting a message. Control is a spin edit.

- **Total Number of Samples** [default = 24] is dependent upon this program source level Reason for this is that to compute the feedback constant, take the total accumulated sample level divided by the total number of samples. The total number of samples must be sufficient to render an accurate reading. Control is a spin edit.

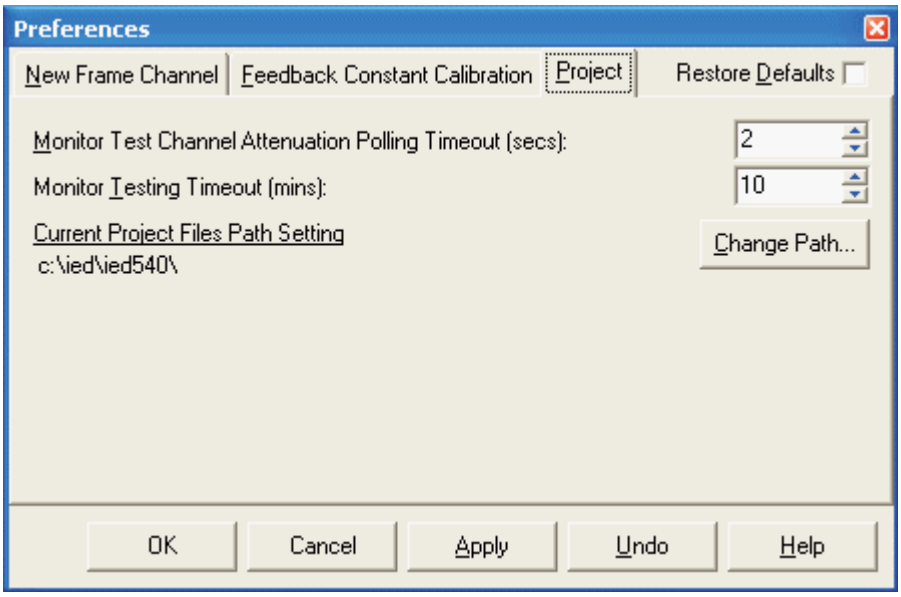


Figure 51 - Preferences
Project Settings

Project Settings is used in Main.

- **Monitor Test Channel Attenuation Polling Inactivity Timeout** [default = 2 seconds] is the wait time before stopping the Monitor/Test - Channel Attenuation. Control is a spin edit.
- **Monitor Testing Inactivity Timeout** [default = 10 minutes] is the wait time before stopping Monitor/Test in case the stop message was not sent from the Monitor/Test originator. Control is a spin edit.
- **Current Project Files Path Setting** [default = c:\ied\ied540\] **Change Path** is the directory that the new project files will be created in.

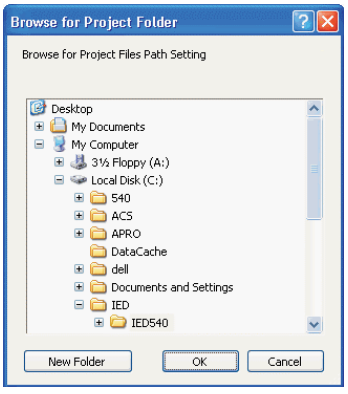


Figure 52 - Browse for Project Folder

Figure 52 will appear. Pressing the **New Folder** button will create a new directory folder. Pressing the **OK** will save directory folder change and update location. Pressing the **Cancel** button will cancel this operation. This form is a standard Windows form and may not be fully accessible for keyboard actions. Checking the **Restore Defaults** checkbox and then pressing either the **OK** button or the **Apply** button will discard all changes made and restore the original program defaults, not the initialization file default settings. Pressing the **OK** will save changes to program's configuration file ("IED540.ini"). Pressing the **Cancel** will cancel this operation. Pressing the **Apply** will save changes to program's configuration file ("IED540.ini") and continue to work. Pressing the **Undo** button discards all changes not previously saved and reloads the program's configuration file ("IED540.ini"). Pressing the **Help** will open this help page.

Password Configuration

This brings up a menu of password options or sub functions available. Based on password permissions, one may not have access to some or all of these functions.

NAVIGATION (These forms are not fully accessible for keyboard actions.)

Edit User Accounts is the form that allows for the editing, creating and deleting users and user permissions. This program uses the following permissions:

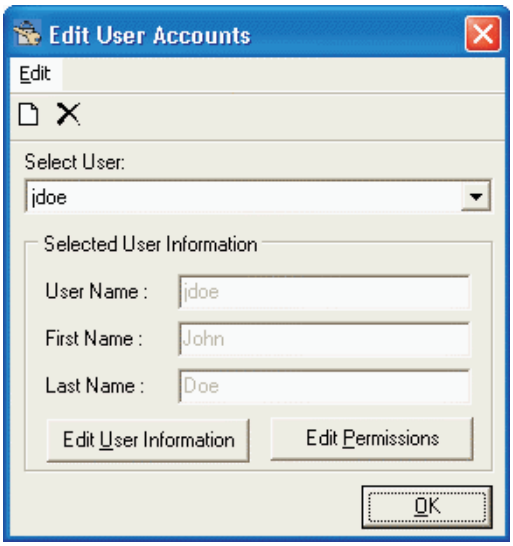


Figure 53 - Edit User Accounts

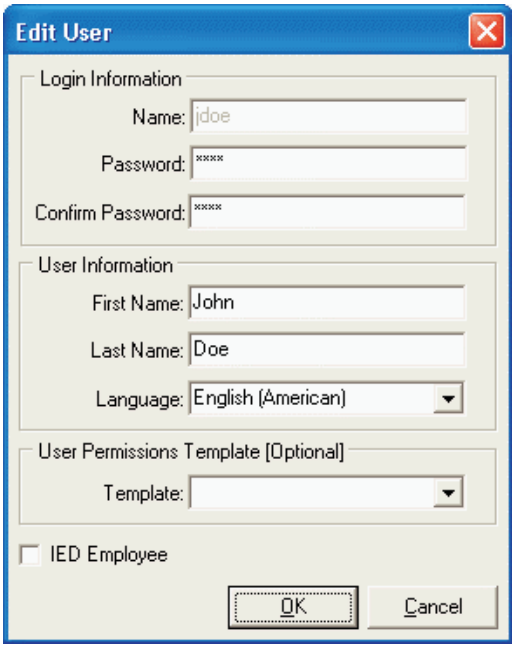


Figure 54 - Edit User

On this window, one can: (1) add a new account, (2) edit an existing account and (3) delete an account. Each of the operations is described in more detail below.

- **To Add an Account**, one either clicks on the new account icon (blank sheet of paper on the toolbar), or selects the Edit|New menu option. This brings up the New User Account window as shown in Figure 54. Then one enters the User Name (the name to enter in the Login window), the password twice (will echo as asterisks), and then the real name of the user. For example, one might enter a user name of Jsmith for the

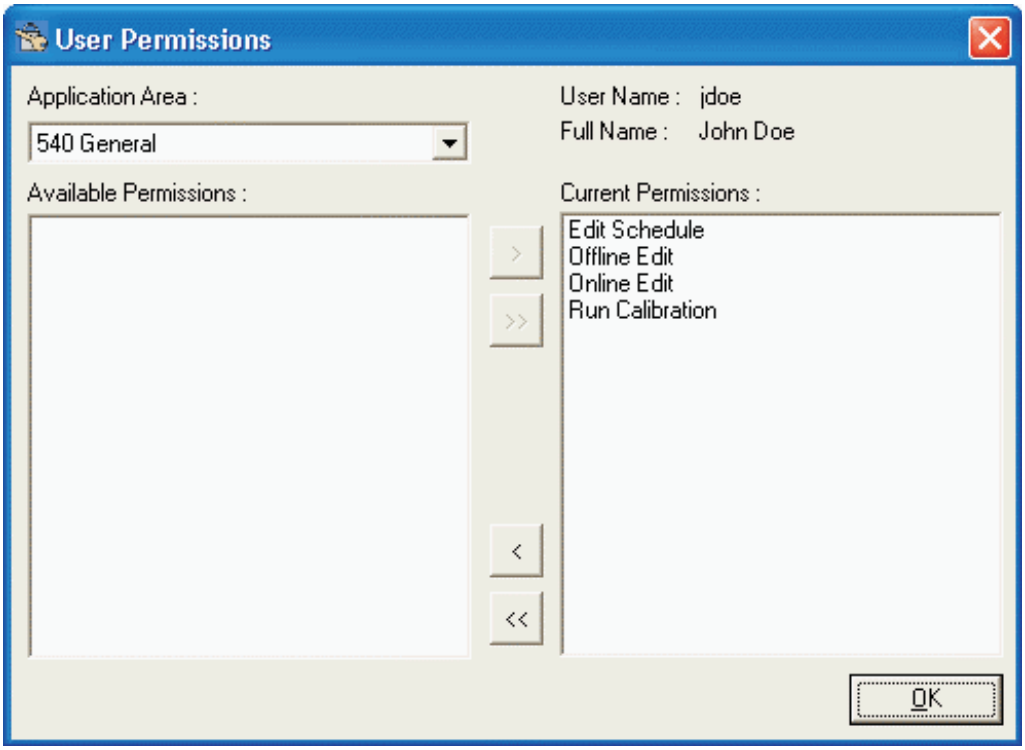


Figure 55 - User Permissions

user who's first and last names are John Smith. The User Name is also where one would put in the Entry ID# that is input via the pop-up keypad. The optional User Permissions Template allows one to assign permissions based upon another existing account. This is a shortcut to save time when setting up several accounts with the same set of permissions. Once all the information is entered, one clicks on **OK** and the account will be created. The second step in creating a New User Account is to assign permissions. If one doesn't use the optional permission template feature, then one should next manually assign each of the permissions by first pressing the **Edit Permissions** button on the Edit Users window as shown in Figure 53. This brings up the User Permissions window as shown in Figure 55. In this window, one first selects each Application Area in the drop-list box and then moves permissions from the left list box to the right list box. The two application areas available are: SYSTEM (mostly password related) and 540 GENERAL (related to the IED540 software). See Login for more information. The single greater-than symbol buttons () will move the currently selected permission from one list box to the other, while the double greater-than system buttons (>) will move all permissions. Once each application area has been visited and the permissions assigned, one clicks on OK to have them take effect.

- **To Edit an Account**, one first selects the desired account in the drop-list box on the Edit User Accounts window as shown in Figure 1, then selects either the Edit User Information button or the Edit Permissions button. Selecting the Edit User Information button brings up a window just like the New User window as shown in Figure 2, except filled in with the selected user's information. One then edits the information and clicks on OK. Selecting Edit Permissions button is identical to doing

this for a new user and described above using the User Permissions window as shown in Figure 3.

- **To Delete an Account**, one clicks on either the X icon on the toolbar or selects the **Edit|Delete** menu option. A notice will appear.

Configure Password Server is the setup form for the password server. Functions include language setup, directory locations, startup options, login options, auto logout options, log file size limits and log file cleanup time.

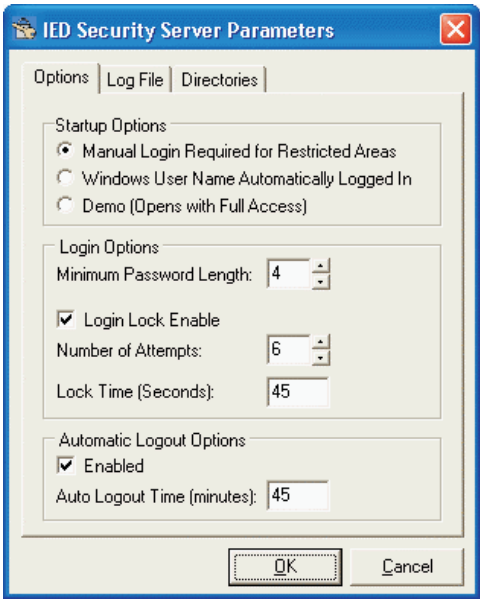


Figure 56 - Security Server Options Tab

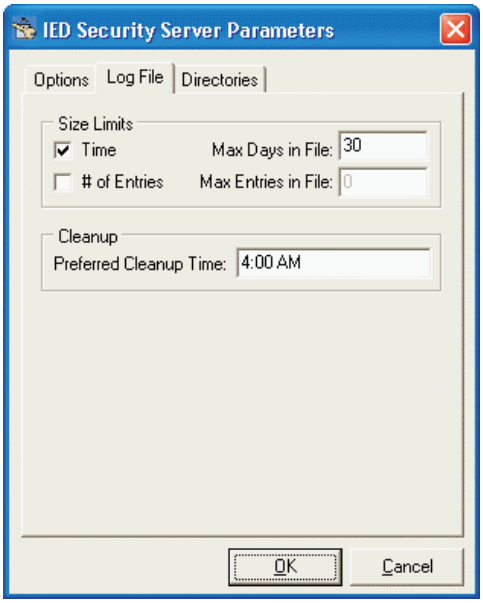


Figure 57 - Security Server Log File Tab

Figure 58 - Security Server Directories Tab

In this window, one can: (1) edit server Options, (2) edit server Log File settings and (3) edit Directories locations.

- **Options**
  - **Startup Options** determines if automatically log in occurs and how.
    - **Manual Login Required for Restricted Areas** will have no user logged in. By default, this option should be chosen and never changed. If one of the others was selected then security access permissions will be bypassed.
    - **Windows User Name Automatically Logged In** will have a user logged in based on reading the user that is currently logged in to the Windows operating system.
    - **Demo (Opens with Full Access)** will be logged in with full access rights/permissions.
  - **Logon Options** controls aspects of the Logon operation.

- **Minimum Password Length** is from 1 to 10 characters. It is best that this number be at a minimum of 4 because the lower the character length the easier it would be figure out a password.
- **Login Lock Enable** allows for locking up the system if a certain number of unsuccessful attempts are made to log in, i.e., presumably somebody is trying to hack into the system by guessing user names and passwords.
- **Number of Attempts** is the number of consecutive times that the password server will allow the user to attempt to log in. Range is 1 to 10 times. Default is 6.
- **Lock Time (Seconds)** is the interval that the password server is locked out from allowing any user log in requests after the Number of Attempts is reached.

- **Automatic Logout Options** controls if/when the security server will automatically log out an open console.
  - **Enabled** means that if there is no detected keyboard actions or mouse movements within a stated length of time, then the password server will automatically log the user off.
  - **Auto Logout Time (minutes)** is the interval to determine when automatic logout would occur.

- **Log File** controls aspects of the user/security log that is a log that basically records when users log in and out of applications.
  - **Size Limits** controls the maximum size that the user log file can reach.
    - **Time** is the Max Days in File parameter will determine the maximum number of days in that the password server will store the data. Any data that is older than the maximum number of days will be deleted.
    - **Max Days in File** is the number of days that events may stay in the log file.
    - **# of Entries** is the Max Entries in File parameter will determine the maximum number of logged entries to store in the file. Any entries that are stored r the limit will be deleted.
    - **Max Entries in File** is the most events that may be held in the log file before older ones will be deleted.
  - **Cleanup** controls the execution of the Log cleanup or size maintenance operations.
    - **Preferred Cleanup Time** is the time of the day to clean up the password server log file based on the Size Limits parameters.
- **Directories**
  - **Database Path** is the location of the main password server database.
  - **Backup Database Path** is the location of the backup to the password server database.
  - **System Log File Path** is the location of the password server log file. On Password Startup, if Main Database is found, it is copied to the Backup

Database Path. If it is not found, then the Backup Database is used, and the user is warned that the Backup Database is being used and user account changes may be lost if made. Typically, in a multi-console application, the Main Database is on a server computer or share drive, and the backup database is always on the local (C:) drive.

View Password Log records when IED applications start/stop and when a user logs into or out of the system. In addition, other special events may be added to this log file. Selecting the **Display Log** option brings up the Event Log Viewer window. On this window, one can scroll through the events, sort with the options at the left, or filter the listing by Date, Description or User Name, by checking the appropriate checkboxes, and setting values associated with each filtering option. The Description filter is a match to any description starting with the entered text. Naturally, the Print button will send the current list (i.e., possibly filtered) to a printer.

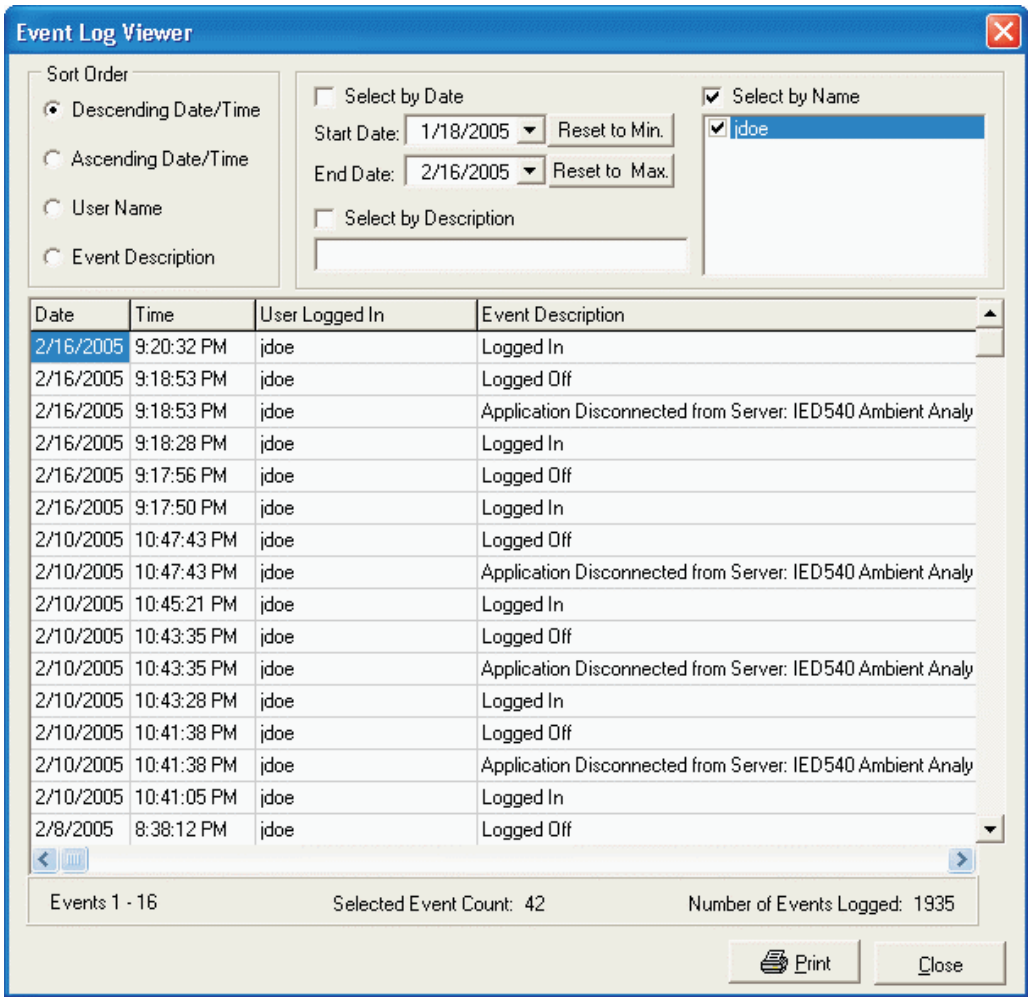


Figure 59 - Event Log Viewer

Figure 60 - Change Password Window

Change Password calls up the Change Password window.

Refer to Figure 60.

- One simply types the current password into the Old Password edit box (to verify that it is the user that is changing the password). Then one types the new password twice in the other two-edit boxes. The keys typed will be echoed as asterisks (*), not the actual keystrokes. A notice will appear if the password change was accepted. A notice will appear if the password change was not successful. A notice will appear if the password change had an error due to trying to make a new password less than 4 characters long. A notice will appear if the password change had an error due to passwords did not match.

About

This option list current version information, copyright information, company address information, company logo, system information and dependent file information.

NAVIGATION

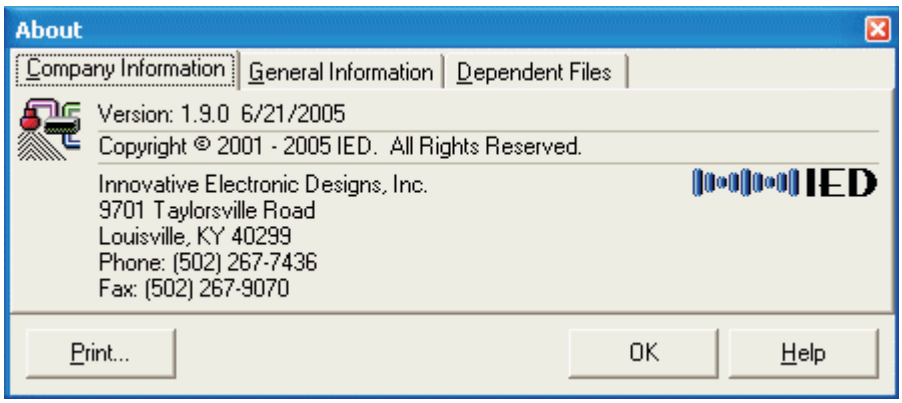


Figure 61 - About window
Company Informatiion Tab

Company Information (See Figure 61)

- **Company Logo** is Innovative Electronic Designs, Inc. logo.
- **Version** is the current version and version date of this program.

- **Copyright** is the legal information.
- **Company Location** is the company name, company address, phone number and fax number.

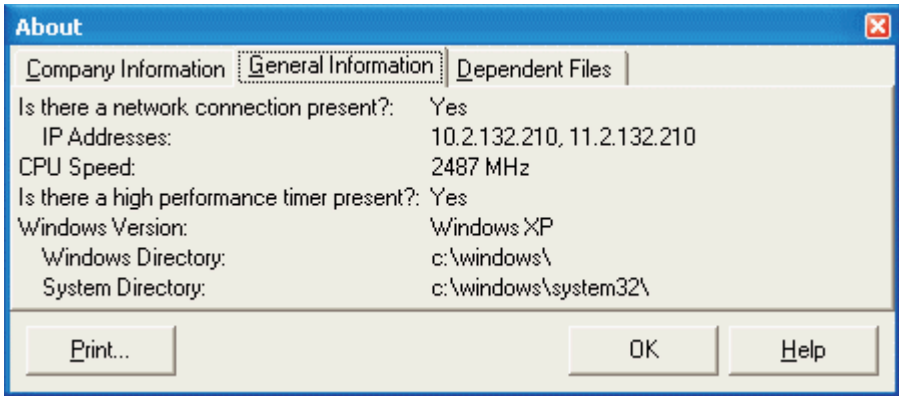


Figure 62 - About Window
General Information Tab

General Information

- **Is there a network connection present?** If "Yes", then network connection is present. If "No", then either the computer has no network card or the computer has a network card but is not hooked up to the network.
- **IP Addresses** is a list of IP Addresses assigned to this computer.
- **CPU Speed** is the clock speed of the computer measured in megahertz (MHz).
- **Is there a Hi Performance Timer present?** If "Yes", then the time speed is kept by a very high-speed timer that clocks in micro-seconds (1/1,000,000). If "No", then the time speed is kept by a multi-media timer that clocks in the milli-seconds (1/1,000).

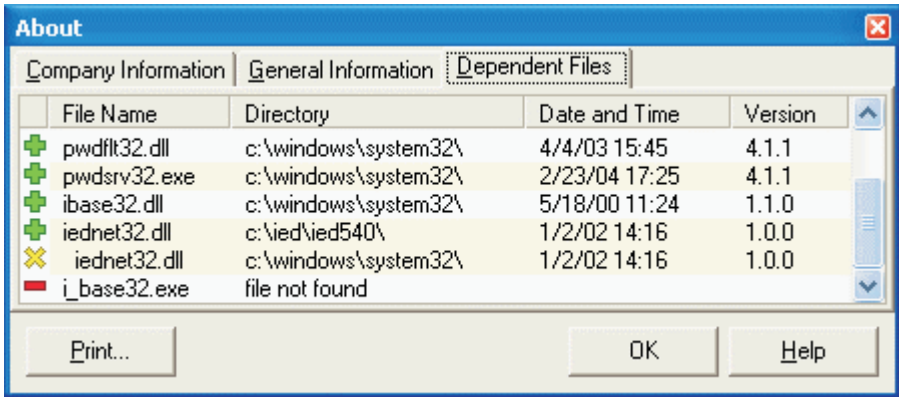


Figure 63 - About Window
Dependent Files Tab

- **Windows Version** is the 32 bit operating system installed in this computer. Possible versions are 95, 98, ME, NT, 2000 and XP. If 2000 or XP is the operating system, then 590I card communications is not supported.
- **Windows Directory** is the location of the windows directory. This location is usually “c:\windows” for Windows versions 95, 98, ME, 2000 and XP, or “c:\winnt” for Windows version NT.
- **System Directory** is the location of the system directory. This location is usually “c:\windows\system” for Windows versions 95, 98, ME and NT, or “c:\windows\system32" for Windows versions 2000 and XP.

Files

- The following is a current list of dependent files:
  - “IED540DLL.dll” contains program image resources.
  - “PwdDLL32.dll” and “PwdFlt32.dll” are password support libraries and “PwdSrv32.exe” is the password server.
  - “IBase32.dll” and “IEDNet32.dll” are IEDNet support libraries, and “I_Base32.exe” is the IEDNet server.
- The all dependent files located on the 590-computer is listed on the Dependent Files list view. Columns are:
  - **Images** - have mouse-fly-over hints.
    - Signifies that this support library (“dll”) or server (“exe”) is used by this program.
    - Signifies that this support library (“dll”) or server (“exe”) is a duplicate and is not used by this program.
    - Signifies that this support library (“dll”) or server (“exe”) is missing. Currently the only file that would show up as missing is “I_Base32.exe”
      - If any of the other dependent files are missing, a notice will appear when starting this program:
        - A notice will appear if the program’s support library (“ied540dll.dll”) is missing.
        - A notice will appear if the program’s support library (“ied540dll.dll”) is the wrong version.
        - A notice will appear if the password server (“pwdsrv32.exe”) or password support library (“pwdflt32.dll”) is missing.
        - A notice will appear if the password support library (“pwddll32.dll”) is missing.
        - A notice will appear if the IEDNet support library (“ibase32.dll”) is missing.
        - A notice will appear if the IEDNet support library (“iednet32.dll”) is missing.
  - **File** is the name of dependent file.

- **Directory** is the folder location of the file. By design when a program is started it looks for these files in the following order. If the missing file is not located in any of these directories then perform a search operation to locate the missing file or do a reinstall of this program:
  - Specified directory (e.g., c:\my directory\my dll directory\).
  - Program directory.
  - System directory is c:\windows\system32\ or c:\windows\system\.
  - Windows directory is c:\windows\ or c:\winnt.
- **Date** is the executable (exe) or dynamic link library (dll) compiled date and time of the dependent file.
- **Version** is the current version of the dependent file.

- Pressing the **Print** button will send the system information is sent to a document previewing and printing.
- Pressing the **OK** button will close this form.
- Pressing the **Help** button will open this help page.

Project Manager

Controls the project and contains a current copy of the project data files and distributes this data to other parts of this program as required as shown in Figure 64.

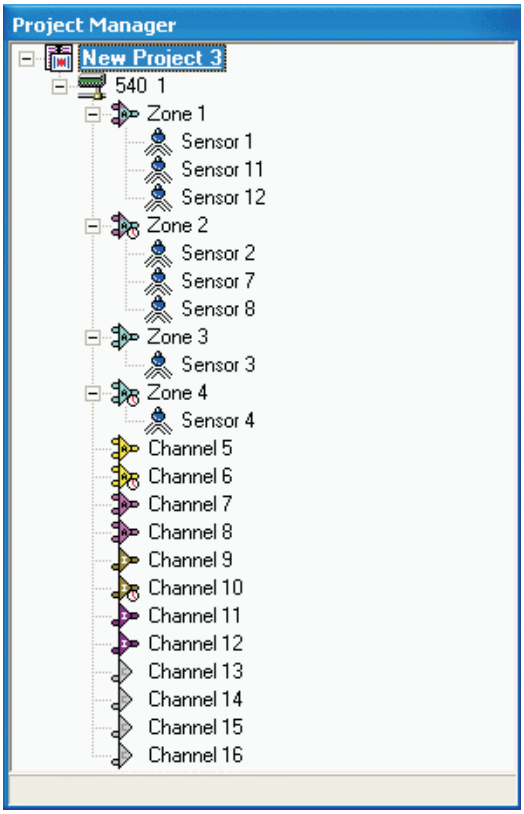


Figure 64 - Project Manager

NAVIGATION

Popup Menu Items

- **Close Project** is used to close the project. When the project is closed, the project file is removed from the Project Manager.
- **Go Online** places the project online. Process uses a progress bar. Online means that any changes made to the project will immediately be written into the selected frame. In this condition both the project and frames are synchronized.
  - A notice will appear if the user does not have password permission to place the project online.
  - When a user chooses to go online, the Project Manager will start to cycle through each project frame by first linking to that 540-frame, then receiving data from that 540-frame. If there is any difference in the data of that 540-frame and the project data, then the discrepancy will have to be resolved in the Frame Compare form before going online.
  - Any problems that develop in the communication's link will be noted in that frame's image.
  - There is a special condition when this program is linked to the Toolset. The program will perform link status, attenuation scheduling and monitor/testing whether online or offline.
- **Go Offline** places the project offline. Offline means that any changes made to the project will not immediately be written into the selected frame. In this condition both the project and frames are not synchronized. One aid that will help the user determine if the project and frames are not synchronized is the Send Data toolbar button.
  - A notice will appear if the user does not password permission to place the project offline.
  - Conditions that can cause automatic offline triggering are emergency shutdown and deleted project file. Another condition occurs when this program is linked to the Toolset. The program will perform link status, attenuation scheduling and monitor/testing whether online or offline.
- **Send Data** performs sending data (process uses a progress bar) to the frames. If this option is flashing (Send Data toolbar button), then offline changes have been made and those changes have not been sent to the frames. In this condition both the project and the 540-frames are not synchronized. A notice will appear.
- **Retry Frame Link Fault** allows manually retry of online link status.
- **New Group** creates a new group that is a collection of frames. This input box will appear.
- **New Frame** calls the new frame creation wizard form that will add a new 540-frame to the project step-by-step.
- **Edit Project** calls the edit project form that allows editing of project information.
- **Edit Frame** calls the edit frame form that allows editing of frame information.

- **Edit Channel** calls the edit channel form that allows editing of individual channel information, assigning sensors to channels and channel feedback constant calibration.
- **Edit Channels** calls the edit channels form that allows editing of all channel's information including assigning zones, assigning sensors to channels, and editing sensor name information.
- **Edit Attenuation Schedule** calls the edit attenuation schedule form that allows editing of channels that have attenuation schedules.
- **Delete** allows for deletion of a group or a frame from a project. There are restrictions to performing this operation.
  - To delete a group requires that the group must be void of any frames. A notice will appear.
  - To delete a frame requires that there is more than one frame in the project. A notice will appear.
- **Rename** allows for changing any assigned name in the project. This input box will appear.
- **Frame Views** calls the Frame Views form that contains section titled Frame Status and Frame VU Metering for a selected frame.
- **Attenuation Schedule Chart** charts the attenuation schedule for all channels that have an attenuation schedule.
- **Expand/Collapse**
  - **Collapse All** will collapse all branches or nodes.
  - **Collapse Selected Frames** will collapse all channel and sensor branches or nodes for the selected frame.
  - **Collapse Channels and Sensors** will collapse all channel and sensors branches or nodes.
  - **Expand All** will expand all branches or nodes.
  - **Expand Selected Frames** will expand all channel and sensor branches or nodes of the selected frame.

IMAGES

- **Project** is the parent name. Placing the mouse over the image identifies project information. There are three types of project images:
  -  Project.
  -  Project - linked to the ACS.
  -  Project - linked to the ACS and recording the project data.
- Group is a child of the project. Can be deleted if there are no frames in the group. There is one type of group image:
  -  Group.

- Frame is a child of the project or child of a group that means that it can be part or not part of a group (drag and drop). Can be deleted if there is more than one frame in the project. Double-click or press the Enter key to open the Edit Frame form. Placing the mouse over the image identifies frame information. There are eight types of frame images:

 540-frame is offline.

 540-frame is offline and is using network communications type.

 540-frame is online.

 540-frame is online and is using network communications type.

 540-frame is offline, is using network communications type and has an invalid IP Address.

 540-frame is online and has a link fault.

 540-frame is online and has a bad CPU.

Online Conditions are normally for the 540-frame link status is checked every minute on the minute. A link fault is determined by multiple-pass link status checking. If a fault condition occurs, then the link is immediately checked a second time. If a fault is still occurring, the fault is legitimate and the frame's image will reflect that fault. If the link fault is still not corrected, then corrective measures can be as follows:

540-frame

With the power off:

- Inspect the CPU card. Make sure that each microchip's pins are properly set into the microchip receiving socket.
- CPU EPROM version must be V2.4, 7/15/02.
- Make sure that the RS422 cable is connected to the 540-frame.

With the power on:

- Power supply card should have all LEDs lit.
- CPU card should have Run (middle green) LED lit and the Fault (top red) LED not lit. The Busy (bottom green) LED status is of no concern during this check.
- CPU Nonvolatile SRAM lithium battery could be dead or unable to retain memory on a power down. If this is the case, then there is a possibility that the battery needs replacing.
- Press the Red Reset Button on the Frame's CPU Card.
- Each channel's slot card should have its LED lit.
- If it is a hardware issue, then see Hardware Check.

422LAN Module

- Make sure power is on (blue LED lit) and the green LED in the network socket is lit.
- If communications is achieved using IEDNet, then make sure that the network cable is connected to the 422LAN module and the 540-frame is connected to the 422LAN module.

Software

If using network communications:

- Make sure that the 422LAN Module is properly configured. One way to check this is using Telnet to check the configuration. See ARP and Telnet for instructions.
- Make sure that the 422LAN Module 590 firmware is installed. One way to check this is using the ping operation in Edit Frame. If 590 firmware is not installed, then it will have to be installed.
- To check for a valid Frame CPU Address, perform a search operation in the Edit Frame form.

If using 590COM or 590I Card:

- Make sure that the Port is correct.

- **Channel** is a child of a frame. Double-click or press the Enter key to open the Edit Channel form with the exception 540C card type channels. Placing the mouse over the image identifies channel information. There are eleven types of channel images:
  - 540IAC card type, “auto” mode controlling other channels.
  - 540IAC card type, “auto” mode controlling other channels with an attenuation schedule today.
  - 540IAC card type, “auto” mode.
  - 540IAC card type, “auto” mode with an attenuation schedule today.
  - 540IAC card type, “fixed” mode.
  - 540IAC card type, “fixed” mode with an attenuation schedule today.
  - 540IAC card type, “slaved” mode.
  - 540I card type, “fixed” mode.
  - 540I card type, “fixed” mode with an attenuation schedule today.
  - 540I card type, “slaved” mode.
  - 540C card type, no mode.
- **Sensor** is a child of the channel. Double-click or press the Enter key to open the Edit Channel form. There is one type of sensor image:
  - Sensor.

INFORMATION

Status bar

- Updating project file data.
- Updating program initialization file data.
- Updating database record data.
- Checking file date/time stamp (30 second marks on every minute). This check is necessary if the same project is being used by 2 or more 590-computers (e.g., server and client). Each project has an “update counter” that increases when data is written

to the file. If this “update counter” is not synchronized (memory versus file), then this means that another 590-computer is using the project file. While this practice is okay, it is strongly advised that this sharing a project file between two 590-computers not be allowed.

Splash

- When this program is started, a splash screen will first appear as shown in Figure 65.

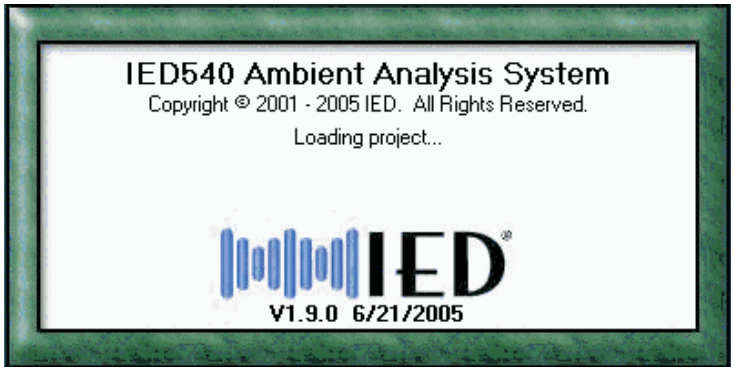


Figure 65 - Splash Screen

The following information is supplied:

- The name of the program.
- Program copyright information.
- Loading information is as follows:
  - Loading support library...
  - Loading ACS database information...
  - Checking parameters...
  - Checking password server...
  - and if externally started:
  - Checking project integrity...
  - Loading project...
  - Checking for 540-frame connectivity...
  - Placing each 540-frame online...
- IED company logo.
- Current program version and the date of the version.

Attenuator Cards and Sensor

There are three types of attenuator cards and one type of sensor.

Figure 66 - 540IAC Attenuator Card

Figure 66 shows a 540IAC Attenuator Card has 4 identical channels to process the level of this program audio signals. Each channel includes a 540AC Analog Conversion module that converts the audio program signal to a varying DC waveform for use by the system. If the channel is in “auto” mode, then the audio program signal is compared with the 540S Remote Sensor audio noise signal and the resultant is an automatically controlled varying attenuation output. If the channel is in “fixed” mode, then the processing of this program and 540S Remote Sensor audio noise signals is bypassed and acts like a volume control. This card has all attenuation configuration modes available - “auto”, “fixed” and “slaved” mode.

Figure 67 - 540I Attenuator Card

Figure 67 shows a 540I Attenuator Card is similar to the 540IAC Attenuator Card except that it does not include the 4 audio conversion modules to process this program audio. As a result, this card operates only in the fixed and “slaved” mode.

Figure 68 - 540C Attenuator Card

Figure 68 shows a 540C Attenuator Card. It only provides the interface to four 540S Remote Sensors. As a result, the sensor channels on the 540C Card must be combined with channels controlled by a 540IAC Card. The 540C Card is used when multiple noise sensors are combined to control one audio channel. This card has no attenuation configuration modes available.

Figure 69 - 540S Remote Sensor

Figure 69 shows a 540S Remote Sensor which consists of an omni directional condenser microphone, a preamplifier, and a 540AC Analog Conversion module that converts the audio noise signal to a varying DC waveform for use by the system

Definitions

This is a listing of common words that appear in this help file.

Address - Numerical identification or location of a piece of equipment that is used to direct communications or commands to it. Each address on a given port must be unique.

Attack Time - Time constant used by the system to respond to sudden large increases in ambient noise. The Attack Window defines the magnitude of a large increase.

Attack Window - Parameter that causes the system to increase attenuation at a rate determined by the attack time constant.

Attenuation Offset - Amount by that the attenuation of a slaved channel is offset from the attenuation of its controlling channel. Its value may be positive or negative. The attenuation offset added algebraically (taking the signs into account) to the controlling channel attenuation equals the attenuation of the slaved channel, until the slaved channel attenuation reaches either its maximum or minimum attenuation.

Automatic - Changes attenuation in response to sensor signal.

Automatic Channel - Accepts an input from one or more ambient noise sensors and compensates the signal level accordingly.

Automatic Calibration - Performs an automatic measurement that determines the proper value of the feedback constant.

Channel Attenuation - Value of attenuation applied to this program signal by the system to adjust its level. Arrived at by the system by smoothing the changes in the Computed Attenuation with the Attack Time Constant or Release Time Constant, as appropriate.

Computed Attenuation - Instantaneous value of attenuation that is computed by the system.

Configuration - Operating mode that can either be “auto”, “fixed” or “slaved” mode.

Controlled Channel or Slaved Channel - Configuration mode that is “slaved” mode to an automatic channel and changes attenuation as the automatic channel changes, with or without an offset and not exceeding its minimum and maximum attenuation limits.

Controlling Channel - “Auto” mode channel that has slaved channels.

Feedback Constant - Correction factor that allows the system to compensate for program signal that is detected by the sensors in combination with the ambient noise.

Fixed Channel - Configuration mode that has a fixed or non-varying value of attenuation.

Link Fault - Condition that exists in RS422 communications link to a 540-frame that impedes correct data transmission.

Maximum Attenuation - In magnitude, the largest value of attenuation that an “auto” mode or a “slaved” mode channel is permitted to attain.

Minimum Attenuation - In magnitude, the smallest value of attenuation that an “auto” mode or a “slaved” mode channel is permitted to attain.

Port - Input and/or output used for data communications.

Rack - 540 Mainframe that may house up to 11 Model 540 cards each having 4 channels, a CPU card, and a power supply card.

Release Time - Time constant used for smoothing small changes in the average signal level.

Release Limit - Maximum value that will be used by the system in calculating channel attenuation when responding to sudden drops in ambient noise. It is not a limit on attenuation, but a limit on the change used in calculating system response to a sudden decrease in noise. It therefore exerts a cushioning effect on attenuation changes.

Remote Sensor - Mounted in a location remote from the system for the purpose of sensing and transmitting ambient noise information to the system.

Remote Threshold - Signal level from a remote sensor above that the system begins to increase the output signal for its associated channels.

Scaling Constant - Ratio of the change in noise level to the resultant change in program level.