90IP/90IPB
INSTRUMENTATION PLATFORM

OPERATIONS MANUAL

CONTENTS

FIGURES

TABLES

1.1 – Device Description

1.1.1 - Chassis

The system is intended for use as a versatile, cost effective instrumentation platform for precision data acquisition applications. Each Model 90IP chassis with controller can be populated with 1 to 4 slot cards offering the user the ability to mix and match up to 4 different card configurations in each chassis. Up to 30, 90IP chassis can be daisy-chained using the GPIB interface from a single PC. Individual chassis boxes are set to a "01" default address at the time of shipment. **Power ON/OFF Switch** along with **GPIB and RS232** communication ports are located on the rear panel. See **Figure 1.1** for 90IP Block Diagram.

1.1.2 - Controller

Each Model 90IP controller contains a hard front panel that provides **Function** and **Select** capabilities, an **Enter** button, and a backlit **Liquid Crystal Display (LCD)**. Upon selection of each slot card (1 thru 4), **smartSLOT Technology** automatically configures each cards control functions. Soft front panel operation is available via the GPIB or RS232 communication ports **(Figure 1.3)**.

Figure 1.1 - 90IP Block Diagram

1.1.3 - Slot Cards

Model 90IP's can be configured with a broad range of standard and custom slot cards that include electronic filters, amplifiers, signal waveform generators, bridge conditioners, FFT's, ADC's, and DAC's. Each slot card has its own micro-controller to automatically configure the controller display upon insertion into any one of the four-smartSLOT locations. Each slot card provides storage capabilities to save multiple set-up configurations along with signal input and output. See slot card data sheets for individual performance specifications.

1.2 - Applications

Models 90IP/90IPB are an excellent product design and development tools for a wide range of analog and digital signal processing, and data acquisition applications. Solutions to numerous frequency, amplification, signal source and data translation problems can be resolved by combining various precision slot cards into your individual or daisy-chained Model 90IP system. The half-rack chassis design is an ideal form factor for bench-top or rack-mount use in a broad range of analytic, electronic, biomedical, and physics applications. The 12-volt external battery powered 90IPB provides portability in automotive and in-the-field testing.

1.3 – System Interconnection

Each 90IP chassis may contain up to four independent slot cards, each of which can perform a broad range of design, test and evaluation procedures. Interconnection between cards is achieved via front panel cabling. Due to varying multi-channel operating functions per card and I/O connector variation per card, each customer will be required to provide his/her own I/O cables.

When operating the Model 90IP via remote operation, care must be taken to follow the **programming rules presented in Section 5** of this manual. In the remote mode, the unit looks at the GPIB or RS232 bus for its operating commands. Control of the instrument is switched to and from the controller by the appropriate controller command.

See **Figure 1.3** for the typical GPIB & RS-232 setups,
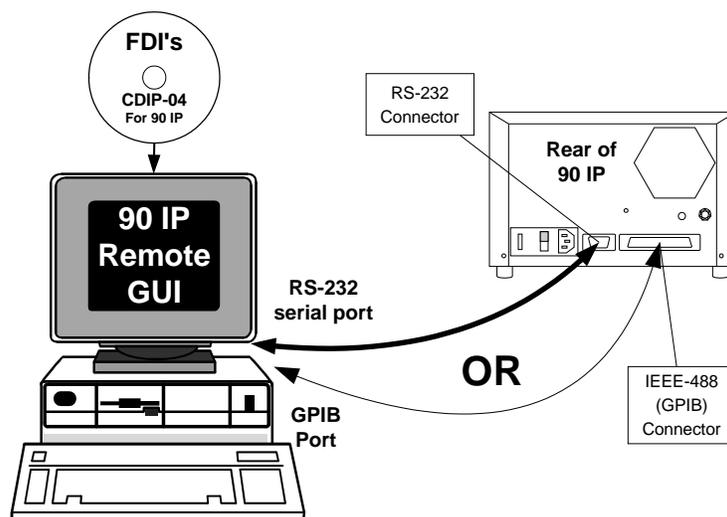
Figure 1.3 – GPIB & RS232 Interconnection

2.1 – Front and Rear Panel Controls

Hard front panel control resides on the front panel of the instrument controller. In remote mode, control is transferred to an interconnected controller on the rear panel. **Figures 2.1a, 2.1b** and **2.1c** show front and rear panels.
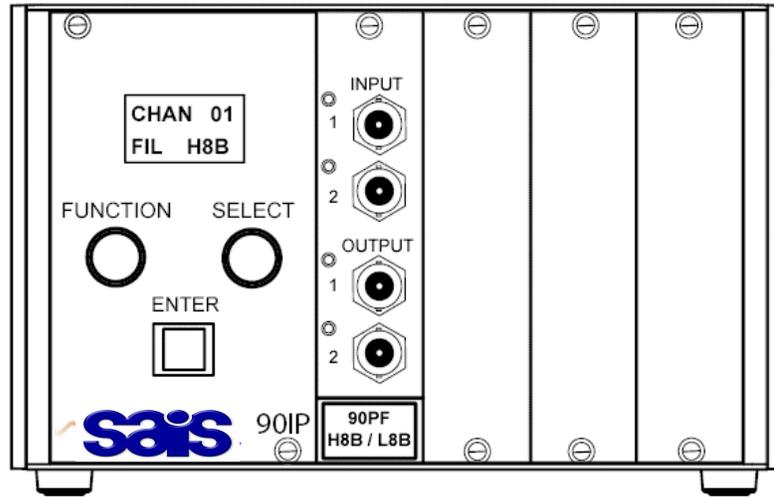
Figure 2.1a – Front Panel
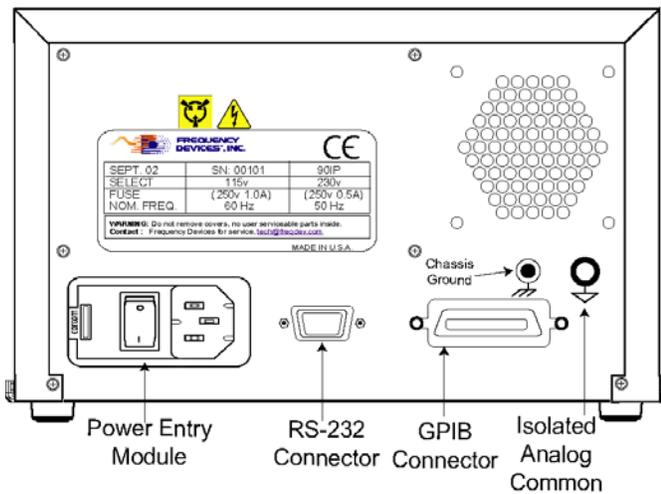
Figure 2.1b – 90IP Rear Panel
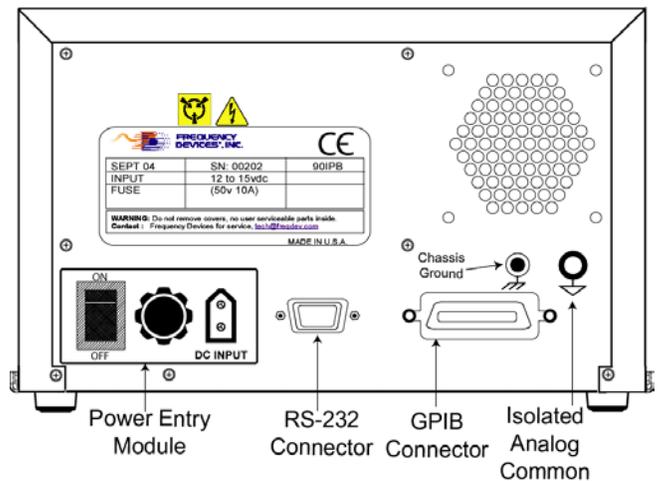
Figure 2.1c – 90IPB Rear Panel

2.2 – Input/Output Characteristics
The Model 90IP consists of a chassis, controller, and space for up to four smartSLOT, slot cards that interface directly with a remote control PC, fitted with RS232 or a GPIB or interface card. 90IP controller connectors are shown in **Figures 2.1b & 2.1c**. Standard GPIB or RS-232 cable connections are shown in **Figure 1.3**.

2.3 – Specifications

2.3.1 – Electrical

<u>AC</u> Line Voltage **90IP**	115 or 230 VAC
<u>DC</u> Input Voltage **90IPB**	11 to 15 Volts (External Battery or DC Power supply)
Maximum Power Consumption	1.0 Amp., 75 Watts

2.3.2 – Physical

Height	5.25 inches, 13.34 cm
Width	8.625 inches, 21.91 cm
Depth	14 inches, 35.56 cm
Weight (Chassis and Controller only)	8.60 pounds, 3.90 Kilograms
Mounting	Bench Top or 19" Rack mount

2.3.3 – Environmental

Operating Temperature	+32ºF to +104ºF, 0ºC to +40ºC
Storage Temperature	-13ºF to +131ºF, -25ºC to +55ºC
Relative Humidity	95% max., non-condensing
Altitude	Up to 15,000 feet, 4500 meters

3.1 – Unpacking and Inspection
When the Model 90IP/B chassis and controller are received, inspect the carton for visible external damage. If there is obvious physical damage, we suggest that you contact the carrier's agent immediately and follow the instructions for a damage claim. Do not destroy the shipping container during opening so that it may be used for future shipment of the device.

After removing the Model 90IP from the shipping container, examine it for obvious physical damage such as dents, dislodged components or damaged connectors. If a component is damaged, notify the carrier and follow the instructions for damage claims.

<div align="center">

WARNING
DO NOT APPLY POWER TO DAMAGED INSTRUMENTS.
INJURY OR FURTHER COMPONENT DAMAGE MAY OCCUR.

</div>

Inform your the sales representative immediately with specific details about the actual extent of
the damage. Your representative will assist in arranging for repair or replacement of the instrument.

3.2 - Packaging for Shipment
 Keep the original shipping carton.
.

Before returning a unit to SAIS you must obtain a Return Authorization (RA) number

To pack the Model 90IP for shipment:
1. Complete all sections of the RA paper work.
2. Tape a tag or letter to the unit identifying the owner and the service or repair to be made.
3. Place the unit in the original carton
4. Secure the carton with strong tape.
5. For international shipments, or if an alternate shipping container must be used, do the following:
    Wrap the unit in heavy plastic and place packing material around all sides of the instrument in a strong carton. Protect the front and rear panels with extra packing material and cardboard strips. Seal the carton with strong tape.
6. Mark the shipping carton: **FRAGILE - DELICATE ELECTRONIC INSTRUMENT**

3.3 - Environmental Requirements
The Model 90IP operates as either a bench top or rack mount unit. When setting up the Model 90IP, be sure it has sufficient space for proper ventilation. See **Section 2.3.3** for temperature and humidity specifications.

3.4 – AC Line Voltage Selection (90IP) - See Figure 2.1B

  A. Power ON/OFF Switch, Figure 3.4 - A two-position toggle switch on the back panel Power Module that interrupts/completes the power circuit. [ON = (|), OFF = (O)]

  B. Power Connection - Denotes power plug location.

  C. Voltage Selector Module:

  115 V Operation
The power module window shows the operating voltage (115 V_{ac} or 230 V_{ac}). **At time of shipment, the voltage window is set in the 115 V_{ac} position.**

  230 V Operation
For 230 V_{ac} operation, use a screwdriver blade to pry open the module door (entry point next to window), remove the red fuse cartridge, replace the 1.25 Amp, 250 V fuse with a 0.63 Amp, 250 Volt fuse, remove the shorting clip in the other leg and replace it with a second 0.63 Amp fuse. Turn the module 180 degrees, re-insert and close the module door. The numerals 230V will now show in the module window. Repeat reverse procedure to change back to 115V.

The Model 90IP operates on 115 or 230 Volts AC, at 50 or 60 Hz, but unless the procedure above is followed, CE SAFETY fusing requirements will not be met. **Units are shipped for 115 Volt operation with the appropriate power line cord.**

CAUTION!
MAKE SURE THE REAR PANEL POWER INPUT CONNECTOR IS IN THE CORRECT POSITION AND THE CORRECT FUSE IS INSTALLED BEFORE APPLYING AC POWER. See Figure 3.4 below.
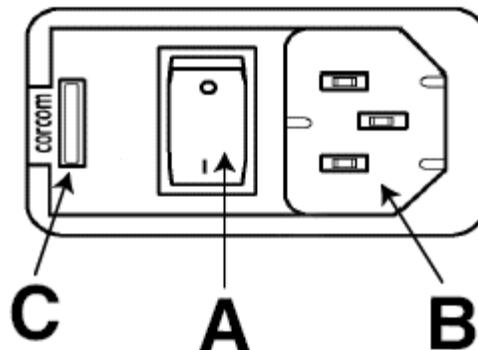
Figure 3.4 – AC Power Entry Module (90IP)

3.5 – DC Line Voltage Operation (90IPB) - See Figure 2.1c

  Power ON/OFF Switch, Figure 3.5 - A two-position toggle switch on the back panel Power Module that interrupts/completes the power circuit. [ON = (|), OFF = (O)].

  Power Connection – Designed to operate with a 12 volt automotive battery or equivalent power supply.
  Fuse - 50volt, 10 Amp cartridge**.**
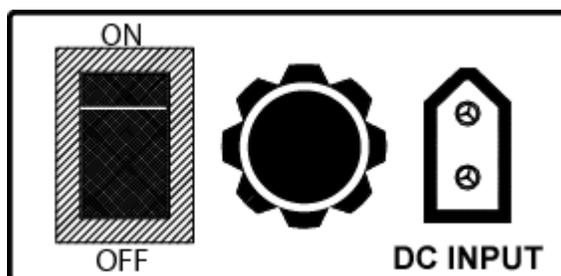
Figure 3.5 – DC Power Entry Module (90IPB)

The Model 90IP grounding system has been designed to allow maximum flexibility and noise immunity. There are two electrically isolated grounds brought out for connection to the external components along with an additional chassis or earth ground.

- Digital ground for connection of the remote controller is provided on the GPIB or RS232 connector.

- Analog signal ground is brought out through a rear panel plastic banana plug and is internally connected to the unit's analog power supply. Analog ground provides a system ground reference for differential input configurations.

- The Chassis or earth ground is brought out through a rear panel metal banana plug, with a solid connection to the metal chassis and the grounding pin of the power entry module.

If a non-floating signal output can be used, connecting the analog and chassis grounds together will provide the lowest noise operation.

Effective grounding of signal lines and each chassis will greatly improve noise immunity and assure precise signal processing spectra.

3.6 – Basic Set Up
Verify that all Slot Cards have been inserted and are secure. The Models 90IP may now be connected to the appropriate power source and to the remote controller (if remote operation is being used).

Connect the device being evaluated to the input and output of the slot card. Be sure that the input and output are hooked up to the same channel. If possible, connect a ground strap between the chassis of the device and the Model 90IP.

For remote operation, connect the GPIB or the RS232 interface from the remote controller to the connector provided on the rear panel of the Model 90IP. **If the controller is not already equipped with an interface card, one must be installed.** Refer to the computer or controller manufacturer's instructions for GPIB or RS232 card insertion.

Plug the Model 90IP into the power source.

You are now ready to learn and utilize the many features of the Model 90IP Instrumentation Platform. The following sections contain specific control, modification and programming information. Please read these sections carefully before using the system.

4.1 – Front Panel Description
In local operation the 90IP can be completely operated from the Controller Front Panel. Four items make up the user interface of the Controller.

- Liquid Crystal Display
- Rotary Function Knob
- Rotary Select Knob
- Enter Push Button

See **Figure 4.1** below.
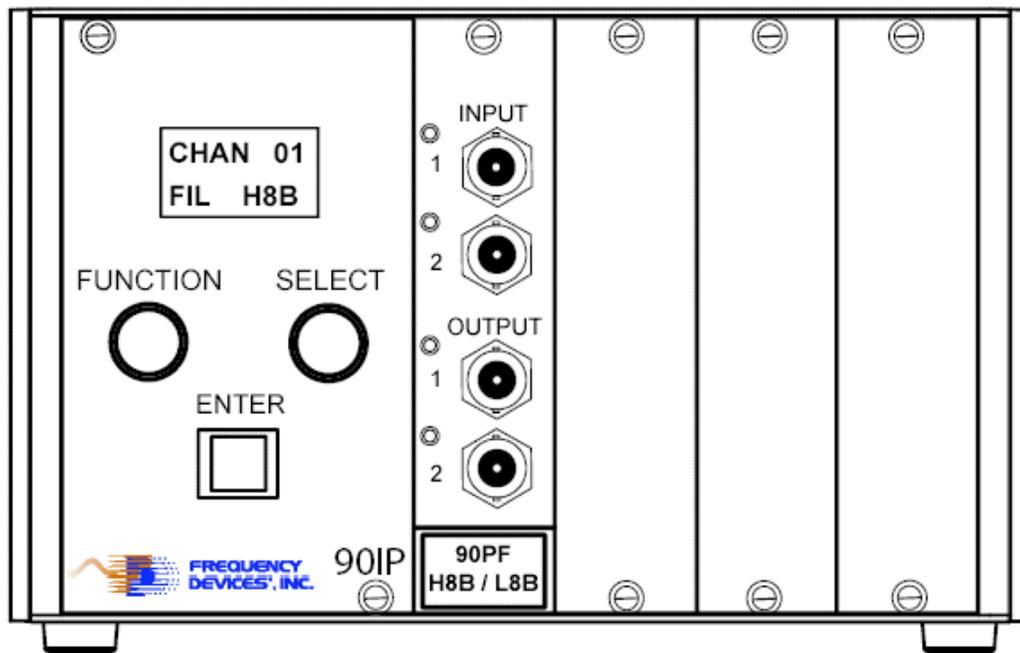
Figure 4.1 – Front Panel

4.1.1 – Liquid Crystal Display (LCD)
The LCD provides visual confirmation of all setup options selected or stored in each slot card location.

4.1.2 – Rotary FUNCTION Knob
This knob allows the user to scroll through the setup options provided by the micro-controller on each slot card or to modify an existing card configuration.

4.1.3 – Rotary SELECT Knob
This knob allows the user to scroll through the available selections by chosen **FUNCTION** (4.1.2 above) provided by the micro-controller on each slot card or to modify a previously selected configuration.

4.1.4 – ENTER Push Button
The **ENTER** button allows the user to confirm each operation selected during system setup or to implement a change in an existing card configuration. The **ENTER** button must be pushed to confirm or implement set-up changes for each slot card configuration.

4.2 - Slot Cards

4.2.1 – Slot Card Insertion

Power switch should be in the **OFF Position** any time a new slot card is inserted into the 90IP chassis. After a new slot card is inserted and the 90IP is powered ON, the LCD displays the slot #, COPY ##% and loads the slot card configuration data into the 90IP controller. The process takes about 10 seconds, after which the display then defaults to the lowest numbered installed slot card.

4.2.2 – Slot Card Configuration

During **Power ON**, by using the **FUNCTION** and **SELECT** knobs, the user can configure each slot card. Each slot card has its own micro-controller to automatically configure the system controller display. During initial system setup, slot cards must be configured for each individual application. After initial setup and following operation, slot cards will retain their previous operating setup or the setup configuration can be saved to the slot card micro-controller memory. For 90IP slot cards, up to 9 configurations can be saved on each card. During power on/off, the last slot card configuration utilized is stored in each of the slot card's on-board start up memory.

See individual data sheets for each slot card's setup configuration and specifications.

5.1 - Introduction

The 90IP instrument platform may be remotely controlled via either the GPIB (IEEE-488 Standard) or RS232 (Serial) interface. You may use any computerized system that supports either one of these interfaces to design, develop, and implement programs to control the 90IP. Only one interface may be connected at a time. Once initialized, the 90IP provides the transmission path to configure the instrument.

A set of software tools is provided on CDIP-04 to remotely configure the 90IP chassis. Instrument drivers for the chassis and function or slot cards are compatible with the VXI*plug&play* instrument driver architecture and the IVI (Interchangeable Virtual Instrument) Foundation Standards. Full instrument operation/control may be achieved by using these tools.

It is strongly recommended that you read and understand how to operate the 90IP from the front panel before attempting remote operation. Also, an understanding of the programming and use of the IEEE-488 and/or RS232 interface will be helpful for the effective use of the remote mode of operation.

5.2 - Connections

The 90IP chassis supports ANSI/IEEE Standards 488.1 and 488.2, which define GPIB communication. It also supports the RS232 Standard without the use of the RTS (Request to Send) and DTR (Data Terminal Ready) signals. See **Figure 1.3a** for interface connector locations on the 90IP rear panel.

5.3 - Command Syntax and Format

To communicate with the 90IP, use ASCII characters. The commands must be issued in **UPPER CASE ONLY** and **cannot** contain any number of embedded space characters. A command to the 90IP consists of a command mnemonic with optional ?, optional =, arguments if necessary, and a command terminator. In RS232, the command terminator is a <lf> (line feed) or (0A)x. In GPIB, the terminator is a linefeed <lf> or EOI. It is important to note that the command terminator is embedded automatically when issuing commands through GPIB. The user/developer need not worry about adding the command terminator to commands using GPIB. For example, you may need to "drop" the "\n" character from the string you are using as a command. No command processing occurs until a command terminator is received. The commands are interpreted in the same way in either RS232 or GPIB. Values returned by the 90IP are sent as a string of ASCII characters terminated by <lf> (line feed) or (0A)x.

When a command is issued, the instrument controller writes a command to the 90IP first, and then reads the result from it. If the command is a valid query command, the 90IP will return the required information as a string of ASCII characters. For instrument parameter configuration commands, a hexadecimal number 00 is returned to show the controller that the command has been executed successfully. If an error occurs, a hexadecimal number 55 will be returned. All returned messages from the 90IP will terminate with a linefeed <lf or (0A)x>.

5.3.1 - Command Set **Table 1** illustrates the 90IP command set:

Command	Function	Expected/Set to Values
IDN?	Returns a string representing the instrument's identification name.	"FreqDev,90IP\n"
GPIB?	Returns a string representing the instrument's GPIB primary address.	An value from 00 to 30.
WHO?	Returns a string list representing the cards present in the 90IP slots. The list will show every card properly inserted into a slot and loaded into the 90IP.	"CARD 1,2,3,4\n" for a fully loaded 90IP.
CARD?	Returns a string representing the active card type.	"2 CHAN FILTER\n" for a 2 channel filter type card.
CHAN?	Returns a string representing the active channel type. This is valid only on channels of function-based cards.	Channel type: "LP8D\n", "LP8E\n", "LP8B\n", "LP8L\n", "HP8D\n", etc.
CARD=n	Selects an active card from valid cards in the instrument.	Select a card where n is 1, 2, 3 or 4 for example: CARD=1\n to set "active"[1] the card in slot one.
CHAN=n	Selects an active card channel of a specific instrument. The operation is valid only on channels of function-based cards.	Select a channel where n is 1 or 2 for example: CHAN=2\n to select channel two the active card.

1. Active means to receive the focus. Every configuration command issued after this one will affect the card in the specified slot. The \n character is dropped in GPIB communication.

Table 1 - 90IP Command Set

5.3.2 - Instrument Controller Command References
For the controller instrument driver see **Set-Up Disk CDIP-04, Frequency Devices 90IP Controller Reference Document**. This document includes the commands, syntax, parameters, expected return values, and error codes to consider when developing a software system using the instrument driver to configure the 90IP. **CDIP-04** also contains **Frequency Devices 90IP Controller Online Help**.

5.4 - Display Indicator

The 90IP LCD provides the user with a remote operation display. When a remote control session is initiated the remote operation display remains for as long as the session lasts.

Figure 5.4a, shows when a successful remote control session is opened:

```
┌─────────────────────────┐
│        REMOTE           │
│  LCL            ENTR     │
└─────────────────────────┘
```
Figure 5.4a – Remote Control Session

You may gain control of the unit at any moment by pressing the **<ENTER>** button on the 90IP Controller Front Panel or by issuing an interface set-to-local function command.

Figure 5.4b shows the 90IP front panel display upon returning to the front panel mode of operation, where XY represents the instrument's assigned address (00 – 30), and Z represents the active slot/function card (1 – 4).

ADD	X<u>Y</u>
SLOT	Z

Figure 5.4b – Front Panel Operation

If all card slots are empty, the 90IP display will show the following: In remote operation, the "CARD MISSING!\n" string is returned to indicate an empty slot or chassis.

NO	CARD
CHECK!	

Figure 5.4c – Empty Slot or Chassis

5.5 - Main Panel

The components of the main Launch Panel are shown in **Figure 5.5**:
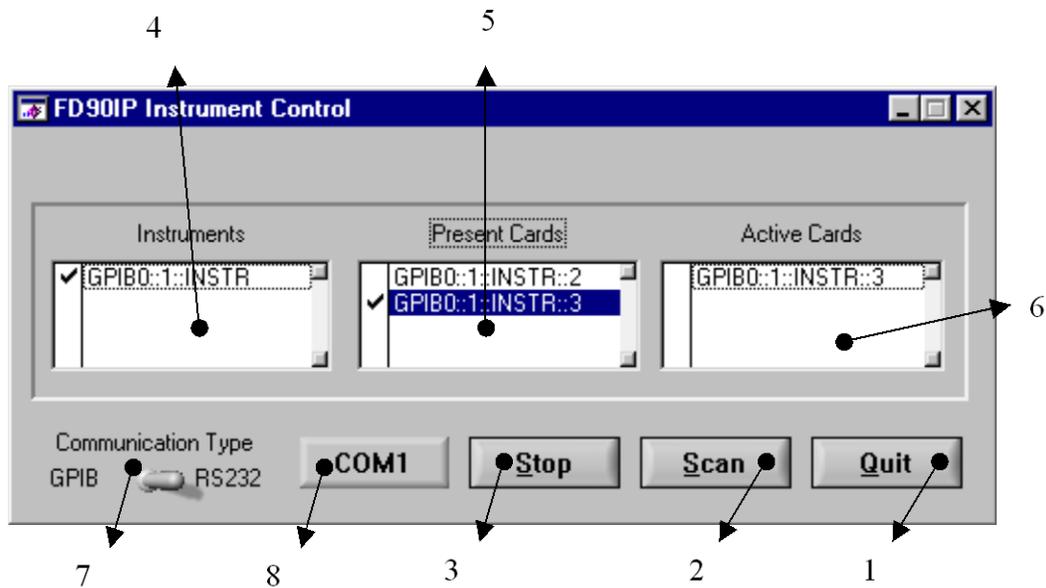
Figure 5.5 - Components of the Launch Panel

The main panel is divided into three functional groups: Command, Process and Communication interfaces. The Command group allows the user to initiate certain process/system commands. The Process group contains the controls necessary to launch and monitor specific slot card processes. Finally, the Communication Interface group presents the controls used to set the communication interface resource.

5.5.1 – Command Group

1 - Quit Command Button: Use this command button whenever you want to exit or close the software. It will close the launch panel **(Figure 5.5)** and stop the parent process without affecting any child slot card process **(See Figure 6.4d)** while shutting down the IC system. You may continue to operate all active slot cards.

2 - Scan Command Button: Use this command button to scan for connected instruments. All valid instruments are identified on the Instrument List Control. After inserting a new slot card, **"CLICK"** the **SCAN** button to refresh the Instrument List.

3 - Stop Command Button: This button initiates the common delete-from-list process. The **STOP** command button deactivates checked cards in the Active Cards List control **(Item 6 below)**. It stops the slot card child process, and deletes items from the Active Card List Control.

5.5.2 - Process Group

4 - Instruments List Control: This control lists valid instruments after the scan process has been started with the **Scan Command Button**. **"CLICK"** on a selected chassis to show the available slot cards in the **Present Cards (Item 5)** display. **"UNCLICK"** a chassis to clear the present card list, related to that chassis only if no related card is active.

5 - Present Cards List Control: This control identifies available cards related to the specific chassis highlighted in the **Instruments List Control (Item 4)**. **"CLICK"** on a specific slot card to highlight and activate the card. This shows the item as an active slot card in the **Active Cards List Control (Item 6)** and initiates the slot card child process.

6 - Active Cards List Control: This control identifies active slot cards related to the **Present Card List (Item 5)**. It monitors the presence of the active card child process. It also provides the means to selectively stop the child process on individual slot cards. **"CLICK"** the **Stop Command Button (Item 3)** for a highlighted **Active Card** to stop operation of the active slot card**.**

5.5.3 - Communication Interface Group

7 - Communication Control: This control selects either the GPIB or RS232 communication interface. Selection must be made prior to scanning for instruments with the **Scan Command Button (Item 2).** The selection is maintained after a valid scan is performed and throughout the existence of every child process created thereafter. If the selected communication type is RS232, it enables the **COM Control (Item 8).**

8 - COM Control: COM Control is enabled whenever you select RS232 in the **Communication Type Control (Item 7).** Use this control to select either COM1 or COM2 serial communication port where the RS232 interface card is installed in your PC. The selection must be made prior to scanning for instruments with the **Scan Command Button (Item 2).** The selection is maintained after a valid scan is performed and throughout the existence of every child process created thereafter.

6.1 - Communicating with GPIB
The 90IP chassis supports most common commands required by the ANSI/IEEE 488 Standards for GPIB communication. Any software environment able to send low-level GPIB commands to the 90IP may be used. The instrument and function card drivers provide all the tools for 90IP-GPIB communications.

6.2 - Setting the GPIB Address
Before attempting communication over the GPIB interface, each 90IP device must have an assigned address (01 – 30) and must be verified through the chassis front panel. If you are using the instrument drivers, each 90IP may be assigned a virtual name. Check the GPIB configuration software in your computer system for instructions on how to define a virtual name for the 90IP. **Upon shipment from SAIS each chassis will be assigned a default address, (01).**

The Instrument Controller (IC) provides the mechanism to perform the following functions: scanning, interfacing, launching, monitoring, and stopping. The software may launch a single or multiple slot card process for one or more 90IP chassis connected through the communication interface. IC will scan and validate any instrument connected through the desired communication interface, and present the list to the user for the slot card configuration startup process. The IC is designed to allow the user to select the communication interface, scan for valid connected instruments, select valid slot cards to activate, and select slot cards to stop. By clicking items in the list, the user may launch child processes that control the configuration of specific slot cards. For this to occur, the IC implements a "process pool" to schedule, monitor, or stop independent configuration routines.

6.3 - Installation and Startup
90IP Remote Software Installation Details:
The (90IP/Slot Cards) installation tools use the Microsoft Windows Installer (MSI) technology to install the necessary 90IP-related software and development tools for remote operation. This software suite was developed using National Instruments' LabWindows/CVI Version 6.0 environment following rules established in the VXI*plug&play* instrument driver architecture and the IVI (Interchangeable Virtual Instrument) Foundation Standards. As such, certain libraries, drivers, and "software engines" are required in the recipient PC for the proper operation of the application software. This is true for either application end-users or software developers.

In the case of software developers, the installation of additional tools may depend on the development environment and/or any other tools needed to open/review or edit the development files supplied with the software suite. For users requiring remote operation every tool **MUST** be installed to be able to remotely operate the 90IP/Slot Cards.

The 90IP uses the following National Instruments' (NI) engines and drivers with their corresponding components:
1. NI-488.2 1.70- for applications using GPIB.
2. NI-VISA 2.6.1- The NI-VISA 2.6 Run-Time Engine must be installed on the target machine.
3. IVI Engine 1.83 - the IVI engine is in the form of a 32-bit DLL. The IVI engine requires that you install VISA, but it is not dependent on any other library.
4. Measurement & Automation Explorer 2.2 - Provides device access and configures hardware and software

The **CDIP-04, 90IP Installation Disk** is provided for custom development of drivers if required. Included is a Word and PDF formatted manual and two main directories. Each directory offers installation software for 90IP software configuration tools. To install any of the software tools simply open the specific directory and start the setup procedure by clicking on the **Setup** icon. This starts the setup procedure.

Note that a canned GUI and launcher is provided with every slot card installation disk, from which remote operation of the 90IP is possible, without the need to use the CDIP-04 software. Customer may wish to print out a copy of the 90IP Operations Manual.

1- 90IP Instrument Driver
This directory will install the code and the files needed to develop **APPLICATIONS** using the 90IP chassis.

2- 90IP User Interface
This directory will install the code and the files used in developing the **90IP GRAPHICAL USER INTERFACE (GUI).**

Follow these process instructions to install any 90IP Instrument Controller Utility into a desired local directory:

- Insert the CDIP-04 disk into the CD-ROM.

- Access the start-up (setup) executables either by using the Start/Run/Browse popup window or with Windows Explorer on your Windows operating system.

- Select the **90IP Instrument Driver** folder. Double-click on **Setup.exe** to install the 90IPCNDriver software. Verify that files reside in the selected target PC directory.

- Select the **90IP User Interface** folder. Double-click on **Setup.exe** to install the 90IP User Interface software. Verify that files reside in the selected target PC directory.

- Note that verification of installed files after each step on the hard drive is optional.

A word of caution: DO NOT RESTART THE PC UNTIL IT IS CERTAIN THAT THE INSTALLATION PROCESS HAS FINISHED.

After installation of the software, **"CLICK"** on the icon in the start programs or navigate to the appropriate directory to access the specific files.
Note that clicking on setup again produces an uninstall screen for the each item of 90IP software. Executing setup toggles between install and uninstall. **Refer to the Appendices to learn more about installation of this software in systems using Windows 2000 or XP. These operating systems were derived from NT operating systems and have administrator/user permissions issues that must be addressed.**

6.4 - GPIB Set-Up

6.4.1 Select the Communication Interface

"CLICK" on the **Communication Type** control to select GPIB communication interface, **Figure 6.4a**. Scan finds one valid GPIB-connected 90IP. The item shows that GPIB card "0" is connected to a 90IP with address "1". The string represents the instruments' name.
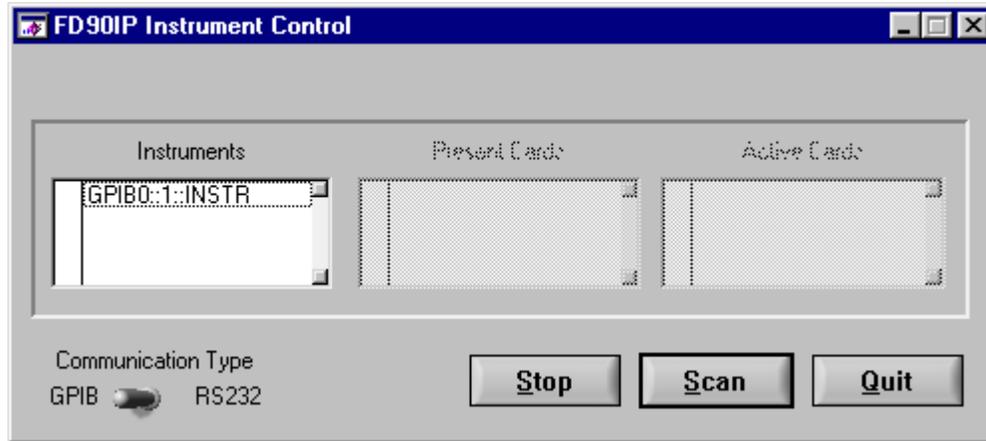
Figure 6.4a – Instrument Communication (GPIB)

6.4.2 - Check for Present Cards

"CLICK" on **Instruments** in **Figure 6.4b** to verify active slot cards. Every card present in the selected 90IP chassis is listed in the **Present Cards** list control. Two cards are present. The numbers at the end of the strings represent the slot position of the cards.
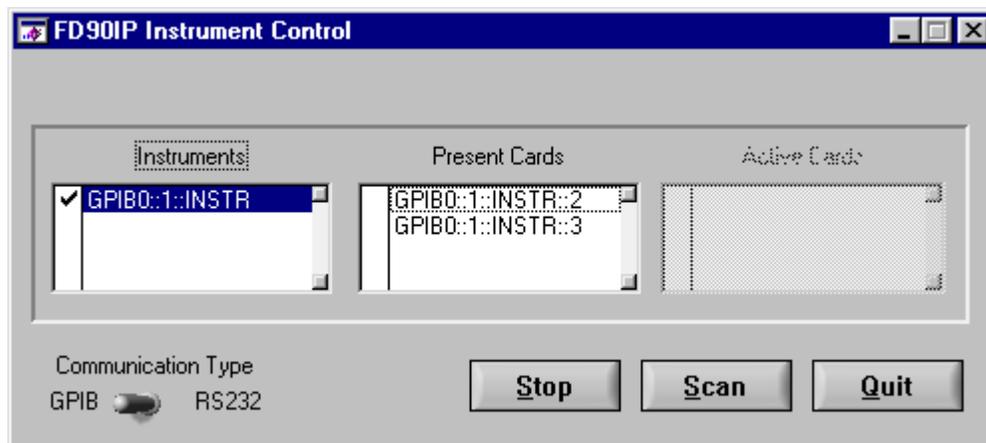
Figure 6.4b – Present Slot Cards

6.4.3 - Activate a Present Card

Highlight the **Present Cards** item to start the child process for the selected function card, **Figure 6.4c**. This opens the specific function card panel, which gains control of the configuration process. This process executes independently from the launcher control. The card at slot 3 is shown active in the Active Cards list.

Figure 6.4c – Active Slot Cards

6.4.4 - Function Panel

To activate a slot card GUI, the slot card GUI must be installed using the **function card's** CD. For instance, to access a 90PF slot card GUI, or any other function card GUI, the CD labeled <u>**CDFC-04**</u> must be inserted and the 90PF user interface must be installed, otherwise the 90IP Instrument controller, though able to detect the presence of a slot card, will not be able to launch the 90PF application GUI or any other valid card. The **CDIP-04** CD is to be used primarily by engineers wishing to create or modify a GUI or driver.

Figure 6.4d shows a 90PF slot card configuration. See **Section 2 of the 90PF User Manual** for instructions on how to configure 90PF slot cards.
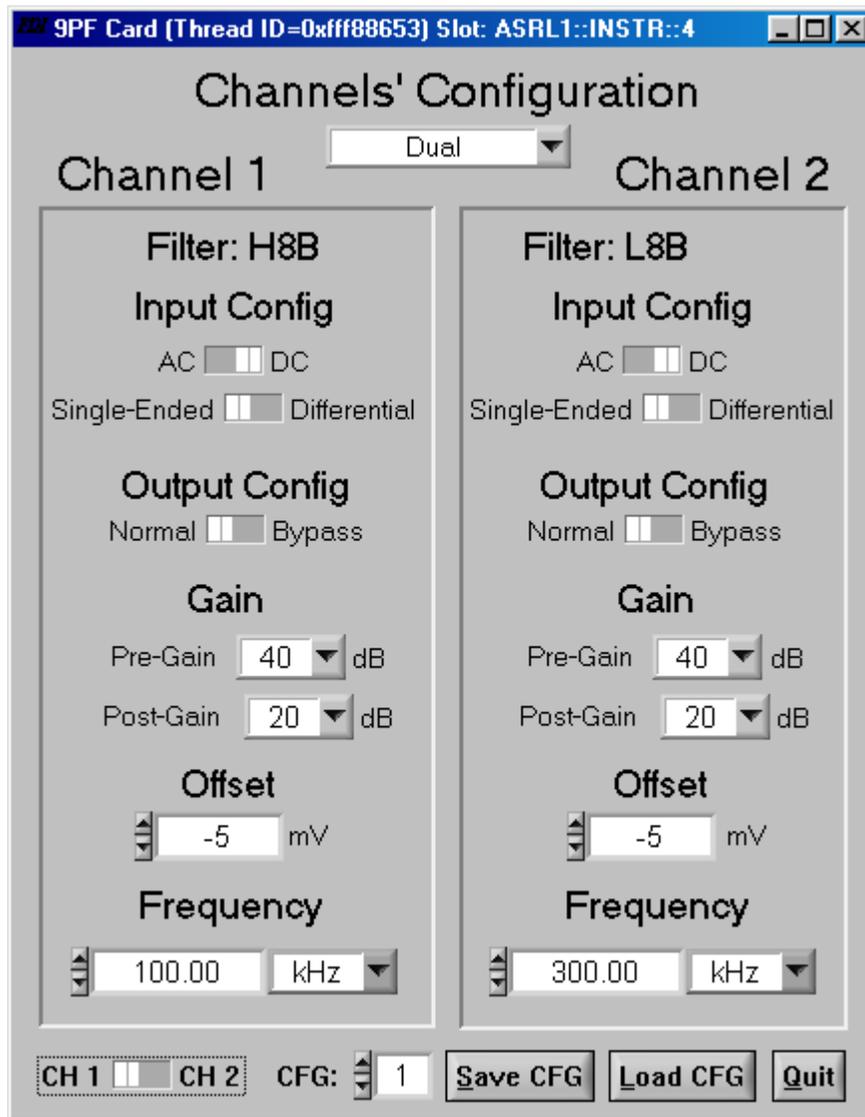
Figure 6.4d – 90PF Configuration Panel

7.1 - Communicating with RS232
The 90IP chassis supports the RS232 Standard. As with GPIB, any software environment able to send low-level serial commands to the 90IP may be used. The instrument and function card drivers provide all the tools for 90IP-RS232 communications.

To send the 90IP into remote mode of operation in a low-level system, the controller must send the hexadecimal number 80, upon which the 90IP will return a hexadecimal number 21. In order to exit the remote mode of operation the controller must send a hexadecimal number 81, upon which the 90IP will return a hexadecimal number 21 if successful. If the 90IP receives multiple $(80)_x$, no returned value is generated by the unit. A similar situation occurs with the $(81)_x$, where no character is added to the buffer if written two or more times at a time.

7.2 - Setting the Serial Port
Before attempting any communication through the serial interface, the computer system serial communication parameters must be set to the values identified in **Table 2**:

Serial Parameter	RS232 Settings	Instrument Drivers Settings
Instrument Name	None	Virtual Name or Interface Instrument Name
Communication Port	COM[1]	COM1 or COM2
Parity Mode	None	None
Data Bits	Eight (8)	Eight (8)
Stop Bits	One (1)	One (1)
Baud Rate	9600bps	9600bps
Output Buffer Size	Any valid size.	512bytes
Input Buffer Size	Any valid size.	512bytes

1. Denotes any valid serial communication port in your computer system
Table 2 - Parameter Settings for RS232 Communication

If you are using instrument drivers, you may access the chassis using a virtual name. Check the RS232 configuration software in your computer system for instructions on how to define a virtual name for the 90IP.

7.3 - RS232 Set-Up
7.3.1 - Select the Communication Interface
"CLICK" on the **Communication Type** control to select RS232 communication interface, **Figure 7.3a**. **"CLICK"** on the **COM Control** to select either COM1 or COM2 serial communication port where the RS232 interface card is installed in your PC. COM port selection must be performed prior to scanning for Present Cards. Select COM1. Scan finds one valid RS232-connected 90IP. The 90IP is connected through COM1. **"ASRL1"** identifies the type in the instrument name.
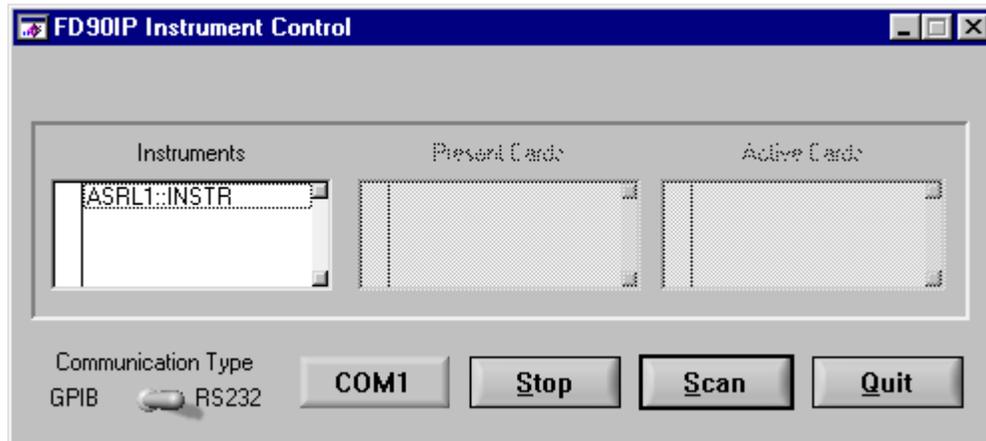
Figure 7.3a – Instrument RS232 Communication

7.3.2 - Check for Present Cards
"CLICK" on **Instrument** in **Figure 7.3b** to verify active slot cards. Every card present in the selected 90IP chassis is listed in the **Present Cards** list control. Two cards are present. The numbers at the end of the strings represent the slot position of the cards.
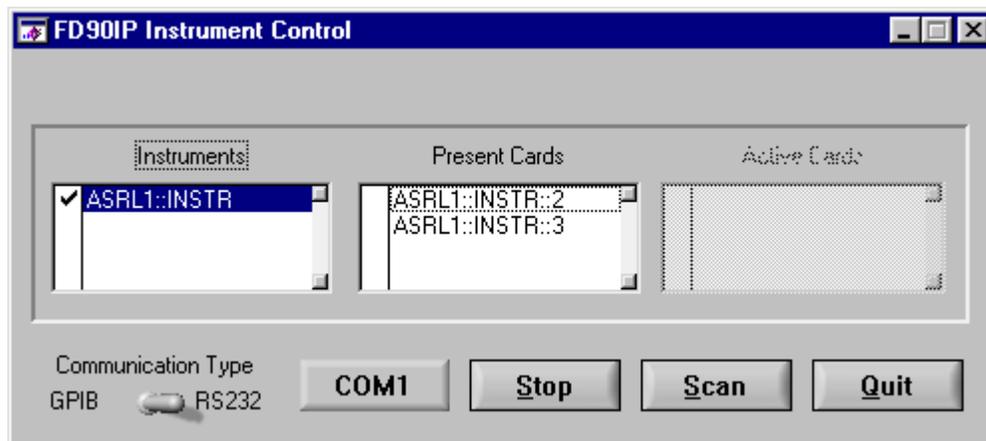
Figure 7.3b – Present Slot Cards

7.3.3 - Activate a Present Card
Highlight the **Present Cards** item to start the child process for the selected function card, **Figure 7.3c**. This opens the specific slot card panel, which gains control of the configuration process. This process executes independently from the launcher control. The card in slot 3 is shown active in the Active Cards list.
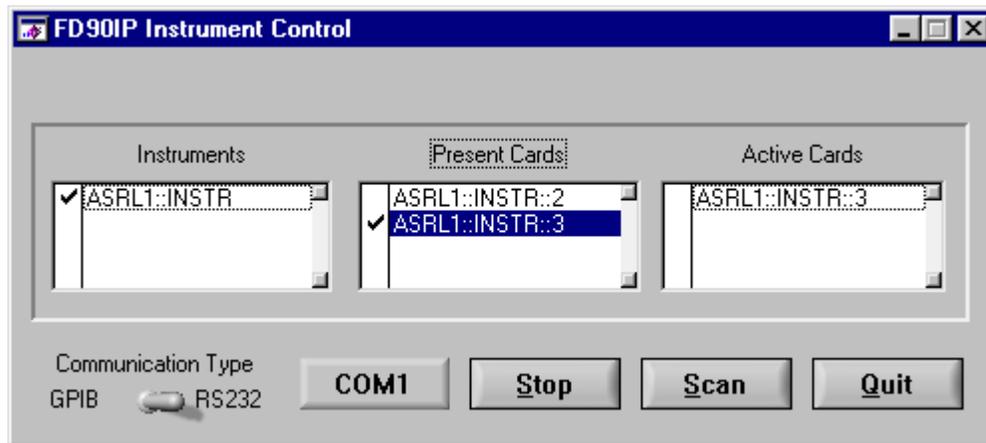
Figure 7.3c – Active Slot Cards

7.3.4 - Function Panel
To activate a slot card GUI, the slot card GUI must be installed using the **function cards** CD. For instance, to access a 90PF slot card GUI, or any other function card GUI, the CD labeled **CDFC-04** must be inserted and the 90PF user interface must be installed, otherwise the 90IP Instrument controller, though able to detect the presence of a slot card, will not be able to launch the 90PF application GUI or any other valid card The **CDIP-04** CD is to be used primarily by engineers wishing to create or modify a GUI or driver

Figure 6.4d shows a 90PF slot card configuration. See **Section 2 of the 90PF User's Manual** for instructions on how to configure 90PF slot cards.

NOTE;   For Windows 2000/NT/XP operating systems, Non-Administrative users must see Appendix A of this manual and the appropriate applications slot card users manual.

Operations Manual   Appendix A

Windows 2000, Windows NT, Windows XP After Installation Considerations:

Condition: The (Slot card) application software reports the inability of a specific set of libraries and files to load and be used in the remote operation of the 90IP unit. Certain users (Non-Admistrative) are not allowed to run the FD90IP Application Software.

Cause:
Conditions are created by one of the key features of the operating system used. W2000/NT/XP systems (All based upon an NT network legacy), work under a very strict permission-controlled hierarchy of groups and users among other things.

The ability of an administrator to "fully operate" our system comes from the fact that Administrators have "full control" of all the necessary libraries and files, whereas users don't. By not having the proper access rights to files and sufficient privileges for the libraries, registry keys, etc., common users may be unable to remotely operate the 90IP with our application software.

Solution:
The specific user must have the right privileges to access the necessary files. The user must have the proper access to open the registry keys opened by specific libraries. Please refer to the slot card User's Manual for the set of guidelines providing methods for a non-administrative user to acquire appropriate privileges to run the FD90IP Application Software.