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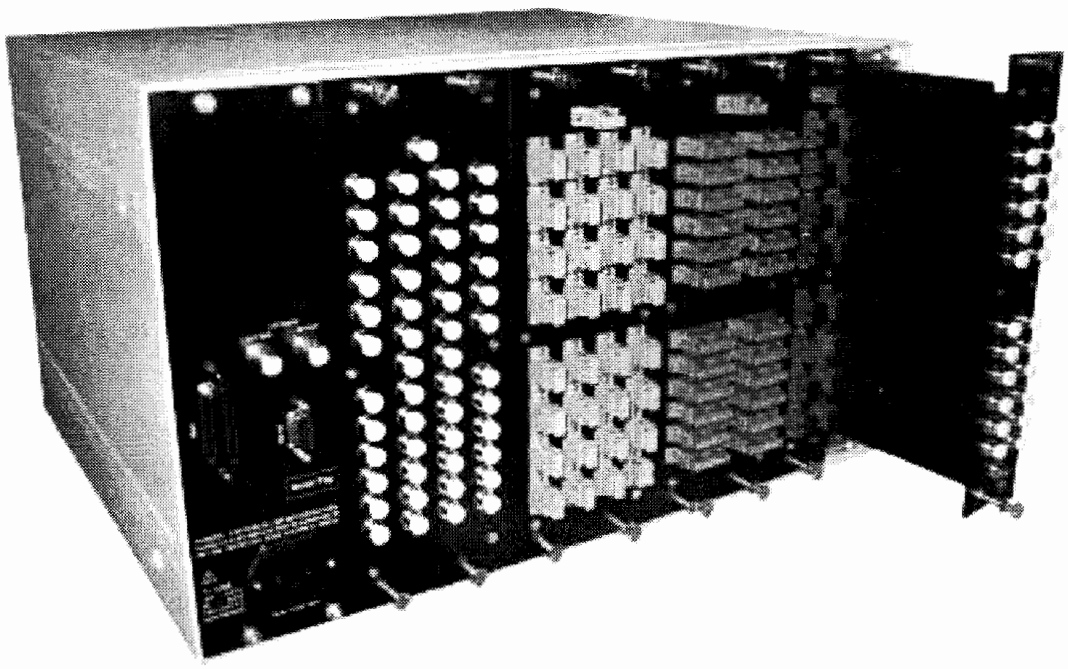
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DiCon
FIBEROPTICS, INC

GP700M
Modular Platform

Supplement to the GP700 Operation Manual



91507 Revision A3

March 11, 2005

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About This Manual

This manual, the GP700M Modular Platform Operation Manual, assumes basic familiarity with the GP700 interface. The GP700M Manual is intended as a supplement to the GP700 Programmable Fiberoptic Instrument Operation Manual (doc. #91506).

The GP700 Manual describes how to control the GP700 and GP700M using the front panel keypad, mini-programs, the RS-232 interface, and the GPIB interface. In addition, the GP700 Manual gives optical and electrical specifications. If you are new to the GP700, you should first familiarize yourself with the instrument and interface by reading the GP700 Manual.

The GP700M Manual describes the unique features of the GP700M, and provides instructions for adding and deleting plug-ins. Once installed, plug-in components behave exactly the same as permanent non-modular components. Refer to the GP700 Manual for information about controlling installed plug-ins and other components.

Product Overview

DiCon's GP700M Modular Platform builds on the flexibility of DiCon's GP700 Programmable Platform by adding modular plug-in capability. The GP700M shares the GP700's powerful user interface at the same time it offers convenient and fast installation of fiberoptic switches, tunable filters, and variable attenuators.

The GP700M can accommodate four or eight modular plug-ins, depending on the configuration purchased. Additionally, the instrument can be configured with non-modular internal components by request. The following diagrams show the four-plug-in and eight-plug-in chassis options.

Figure 1: *GP700M With Four Plug-In Bays (Top View)*

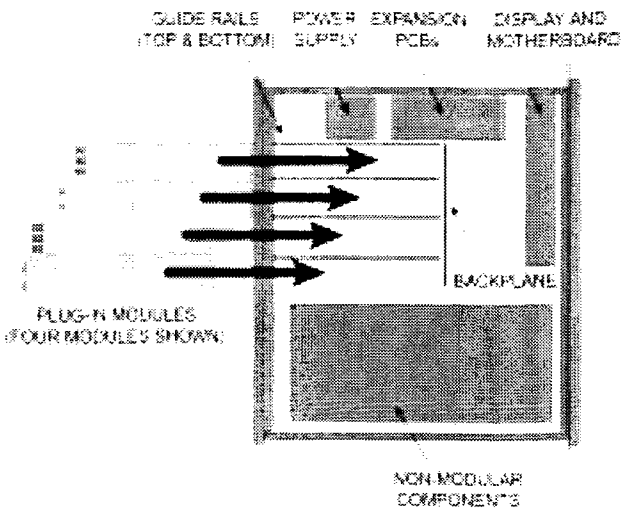
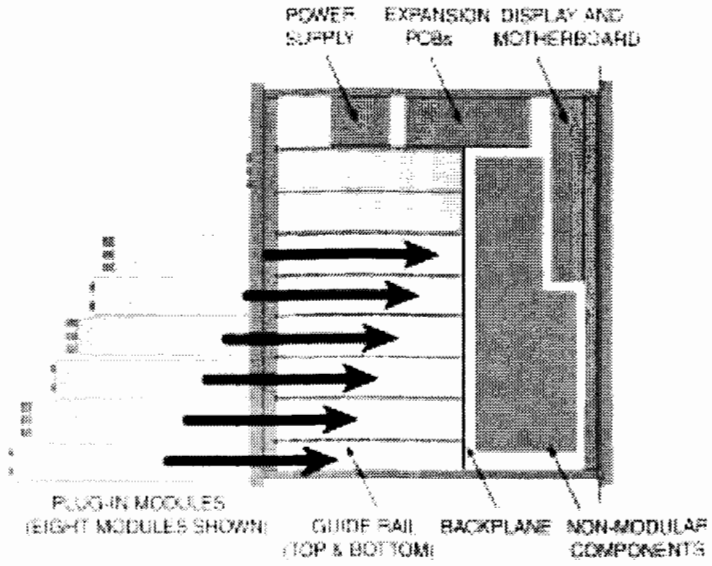


Figure 2: *GP700M With Eight Plug-In Bays (Top View)*



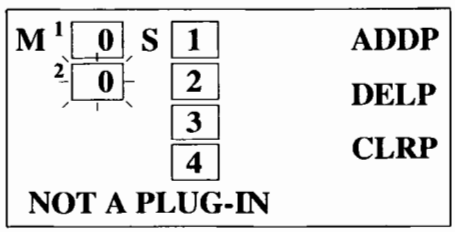
The Plug-In Configuration Menu

Press the **PCFG** softkey to open the plug-in configuration menu. You may have to press **MORE** a few times in order to see the **PCFG** key. The plug-in configuration menu offers three options:

- Use ADDP to add a plug-in.
- Use DELP to delete a plug-in.
- Use CLRP to clear all plug-ins.

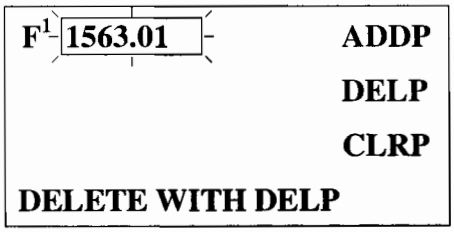
Depending on the status of the currently selected component, the bottom line will display one of two messages. If the currently selected device is not a plug-in module, the bottom line will display "**NOT A PLUG-IN**". The following diagram shows the plug-in configuration menu of a GP700M configured with several components. The currently selected component, M2, is a permanent non-modular component.

Figure 3: *Plug-in Configuration Menu Screen, Permanent Component Selected*



If the currently selected device is a plug-in module, the bottom line will display "**DELETE WITH DELP**". The following diagram shows the plug-in configuration menu of a GP700M configured with a tunable-filter plug-in. The plug-in is the currently selected component.

Figure 4: *Plug-in Configuration Menu Screen, Plug-in Selected*

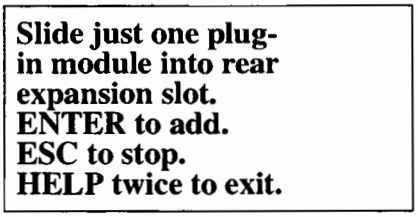


Adding a Plug-In

Adding a plug-in alters the configuration of both the plug-in and the GP700M instrument. For this reason, a plug-in that has been added to one instrument cannot be added to a second instrument until it has been deleted from the first instrument using the **DELP** command, or cleared using the **CLRP** command. See below for information about these commands.

To add a new plug-in, open the plug-in configuration menu by pressing the **PCFG** softkey. Then press **ADDP** to begin the add plug-in procedure. The GP700M will display an instruction dialog screen that gives you the option to continue or to exit.

Figure 5: *Add Plug-In Instruction Dialog*



If you do not wish to add a plug-in, press **ESC** once or **HELP** twice. Both operations will perform a system reset and return you to the main menu.

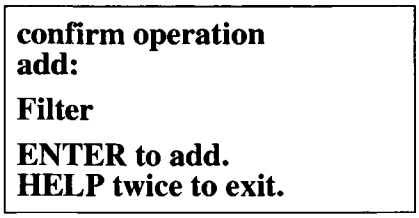
To install a plug-in, locate a vacant slot in the rear of the instrument. Remove the blank cover panel by loosening the top and bottom captured thumb screws. Stop loosening when the screws spring out. Hold the plug-in so that the printed text and logo are upright legible, taking care not to touch the recessed electrical connector on the opposite side.

Slide the plug-in cartridge into a vacant slot in the rear of the instrument. Each plug-in has top and bottom flanges that slide into rails installed in the housing. The plug-in should slide easily. Do not force the plug-in, as this could cause damage to the plug-in, the instrument, or both.

When you have inserted the plug-in almost completely, you will feel some resistance as the plug-in comes into contact with the backplane. Press firmly to establish a proper connection. The plug-in's external panel should now be flush with the fixed rear electrical panel. Tighten the thumb screws to secure the plug-in.

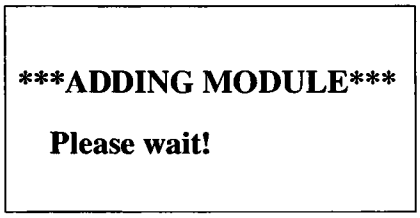
Press **ENTER** to continue the installation process. The GP700M searches for a new plug-in. If it finds a new plug-in, the GP700M displays the add plug-in confirmation dialog which includes a description of the new component. A variable attenuator is described as "attenuator". A tunable filter is described as "filter". A multi-channel switch is described as "Type1: *MxN*", where *M* is the number of input channels (1 or 2), and *N* is the number of output channels.

Figure 6: *Add Plug-In Confirmation Dialog*



Press ENTER again to complete the installation of the plug-in. The GP700M displays a wait screen while it updates the configuration of the plug-in and the instrument.

Figure 7: *Add Plug-in Wait Screen*



After a plug-in has been successfully added the GP700M returns to the add plug-in instruction dialog, giving you the opportunity to add additional plug-ins or exit. Upon exiting, the GP700M resets and finalizes the add procedure. After the reset completes, the screen displays a new display box for each plug-in that has been added. There is no difference between the display box for a plug-in component and the display box for a permanent non-modular component.



ATTENTION

It is important to keep in mind that the modules are not plug-and-play. Each module has to be properly added as described above before it could communicate with GP700 instrument. Note that the identification number of each installed component depends upon the order in which the components are added and not the slot location to which the module is plugged in. For example, if your GP700M has one permanent filter component and you install three additional filter plug-ins, the permanent filter will be F1, the first-installed filter plug-in will be F2, the second plug-in will be F3, and the third will be F4. Added modules are slot independent. Therefore, they could be swapped into any open slot and would still communicate properly with the instrument. However, if you clear and re-install the plug-ins in a different order, each individual plug-in will have a different identification number.

Deleting a Plug-In

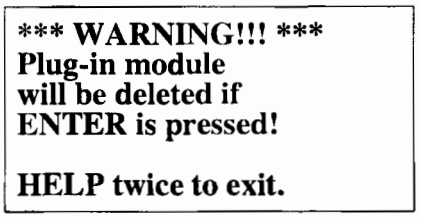
Deleting a plug-in erases record of the plug-in from the GP700M controller configuration, and clears the plug-in configuration record. It is necessary to delete a plug-in or clear all plug-ins (see below) before re-installing in another chassis.

To delete a plug-in, open the plug-in configuration menu by pressing the **PCFG** softkey. Next, activate the component you wish to delete by pressing the ⧉, **DEV**, **PREV**, and **NEXT** keys. The ⧉ key toggles the display screen; the **DEV** key selects the component category; the **PREV** and **NEXT** keys select a particular component within a component category.

The bottom line on the front-panel display will show "**NOT A PLUG-IN**" if the currently activated component is not a plug-in module. When you activate a plug-in component, the display will show "**DELETE WITH DELP**".

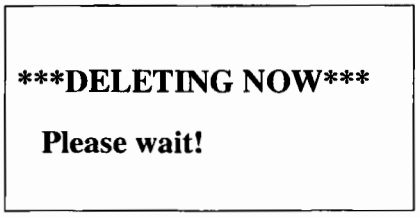
When you have activated the plug-in you wish to delete, press **DELP** to begin the delete plug-in procedure. The GP700M will display an confirmation dialog screen prompting you to press **ENTER** to confirm or **HELP** twice to exit without deleting.

Figure 8: *Delete Plug-in Confirmation Screen*



Choosing to exit causes the GP700M to reset without deleting the plug-in. Pressing **ENTER** causes the GP700M to update the controller and plug-in configuration records. The GP700M displays a wait screen during the deletion process, then the instrument resets.

Figure 9: *Delete Plug-in Wait Screen*



Remove the plug-in from the chassis by loosening the captured thumb screws. Stop loosening when the screws spring out. Next, pull gently but firmly on the loosened screws. You will feel some resistance as the plug-in disengages from the backplane. Once free of the backplane, the plug-in should slide easily. Do not force the plug-in, as this could cause damage to the plug-in, the instrument, or both.

When you remove the plug-in from the chassis, take care not to touch the plug-in's recessed electrical PCB. Cover the empty slot in the chassis with a blank cover panel to minimize dust contamination.



Warning

Do not leave deleted plug-ins connected to the controller backplane as this could result in functional errors.

Supplemental Instructions For GP700 Modular With Two-Position Prism Switch Plug-In

This section describes the operating instructions and NEW command set required for any GP700M Modular Mainframe containing the Two-Position (Prism) Switch Plug-Ins.

WARNING

Do not install the Two-Position Switch Plug-In into GP700 Mainframes without a triangular "Prism Ready" label on the rear or with firmware version lower then Vesion 2.12. The Two-Position Switch Plug-In is identified by a P/N starting with "PS-" which is marked on the lower section of the connector faceplate. This device will NOT function with any earlier version of the firmware. The firmware version is shown on the front panel display upon power up. Contact DiCon if you wish to use this Plug-In in a GP700 Mainframe that does not fit this description.

FRONT PANEL OPERATION

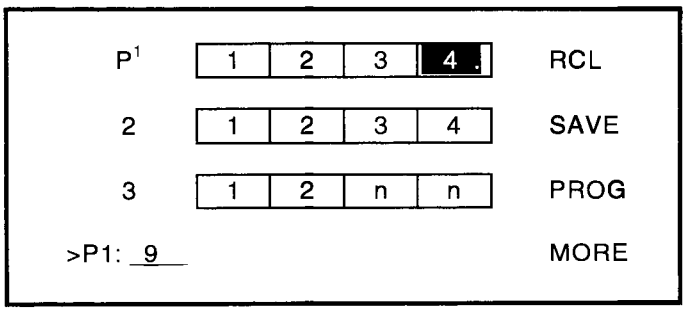
a. Add/Delete
User can use the **PCFG** softkey to add/delete Pwo-Position PlugIns. The procedure is identical to any other modular Plug In. It will display the current module configuration when user adds in the module and allow the user to accept it.

b. Display and Moving Switches

The Two-Position Plug Ins are always displayed on the last page of the screen, depending on if there are other types of Plug-Ins, the 'Next Page' button may need to pressed several times to display the Two-Position Plug-Ins. The 'Next Page' button is represented by two overlapping boxes located directly above the PREV button.

The front panel will show a row four small boxes for each Plug In module. Each small box stands for one switch, starting from 1 to 4. It will show "n" in the box where there is no switch.

When the small box is ***not*** highlighted, the switch is in state 1, when the box ***is*** highlighted the switch is set to state 2. The figure below indicates that switch number 4 in Plug-In number 1 is in State 2.



Pressing the PREV and NEXT key will change the active selection *Vertically* on the screen (between P1, P2, P3, etc.)

The DEV key changes the active selection *Horizontally* on the screen

Pressing the DEV key repeatedly will 'step' though modes one and mode two as described below

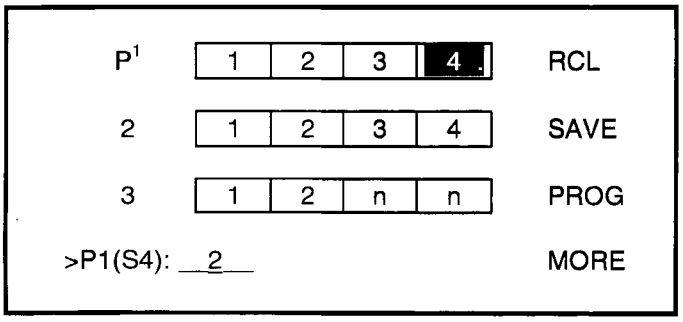
Mode one appears as >P2: ***9*** the numeric value ***9*** represents the Channel Value, shown in ***bold italics*** in the table below.

This mode allows the user to move all switches contained in the Plug-In simultaneously for time saving advantages.

Bit Map	Channel Value	Switch 1	Switch2	Switch3	Switch4
0000	1	State 1	State 1	State 1	State 1
0001	2	State 2	State 1	State 1	State 1
0010	3	State 1	State 2	State 1	State 1
0011	4	State 2	State 2	State 1	State 1
0100	5	State 1	State 1	State 2	State 1
0101	6	State 2	State 1	State 2	State 1
0110	7	State 1	State 2	State 2	State 1
0111	8	State 2	State 2	State 2	State 1
1000	***9***	***State 1***	***State 1***	***State 1***	***State 2***
1001	10	State 2	State 1	State 1	State 2
1010	11	State 1	State 2	State 1	State 2
1011	12	State 2	State 2	State 1	State 2
1100	13	State 1	State 1	State 2	State 2
1101	14	State 2	State 1	State 2	State 2
1110	15	State 1	State 2	State 2	State 2
1111	16	State 2	State 2	State 2	State 2

Mode Two appears as >P1 (S4): ***2*** the numeric value ***2*** means switch number 4 in Plug in number 1 is in State ***2*** as shown below.

In Mode Two the user can either press number 1 or 2 then the ENTER key or use the Up/Down arrow key to toggle the switch between state 1 and state 2.



a. Mini-Program/Recall
The Mini program and recall is same as other modules.

REMOTE COMMAND DEFINITIONS

Pn m

Select P-Type Module Channel
Application: GPIB, RS-232, MINI
Format: P<*module*> <*channel*>
Description: The **P** command sets prism switch module number *module* to channel number *channel.* Do not send switching commands to busy modules.
Example: The following Visual Basic command sets prism switch module P1 to channel 8 and P2 to channel 3.

```
CALL Send(0, 3, "P1 8; P2 3", NLend)
```

See Also: **SYSTem:CONFig?,** page 74 "Command Timing", page 39

Pn?

P-Type Module Channel Query
Application: GPIB, RS-232
Format: P<*module*>?
Description: The **P?** command places the current channel of prism switch module number *module* into the output queue.
Example: The following Visual Basic command places the current channel of prism switch module P1 into the output queue, and reads the output queue into buffer$.

```
CALL Send(0, 3, "P1?", NLend)
CALL Receive(0, 3, buffer$, NLend)
```

INCPn

Increment P-Type Module Channel
Application: GPIB, RS-232, MINI
Format: INCP<*module*>
Description: The INCP command increments prism switch module number *module* by one channel. Do not send switching commands to busy modules.
Example: The following Visual Basic command increments prism switch module P2 by one channel.

```
CALL Send(0, 3, "INCP2", NLend)
```

See Also: "Command Timing", page 39

DECPn

Decrement P-Type Module Channel
Application: GPIB, RS-232, MINI
Format: DECP<*module*>
Description: The DECP command decrements prism switch module number *module* by one channel. Do not send switching commands to busy modules.
Example: The following Visual Basic command decrements prism switch module P2 by one channel.

```
CALL Send(0, 3, "DECP2", NLend)
```

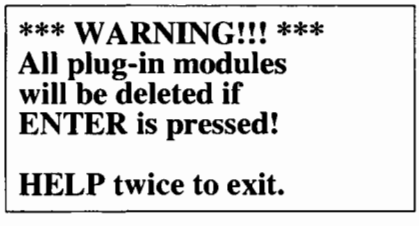
See Also: "Command Timing", page 39

Clearing All Plug-Ins

Clearing all plug-ins erases all plug-in records from the GP700M controller configuration, and clears the configuration record within each connected plug-in. It is necessary to delete a plug-in (see above) or clear all plug-ins before re-installing in another chassis.

To clear all plug-ins, open the plug-in configuration menu by pressing the **PCFG** softkey. press **CLRP** to begin the clear plug-ins procedure. The GP700M will display an confirmation dialog screen prompting you to press **ENTER** to confirm or **HELP** twice to exit without clearing.

Figure 10: *Clear Plug-in Dialog Screen*



Choosing to exit causes the GP700M to reset without clearing the plug-ins. Pressing **ENTER** causes the GP700M to update the controller and plug-in configuration records. The GP700M displays a wait screen during the clear plug-in process, then the instrument resets.

Remove each plug-in from the chassis by loosening the captured thumb screws. Stop loosening when the screws spring out. Next, pull gently but firmly on the loosened screws. You will feel some resistance as the plug-in disengages from the backplane. Once free of the backplane, the plug-in should slide easily. Do not force the plug-in, as this could cause damage to the plug-in, the instrument, or both.

When you remove the plug-in from the chassis, take care not to touch the plug-in's recessed electrical PCB. Cover the empty slots in the chassis with blank cover panels to minimize dust contamination.



Warning

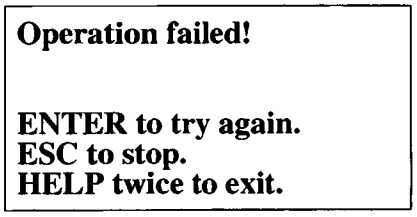
Do not leave cleared plug-ins connected to the controller backplane as this could result in functional errors.

Troubleshooting

The add plug-in command only works if there is one new, cleared, or deleted plug-in inserted into the GP700. If there are two or more new plug-ins inserted when you begin the add procedure, the attempt will usually fail and give an error message. It is possible the add procedure will appear to work, but will not complete successfully. In this case, when you exit the add procedure and reset the instrument, the screen will not show a display box for the new devices.

Although the plug-ins were not added successfully, the GP700M may have created errors in the configuration records in the GP700M as well as in each of the plug-ins. To correct a multiple add error, execute the clear plug-in command (**CLRP**) and re-install the plug-ins one at a time.

Figure 11: *Add Plug-in Error Screen*

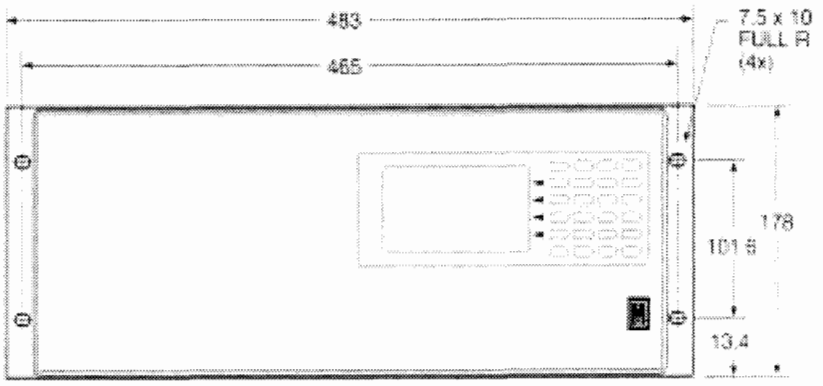


Attempting to add a plug-in without inserting the physical cartridge will also result in an "operation failed" error. Insert a plug-in and press **ENTER** to try again.

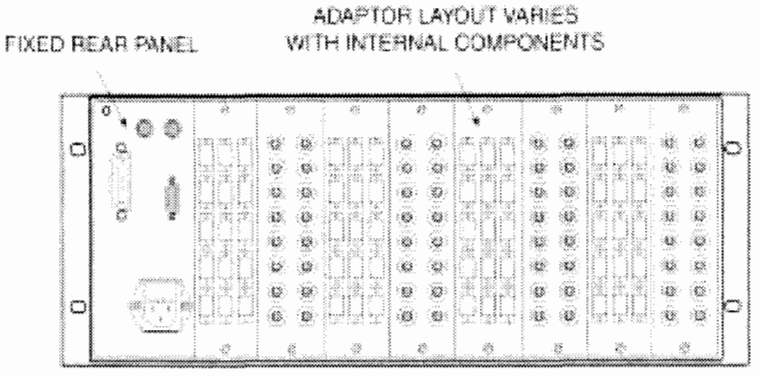
Device Housing

Figure 12: *GP700M Modular Platform 4U Standard Rackmount Chassis*

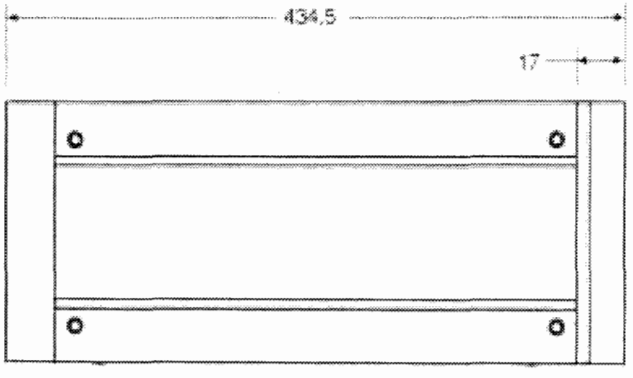
Front View



Rear View



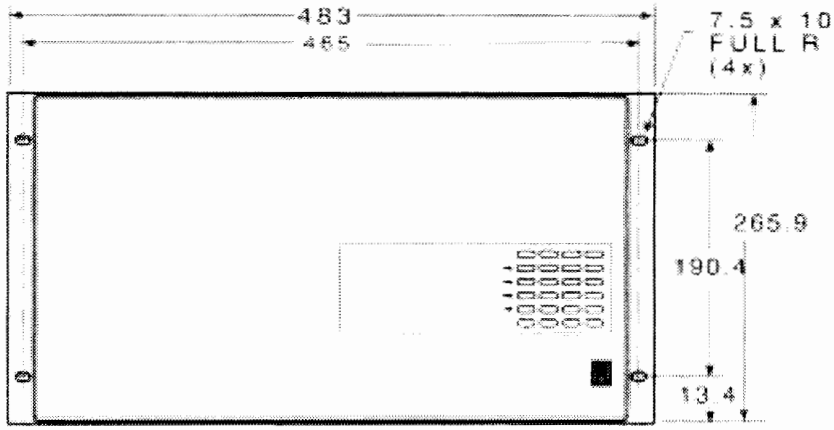
Side View



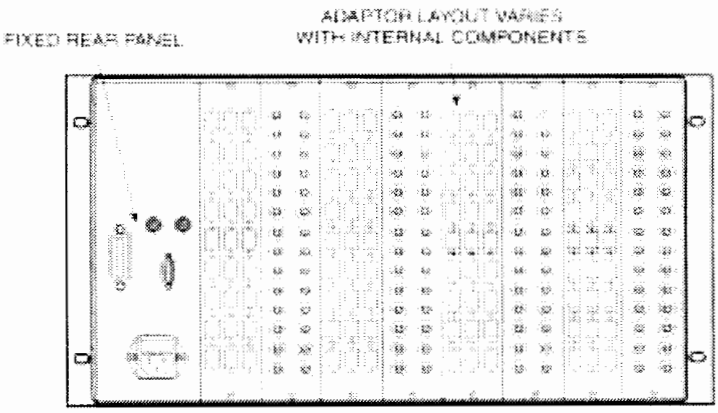
Note: 4U extended rackmount chassis differs only in depth (554mm).

Figure 13: *GP700M Modular Platform 6U Standard Rackmount Chassis*

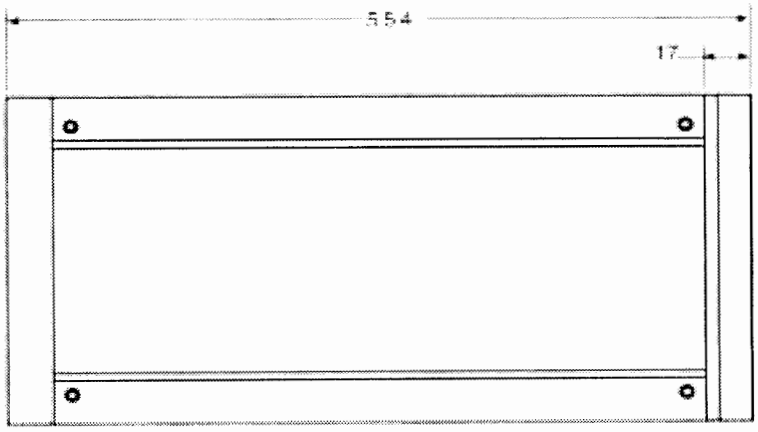
Front View



Rear View



Side View



Handling Fiberoptic Components and Cables

Fiber optic components require special handling. Follow these guidelines when handling the cables and connectors.

Handling Fiber Optic Cables

To avoid cable damage and to minimize optical loss, follow these guidelines when handling fiber optic cables.

- Handle the fiber pigtail outputs carefully.
- The minimum bend radius for most optical cables is 35mm. Never bend an optical cable more sharply than this specification. Optical performance will degrade, and the cable might break.
- Avoid bending the optical cable near a cable strain relief boot. Bending an optical cable near a strain relief boot is one of the easiest ways to permanently damage the optical fiber.
- Avoid bending the optical cable over a sharp edge.
- Avoid using cable tie wraps to hold optical cable. Tie wraps when tightened can create micro-bends or break an optical cable. Microbends can cause a dramatic reduction in optical performance.
- Do not pull on the bare fiber as this can break the fiber inside the component.
- Avoid using soldering irons near optical cables. Accidental damage can easily occur when a soldering iron is used near an optical cable. In addition, solder splatter can contaminate and permanently damage optical fiber connectors.
- To assure the most stable, repeatable optical performance after the optical cables have been connected, immobilize the cables using wide pieces of tape or another form of mechanical cushion.

Storing Optical Connectors

All switches that include optical connectors are shipped with dust caps covering those optical connectors. Optical connectors should remain covered at all times when the instrument is not in use.

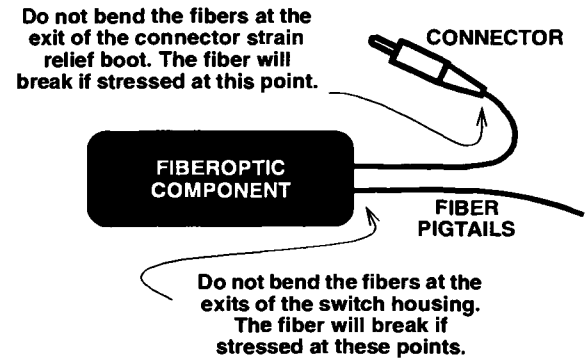


Figure 13: *Fiber-Optic Component, Connectors, and Fiber Pigtails*

Cleaning Optical Connectors

Clean any exposed connector using a cleaning kit supplied by the connector manufacturer or high-grade isopropyl alcohol and a cotton swab. To clean with alcohol and a swab, dab the tip of a cotton swab in alcohol and then shake off any excess alcohol. The tip should be moist, not dripping wet. Stroke the swab tip gently across the surface of the connector and around the connector ferrule.

Either allow the connector a minute to dry, or blow-dry the connector using compressed air. Be careful when using compressed air: improper use may deposit a spray residue on the connector.

Mating Optical Connectors

Follow these instructions when mating optical connectors.

- Clean both connectors prior to mating. Any small particles trapped during the mating process can permanently damage the connector.
- Smoothly insert the appropriate connector ferrule into the adapter. Do not allow the fiber tip to contact any surface. If the tip accidentally contacts a surface before mating, stop. Reclean the connector and try again.
- Tighten the connector until it is finger tight or to the torque specified by the connector manufacturer. Do not over-tighten the connector as this can lead to optical loss and connector damage.
- Check the optical insertion loss. If the loss is unacceptable, remove the connector, reclean both ends of the mate, and reconnect them. You have to repeat this process several times before a low-loss connection is made.
- After you make the connection, monitor the stability of the optical throughput for a few minutes. Optical power trending (slowly increasing or decreasing) is caused by the slow evaporation of alcohol trapped in the connector. Continue to monitor optical power until it stabilizes. If the loss is unacceptable, reclean the connectors and start again.

DiCon

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