HPF-9500

High-Power 20-Slot Frame

Product Manual

HPF-9500-Frame-OM_v1.0

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Manual Identification

Manual Name HPF-9500-OM_v1.0 Release Date October 3, 2025

Table 1: Record of Release, Manual Versions, and Changes

Document Version	Date	Description
V1.0	October 3, 2025	Initial release

Specifications subject to change. E&OE.

Contact

Thank you for choosing this Cobalt Digital, Inc. product. The Cobalt Digital line includes video decoders and encoders, audio embedders and de-embedders, distribution amplifiers, format converters, remote control systems, and much more.
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Cobalt Digital Inc. Factory Service Center, 2506 Galen Drive, Champaign, Illinois 61821

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Cobalt Digital Inc. 2015/Rev.1.9 Specifications subject to change. E&OE.

Overview

This manual provides installation and operation instructions for the Cobalt High-Power Frame HPF-9500.

For more information, visit www.cobaltdigital.com. Explore guides to network control of devices, firmware updates, and other topics.

Product Overview

The Cobalt High Performance Frame (HPF-9500) Series has a 2RU 20-slot frame. The frame provides a high density solution that offers unprecedented flexibility, ease of use, and integration. Each frame has a frame controller card supporting a single 100/1000 Ethernet port for IP-based controls. Each unit also has two pairs of BNC reference loop connectors for common timing reference among signal processes.

Warnings, Cautions, and Notes

Certain items in this manual are highlighted by special messages.
Here is some important information about product use and disposal.

Electronic device or assembly is susceptible to damage from an ESD (electrostatic discharge) event.
Handle only using appropriate ESD prevention practices.
If an ESD wrist strap is not available, handle device only by edges and
avoid contact with any connectors or components.

Symbol (WEEE 2002/96/EC)
For product disposal, ensure the following:
Do not dispose of this product as unsorted municipal waste.
Collect this product separately.
Use collection and return systems available to you.

Warnings

Warning messages indicate a possible hazard which, if not avoided, could result in personal injury or death.

Warning

NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

Cautions

Caution messages indicate a problem or incorrect practice which, if not avoided, could result in improper operation or damage to the product.

CAUTION! This device is intended for installation and usage in a restricted access environmentally controlled installation using openGear-compliant cards and network control.

CAUTION! Inadequate cooling can reduce equipment reliability.
Install devices in a rack with adequate space for air circulation,
especially devices with no fans for cooling.

Notes

Notes provide supplemental information to the accompanying text. Notes typically precede the text to which they apply.

Important notes regarding product use are shown.
Failure to observe may result in unexpected or incorrect operation.

Important Safety Instructions

These instructions are provided to support US national and international safety compliance.

Read these instructions.

Keep these instructions.

Heed all warnings.

Follow all instructions.

Do not use this apparatus near water.

Warning

Clean only with a dry cloth.

Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

Warning

Do not defeat the safety purpose of polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

Warning

Only use attachments/accessories specified by the manufacturer and in this manual.

Unplug this apparatus during lightning storms or when unused for long periods of time.

Warning

Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Warning

This apparatus shall not be exposed to dripping or splashing. Do not place objects such as water containers on the apparatus.

Warning

The AC mains power receptacle on the rear of the apparatus shall only be connected by means of the power cord supplied with this apparatus. No other devices or cables shall be connected to this connector. If the supplied AC power cord is damaged or lost, it shall only be replaced using the AC power cord specified in this manual or by the manufacturer.

To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.

Warning

To reduce the risk of fire, replacement fuses shall be the same type and rating as installed and as specified on the rear label adjacent to the power receptacle fuse holder.

E334301-A6002 Compliance Statements in English and French

F.4 Restricted Access Area: Equipment is intended for installation in Restricted Access Area
Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT

L.8 Multiple power sources:  CAUTION - Shock hazard. Disconnect all power sources
ATTENTION - Danger de choc Déconnecter toutes les sources d'énergie

Functional Description

The HPF-9500 is an openGear-compatible 2RU high-density modular frame offering 360 Watts of net (user) available power in a high-capacity 20-slot format. Capacity varies with card and Rear I/O module choice.

High power-density power supplies (single standard, redundant second optional) and engineered cooling/ventilation design allow 10 high-power cards in a frame (10 x 36 W = 360 W), or 20 medium-power cards in a frame (20 x 18 W = 360W). Card slots and power supplies have independent ventilation paths. An intelligent fan controller adjusts fan speed with changes in power supply loading and frame temperature.

The HPF-9500 can accommodate two front-loaded PS-9000 power supply modules. Adding a second (optional) supply gives the frame full power redundancy. The PS-9000 power supply unit is interchangeable as a primary or redundant power supply module, with supplies in either position being hot-swappable. Each power supply has an independent cooling fan and a front-mounted power switch.

The HPF-9500-FC Network Controller Card (furnished as standard on the HPF-9500 frame) allows Ethernet connectivity to any number of connections for full multi-point control and monitoring via free DashBoard software.

The frame is equipped with two independent reference buses that can supply a selected reference to cards within the frame.

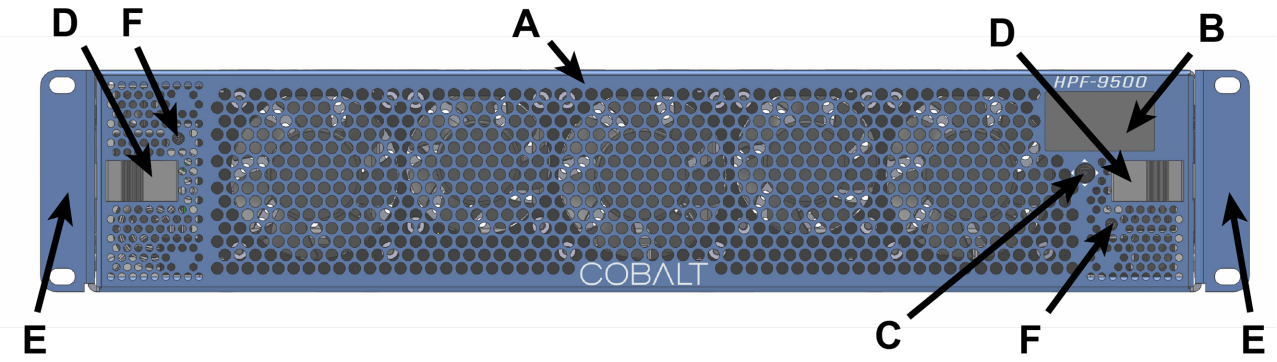
The HPF-9500 frame can also be ordered with the HPF-GE-FC Network Controller Card. In addition to all the functions of the HPF-9500-FC, the HPF-GE-FC provides Gigabit Ethernet connectivity to all 20 frame slots.

Technical Specifications

Table 2: Product Specifications

Item	Characteristic
Part number, nomenclature	HPF-9500 High-Power 20-Slot Frame (PN HPF-9500-CN) Includes (1) PS-9500 Power Supply Module, (1) Power cord, and (1) HPF-9500-FC Network Controller Card.
Installation / usage environment	Intended for installation and usage in a restricted access environmentally controlled installation using openGear-compliant cards and network control.
AC Line Input (per each of 2 (max) PS IEC inputs)	100-240 VAC, 48-63 Hz, 500 watts maximum
Environmental: Operating temperature and Relative humidity (operating or storage)	+32 °F – +104 °F (0 °C – +40 °C) < 95%, non-condensing
Available user (net) power	360 Watts continuous-operation maximum
Available user card slots	20 maximum
Frame communication	100/1000 Mbps Ethernet with Auto-MDIX
Dimensions (WxHxD): Weight (with standard power supply PS1):	19” x 3.5” (2RU) x 17” (48 cm x 9 cm x 43 cm) (Dimensions include component projections such as mounting tabs, etc.) 14.0 lb. (6.4 kg) (with single standard power supply PS-9000 and HPF-9500-FC Network Controller Card)
Reference Video Input	Number of Inputs: Two non-terminating (looping) Frame Reference inputs, Signal Level: 1 Vp-p nominal Signal Type: Analog video sync (black burst or tri-level) Impedance: 75 Ohms , Return Loss: > 30 dB to 30 MHz Allowable Maximum DC on Ref Input: ±1.0 V
Optional accessories	PS-9000 – Extra (redundant) frame power supply and power cord HPF-GE-FC Advanced Network Controller Card provides gigabit switch connections to all frame slots 9000-FSB-L or 9000-FSB-S Frame support bracket kit

Figure 1: Front Panel



Front Panel Components

The front panel of each frame has controls and indicators:

CAUTION! Opening the door removes power from the fans, stopping ventilation of the frame. Open the door only briefly while inserting, removing, or servicing cards in the frame.

DOOR WITH FANS: (Figure 1, Item A) The door has a screen over five fans to ventilate the frame. The fans pull in air at the front and push air out at the back and top of the frame.

CAUTION! The LCD screen on the frame is not a touch screen. Any pressure on the screen may damage the screen beyond repair, requiring replacement.

LCD SCREEN: (Figure 1, Item B) On the right side of the front panel a small LCD screen displays information. Moving the nearby navigation control actuates four screens with IP address information and frame temperature.

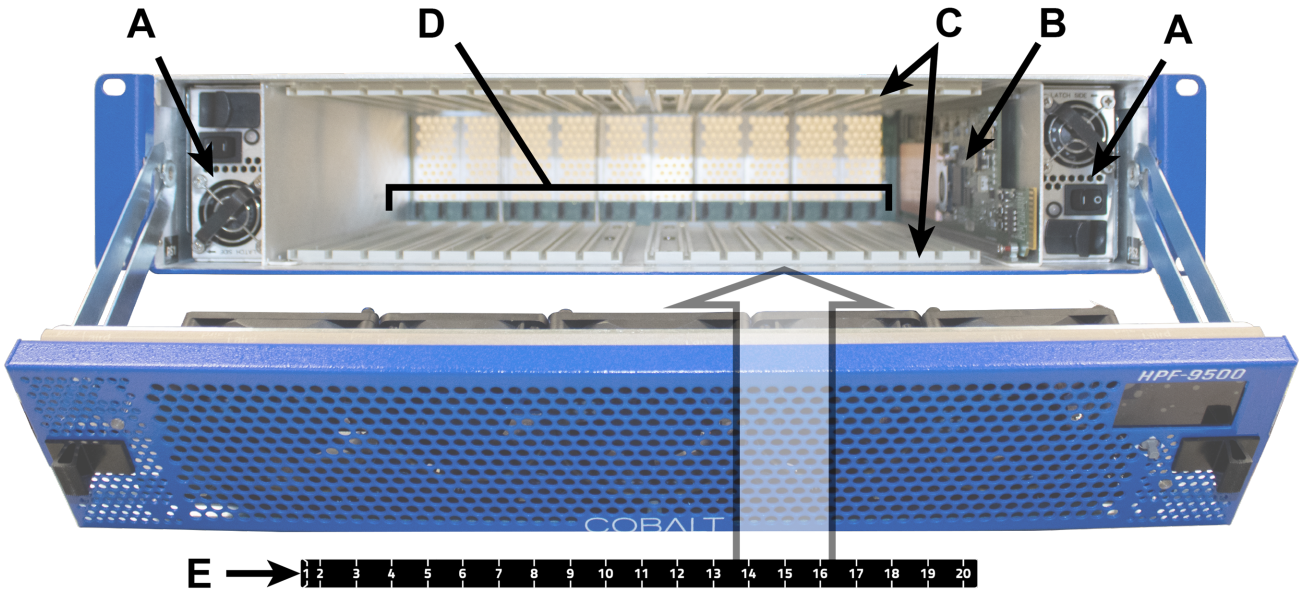
NAVIGATION CONTROL: (Figure 1, Item C) Near the LCD screen is a small gray toggle. It can be moved and pushed in to show or modify information on the LCD screen.

LATCH: (Figure 1, Item D) On the right and left sides of the front panel, small handles can be moved toward the center of the panel to free latches and allow opening the front door of the frame.

EAR BRACKET: (Figure 1, Item E) Slots in the ear brackets on each side of the frame enable securing the frame in a 19-inch EIA-310 rack.

LIGHT PIPE: (Figure 1, Item F) Clear plastic cylinders allow power supply LED illumination to show when the frame door is shut.

Figure 2: Frame Interior



Frame Interior Components

Inside the frame there are several components:

POWER SUPPLY: (Figure 2, Item A) Compartments on each side are marked PS1 (left) annd right (PS2) in the frame there is a compartment for a power supply. An LED, power switch, toggle, and handle is visible on each installed power supply. One power
supply is required to operate the frame. An optional second power supply may be installed for redundant power.

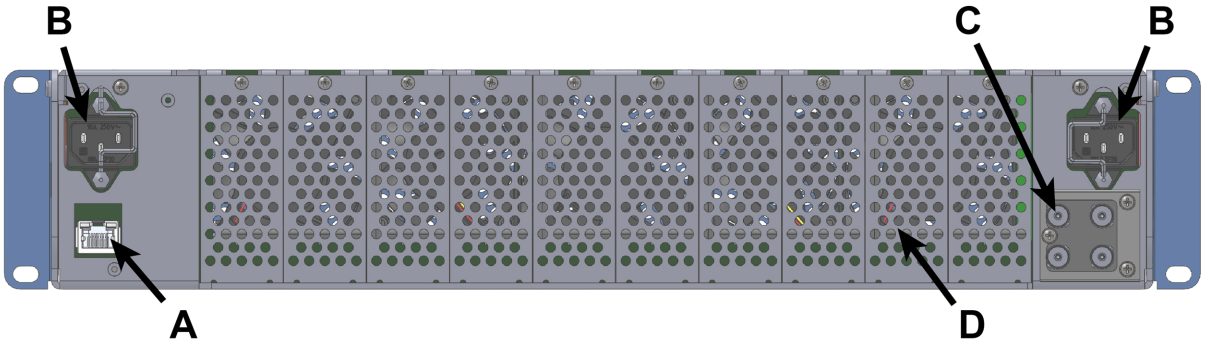
FRAME CONTROLLER CARD: (Figure 2, Item B) On the right side of the frame is the frame controller card. The card is secured in the frame with a small screw in the card mount.

CARD SLOTS: (Figure 2, Item C) 20 upper and lower slotted plastic plates allow cards to be aligned and inserted into frame network receivers and Rear I/O Modules.

FRAME CARD CONNECTORS: (Figure 2, Item D) 20 card receivers delivering frame power and communication connection are mounted at the rear end of the lower slots.

NUMBER GUIDE: (Figure 2, Item E) In front of the lower card slots is a label showing a number for each slot. Slots are numbered from left to right, 1 to 20.

Figure 3: Rear Panel Typical Components



Rear Panel Components

The rear panel of each frame has connectors and covers:

ETHERNET PORT: (Figure 3, Item A) An RJ45 Ethernet 100/1000 LAN port is located on the lower left side of the frame rear panel. The RJ45 Ethernet connector allows you to connect the frame to a 100/1000 Ethernet LAN using a Cat 5 (or better) cable to access the frame's controls through an Internet browser.

Table 3: Ethernet Port LEDs

Position and Color	State	Description
Right LED, Amber	OFF ON	No Link Established Link Established
Left LED, Green	OFF ON	No Network Activity Blinking LED shows network activity

POWER SOCKETS: (Figure 3, Item B) On the left and right sides of the rear panel of the frame are grounded power sockets, supporting one or two (optional and redundant) power supplies. At least one power supply must be installed in the frame and connected through a cable to main power. Retainer clips help hold a cord plug on the frame. LEDs on the power supplies inside the frame show when the supply is powered ON.

BNC REF LOOPS: (Figure 3, Item C) The two pairs of upper and lower REF LOOP BNC connectors on the right side of the frame's rear panel. These are marked REF1 LOOP or REF2 LOOP. These connectors allow input or daisy chain connection of a timing reference source.

REAR I/O MODULE SLOTS AND COVERS: (Figure 3, Item D) The rear panel of the frame has ten Rear I/O module tab slots in a lower plate. There are ten threaded holes for rear module retainer screws in the upper plate. Ten metal covers with screws and elastomer washers protect empty slots from intrusion.

Frame Capacity For Cards and Rear I/O Modules

Various Rear I/O modules for Cobalt cards are available and are described in respective product information for the cards.

A frame's card capacity is determined by the Rear I/O modules used. A 20-slot frame can be fitted with a mix of rear module types, offering a variety of connector options while maximizing frame capacity.

The frame has a 360 watt power limit, which may not allow installation of 20 high-power cards in the frame. Select cards then Rear I/O modules to meet your input and output requirements. Signal inputs and outputs

enter and exit a card through the card edge backplane connector. A Rear I/O module breaks out the card edge connections to industry standard connectors to interface with other components and systems in the signal chain.

A split rear module takes one rear module slot and connects to two cards in the frame. Not all openGear cards are supported by split rear modules. A rear module may not support all connections offered by a card.

The standard width rear module takes one module slot and connects to only one card in the frame, leaving one card slot empty, not available to hold a card.

Some rear modules take two or more module slots, while connecting to only one card, making several slots unavailable for other cards and rear modules. Some cards take more than one card slot due to space required by attached daughter cards.

System Requirements for Network Connection to a Frame

The frame interface requires a network capable computer, a current browser, and a network connection to the frame. Frame user interfaces are available, such as Ross DashBoard software, an interface embedded in the frame controller card, or the SNMP (Simple Network Management Protocol) software option for the controller card.

All user control interfaces described here are cross-compatible and can operate together as desired. Where applicable, a control setting change made using a particular user interface is reflected on another connected interface.

DashBoard

DashBoard User Interface – Using DashBoard, cards in the HPF-9500 Frame can be controlled from a computer and monitor.

DashBoard allows users to view all frames on a network with control and monitoring for all populated slots inside a frame. This simplifies the setup and use of numerous modules in a large installation and offers the ability to centralize monitoring. Cards define their controllable parameters to DashBoard, so the control interface is always up to date.

The DashBoard software can be downloaded from the openGear website: https://www.opengear.tv/frame-and-control/control-system/download-dashboard/.

Cobalt Embedded User Interface

The frame can also be accessed with a web browser through an embedded user interface on the frame controller card, using the IP Address of the frame.

SNMP Option

A network card with the SNMP option provides a standardized framework for monitoring and managing network devices. The SNMP option supports the SNMP v1|v2, and requires an SNMP manager software on a network connected to the frame. SNMP can be used in parallel with the DashBoard and the Cobalt frame controller user interfaces. The SNMP option supports the SNMP v1|v2, and requires an SNMP manager software on a network connected to the frame. SNMP is a software option that may be purchased before or after frame delivery. SNMP software may be applied to the controller card in the field. Product name SNMP-HPF-FC provides SNMP (v1 and v2) control and monitoring for the HPF-9000-FC or HPF-GE-FC Network Controller Card.

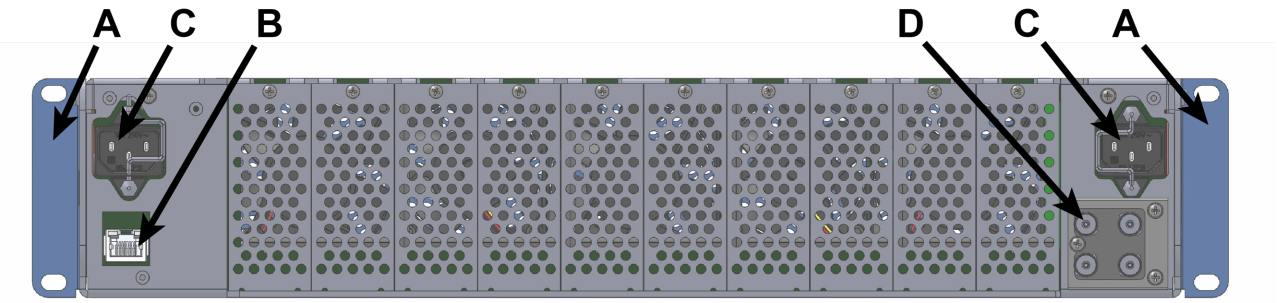
Installation and Setup

Warning

NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

Electronic device or assembly is susceptible to damage from an ESD (electrostatic discharge) event. Handle only using appropriate ESD prevention practices.
If an ESD wrist strap is not available, handle device only by edges and avoid contact with any connectors or components.

Figure 4: Frame Rear Panel Connections



Install a Frame in a Rack

1. Contact Cobalt support if parts are missing. Remove the frame from packaging.
2. For normal installations, the frame is designed to be supported in a standard EIA-310 19-inch rack by securing the frame by its four front panel mounting holes only, without added rear support.

   If higher power cards (such as decoders, encoders, or cards processing 4K signals) fill the frame, select an installation location within the rack allowing a 1RU space above the frame for ventilation.

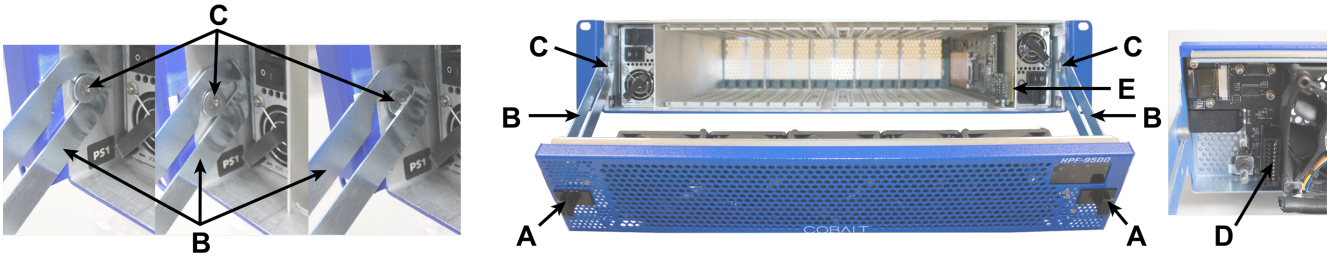
   If a frame is installed in a mobile environment OB truck or equipment case (fly pack), frame support rails (9000-FSB-S or 9000-FSB-L) are recommended for the frame in a rack.
3. On the front panel of the frame, first install right and left screws in the lower holes in the ear brackets (Figure 4, Items A) to hold the frame on the rack. This makes placement and alignment easier for upper screws put through the ear bracket holes into the rack.
4. On the frame's rear panel, connect an Ethernet cable (Cat 5 or better) to the RJ45 port (Figure 4, Item B) on the left side of the frame.
5. The power socket on each side of the frame is connected only to the power supply inside. There is no cross connection between sockets to power supplies. Connect a cable to one or both of the frame's power supply sockets (Figure 1, Items C). Where two power supplies are installed in the frame, use of both sockets provides redundant power to the frame.
6. Connect a cable from a compatible analog timing source to one of the two REF LOOP BNC connectors (Figure 1, Items D) on the rear panel of the frame (REF1 LOOP or REF2 LOOP).

   General practice is input on the left and loop out on the right, although looping reference connectors can receive reference input on either connector of the looping pair.

If the open BNC connector is not connected to another device, terminate the connector with a 75 Ohm dummy load.

If no timing source is connected to the frame, there is no need to terminate either REF LOOP connector.

Figure 5: Frame Door Features



Open and Shut the Frame Door

1. On the front of the frame, push in the left and right latch handles (Figure 5, Items A) toward the center of the door front and open the door.
2. Pull the door out on its slotted retainers (Figure 5, Items B) and let the door lay open. Do not put more weight on the door or the retainers may be deformed, making door shutting more difficult.

   When necessary, the door may be removed or replaced.

   Pull the door out on the retainer until the round hole near the end of the slot is around the fastener (Figure 5, Items C) in the frame.

   Depress a section of the retainer to free the retainer from the fastener.

   Fan operation is required for ventilation of the frame, so removing the door and powering ON the frame results in a persistent alarm.

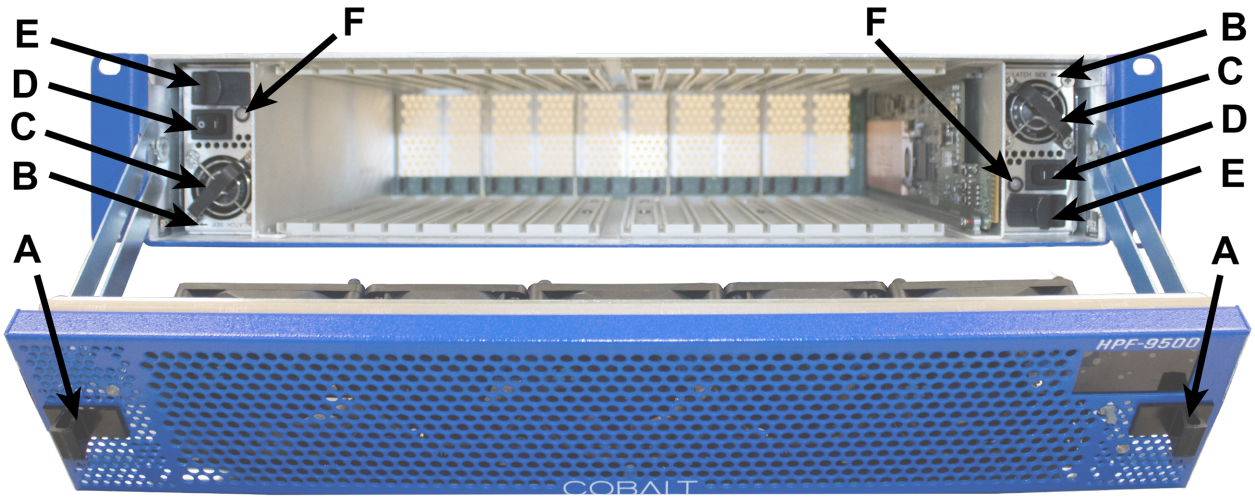
   The alarm may be silenced using the controller card alarm switch or a user interface alarm settings.
3. Look inside the door at the card receiver (Figure 5, Item D) to make sure it is clean and free of defects. The receiver connects to the frame controller card (Figure 5, Item E) when the door is fully closed.
4. Lift and push the frame door back onto the frame until both door latches secure the door on the frame, connecting power to the front LCD and the door fans.

   The fans go to higher speed immediately after the door is shut, but will settle down to the speed set by the controller card and user interface fan speed setting.

   If the LCD screen does not show information correctly, open and shut the door to restore correct connection between the card receiver and the frame controller card.

Power a Frame

Figure 6: Power Supplies Inside the Frame



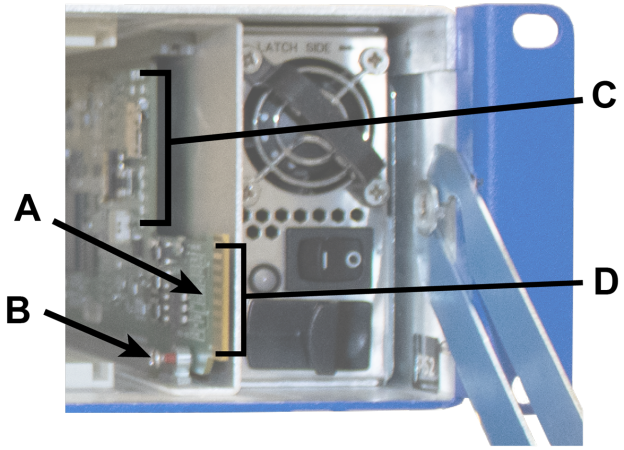
Power Supply

1. Power ON the frame by presssing the rocker switch (Figure 6, Item D) to the I (ON) position.
2. Power supplies may be hot swapped. Make sure the other power supply is powered ON before powering OFF the supply being removed or replaced.
3. Grip the handle (Figure 6, Item C) over the power supply fan, hold the latch accuator (Figure 6, Item E) away from the outer wall of the frame, and pull the supply out of the frame. The latch will resist movement unless it is held fully away from the frame outer wall.
4. Insert a power supply into the frame compartment with the supply's latch label arrow (Figure 6, Item B) pointing to the outer wall of the frame. Hold the latch accuator away from the frame wall to prevent excess wear to the plastic latch until the power supply is fully connected to the frame.
5. Power ON the frame by pressing the rocker switch (Figure 6, Item D) on a power supply from the O (OFF) position to the I (ON) position. If two power supplies are installed in the frame, power ON both supplies. An LED (Figure 6, Item F) on the power supply illuminates when the supply is powered ON.

Connect the Frame to a Network

The IP Address for the frame may be set by use of the frame controller card DIP switches, the front panel LCD display and toggle control, or a user interface connected through a network to the frame. The DIP switches positions on the controller card enable IP Address change from the front panel or through a user interface.

Figure 7: Frame Controller Card Installation



Set the Frame IP Address Using the Frame Controller Card

1. For easier access to the frame controller card, remove nearby cards (if previously installed) from the frame before handling the controller card.
2. In the frame controller card housing, loosen the #1 Phillips screw (Figure 7, Item B) that goes in a hole in the frame controller card.
3. Due to tight mechanical tolerances, removing and installing the card in the frame card receiver may be difficult.
4. On the network controller card (HPF-9500-FC or HPF-GE-FC), IP Address options can be set with DIP switches 1 and 2 (Figure 8) positions according to a table printed on the card (shown in Table 4).

Figure 8: DIP Switches on Frame Controller Cards

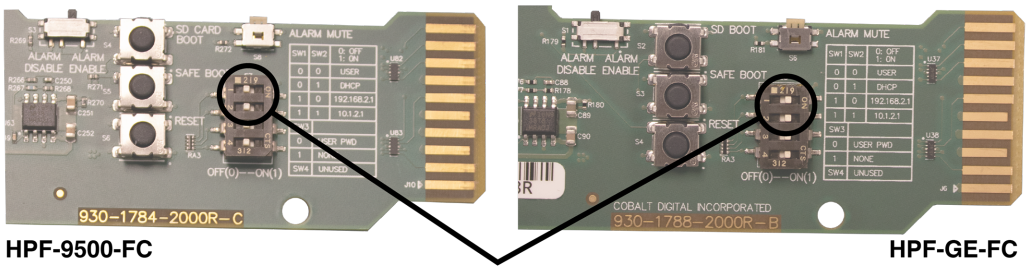
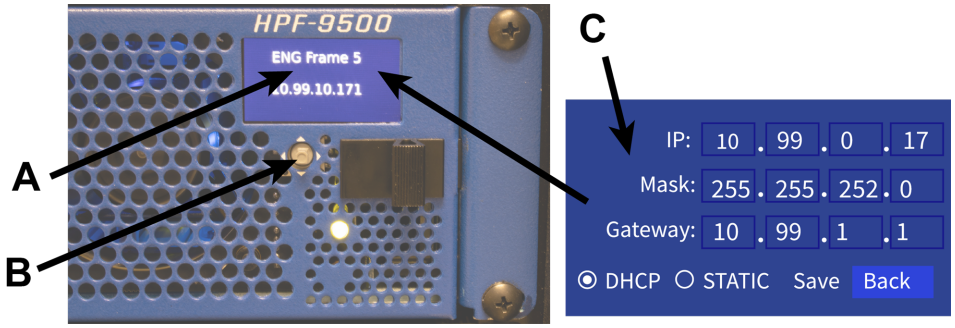


Table 4: DIP Switches Positions (HPF-9500-FC or HPF-GE-FC)

DIP Switch 1	DIP Switch 2	0: OFF, 1:ON
0	0	User
0	1	DHCP
1	0	192.168.2.1
1	1	10.1.2.1

5. Some pressure on the both the upper (Figure 7, Item C) and lower (Figure 7, Item D) parts of the card end may be required to insert the card into the frame card receiver.
6. Tighten the card housing screw (Figure 7, Item B) through the card to secure the card in the frame.
7. Power ON the frame and connect it to a network using a Cat 5 (or better) Ethernet cable through the RJ45 connector on the rear panel of the frame.

Figure 9: Frame LCD Display and Navigation Control



Set the Frame IP Address Using the Front Panel

1. No information shows on the LCD until the frame is powered on using a power supply switch inside the frame.

   When the frame is powered on, “HPF-9500” (or a name assigned by other means) and an IP address (IPv4 standard) shows on the LCD display (Figure 9, Item A), either setup previously or forced by DIP switch positions on the frame controller card.
2. Move the navigation control (Figure 9, Item B) to the right four times and the display cycles through the following menus: “Slot 0 Temperatures”, “Current Network Settings”, “Static Network Settings”, then back to the default menu of “HPF-9500" and an IP address. Move the navigation control four times right, left, up, or down and the screen will show these menus.

   The Slot 0 Temperatures are for sections of the frame: F (front), M (middle), and R (rear). The navigation control does not control frame temperature.
3. Move the navigation control to the left once to display the “Static Network Settings” menu.
4. At the center position, push in and hold the navigation control to enter the “Static Network Settings” edit menu.

   If the frame controller card DIP switches 1 and 2 are set to anything other than USER, editing of the IP address cannot be done with the navigation control. A warning message shows on the screen "Override by Switch (sw1/sw2) Enabled". In DashBoard or a Cobalt user interface, the IP Address

may be changed. The address change will not be applied by the controller card until the card DIP switches areset to USER.

5. On the editing screen (Figure 9, Item C), move the navigation control to the left or right to move the cursor among IP Address settings for IP, Mask, and Gateway number options.
6. In each number position move the control up to increase the value or down to decrease the value.
7. Select DHCP or STATIC by moving the cursor over the left side radio button circle, and pressing in on the control.
8. Move the cursor to Save to apply changes or Back to deny the changes.
9. Press in on the control to apply the choice. The screen will show the result of the choices made in the edit screen.

Set the Frame IP Address Using a User Interface

The frame may be accessed by a computer connected to the same network as the frame. The frame IP address can be changed either through Ross DashBoard or by entering the IP address for the frame into a web browser (an embedded Cobalt user interface will show, providing control of the individual frame).

1. Open a web browser on a computer connected to the same network as the frame. Based on the setting of the DIP switches in the frame controller card in the frame, or connect to the Forced IP address also shown on the frame LCD screen. The address may vary based on previous operation of the frame. Specifications are subject to change.
2. In the IP Settings window select either Static or DHCP, depending on your local network needs.
3. For the Static option, enter the information needed to connect the frame to your local network. For the DHCP (Dynamic Host Configuration Protocol) option, automatic communication will establish a connection if the local network supports a DHCP server.

   If the DIP switches configuration is set to any of the "forced" IP address modes, a warning message may show in software connected to the frame. To avoid the warning message and apply the network settings, set the DIP switches to the User (software) mode and reboot the frame. Upon reboot, the frame will use the network settings set in software.

Install a Rear I/O and Card in a Frame

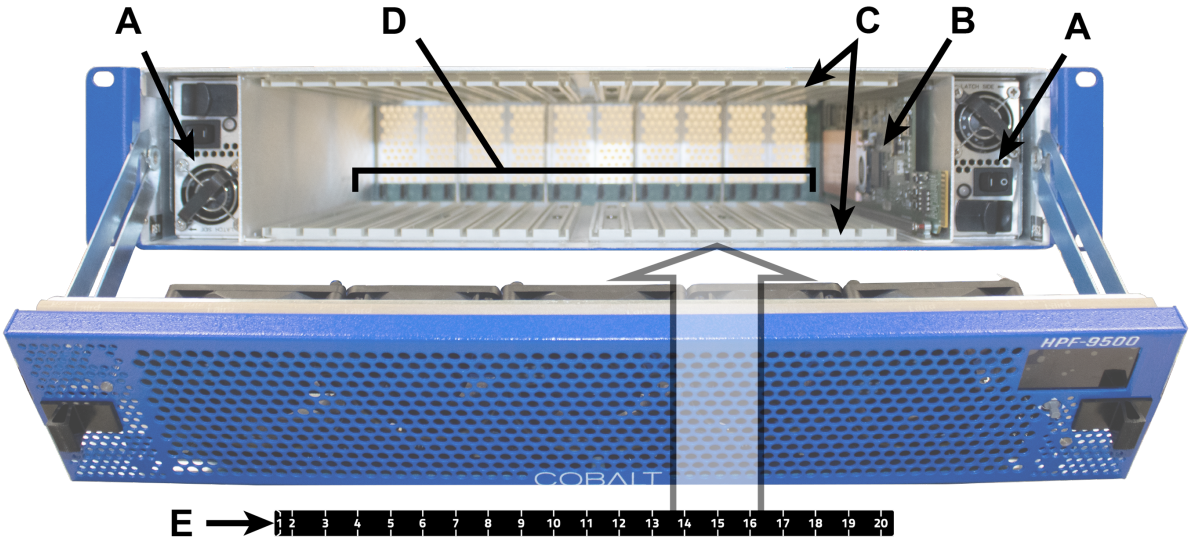
Inside the frame, slots and card receivers must be clean and free of obstruction to allow installation of Rear I/O modules on the rear panel of the frame and cards inside the frame.

CAUTION! Make sure cards and Rear I/O modules are not damaged before installation, due to tight mechanical tolerances in connections. If card connectors are damaged, do not install the card in a frame. If Rear I/O card receiver connectors are damaged, do not install the Rear I/O in a frame. Contact Cobalt support if damage is found.

CAUTION! Always ground yourself before handling cards or Rear I/O modules. Prevent ESD (electrostatic discharge into circuits) by holding a device by the long edges without touching components or exposed metal.

⚠ The fans on the frame door do not operate unless fully connected to frame power. An alarm may sound if the door is not completely latched. With some cards, continuous ventilation is required to prevent overheating.

Figure 10: Interior Features of the Frame

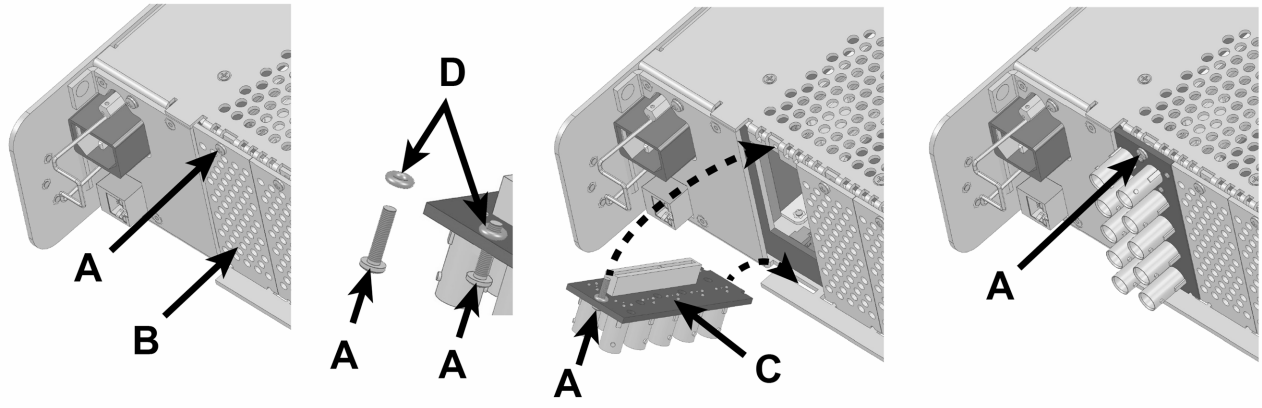


Inside the Frame

1. On the front of the frame, push in the left and right latch handles(Figure 10, Items A) toward the center of the door front and open the door.
2. Pull the door out on its slotted retainers and let the door lay open on its hinge.
3. Look into the frame to make sure card receivers (Figure 10, Items C) and slots (Figure 10, Items B) are clean and free of defects. Make sure components of any previously installed Rear I/O or card does not block frame slots.
4. Refer to the slot guide (Figure 10, Item D) inside the frame door for the numbers marked on the slots. Choose card slots appropriate for the card in the frame.
5. After installation of a card or cards, lift and push the frame door back onto the frame until both door latches secure the door on the frame, connecting power to the front LCD and the door fans.

Install a Rear I/O Module on the Rear Panel

Figure 11: Rear I/O on the Rear Panel



⚠ A card with an attached daughter card or cooling devices takes several frame slots. These double-wide cards must be installed in an odd-numbered (1, 3, 5, etc.) frame slot to allow space for other cards in the frame.

1. Where installed, loosen the retainer Phillips head screw (Figure 11, Item A) in a cover plate (Figure 11, Item B) on the rear of the frame.
2. Remove and retain the cover plate from the frame.

⚠ Some modules with SFP (Small Form-factor Pluggable) fiber module ports may be difficult to install in the frame. To allow clearance, move the capturing washer (Figure 11, Item D) out on the screw (Figure 11, Item A) before installing a module.

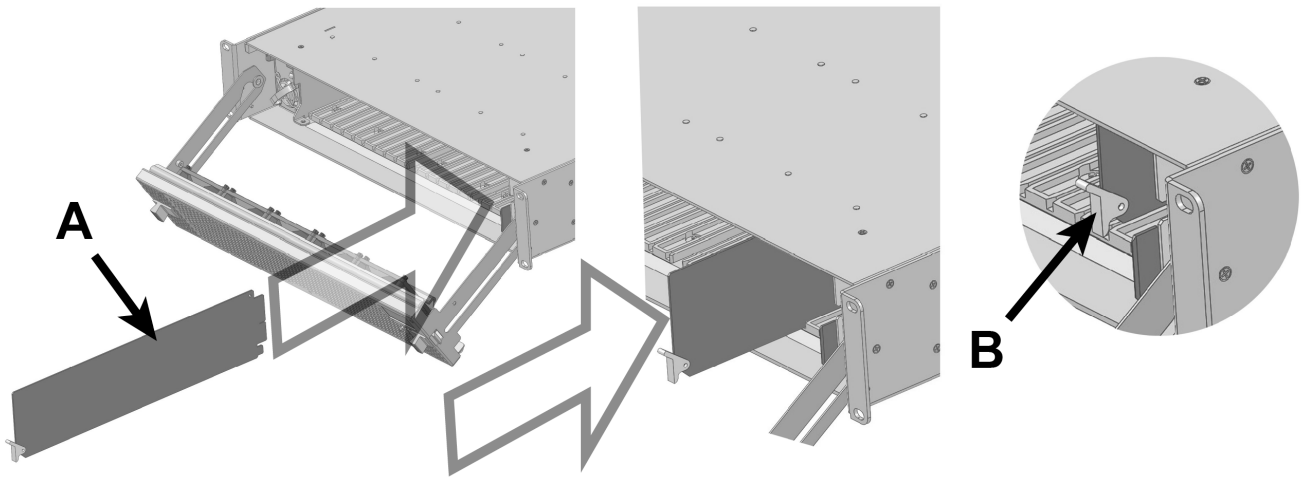
3. With the BNC or other cable connectors of the module facing out from the frame, insert the lower key tab of the Rear I/O module (Figure 11, Item C) in a lower slot on the frame.

⚠ Do NOT force a Rear I/O screw into the frame if there is resistance.
Cross threading a screw in the hole may cause the frame to be damaged beyond repair.
Remove the screw and restart it in the frame.

4. Tighten the captive Phillips head screw (Figure 11, Item A) at the top of the module into the threaded hole in the frame.

Insert a Card into the Frame

Figure 12: Installing a Card in the Frame



1. Where the Rear I/O is installed, insert the card (Figure 12, Item A) into the chosen upper and lower slots in the frame.
2. Press the card in the frame slot to connect the card to the frame and Rear I/O card receivers. Tight machine tolerances are sustained to provide a reliable electrical connection, so fully seating the card in the frame and Rear I/O card receivers may be difficult.
3. Lift and push the frame door back onto the frame until both door latches secure the door.
4. Use a user interface to make sure the card communicates with the frame and local network.

5. When needed, pull down the top edge of the white ejector tab (Figure 12, Item B) to pull the card from the Rear I/O module.

If there is NOT communication and control of a card, remove the card from the frame. Examine the card edge and the card receiver in the frame for possible damage. Replace the card in the frame and make sure the card is fully seated in the frame.
If there is NOT communication, insert the card in another slot, or into another frame. Contact Cobalt support if damage is found.

Remote Control of a Frame

The frame may be accessed, monitored, and operated by remote control using a computer connected to the same network as the frame. There are options for remote control of the frame, such as DashBoard, an embedded Cobalt user interface in the frame controller card, or an SNMP software option. Features vary among frames and interfaces.

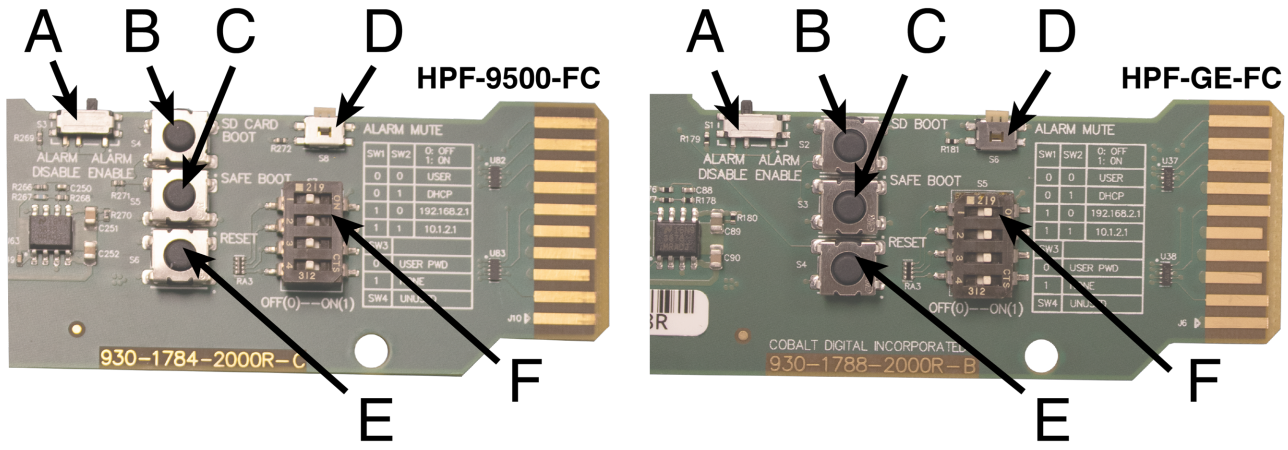
Operating Instructions

Frame Control Card Operation

The controls on the frame control cards (HPF-9500-FC and HPF-GE-FC) are rarely needed. These controls operate the same on the standard card (HPF-9500-FC) and the Gigabit Ethernet capable card (HPF-GE-FC).

⚠ Do not press buttons or change DIP switches positions elsewhere on the card.
The other buttons and DIP switches support only manufacturing and quality control in card production.

Figure 13: Frame Control Card Controls



ALARM

This switch (Figure 13, Item A) enables or disables the card in sounding an alarm condition.

An alarm sounds from the frame controller card when there is a fault in frame operation and the ALARM switch is in the ENABLE position.
No alarm will sound from the card when the switch is in the DISABLE position.
Press the MUTE button on the controller card to stop an alarm for 120 seconds.
Standard alarm conditions are the open frame door, fan failure, and power supply failure.
Alarm conditions may be set in a user interface.

These conditions may cause an alarm:

Open frame door: The sensor enables the alarm, if the door connection is not complete, The door needs to be fully connected to operate ventilation of the frame. Some cards need full ventilation when they operate due to high-demand processors. Open and shut the door to make sure the connection is secure.

Fan failure: Make sure which fan is not rotating. Clear debris and dust from all fans. Shut the door.
If this does not restore fan operation and silence the alarm, disable the alarm temporarily.
Replace the individual fan or the whole door.

Power supply failure: Make sure the LED on the power supply is powered ON and that the power supply fan is operating. If the LED and fan do not operate, swap power supplies.

If an alarm condition persists, contact Cobalt support.

SD CARD BOOT

This button is rarely used. The SD CARD BOOT button (Figure 13, Item B) supports factory installation of the operating system for the frame control card. The button must be held down while the SD card is inserted into the card holder. An SD card is not available for field operation of a frame.

SAFE BOOT

This button is rarely used. The SAFE BOOT button (Figure13, Item C) supports loading a firmware image previously saved in the controller card memory. If the button is held down while the frame is powered ON, the card will load a saved factory image. This is a safety feature to recover from loading faulty firmware.

ALARM MUTE

The ALARM MUTE button (Figure 13, Item D) silences the card from sounding an alarm for 120 seconds during an alarm condition. Muting the alarm may allow time for the alarm condition to be corrected.

RESET

This button is rarely used. The RESET button (Figure 13, Item E) reboots the frame, reloading the operating system for the control card.

DIP SWITCHES

The DIP switches near the front edge of the frame controller card forces (Figure 13, Item F) an IP Address for the card and frame or sets a password limitation on the card. A small graphic on each card describes options for DIP switches positions.

IP Address Setting

Once the frame is installed and setup, rarely do these DIP switches need to be changed. Select either the DHCP or User option using DIP switches 1 and 2. Make sure of your local network policy for addresses before changing these DIP switches. The DHCP setting is usually used for automatic, rapid connection to a large network when the network is supported by a DHCP server.

Table 5: IP Address DIP Switches Positions

DIP Switch 1	DIP Switch 2	0: OFF, 1:ON
0	0	User
0	1	DHCP
1	0	192.168.2.1
1	1	10.1.2.1

Password Setting

The standard approach is to put DIP switch 3 in the (1) ON position for no password.
The password option is rarely used but is available for security purposes. In a user interface (DashBoard or Cobalt), under the Network Tab, three fields show under Connection Management for Password settings. The Master Password has no effect unless a character string is entered in place of the placeholder (eight asterisks) character string. In either DIP switch position, this section is visible in a controller card user interface.

Figure 14: Connection Management Fields in DashBoard and Cobalt Interfaces

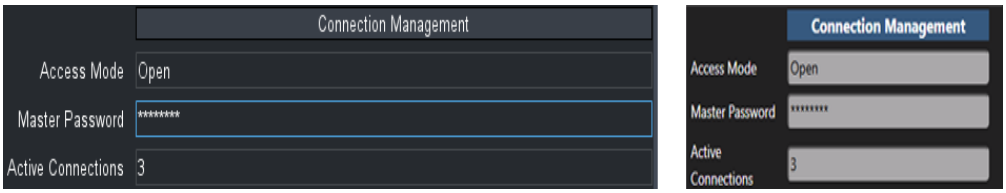


Table 6: Password Protection

DIP Switch 3	0: OFF, 1:ON
0	User Password
1	None (no password)

⚠ Currently, DIP switch 4 is not used. It does not control a card function.

Frame Controller Card LEDs

LEDs illuminate on the frame controller card during operation. Sometimes the LEDs are visible through the ventilation holes in the front of the frame.

Figure 15: Frame Control Card LEDs

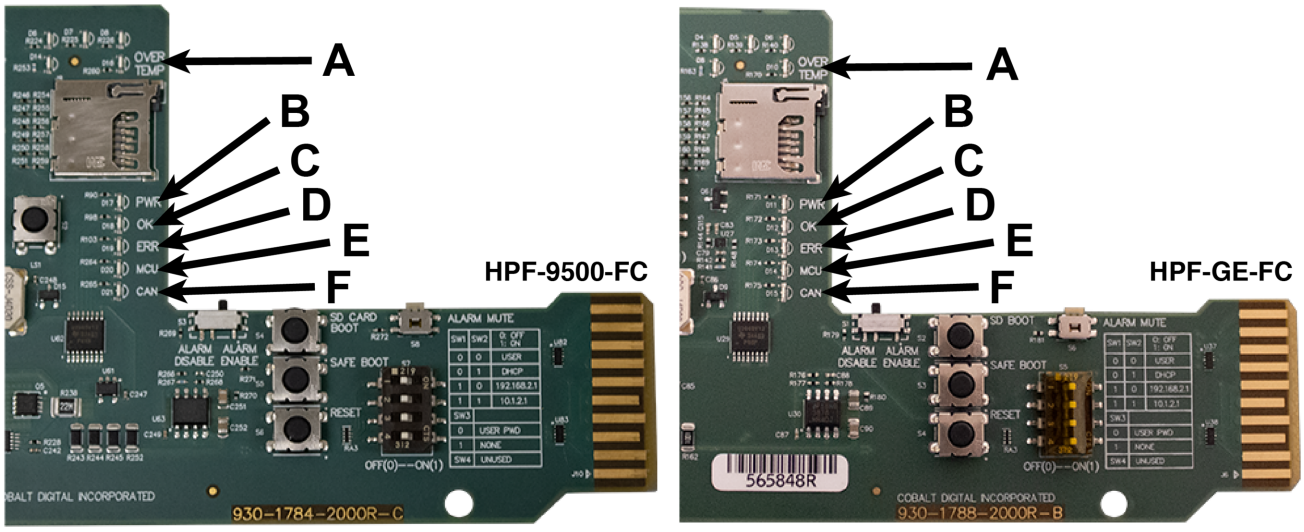


Table 7: Controller Card LED Messaging

LED position	Labels	Color	Message
A (top, above SD Card input)	OVER TEMP	Red	Frame is near over temperature shutdown.
B	PWR	Green	Power is supplied to the card.
C	OK	Green	When lit, controller card has no detected errors and is receiving power properly.
D	ERR	Red	When lit, indicates an alarm condition is occurring on a card within the frame.
E	MCU	Blue	Main controller unit (MCU) status indicator normal status is blinking.
F (bottom)	CAN	Blue	CAN bus activity indicator. When lit, the controller card is transmitting messages on the internal communications bus.

Frame Door Fan Speed

After the frame door is opened and shut, the fans accelerate momentarily to cool interior electronics, then the speed settles down to the speed set in the frame controller card. Refer to frame fan control options in remote control software. For example, DashBoard offers two frame fan speed settings, Auto or Max.

Update Cobalt Firmware

On occasion, a firmware release is made to add features or to apply improvements.
Firmware may be downloaded from the web and loaded into a connected frame.

1. View the installed firmware version for a frame and installed cards using the DashBoard interface connected to the frame.
2. Current Cobalt firmware is available on the Cobalt website. In a web browser, go to https://www.cobaltdigital.com/support/firmware
3. Search the list for the current firmware for the Cobalt product.
4. Click on the firmware link for the product.
5. In a dialog window, select a location to save the file, and click OK.
6. Upload the file to the connected Cobalt product using the DashBoard interface.
7. Reboot the Cobalt product to apply a firmware update.

Troubleshooting

The table below provides frame and remote control troubleshooting information. If cards in the frame or remote connections exhibit listed symptoms here are some possible solutions. If an alert message shows on the remote control interface, it may be disabled using an interface drop-down menu.

Table 8: Symptoms, Errors, and Corrective Action

Symptom	Error	Corrective Action
Remote control interface does not show or control a frame or card in a frame	Communication	Make sure cables are connected Make sure frame IP Address is correct Make sure DHCP server is operating if DHCP chosen Reboot the frame Use an alternate control interface to see the frame Move card to another card slot without a Rear I/O Move card to another frame
Intermittent frame or card failure	Damage	Make sure frame and card external connections are secure Make sure frame control card and power supplies are fully seated in the frame Make sure card is fully seated in the Rear I/O Replace damaged parts (contact Cobalt support)
Signals input to a frame or card do not result in expected output	Communication	Make sure cards and frame power supply are fully seated Make sure frame and card connections are secure Make sure Rear I/O connections are correct and secure
Audible alarm	Door is open, fan failure, or power supply failure	Clean fan or replace faulty door, fan, or power supply (contact Cobalt support)
LCD screen shows odd images	Connection	Open and shut the frame door to improve connection between the controller card and the LCD screen
LCD screen failure	Damage	Any pressure on the screen may damage the screen beyond repair, requiring replacement (contact Cobalt support)
HPF-GE-FC controller card fan noise	Damage	Excessive noise may show impending fan failure, Replace frame controller card

If these or other issues arise in the installation, setup, or operation of this device:

Generate a system log file with remote control interface to capture system data

Send an email to support@cobaltdigital.com, call 1-217-344-1243, or call Toll Free in the USA 1-800-669-1691.

HPF-9500 Available Parts

HPF-9500-FC Network Controller Card

This network controller card allows multiple connection network control through DashBoard software or Cobalt OGCP-9000 Remote Control Panel.

HPF-9500-FC Network Controller Card with SNMP

This network controller card allows multiple connection network control through DashBoard software or Cobalt OGCP-9000 Remote Control Panel. The network controller card has SNMP (Simple Network Management Protocol), providing a standardized framework for monitoring and managing network devices. The SNMP option supports the SNMP v1|v2, and requires an SNMP manager software on a network connected to the frame. SNMP is a software option that may be purchased before or after frame delivery. SNMP software may be applied to the controller card in the field. Product name SNMP-HPF-FC provides SNMP (v1 and v2) control and monitoring for the HPF-9000-FC Network Controller Card.

HPF-GE-FC Network Controller Card

This advanced network controller card provides gigabit switch connections to all frame slots in the frame.

HPF-GES-FC Network Controller Card with SNMP

This advanced network controller card provides gigabit switch connections to all frame slots in the frame. The network controller card has SNMP (Simple Network Management Protocol) providing a standardized framework for monitoring and managing network devices. The SNMP option supports the SNMP v1|v2, and requires an SNMP manager software on a network connected to the frame. SNMP can be used in parallel with the DashBoard and Cobalt frame controller web interfaces. The SNMP option supports the SNMP v1|v2 and requires an SNMP manager software on a network connected to the frame. SNMP is a software option that may be purchased before or after frame delivery. SNMP software may be applied to the controller card in the field. Product name HPF-GES-FC provides SNMP (v1 and v2) control and monitoring for the Network Controller Card.

PS-9000 Power Supply

This 360 watt power supply has a power cord suitable for the installation region. This power supply for the HPF-9500 frame was also used in the Cobalt HPF-9000 frame.

9000-FSB-S Frame Support Bracket Kit

These 16.5 inch rails support 1RU rear rack mounting for a Cobalt HPF-9000, HPF-9500, or HPF-MAX 20-Slot Frame. The short (9000-FSB-S) option is for racks that are 18—26 inches deep.

9000-FSB-L Frame Support Bracket Kit

These 21.5 inch rails support 1RU rear rack mounting for a Cobalt HPF-9000, HPF-9500, or HPF-MAX 20-Slot Frame. The long (9000-FSB-L) option is for racks that are 26—32 inches deep.

Medium Fan HPF-9500 Door

On the HPF-9500 door, two fans are smaller than three other fans.

Large Fan HPF-9500 Door

On the HPF-9500 door, three fans are larger than the other two fans.

HPF-9500-Front-Door-Panel

Frame door including three large fans, two medium fans, and two light pipes to convey power supply LED illumination to the front of the frame door.

HPF-9500-Frame-OM_v1.0

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