HPF-9000 • High-Power 20-Slot openGear® Frame

The **HPF-9000** is a 2RU high-density openGear® compatible modular frame offering 360 Watts of net (user) available power in a high-capacity 20-slot format. It uses the same form factor and DashBoard™ remote control as our other 20-slot frames and supports all openGear compatible cards and rear I/O modules, but offers significantly more available user power (3x the available user power of the 8321 frame). This makes the HPF-9000 perfectly suited for high-density utilization.

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). Separate forced-air cooling paths are provided for the card area and the power supply areas. An intelligent fan controller adjusts fan speed with changes in power supply loading and temperature.

The HPF-9000 uses the same rear I/O modules as our current 20-slot frames, allowing a seamless transition from a current 20-slot frame to the HPF-9000. These rear modules offer a broad selection for a flexible and wide array of interfaces such as BNC, twisted-pair audio, and fiber. Special high-density/high-ventilation rear I/O modules offer even greater packaging density when used with compatible Cobalt® cards.

The HPF-9000 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 contains an independent cooling fan, status LED, and a front-mounted power switch. A Network Controller Card (furnished as standard on the HPF-9000 frame) allows Ethernet connectivity to any number of connections for full multi-point control and monitoring via free DashBoard™ software. Optional SNMP support, for large scale monitoring implementation, is also available.

FEATURES

- High-power with 360 Watts available net – 3x the available power of previous 20-slot frames
- Full openGear® compatibility supporting openGear-compatible cards as well as latest and legacy 20-slot frame openGear rear modules
- Two independent looping references internally routed to all user card slots
- Power supply is hot-swappable for 24/7 operation
- Power switch/supplies accessible from the front of the frame
- Separate power cords to each power supply for power redundancy
- Network Controller Card enables multiple copies of DashBoard™ for seamless remote setup, monitoring, and control. SNMP option can further be added.
- Fan status and error indicator LEDs on front of the frame
- Hinged, pull-away front door panel lowers to allow quick, easy card insertion
- Optional Frame Support Bracket kit provides frame rear support for mobile applications
- Remote control/monitoring via Ethernet using free DashBoard™ software, or optional OGCP-9000 remote control panel
- Five year warranty

ORDERING INFORMATION

HPF-9000-CN High-Power 20-Slot Frame - 2RU with fans, cover plates for unused slots. Includes one PS-9000 Power Supply Module and Network Controller Card. (Network Controller Card allows multiple connection network control through DashBoard™ software or Cobalt OGCP-9000 Remote Control Panel.)

HPF-9000-NS High-Power 20-Slot openGear® Frame - 2RU with fans, cover plates for unused slots. Includes one PS-9000 Power Supply Module and HPF-FC Network Controller Card with SNMP. (Network Controller Card allows multiple connection network control through DashBoard™ software or Cobalt OGCP-9000 Remote Control Panel.)

PS-9000 Extra (redundant) HPF-9000 frame power supply

9000-FSB Frame support bracket kit (supports rear of frame to rear frame rails)

Note: Maximum cooling performance is obtained when a 1RU space is provided above the frame. Optional high-ventilation rear modules are available to increase airflow where above-frame cooling space is compromised. Please contact Cobalt Sales for more information regarding frame build-out where ventilation is less than optimal.

SPECIFICATIONS

AC Line Input
(per each of 2 (max) AC IEC inputs) 100-240 VAC, 48-63 Hz, 500 Watts maximum

Available User Card Slots
20 maximum

Available User (Net) Power
360 Watts continuous-operation maximum

Frame Communication
100/1000 Mbps Ethernet with Auto-MDIX

Reference Video Input
Two non-terminating (looping) Frame Reference inputs

Dimensions (WxHxD)
19" x 3.5" (2RU) x 17" (48 cm x 9 cm x 43 cm)
(Dimensions include any component projections such as mounting tabs, etc.)

Weight (with single standard power supply PS-9000)
13.9 lbs (6.3 kg)

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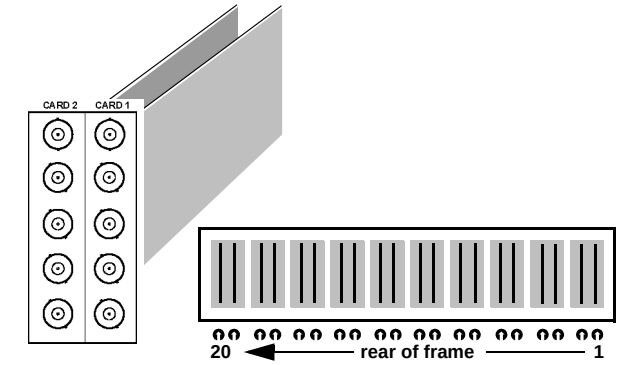
HPF-9000 Frame Card Capacity and Rear Modules

Frame card capacity is largely determined by the rear modules that mate a card with its rear panel user connections. For example, when using "split" rear modules, the card capacity in the 20-slot openGear®-compliant 2RU frame is greater than previously possible. 20-slot frames can be fitted with any mix of the rear module types described here, offering connection break-out that suits your requirements while maximizing frame capacity.

Split Rear Module



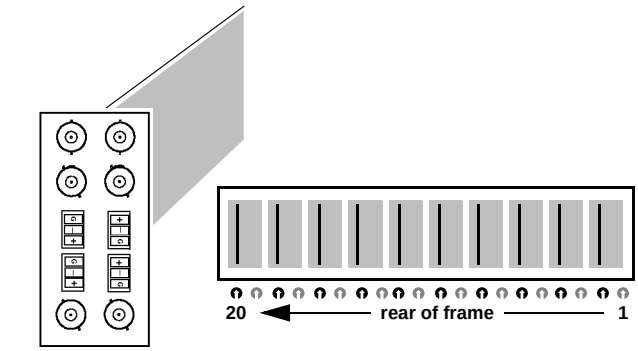
2 cards per rear module
2 card slots used

20 cards per frame (max)
10 rear modules per frame (max)

Split Rear Module occupies 2 card slots, but also accommodates 2 card in adjacent slots. In this manner, for a frame fitted entirely with split rear modules, the maximum 20-card frame capacity can be achieved.

Notes:
- Split rear modules are available only for certain Cobalt cards. Consult our catalog, card Product Manual, or our website for availability of rear modules for particular cards.
- Split rear modules may not in all cases support the maximum number of connections offered by a card. (For example, a 9323 card fitted with a split rear module offers two AES ports vs. four available when using a standard rear module.) Some cards are available with split rear modules using high-density HD-BNC or DIN 1.0/2.3 connectors which allow more connections than with BNC connectors.
- In all cases, 360 W maximum frame power budget for user slot total must be considered when planning frame build-out. If necessary, consult Cobalt Sales for assistance in power planning.

Standard-Width Rear Module



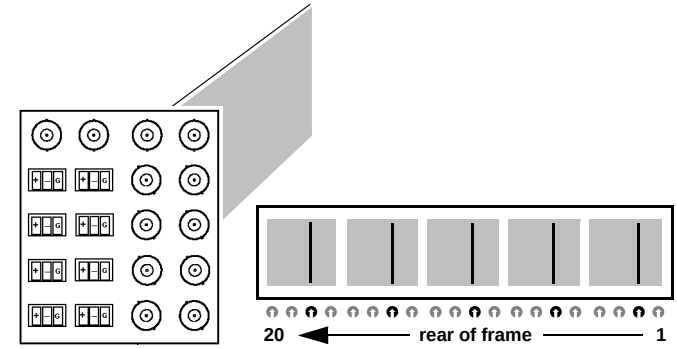
1 card per rear module
2 card slots used

10 cards per frame (max)
10 rear modules per frame (max)

Standard-Width Rear Module occupies 2 card slots and can accommodate BNC and wired connections such as balanced audio and GPIO connections. Standard-width rear modules are available for all Cobalt cards, and offer a wide variety of signals accommodation choices in the smallest space.

Notes:
- Not all slots can be fitted with cards when using a standard-width rear module (for example, when a standard-width module is fitted in the right-most frame position (viewed from rear), first available slot is slot 2, with slot 1 not being available). **Standard-width rear modules fit even slots unless noted otherwise.**
- In all cases, 360 W maximum frame power budget for user slot total must be considered when planning frame build-out. If necessary, consult Cobalt Sales for assistance in power planning.

Double-Width Rear Module



1 card per rear module
4 card slots used

5 cards per frame (max)
5 rear modules per frame (max)

Double-Width Rear Module occupies 4 card slots and can accommodate a very high degree of signal count and types, including multiple BNC and wired connections such as balanced audio and GPIO connections.

Notes:
- Not all slots can be fitted with cards when using a double-width rear module (for example, when a double-width module is fitted in the right-most frame position (viewed from rear), first available slot is slot 2, with slot 1 not being available). **Double-width rear modules fit even slots unless noted otherwise.**
- In all cases, 360 W maximum frame power budget for user slot total must be considered when planning frame build-out. If necessary, consult Cobalt Sales for assistance in power planning.

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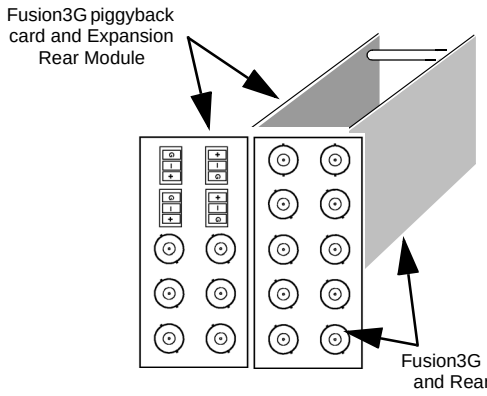
Expansion Rear Module

(Fusion3G® only)



An Expansion Rear Module is used in conjunction with a Fusion3G® card equipped to provide optional connections such as analog audio I/O (which is in turn provided by an Expansion piggyback card factory-installed on the base card when this option is ordered). Expansion Rear Modules are identified with "X" in the part number and must be used in conjunction with a Base Rear Module.

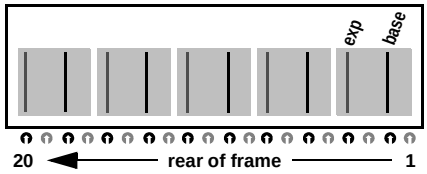
The expansion rear module installs directly to the left of the base Rear Module (as shown viewed from rear), and interfaces with the piggyback card. Base rear modules fit even slots, with expansion rear module fitting in next even slot to the left unless noted otherwise (e.g., base in slot 2; expansion in slot 4).

The Fusion3G® base/piggyback card assembly occupies the space identical to that of two regular Fusion3G® cards using two standard-width rear modules.

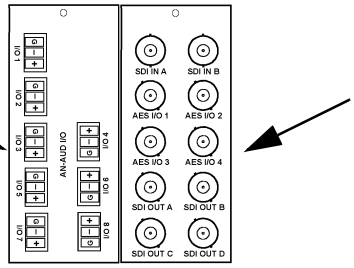
Note: In all cases, 360 W maximum frame power budget for user slot total must be considered when planning frame build-out. If necessary, consult Cobalt Sales for assistance in power planning.

1 card assembly per base/expansion rear module combination
4 card slots used

→ **5** card assemblies per frame (max)
5 base/expansion rear modules per frame (max)

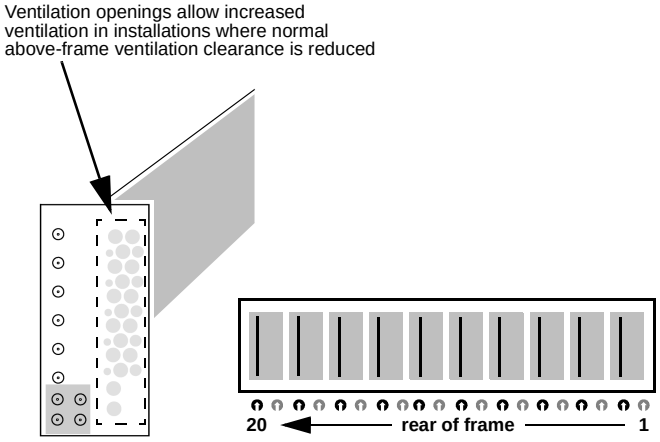


Expansion Rear Module installs directly to the left of base Rear Module, and interfaces with the piggyback card. In this example, an RM20-9901-XC expansion rear module breaks out analog audio connections provided by Option +ANA (analog audio option).



RM20-9901-B Rear Module provides connection break-out for base card functions.

High-Ventilation Rear Module



1 card per rear module
2 card slots used

→ **10** cards per frame (max)
10 rear modules per frame (max)

High Ventilation (HV) Rear Module occupies 2 card slots and offers coaxial connections using miniaturized connectors (HDBNC or DIN 1.0/2.3). These rear modules have openings to increase ventilation where the normal recommended above-frame ventilation space (1 RU) cannot be accommodated.

Notes:
- HV (high-ventilation) rear modules are available only for certain Cobalt cards. Consult our catalog, card Product Manual, or our website for availability of high-ventilation rear modules for particular cards. **This rear module fits even slots unless noted otherwise.**
- (Fusion3G® only) Where a base HV rear module is to be used in conjunction with an expansion rear module, **a companion HV expansion rear module must also be used**. Both base and expansion HV rear modules use card positioning that optimizes air flow across the component surface of the card PCB. Also note that when using an expansion rear module, frame capacity then follows the form as specified in "Expansion Rear Module" above.
- In all cases, 360 W maximum frame power budget for user slot total must be considered when planning frame build-out. If necessary, consult Cobalt Sales for assistance in power planning.

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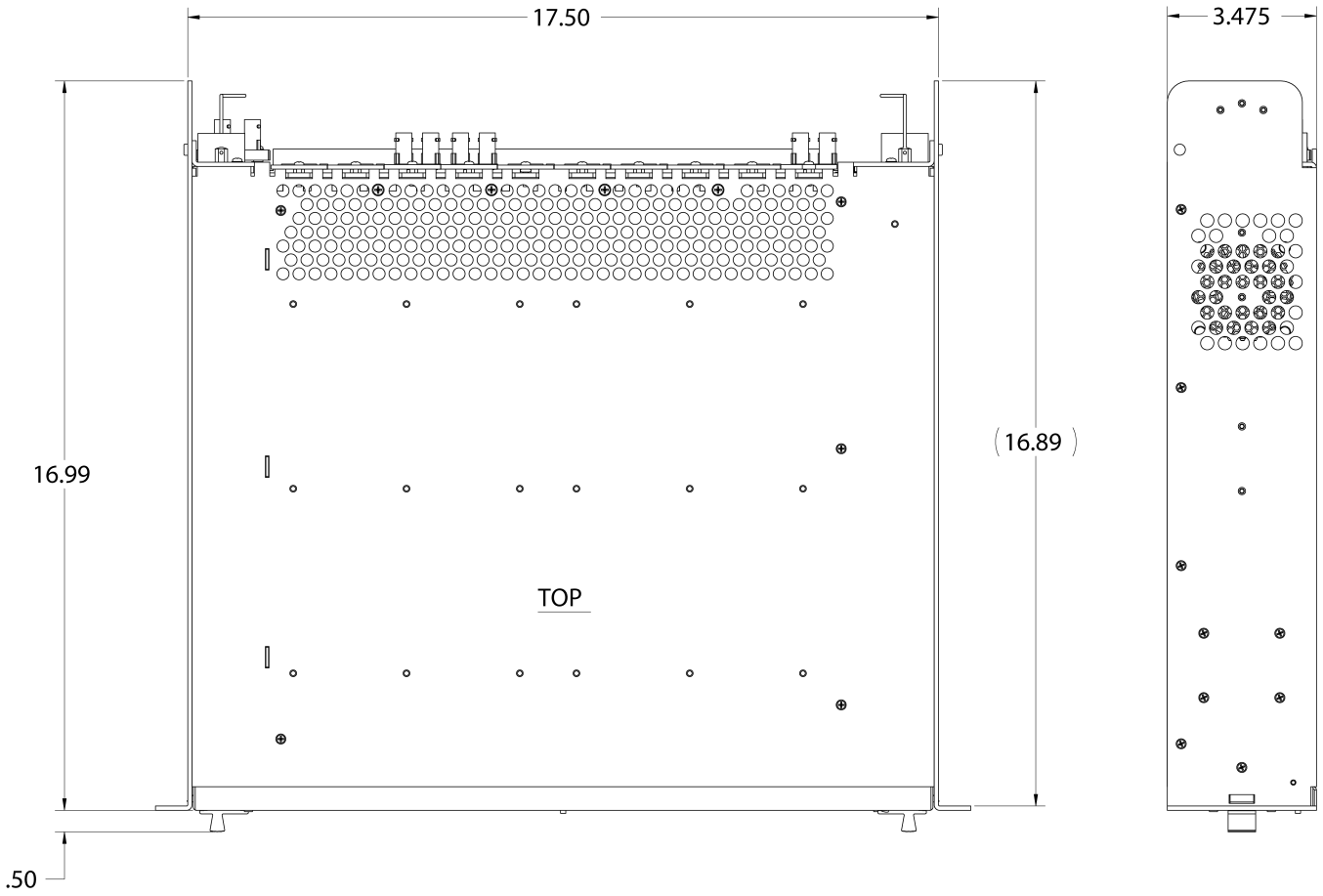

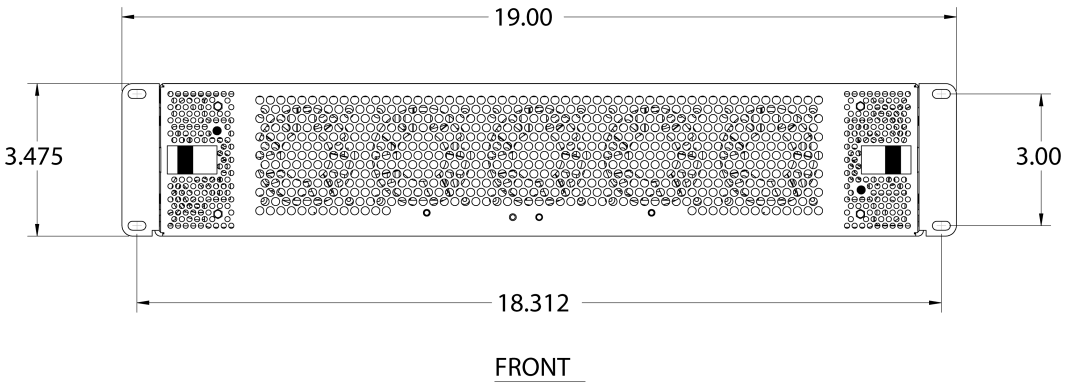

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