



HoneyBadger

Video/Audio/Intercom/Data Extension Platform

USER MANUAL



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Document Revisions

Revision	Description	Date	Author
A	Initial	10/23/2023	SDP

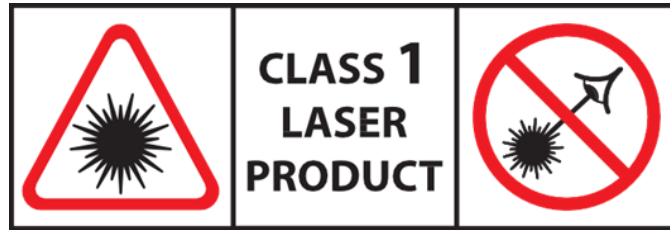
Safety Info

- Do not use this apparatus near water.
- Clean only with lint free dry cloth.
- Do not block any ventilation openings.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purposes of the grounding- type plug. A ground type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit in to your outlet, consult an electrician for replacement of the obsolete outlet.
- Install in accordance with the MultiDyne® installation instructions.
- Install all peripheral equipment (cameras, routers, etc.) in accordance with the manufacturer's instructions and safety requirements.
- Protect the power cord from being walked on or pinching particularly at plugs, convenience receptacles, and point where they exit from the apparatus.
- Only use attachments/accessories specified by MultiDyne®.
- Use only with the cart, rack, stand, tripod, bracket, or table specified by MultiDyne®, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- Follow all local Electrical Codes for Grounding, Lightning Arrestment and Surge Protection. Unplug this apparatus during lightning storms or when unused for extended periods of time.
- All Electrical Work to the facility must be performed by a qualified Licensed Electrician. All local Electrical Codes must be followed and, if necessary, must be inspected by a Local or State Inspector.
- All servicing of MultiDyne equipment must be performed at the factory by a MultiDyne trained service technician or engineer.
- Throughout this manual, several Warnings and Cautions and Notes may be presented to alert the user to important safety or operating information.
- Always adhere to local building, safety and fire prevention codes during the installation and operation of this product.
- Use only power cords that were shipped with specified for this product and certified for the country of use.
- Connect the unit only to a power source with the specified voltage rating.
- Unless otherwise stated in the Installation Instructions, and in adherence to local Electrical Codes, MultiDyne® Equipment should only be plugged into a standard 15-amp dedicated circuit.

	Warning –indicate danger that requires proper procedures or practices to prevent injury or death to personnel.
	Cautions indicate proper procedures or practices to prevent damage to equipment or property.
	Warning –The safe operation of this product requires that a protective earth connection be provided. A grounding conductor in the equipment's mains supply cord provides this protective earth. To reduce the risk of electrical shock to the operator and service personnel, this ground conductor must be connected to an earthed ground. The mains plug shall remain readily operable.
	Warning –The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.
	Warning - This symbol on the equipment indicates for use at altitudes not exceeding 2000 m.
	Warning - Contact your local authority for further details on the correct disposal of this waste, in accordance with your national legislation.

Laser Safety Information

This unit is classified as a CLASS 1 LASER PRODUCT according to EN60825-1 (EU) and FDA 21CFR 1040.10 (USA). Class 1 laser products are considered safe and do not result in biological hazard if used according to these instructions.



	Warning – Use of controls, adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.
	Warning – Never look directly into the end of the optical fiber while either end of the system is operating.
	Warning – Never clean an optical fiber connector on equipment or cable that is carrying light.
	Warning – Always use dust caps on fiber optic connectors when cables are not connected. This will protect the connector from damage and accidental exposure of a human eye to an operating laser.

1. Overview

The HoneyBadger (HB) is a multi-format transceiver that multiplexes a wide collection of broadcast signal types onto 2 fibers. This includes SDI, analog and intercom audio, Gigabit Ethernet, Genlock (sync), serial data (RS-232/422/485) and GPIO. This is all accomplished with a 4RU local box and a 5RU remote unit.

Video

There are 8 transmit and 8 receive (8x8) SDI signal paths available. For HD applications, the **3G** model supports SD/HD/3G-SDI. The HB can also support single-link 4K UHD with the **12G** model, which covers all SDI rates from SD- to 12G-SDI.

Audio

There are 8 transmit and 8 receive (8x8) balanced audio paths, with mic-level gain and phantom power available on the 5RU end.

Intercom

Connect up to 4 RTS® or Clear-Com® intercoms with wet or dry power.

Ethernet

Two, fully independent 1GbE ports

Data/Tally/GPIO

Two RS-232/422/485 data paths, 2 GPIO, and 2 Tallies on multi-pin Phoenix connectors for easy termination

Sync

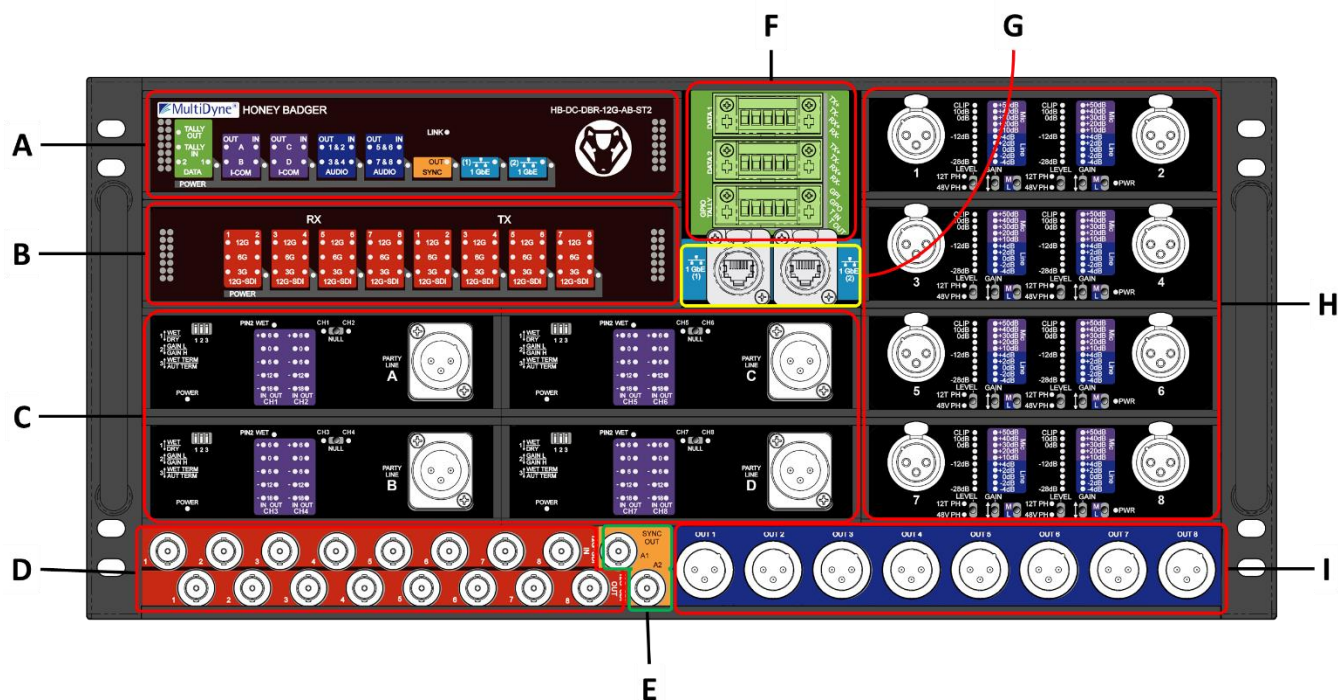
Bi-/Tri-level genlock

Key Features

- Wide complement of signal types multiplex onto only 2 fibers
- Optional Fiber I/O includes ST, LC, SC, Lemo, and Neutrik OpticalCon Duo
- Full-sized connectors for fast setup
- Dual AC power supplies are supported to prevent dropouts.
- Anton-Bauer or V-mount Battery plate for emergency backup power

2. Feature Descriptions

2.1. Front Panel HB-DC-DBR (5RU)



A. Status Indicators – Intercom, Ethernet, Sync, Data/Tally, Audio

a. Intercom & Audio

Each LED is shared between 2 audio channels. For example, for Intercom (I-COM) **IN “A”**, the LED will light when audio is detected on either channel 1 [CH1] or channel 2 [CH2].

b. Ethernet, Sync, and Data LEDs are lit when signal is detected. Detailed parameters are described below in their respective sections.

c. LINK – LED indicates unit fiber link is up and running with remote end.

B. Status Indicators – SDI

Relative to the input and output BNCs, the data rate is indicated for each associated channel (SMPTE rates only). For example, 1.5Gbps video will light the **HD** LED. Video going into the BNC is transmitted (TX) to the remote end. Video received (RX) from remote unit is output from BNC.

C. Intercoms

See [Section 3.1](#) for details on the level meters and operation of Intercom modules.

D. SDI I/O

IN 1–8 are transmitted to remote end.

OUT 1–8 are received from remote end.

E. Sync

Output from the Local end. The Sync Card can transport a video reference signal in formats that include NTSC, PAL, and HD Tri-Level. Only the sync portion of the signal is transported across a fiber link, all video and color information are stripped from the signal.

HD SYNC supported formats:

NTSC, PAL, 1080p30, 1080p29.97, 1080p25, 1080p24, 1080p23.98, 1080psf24, 1080psf23.98, 1080i60, 1080i59.94, 1080i50, 720p60, 720p59.94, 720p50, 1080p60, 1080p59.94, 1080p50

F. Data, GPIO, & Tally I/O

Data 1 and Data 2 each support one bi-directional Tally, one GPIO Bidirectional Channel, and two Data Channels transport up to 3Mbps. The LEDs in the front will turn on showing the data paths are active. The HoneyBadger is built with 422 selected as the default mode. RS-232 and RS-422 operate in full-duplex mode. RS-485 operates in half duplex and is available by [contacting](#) MultiDyne.

G. Ethernet

Each Ethernet port supports rates of 10/100/1000 Mbps. When a link is established between two units, the green LED on the front panel for respective channel will turn on. Then as each port senses data activity the LEDs will flicker.

H. MIC/Line Inputs 1–8

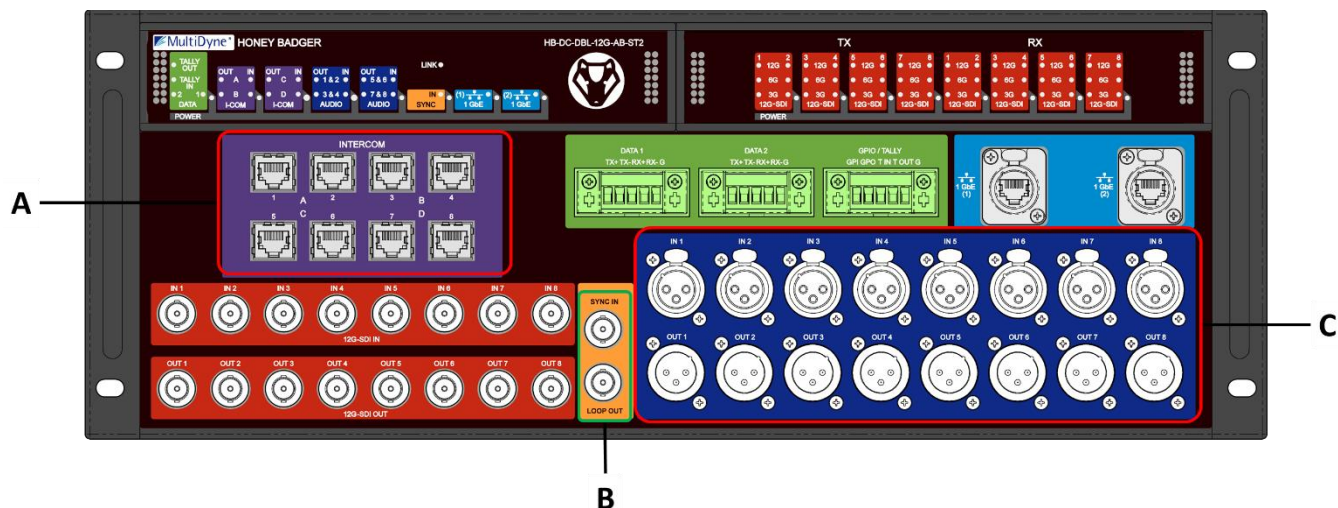
See [Section 3.2](#) for details on the MIC/Line Input operation and their indicators.

I. Audio Outputs 1–8

Industry standard, balanced XLR line-level audio output received from remote unit.

2.2. Front Panel HB-DC-DBL (4RU)

Since both boxes are mirror images of each other, only the differences from 5RU are shown here. See [Section 2.1](#) for full panel descriptions.



A. Intercom Matrix

Patch balanced audio to interface with Matrix frames. [Section 2.4.1](#) has detailed pinouts.

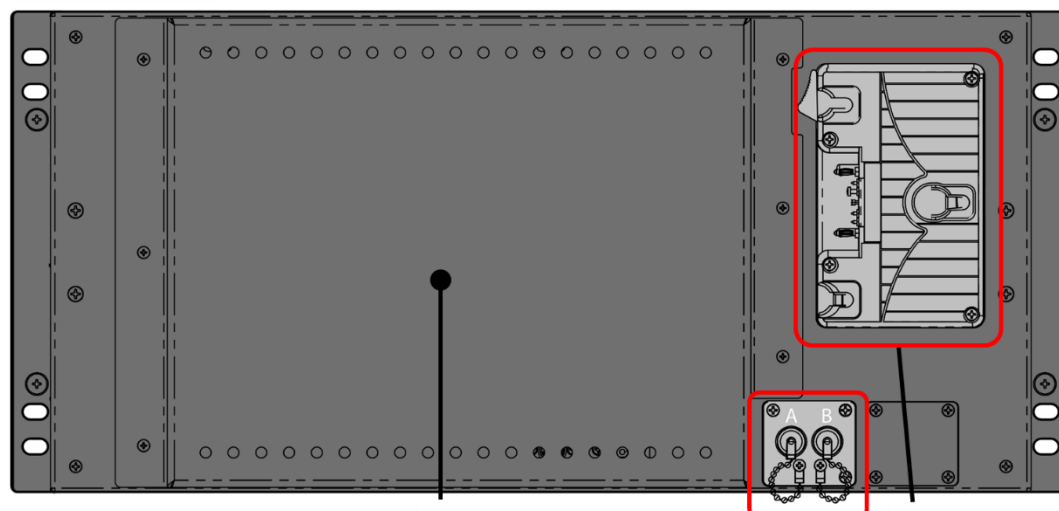
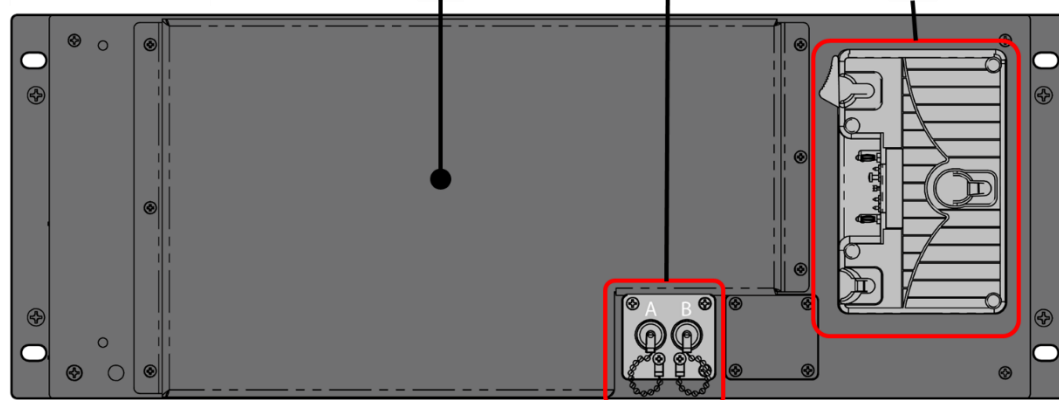
B. Sync

Input sent to remote end. Supported rates mentioned in [Section 2.1.E](#)

C. Audio I/O 1-8

Line-level balanced audio

2.3. Rear Panel (Both Models)

DBR (5RU)**DBL (4RU)****A. UFP**

Universal Fiber Plate for fiber I/O interface. Fiber options are chosen at time of order. See [Section 4.1](#) for all available fiber types.

B. AC Power supplies + cover

One power supply is installed by default. For redundancy in case of supply failure, a 2nd unit can be installed. See the [Accessories](#) section for part numbers.

C. Battery Plate

Battery support for emergency power backup. Battery options are chosen at time of order, **AB** for Anton Bauer and **V** for V-mount type.

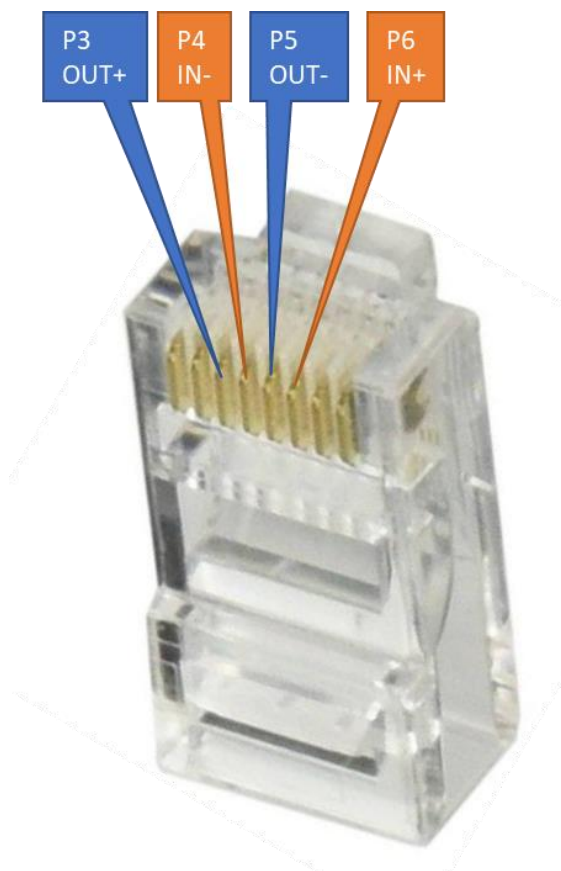
The 3G HB consumes around 5A @ 14.7V [no Intercom beltpacks]. Therefore a 140Wh battery, for example, should run the unit for a little less than 2 hours.

2.4. Pinouts

2.4.1. Intercom Matrix

Pin	Function
1	x
2	x
3	OUT+
4	IN-
5	OUT-
6	IN+
7	x
8	x

Diagram



2.4.2. Intercom

Pin	Function
1	Ground
2	Channel 1
3	Channel 2

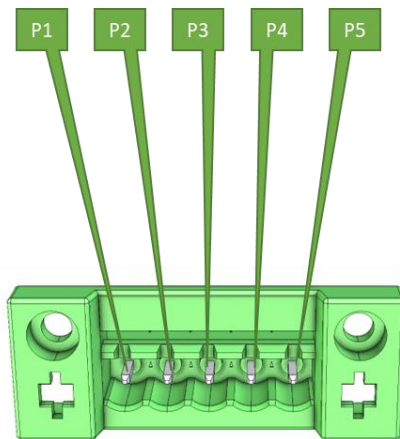


2.4.3. Data

[Contact](#) MultiDyne for running RS-232 or 485

Pin	Function
1	TX+ 422 Out
2	TX- 422 Out
3	RX+ 422 In
4	RX- 422 In
5	Ground

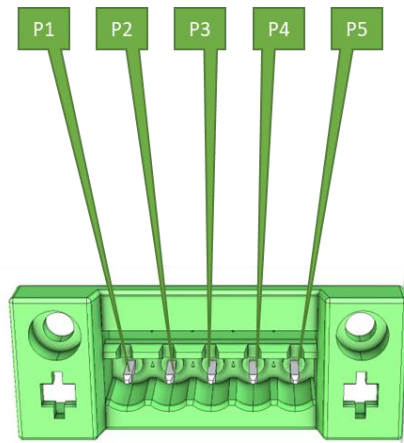
Diagram



2.4.4. GPIO & Tally

Pin	Function
1	GP Input
2	GP Output
3	Tally In
4	Tally Out
5	Ground

Diagram



2.4.5. Audio

Industry standard for XLR balanced audio

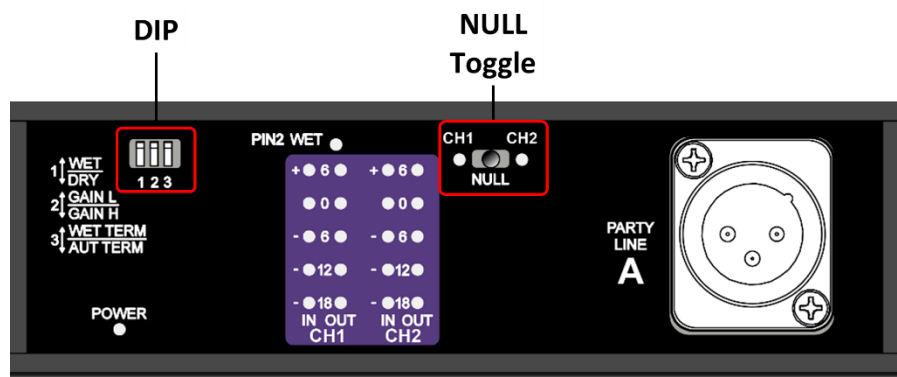
Pin	Function
1	Ground
2	Balanced Audio +
3	Balanced Audio -

3. Operation

3.1. Intercom (4x) [HB-DC-DBR Only]

The Intercom units provide a means to interface between two channels of 2-wire party-line intercom audio and two channels of 4-Wire analog line-level signals. The unit can perform auto-nulling for each channel with the push of a button. In addition, each of the 4-Wire input and output channel levels are monitored and displayed on front panel VU meters.

With the flip of a switch the unit can be a +28VDC party-line voltage power source while providing the 200-ohm intercom audio termination on both channels. If so desired, the party-line source and termination can be removed by just flipping the switch back. The unit can also be configured to work with either RTS party-line or Clear Com party-line equipment with the flip of a front panel control switch. This switch adjusts the output gain between the party line circuitry and the 4-wire line level circuitry depending on which type of units one is interfacing with.



DIP Switch	Off (Down)	On (Up)
1	DRY (No Power)	WET (+28V ON)
2	High Gain [RTS]	Low Gain [Clear-Com]
3	AUTO Terminate	WET Terminate

Switch 1

The Intercom can supply party-line power by moving the WET/DRY switch to the up position. With this function enabled, the unit will provide +28 VDC to pin 2 of the XLR connector of the party-line ports. When enabled, the CH1 WET LED will turn green. When selecting the WET mode, verify that the WET LED is green. If red, it means there is a short or overload on the party-line, or the wetting circuitry within the unit is defective. If the Intercom unit is to be connected to a party-line intercom system with an existing power source, then the internal power supply within the Intercom board should be turned off. This is accomplished by flipping the WET/DRY switch to DRY (down). When in DRY mode, the CH1 WET LED will go out. Pin 2 of the XLR connector will no longer provide +28VDC to the rest of the party-line.

Switch 2

Set to RTS or Clear-Com mode.

To be compatible with RTS units, push the GAIN L/GAIN H switch UP; to be compatible with Clear Com units push switch DOWN.

This switch adjusts the gain needed to interface between the 4-wire to 2-wire signals and it also adjusts the gain from the 2-wire to 4-wire signals. It increases the gain going from a Clear Com connected 2-wire unit to the 4-wire side of the interface to compensate for the lower 2-wire operating voltages of the Clear Com units as compared to RTS units. The RTS units operate at a higher voltage on the party-line side and thus require less gain when translating from 2-wire to 4-wire signals. When the signal originates from the 4-wire side and translates over to the 2-wire side the gains are opposite. Less gain is applied to a 4-wire input as it translates to the 2-wire side of the interface with when a Clear Com unit is present on the party-line connection as opposed to a RTS unit.

Switch 3

The Intercom can be set to the AUTOTERM mode by pushing the WET TERM/AUT TERM switch down. When this selection is chosen, the unit will look at both party-line channels to see if they contain the +28 VDC wetting voltage. For channel 1 the unit's internal circuitry will remove the internal 200-ohm terminating resistor if the unit is sourcing the +28 VDC or if it is externally wetted. For Ch2, it will remove the 200-ohm only if the channel is externally wetted. (Ch2 cannot be internally wetted). If the WET TERM is selected, then if the Intercom is providing the +28 VDC (WET/DRY switch set to WET), both channels will be terminated. If the Intercom is not providing the +28 VDC (WET/DRY switch set to DRY) then the terminations on both channels are removed.

NULL Toggle Switch (Ch1 & Ch2)

Auto nulling is done to achieve maximum return loss between the 4-wire input and the 4-wire output channels. Auto nulling can be and should be done whenever there's been changes made to the party-line connections.

To auto null Channel 1, slide the NULL switch to the left momentarily and release. Observe that the null CH1 status LED glows orange while the nulling process is taking place. The Intercom will also produce a 24khz Mic Kill tone. RTS compatible belt packs will respond to this tone and automatically kill the mic input. If you have another type of belt pack, be sure to turn off the mic input or the null will be poor. The process should last about 20 seconds after which time the LED will turn green if successful or red if a null was not able to be obtained. Wait for the auto nulling process to complete on one channel before attempting to do it on the other channel. Repeat these steps for nulling Channel 2 by momentarily sliding the switch to the right while observing the CH2 LED alongside it. During the auto nulling process there will be tones of 1kHz, 300Hz, 3kHz and 1kHz again on each of the party line channels.

After the nulling process is complete, you will need to re-enable your mic inputs. If two or more Intercom units are used as part of the 2-Wire system, they should be nulled to prevent an audio feedback path that may cause an audio oscillation. This is evidenced by the VU LEDs being maxed, as well as an audio squeal, howling or whistle. Once the units are nulled, this should go away. But it can also return if one of the belt packs or other loads are changed or disconnected from one or both ends. Then the oscillation will return since the load that the intercom has been nulled for is suddenly gone,

and the resulting lack audio return loss will result in feedback. Note that if the party line has been altered after a null has been done, the status LEDs will not update on their own. They do not monitor status on a continuous basis. They only reflect the result of the last nulling procedure, so it will be necessary to perform the nulling procedure again. This is commonplace in the industry, as it is impossible to measure the depth of the null on a continuous basis without asserting mic kill and injecting tones.

Level Meters

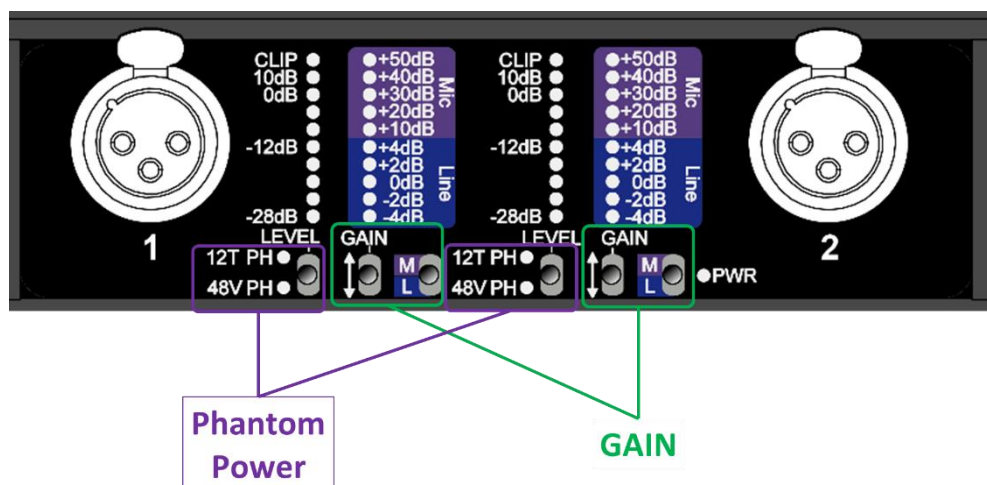
The Intercom unit contains four, 5-segment LED VU meters on the front panel. The first set displays the 4-wire input levels for Channel 1 as well as the 4-wire output levels for Channel 1. The second set of VU meters display the input and output levels associated with Channel 2. The nominal 4-wire input level for either version of Intercom is +4dBu which should correspond to the lower four LEDs for an input channel turning green with the top LED off (0 LED represents 4dBu). If the input is 6 dB or more over the nominal input value, then the top LED will light yellow indicating clipping could be on the verge of occurring. The output VU meters function in the same manner as the input meters. To maintain accuracy of the meters, the system should always be re-nulled if any of the party-line connections are changed.

Summary of Internal Termination States vs. Mode Selection

External DC (WET) Y/N	Unit Mode Wet/Dry	Auto Term On/Off	Channel 1 Int. Termination On Y/N	Channel 2 Int. Termination On Y/N
N	DRY	OFF	N	N
N	DRY	ON	Y	Y
Y	DRY	OFF	N	N
Y	DRY	ON	N	Y
N	WET	OFF	Y	Y
N	WET	ON	Y	N

3.2. MIC/Line Inputs (8x) [HB-DC-DBR Only]

The MIC level inputs contain microphone preamplifiers intended for use with low-level microphones or line-level audio sources. It features adjustable input gain and impedance settings, LED metering, and individual 48V/12V phantom power (or A-B powered) for each input.



The display area has 2 parts: the VU meter itself, and the two blocks for gain control next to it. The top block displays the mic gain and the bottom block the line gain.

Along the bottom are the control switches for the mic phantom power, level gain, and to switch between Mic and Line level for both channels, respectively. The VU meter is set to show a relative value that can be set to US broadcast audio level of +24dBu FS, EBU R68 of +18dBuFS and consumer level of +12dBu FS.

12V/48V PH Phantom Power

The phantom toggle switch has 3 phantom voltage modes. By default, all the phantoms will be turned off or it will be in the previously selected mode before the unit was turned off. The phantom voltage mode will turn on the direction the toggle switch is pushed. To turn the 12T power on, push the toggle switch UP. To turn it off push it UP again, or down.

When phantom power is on, the corresponding LED will be lit green. The operation of the switch for 48V phantom is the same, but when the toggle switch is pushed down. The maximum recommended current rating is 5mA for the microphone connected to each channel input. If the microphone connected to it draws more current than 5mA the LEDs will turn red. If there is any problem with the phantom power the LED will turn red. Phantom voltages will not turn on when operated in line mode [L] to avoid damage to the systems connected to the inputs.

WARNING: The 48 V phantom power biases both pin2 and pin3 to 48V (referenced to pin 1). But the 12T power measures 12V **across pin 2 and pin 3**.

GAIN

The gain is adjusted by toggling the gain switch up or down in the front panel. Push it up to increase the gain and down to reduce the gain. The gain is displayed in the two gain LED blocks for either line or microphone as selected by toggling the M-L switch.

There are 9 total gain adjustment steps in Line and Mic modes:

Line mode: -4dB, -3dB, -2dB, -1dB, 0dB, +1dB, +2dB, +3dB, +4dB.

Mic mode: +10dB, +15dB, +20dB, +25dB, +30dB, +35dB, +40dB, +45dB, +50dB

The gain is incremented by 1dB in Line mode and 5dB in Mic mode. For both line and mic modes, the gain positions which are intermediate to those indicated on the gain LED bar are indicated by lighting two adjacent LEDs together.

Example: In line mode, when the gain is increased to -3dB from -4dB by toggling the switch up. This will be indicated by lighting up the LEDs corresponding to -4dB and -2dB. If the gain is increased again, then the LED -2dB position will light up alone. The LEDs for the gain on mic mode work similarly.

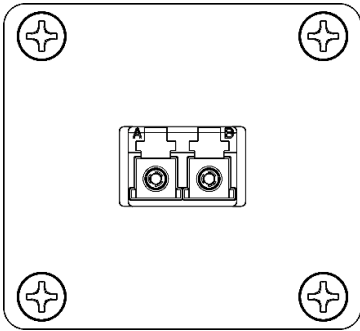
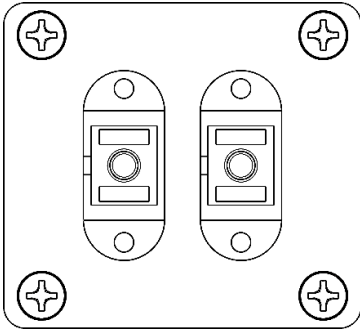
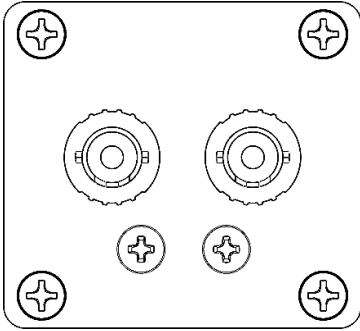
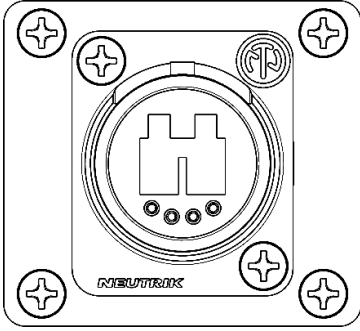
- Default max audio levels are +24dBu. [Contact](#) MultiDyne for other custom levels, e.g., +18.
- Input impedance can also be selected if needed (2.4k, 660 ohm). [Contact](#) MultiDyne.

4. Accessories / Field-Replaceable Units

Description	Part Number
Redundant/Replacement External Power Supply	OEM-00010
Pull Handle 4RU	HWR-00087
Pull Handle 5RU	HWR-00093
Fan Assembly (Single)	80-0123-004

4.1 Fiber Plate Options

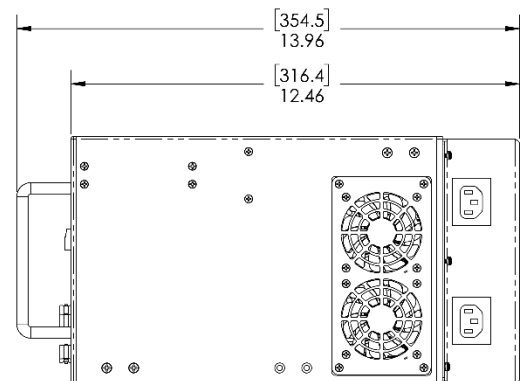
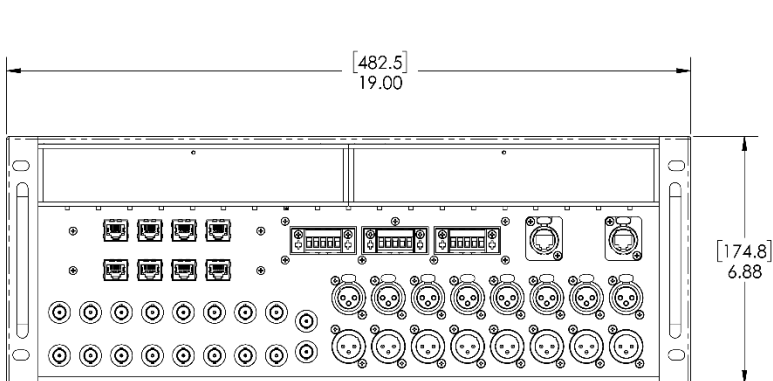
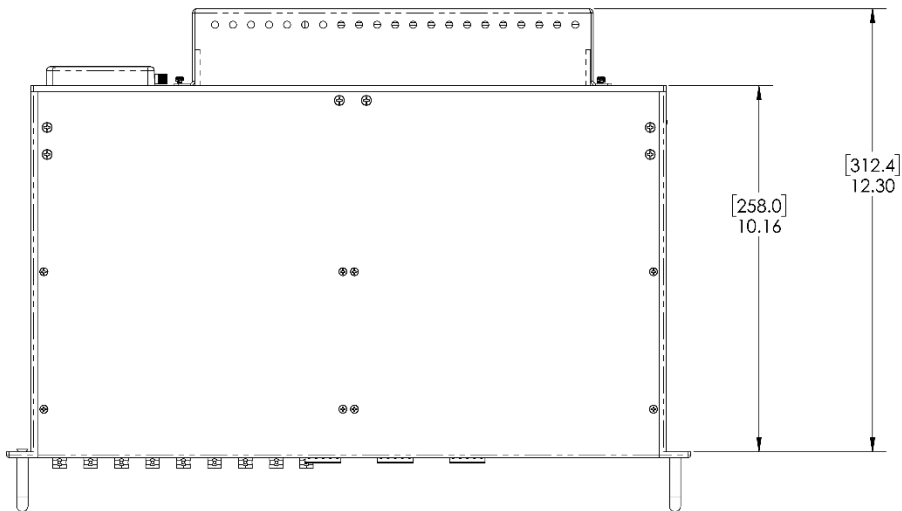
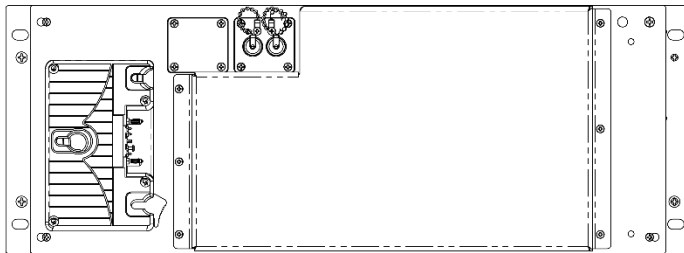
The 3-digit suffix of the top-level part number indicates the fiber connector type.

-LC2 LC/UPC	
-SC2 SC/UPC	
-ST2 ST/UPC	
-OC2 Neutrik® opticalCON® Duo	

5. Specifications

5.1 HB-DBL 4RU Unit Dimensions & Weight

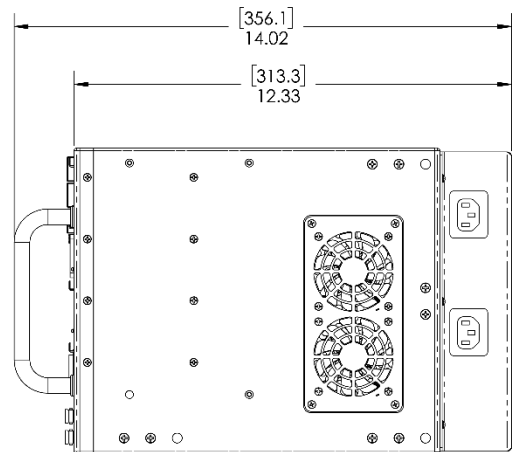
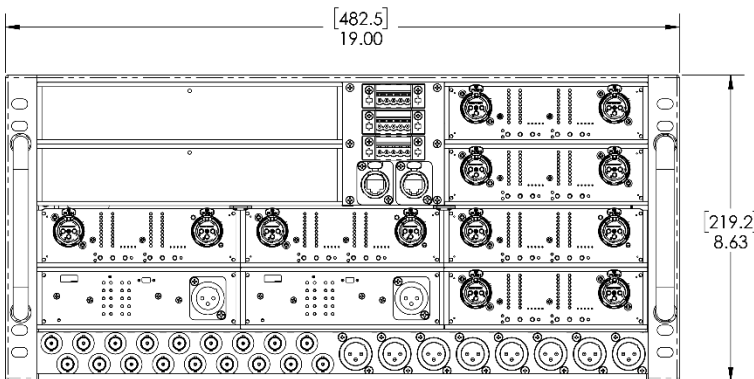
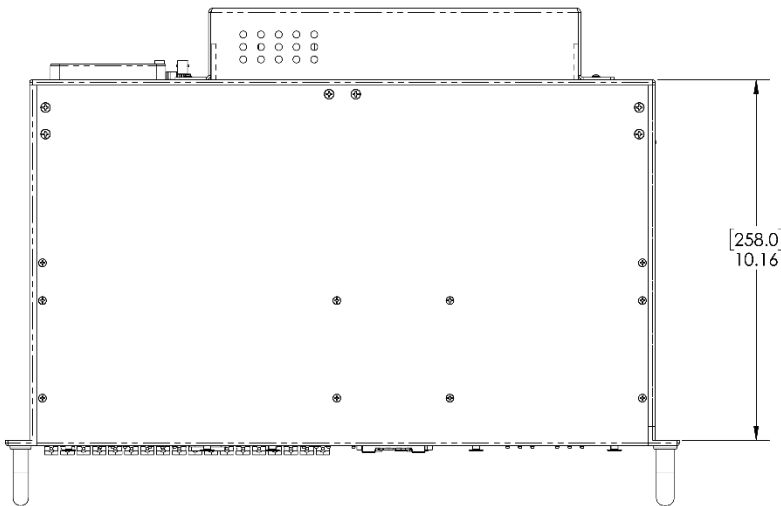
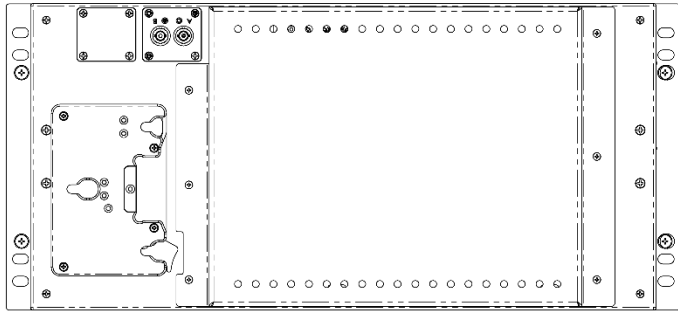
WEIGHT: ~38 lbs. [17kg]



SPECIFICATIONS

5.2 HB-DBL 5RU Unit Dimensions & Weight

WEIGHT: ~ 42lbs. [19kg]



5.3 Electro-Optical

Fiber Type	Singlemode
Fiber Polish	Ultra-physical contact [UPC]
Fiber Connectors	LC, ST, SC, or Neutrik® opticalCon® DUO

5.4 Power

HB-DC-DBL	~70W
HB-DC-DBR	~70W
OEM-00010 Supplied AC-DC Power Supply	Input: 90–264Vac, 47/63Hz Output: 48Vdc 4.17A (200W)

6. Contact Info

Contact support@multidyne.com

7. Copyrights

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