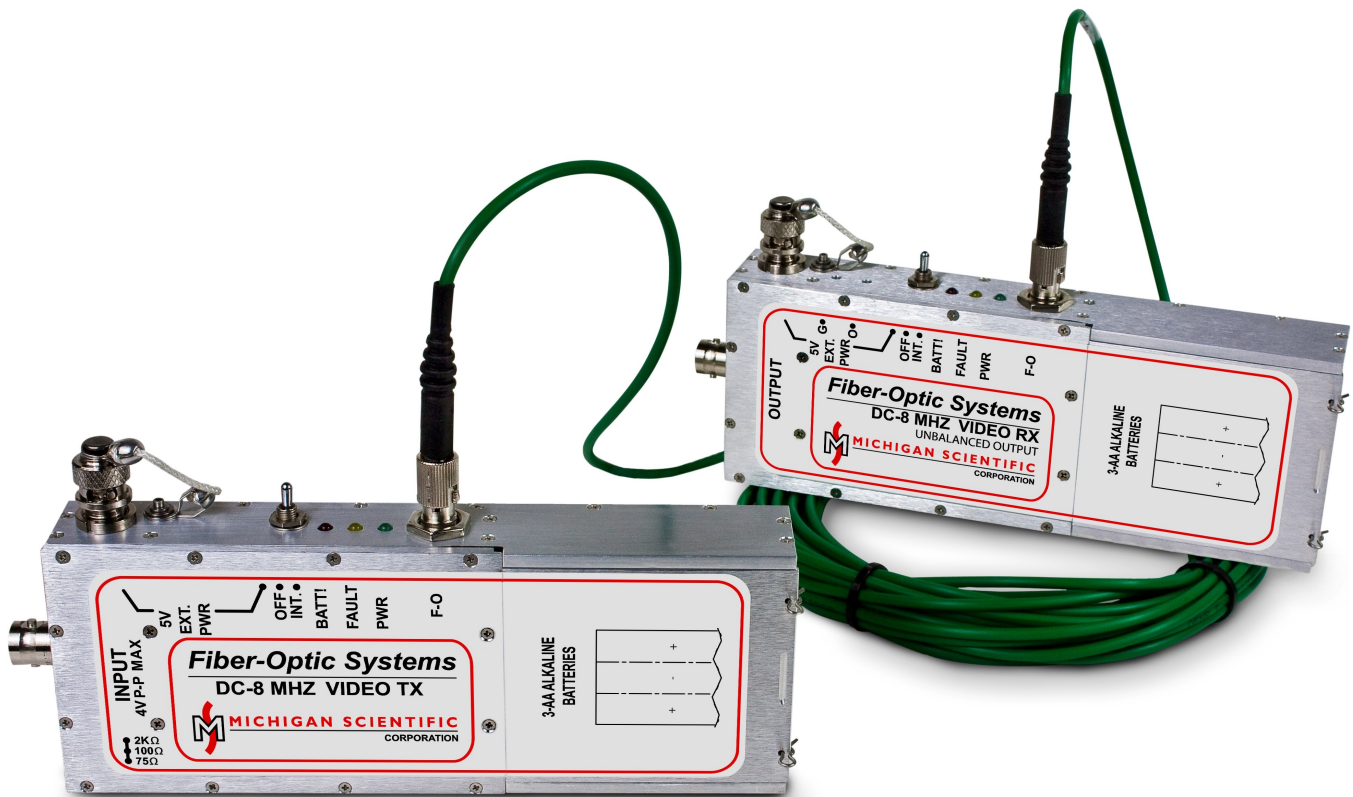


Fiber-Optic Systems

User Manual



Model: FO-HBAVT & FO-HBAVR
EM Hardened Analog Video Link



1. Description

The FO-HBAVT (transmitter) and FO-HBAVR (receiver) form a low-level analog or NTSC/PAL video signal pair. A ± 1 V full-scale voltage signal is monitored or sourced to the device under test (DUT) by connecting either the FO-HBAVT or FO-HBAVR. Fiber-optic cable connects to the corresponding module to monitor or source the desired signal remotely.

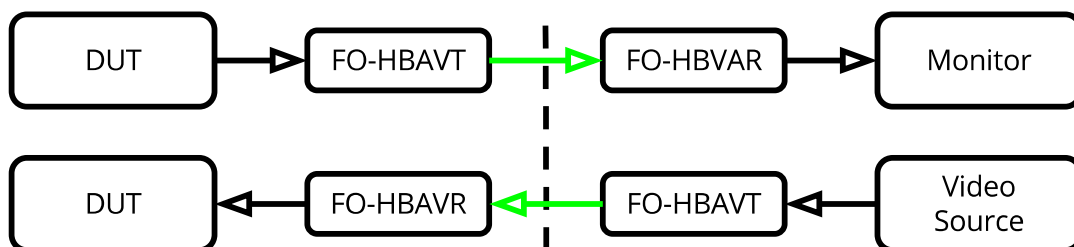


Figure 1: Setup to source or monitor a signal

Each module may be powered by 3-AA batteries or an external power adapter.

Both modules have shielding and custom input/output filtering that provides high immunity from electromagnetic interference (EMI), electromagnetic pulse (EMP), or high voltages associated with plasma research. This allows for rigorous electromagnetic compatibility (EMC) testing/engineering. The satellite modules are validated for EMC up to 200 V/m (46 dBV/m) at 500 kHz to 18 GHz and 600 V/m (pulsed 5 % duty-cycle, 5 μ s rise-time) 1 GHz to 2.5 GHz.

2. Setup

Either the FO-HBAVT or FO-HBAVR may be connected to the DUT to measure or source a signal. Connect the FO-HBAVT to FO-HBAVR with ST multimode fiber-optic cables. The module connected to the DUT must be battery powered. The remote module may be powered by batteries or the external power adapter.

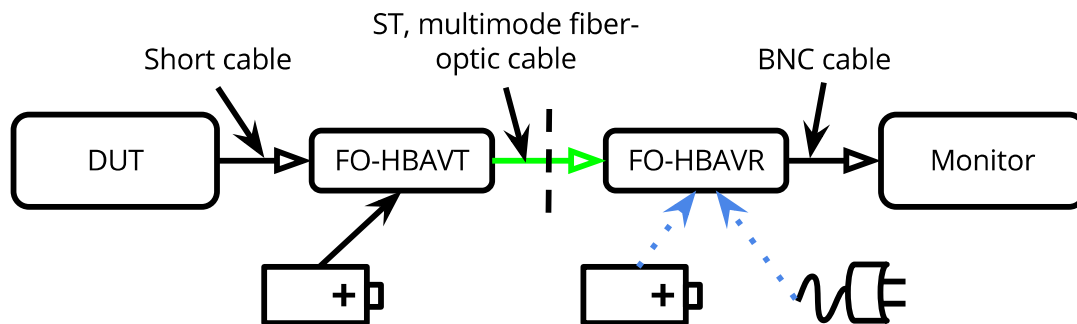


Figure 2: Setup connections

WARNING: The module connected to the DUT must be separated from the ground plane on a 50 mm thick foam block. The module enclosure cannot be touching any other piece of testing equipment (another module, cable harness, etc.).

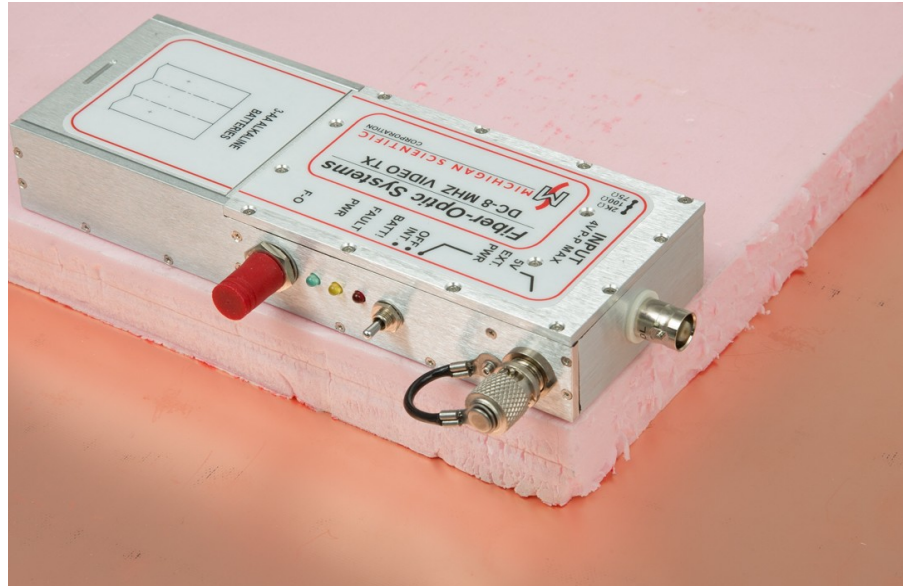


Figure 3: FO-HBAVT on 50 mm of foam

WARNING: The FO-HBAVR can only source impedance of 75 Ω . Improper termination will change the full-scale output signal levels.

Set the input termination on the FO-HBAVT as shown in Figure 4.

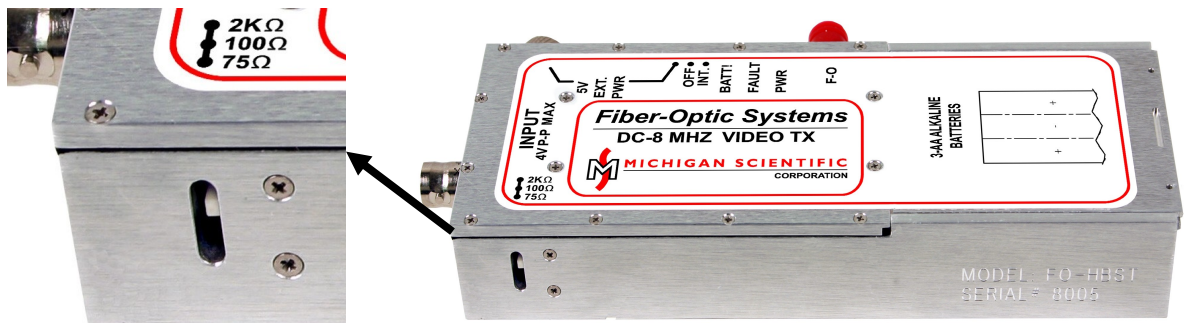


Figure 4: FO-HBAVT input termination switch

Note: Use the 2 k Ω setting when external termination is used.

3. Operation

The FO-HBAVT and FO-HBAVR were designed for use with alkaline batteries. The red **BATT!** indicator illuminates when the alkaline batteries need replacement. NiMH may be used but the low-battery indicator will not work as intended. To power the unit select **INT.** for internal batteries, **5V EXT. PWR** for the external power adapter, or **OFF** to turn off.

Note: Only the manufacturer supplied power adapter may be used.

3.1. FO-HBAVT

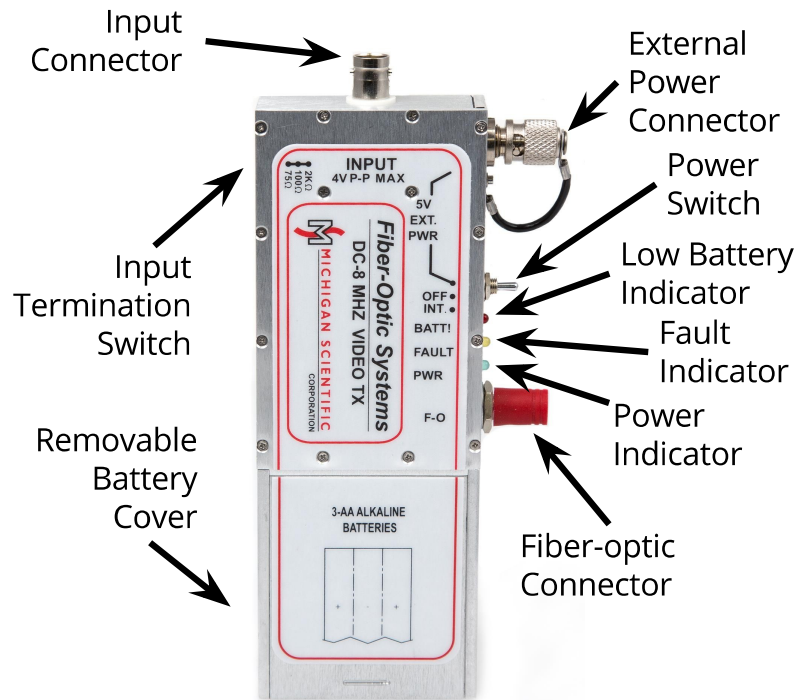


Figure 5: FO-HBAVT point out

The yellow **FAULT** indicator shows when the input voltage exceeds full-scale.

3.2. FO-HBAVR

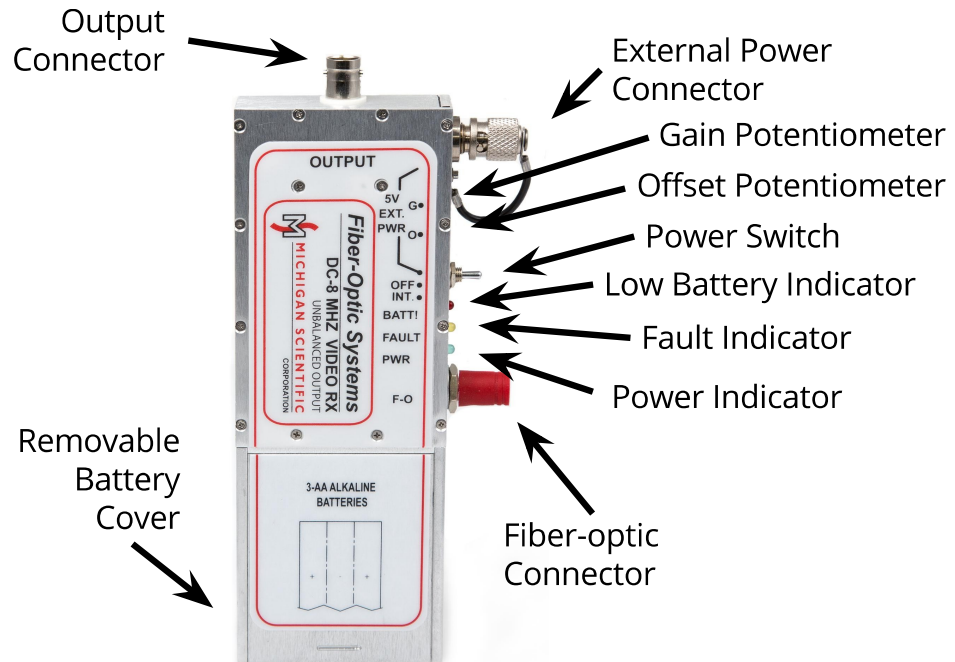


Figure 6: FO-HBAVR point out

To adjust the gain (**G•**) and offset (**O•**) potentiometers, carefully insert the provided flat head screw driver and turn. Offset and gain are set by following the User Adjustment Procedure found on the next page. The yellow **FAULT** indicator will trigger if there is no fiber-optic cable connected or the fiber-optic cable is causing too much optical loss. Test the fiber-optic cable for optical loss greater than 10 dB.

WARNING: The FO-HBAVR potentiometers can be damaged by applying too much force.

4. User Adjustment Procedure

Note: Perform a user adjustment at the start of each testing day and when the FO-HBST input termination is changed.

1. Turn on both the FO-HBAVT and FO-HBAVR and allow for 5 min to warm-up
2. Connect a digital volt meter (DVM) to the FO-HBAVR output
3. Connect a voltage reference to the FO-HBAVT input
4. Set the voltage reference to apply 0 V to the FO-HBAVT input
5. Adjust the FO-HBAVR offset potentiometer until output indicates 0V on the DVM
6. Apply 0.80 V DC to the FO-HBAVT channel input

Note: The voltage reference needs be able to source at least 11 mA depending on the FO-HBAVT termination setting

7. Adjust the FO-HBAVR gain potentiometer until output reaches 0.8 V DC
8. Repeat from step 4 until within specification

5. Technical Support

For technical support please contact:

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6. Specifications

Transmitter (FO-HBST)	
Voltage range	± 1 V (75 Ω doubly terminated)
Impedance	75 Ω / 100 Ω / 2 k Ω
Over-voltage protection	± 6 V continuous
Resolution	4 mV
Battery life	14 h
Receiver (FO-HBSR)	
Noise	10 mV RMS
Impedance	75 Ω
Voltage range	± 1 V into 75 Ω load
Battery life	11 h (load dependent)
System General	
Signal type	differential input/ balanced output
Signal connector	BNC
Bandwidth (10 V peak to peak sine)	8 MHz (-3 dB)
Flatness (10 V peak to peak sine)	± 1 dB up to 500 kHz
Rise/fall times	40 ns (20 % to 80 %)
End to end delay	750 ns
Offset voltage drift	0.5 % full-scale across temperature range
Optical connector	ST
Optical cable	multimode
Operating temperature	-18 $^{\circ}$ C to 85 $^{\circ}$ C
Power requirement	3-AA alkaline batteries or external adapter
Dimension (L x W x H)	172 mm x 76 mm x 25 mm
Weight	285 g
EMC	300 V/m 500 kHz to 1 GHz 200 V/m 1 GHz to 18 GHz 600 V/m pulsed 1 GHz to 2.5 GHz