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Find the *Avtech Electrosystems AV-CTL1-ENC* at our website: *Click HERE*

AV-CLZ & AV-HLZ SERIES

RUGGED & CONNECTORIZED
LOW CHARACTERISTIC IMPEDANCE (Z_0)
CABLES FOR LASER DIODE DRIVERS

BOTH SERIES

In many high-current laser diode testing applications, it is not possible to use a 50Ω termination. Typically the load is closer to 1 - 10Ω. For these applications, Avtech offers the unique AV-CLZ and AV-HLZ series of transmission lines with characteristic impedances (Z_0) in this range.

When a transmission line with a characteristic impedance of Z_0 is used to drive a load impedance of R_L, and $Z_0 = R_L$, ideal matching will occur. Under these conditions, longer-than-normal cable lengths can be used without introducing significant ringing, speed degradation, or other distortions.

The AV-CLZ and AV-HLZ transmission lines are constructed of one or more high-current cables connected in parallel. These transmission line are rugged, and are suitable for use in both research and production environments.

The AV-CLZ and AV-HLZ families differ in the connectors used at either end of the cable. The AV-CLZ family is limited to voltages of 100V. The larger connectors used in the AV-HLZ operate to 1000V.

AV-CLZ CABLES

Both ends of a AV-CLZ transmission line are terminated with a male metal-shell DB-9 or DB-37 connector. The upper row of pins (pins 1-5 or 1-20) are connected to the signal line, and the lower row of pins (pins 6-9 or 20-37) are connected to the ground line. Those Avtech instruments which are designed to mate to AV-CLZ lines (for instance, the AVOZ-A4-B) will have a female DB-9 or DB-37 connector on there rear-panel.

Test loads are also available for use with these cables. The test loads consist of a female DB-9 or DB-37 connector to which a small circuit board is soldered. The signal pins connector are soldered to the top side of the board, and the ground pins are soldered to the bottom side. Several high-power, low-inductance resistors suitable for pulsed applications are soldered between the two sides of the board. A version with no resistors, which is intended for use with a user-supplied load, is also available (AV-CTLX or AV-CTLY).

The standard test loads have user-accessible signal pins and are only suitable for low-voltage applications (55V and lower). For higher-voltage applications (up to 100V), the test load can be supplied enclosed in an aluminum enclosure (the -ENC option). Two unconnected SMA connectors are provided in the enclosure wall, for use as required. The user may also drill or mill the enclosure as desired to accommodate particular applications.

This cabling solution is recommended over the older AV-LZ series of flat-ribbon cable transmission lines. Contact Avtech for cabling suggestions for your application!

See http://www.avtechpulse.com/laser/avoz-a4 for one example of a pulser that uses the AV-CLZ cabling.



AV-CLZ1-60 Transmission Line

AV-HLZ CABLES

The AV-HLZ cables use the same bulk cabling as the AV-CLZ series, but are terminated with larger connectors suitable for higher voltages and currents.

The AV-HLZAX adapter will mate to the output end of the AV-HLZ cables. The adapter provides four high-current posts, which are terminated with M6-1.0 internal threads. An M6-1.0x12 screw may be used to attach cabling to each of the four posts, or the load may be soldered between two supplied brackets that attach to the four posts. The inner two posts carry the OUT signal, and the outer two posts carry the ground.



AV-HLZ1-100 Transmission Line

TEST LOADS

Avtech can also supply connectorized test loads or series resistances with much higher power ratings (up to several kilowatts, with water cooling). Contact Avtech for details.

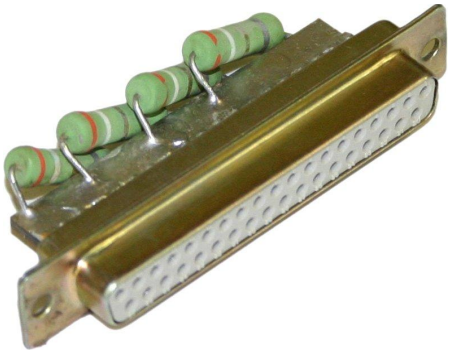
Low Voltage Transmission Lines – AV-CLZ Series

Model:	AV-CLZ1	AV-CLZ2	AV-CLZ3	AV-CLZ4	AV-CLZ5	AV-CLZ11
Characteristic impedance (Z_0, ±10%):	1.0 Ω	1.8 Ω	2.7 Ω	3.6 Ω	5.4 Ω	10.8 Ω
Maximum pulse current:	200 A	50 A	30 A	25 A	20 A	10 A
Maximum average current:	75 A	37 A	22 A	18 A	5 A	2 A
Series resistance: (signal and ground lines)	3 mΩ + 3 mΩ / meter	6 mΩ + 6 mΩ / meter	8 mΩ + 8 mΩ / meter	12 mΩ + 12 mΩ / meter	100 mΩ + 15 mΩ / meter	100 mΩ + 30 mΩ / meter
Maximum voltage:	100V					
Rise time:	< 5 ns					
Terminating connector:	DB-37 male. Pins 1-19 = signal, pins 20-37 = ground.				DB-9 male. Pins 1-5 = signal, pins 6-9 = ground.	
Standard lengths:	60 cm (add suffix -60), 100 cm (suffix -100), 200 cm (suffix -200). Custom lengths are available.					
Temperature range[1]:	+5°C to +40°C					
Bend radius:	20 cm					

1) Avtech is not aware of any issues preventing use at cryogenic temperatures, but the transmission lines have not been tested under such conditions. Usage at cryogenic temperatures is "at your own risk".

Low Voltage Test Loads / Load Adapters

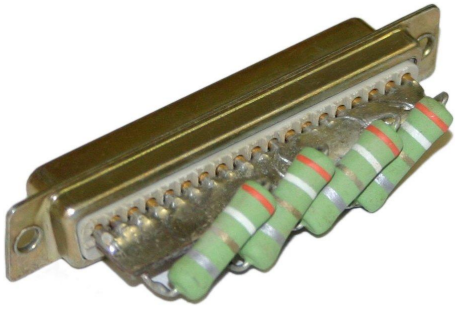
Model:	AV-CTLX	AV-CTL1	AV-CTL2	AV-CTL3	AV-CTL4	AV-CTL5	AV-CTL11	AV-CTL12	AV-CTLY
Load resistance (R_L, ±10%):	Open circuit	1.0 Ω	1.8 Ω	2.7 Ω	3.6 Ω	5.4 Ω	10.8 Ω	12 Ω	Open circuit
Max. pulse current:	200 A	200 A	50 A	30A	25A	20A	10A	10A	20 A
Max. average power/current:	75 A	5 Watts						2 Watts	20 A
Resistor type:	N/A	Low-inductance ceramic composition resistors.							N/A
Rise time:	< 5 ns								
Maximum voltage:	Standard (open construction): 55V. With -ENC option (enclosed): 110V.								
Connector:	DB-37 female. Pins 1-19 = signal, pins 20-37 = ground.					DB-9 female. Pins 1-5 = signal, pins 6-9 = ground.			
Temp. range:	+5°C to +40°C								



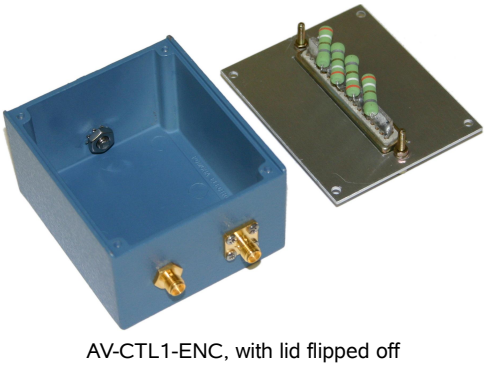
AV-CTL1, CONNECTOR VIEW



AV-CTL1-ENC, with lid on



AV-CTL1, RESISTOR VIEW



AV-CTL1-ENC, with lid flipped off

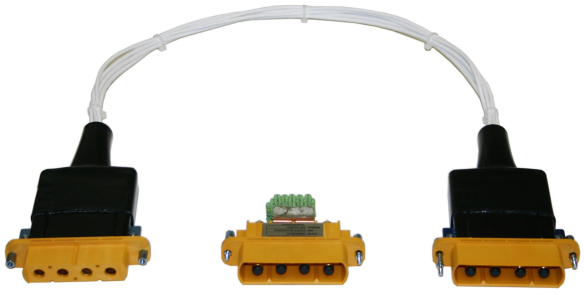
High Voltage Transmission Lines – AV-HLZ Series

Model:	AV-HLZ1	AV-HLZ2
Characteristic impedance (Z_0, ±10%):	1.0 Ω	1.8 Ω
Maximum pulse current:	200 A	50 A
Maximum average current:	75 A	37 A
Series resistance: (signal and ground lines)	3 mΩ + 3 mΩ per meter	6 mΩ + 6 mΩ per meter
Maximum voltage:	1000V	
Rise time:	< 15 ns	
Terminating connector (one end):	Positronic part number GG8888F1, with four GGFIT00MS/AA high-current contacts. The inner two contacts carry the signal, and the outer two carry the ground lines.	
Terminating connector (other end):	Positronic part number GG8888M1, with four GGMIT00MS/AA high-current contacts. The inner two contacts carry the signal, and the outer two carry the ground lines.	
Standard lengths:	100 cm (suffix -100), 200 cm (suffix -200). Custom lengths are available.	
Temperature range[2]:	+5°C to +40°C	
Bend radius:	20 cm	

2) Avtech is not aware of any issues preventing use at cryogenic temperatures, but the transmission lines have not been tested under such conditions. Usage at cryogenic temperatures is "at your own risk".

High Voltage Load Adapters

Model:	AV-HLZAX
Load resistance (R_L, ±10%):	Open circuit
Max. pulse current:	500 A
Max. average power/current:	200 A
Rise time:	< 15 ns
Maximum voltage:	1000V
Connector (cable end):	Positronic part number GG8888M1, with four GGMIT00MS/AA high-current contacts. The inner two contacts carry the signal, and the outer two carry the ground lines.
Connector (load end):	Four high-current posts with M6-1.0 internal threads. The inner two posts carry the signal, and the outer two carry the ground lines. Two copper brackets are supplied to join the pairs of posts and provide an area to solder loads to.
Temperature range:	+5°C to +40°C



AV-HLZ1-100 output cable and mating AV-HLZAX adapter (middle). The adapter is shown with some test resistors installed on copper brackets. The copper brackets are screwed into the four contact posts on the rear of the adapter. The resistors are not included with the adapter; this is just a sample configuration.



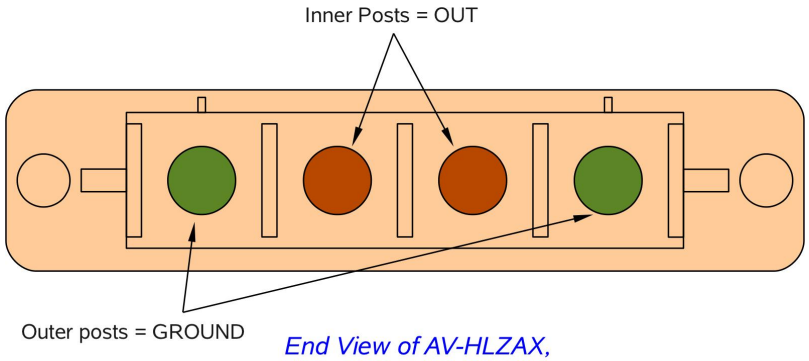
One end of the AV-HLZ1-100 cable plugged into the rear panel of an Avtech AVO-8D3-P pulse generator.



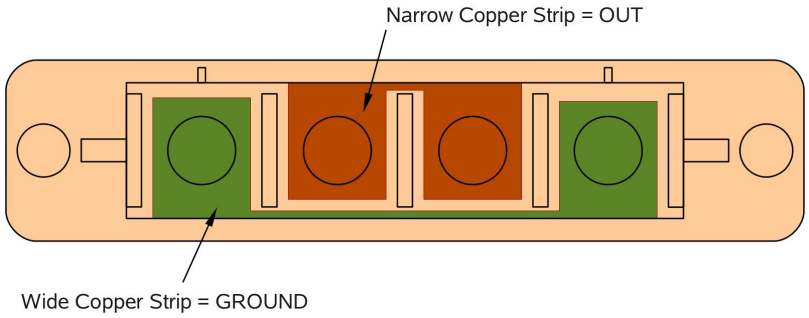
Front view of the AV-HLZAX adapter. This end may be plugged directly into a rear panel output connector, or into the output end of the AV-HLZ1-100 cable.



Rear view of the AV-HLZAX adapter. The outer two contact posts are grounded, and the inner two carry the signal. The user may screw into these posts, to attach the user's load. Copper brackets are included (and are normally installed) to jumper the pairs of posts together.



End View of AV-HLZAX, Without Copper Brackets



End View of AV-HLZAX, With Copper Brackets Installed



Output end of an AV-HLZ1-100 cable with the AV-HLZAX adapter installed. The supplied copper brackets are installed (one to join the two output posts, and one to join the two ground posts), and some resistors (not supplied) have been soldered to the copper brackets.

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