



# CATV Inverter

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## 1. Introduction

The CATV Inverter has been designed to provide up to 300VA of output power to cable network equipment during periods of extended outage, construction or modification to the CATV plant, or during emergency situations where immediate power is required. With a 12VDC battery voltage applied, the CATV Inverter will provide a regulated output voltage of either 60 or 90VAC, depending on model. A Tri-color LED provides battery voltage levels and provides warning for low battery voltage and low battery shutdown. Automatic output overload fold back and short circuit protection is built in to protect the CATV Inverter and attached network equipment. Embedded over temperature shutdown protects the inverter from overheating. The CATV Inverter is intended to be used in conjunction with existing Power Inserter Modules (PIM) in power supply cabinets.

### 1.1 CATV Inverter Features

- 12VDC Input with 60/90VAC, 60Hz Output.
- ON/OFF Power switch.
- LED to monitor battery voltage.

### 1.2 Packaged Materials

All CATV Inverters include:

- 1 CATV Inverter
- 1 Battery harness with protection covers

### 1.3 Unpacking and Inspection

Before installing this equipment, inspect the CATV Inverter for shipping damage or missing components. If the inverter or other items were damaged in shipment, file a damage claim with the shipping company and contact your Multilink representative immediately. Be sure to retain the original shipping carton and all packing material for the inverter until you are certain that warranty return will not be required. Each CATV Inverter will become heavy upon installation of battery. Use proper techniques on moving the CATV Inverter to prevent any unnecessary injuries.

### 1.4 Missing or Damaged Items

If items are found to be damaged or missing, contact the shipping company and your Multilink representative immediately. All damage claims must be filed with the shipping company conveying your equipment. Your Multilink representative will be able to assist with immediate equipment needs if necessary. **DO NOT DROP MULTILINK CATV INVERTER!**

### 1.5 Original Shipping Container

When returning a unit for service, use its original shipping container and all original packing materials. Items damaged as a result of improper packaging will not be covered under provisions of warranty service.

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## 2. Critical Safety Issues

Three different levels of safety admonishments are used within this instruction manual; specifically **DANGER**, **WARNING**, and **CAUTION**.

*Trois niveaux différents d'avertissements de sécurité sont utilisés dans ce mode d'emploi; spécifiquement DANGER, AVERTISSEMENT et ATTENTION.*



### 2.1 DANGER

The statement following the **DANGER** heading alerts the equipment user of a potentially life or health-threatening situation unless precautions are taken against it. Admonishments of this nature usually entail the hazards of electrical shock or those encountered that may result in physical injury.

*La déclaration sous la rubrique **DANGER** avertit l'utilisateur de l'équipement d'une situation potentiellement mortelle ou mortelle, sauf si des précautions sont prises contre lui. Les admonistances de cette nature entraînent habituellement les dangers d'un choc électrique ou ceux rencontrés qui peuvent entraîner des blessures physiques.*



### 2.2 WARNING / AVERTISSEMENT

The statement following the **WARNING** heading alerts the equipment user of a condition or procedure that could result in interruption of service to the users or subscribers of the service receiving power from this product.

*La déclaration sous le chapitre **AVERTISSEMENT** avertit l'utilisateur de l'équipement d'une condition ou d'une procédure qui pourrait entraîner une interruption de service pour les utilisateurs ou les abonnés du service qui reçoit l'alimentation de ce produit.*



### 2.3 CAUTION / ATTENTION

The statement following the **CAUTION** heading alerts the equipment user of a condition that could result in damage to the subject equipment or ancillary equipment if care is not exercised during certain maintenance or operating procedures.

*La déclaration suivant la rubrique **ATTENTION** avertit l'utilisateur de l'équipement d'une condition qui pourrait endommager l'équipement concerné ou l'équipement auxiliaire si les soins ne sont pas exercés pendant certaines procédures de maintenance ou d'exploitation.*

### 3. Emergency Shutdown



Exercise extreme caution when performing the following procedure. Carry out the steps precisely in the order given to avoid the possibility of personal injury or equipment damage.

Perform the following procedure if the CATV Inverter must be shut down and disconnected on an emergency basis:

1. Turn OFF the Power switch.
2. Remove the Battery harness from the CATV Inverter.
3. Disconnect the Output connector from the CATV Inverter.

#### 3.1 General Safety Issues:

The CATV Inverter that is documented in these instructions has been designed, tested and produced to ensure safe, trouble-free operation. Personnel using or installing this CATV Inverter should completely read and fully understand the following safety instructions. They are provided here as informational guidelines for your continued safety in the usage of this product. The CATV Inverter has a safety protocol where if the internal temperatures reach 55°C the Inverter will initiate a shutdown sequence to prevent damage.

#### 3.2 Safety Issues with the CATV Inverter Installation and Use:

The CATV Inverter has been designed and built to power cable network equipment. It is not intended for any other usage and provides output voltages suitable only for its intended application. Please contact Multilink if use of this product falls outside of cable network equipment. ON/OFF switch does not fully disconnect battery voltage from the CATV Inverter. Please disconnect battery from CATV Inverter immediately after every use.

**DANGER**

This CATV Inverter operates from a DC source ranging from 10.5VDC to 14.4VDC and generates high and potentially lethal AC voltage. DO NOT open any covers or panels or attempt to perform any service to the CATV Inverter without first removing and disconnecting all external DC power sources. Only trained, qualified personnel should attempt service and repair work on the CATV Inverter.

## 4. Front Panel Controls

The front panel of each CATV Inverter contains various connections. These items are described as follows. See figure 3-1, 4-1, and 4-2 for connector locations. Further details regarding use of control and operation may be found in the Startup and Operation section of this manual.

### 4.1 Control

**ON/OFF SWITCH:** This switch powers the CATV Inverter. NOTE: Power switch does not fully disconnect battery voltage from the CATV Inverter. Please disconnect battery from CATV Inverter immediately after every use.

### 4.2 Connections

**POWER CONNECTOR:** Anderson Power Pole connector.

**AC OUTPUT CONNECTOR:** Amp Power Lock connector.

### 4.3 Observations

**LED:** Tri-color LED. Green: ON and battery voltage is greater than 11.5VDC. Amber: Battery voltage warning with battery voltage 11.5VDC or lower. Red: Battery voltage low, disconnect or replace battery.

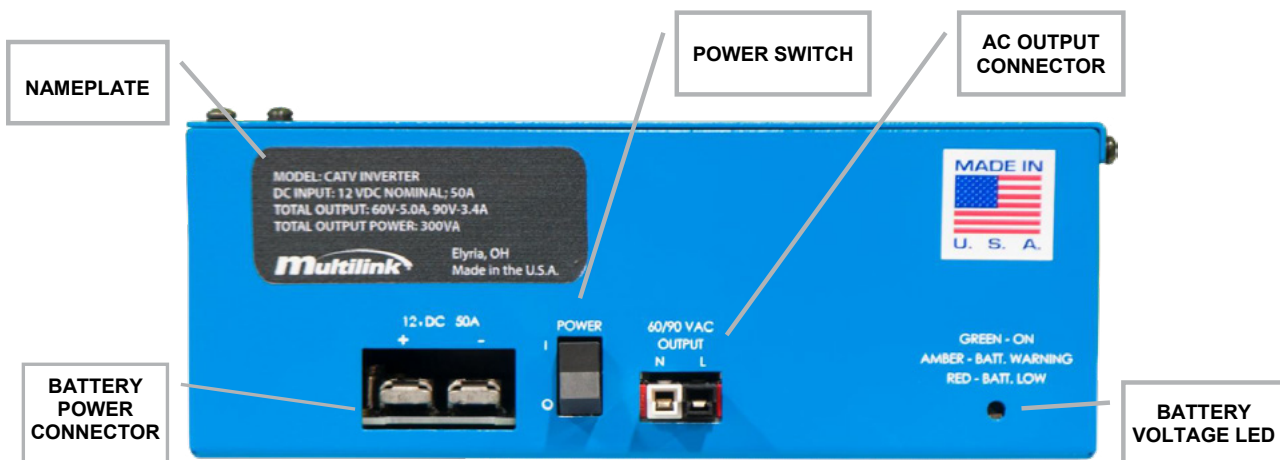


Fig. 4-1 CATV Inverter Front Panel Detail

## 5. Installation

Refer to the following diagram and instructions to setup and connect the CATV inverter.

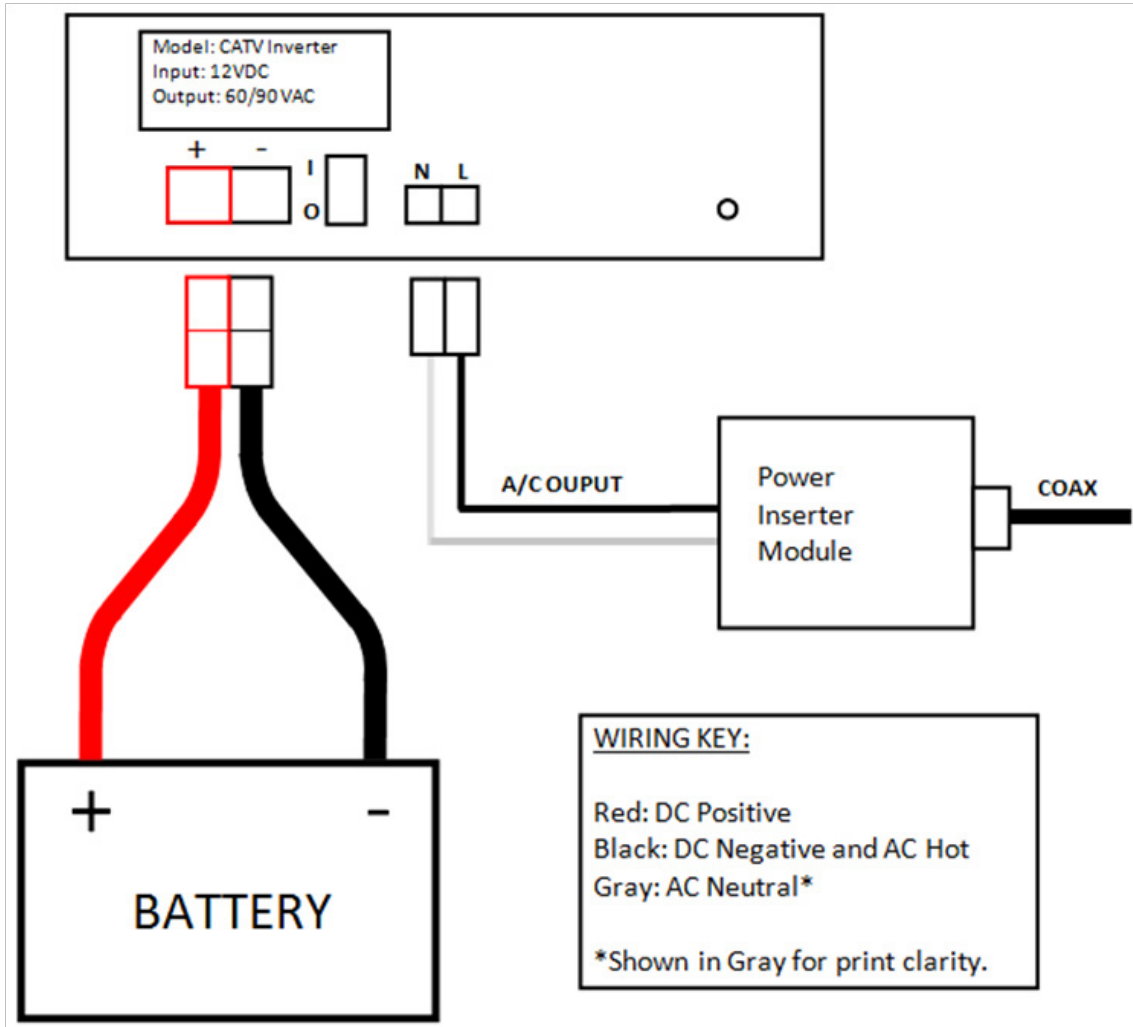


Fig. 5-1 CATV Inverter Front Panel Detail

1. Place CATV Inverter in existing power supply cabinet or portable cabinet within 48" of the Power Inserter Module and a single 12VDC battery.
2. Verify the battery voltage of the battery is at least 12.0VDC. Replace battery if voltage is not adequate.
3. Attach the supplied Battery harness to the battery with Red to the Positive (+) terminal and Black to the Negative (-) terminal.
4. Place covers over each terminal to prevent accidental short circuit of battery.
5. Attach the Mini Amp connector from the Power Inserter Module to the output connector of the CATV Inverter.
6. Place the Power switch in the OFF position if not already in the OFF position.
7. Attach the battery connector to the CATV Inverter.
8. Verify the switch on the PIM is in the "MAIN" position.
9. Verify that the load attached to the CATV Inverter does not exceed the 300VA capacity.

## Installation (Cont.)

### Extended Runtime

It is possible to extend the runtime of the CATV Inverter by using the optional Extended Runtime Battery Harness to add an additional 12VDC battery in parallel with an existing 12VDC battery as shown below. An additional battery and connecting harness will also be required when using the extended runtime battery harness.

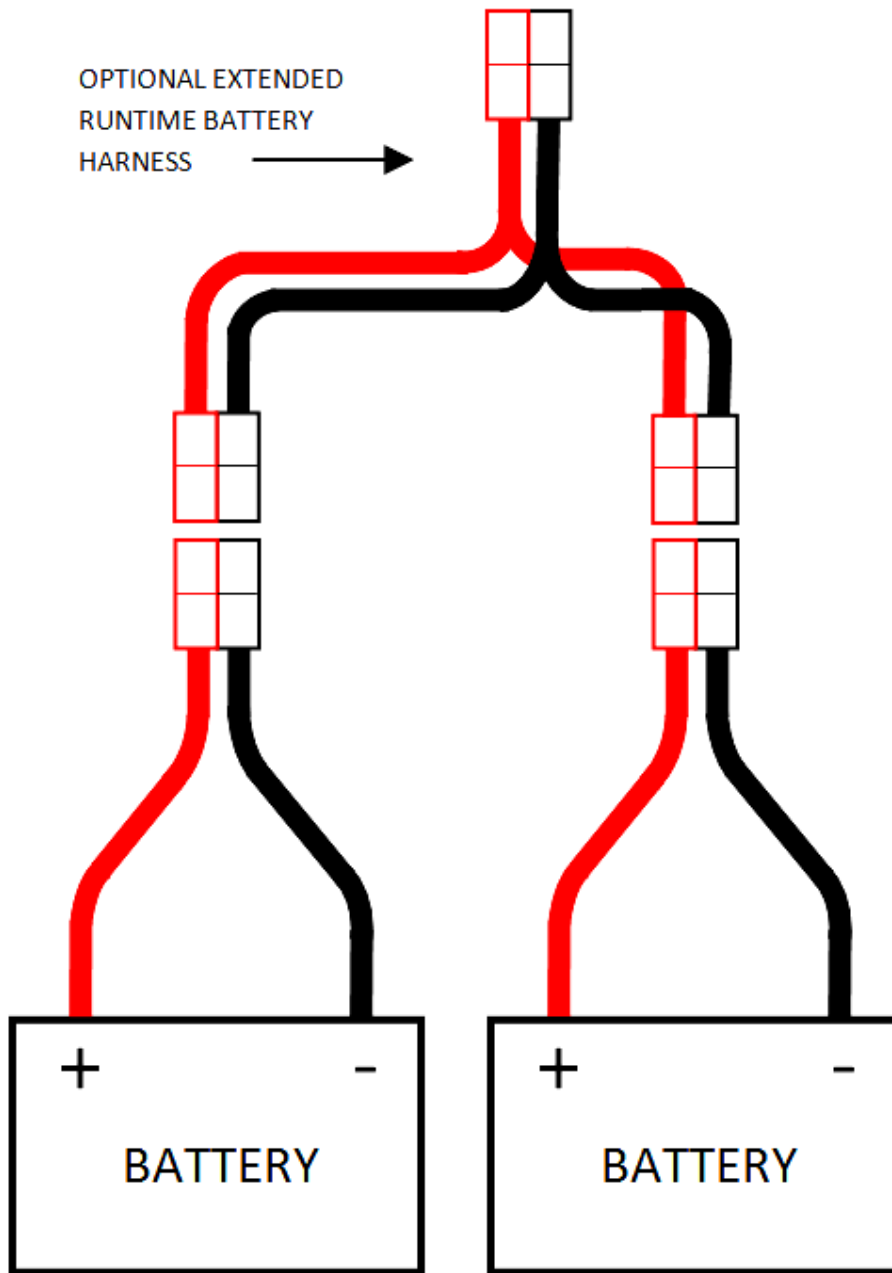


Fig. 5-2 CATV Inverter Front Panel Detail

## 6. Startup & Operation

For normal operation, perform the following procedure:

1. Operate the Power switch to the ON or “I” position.
2. The CATV inverter will start to produce output voltage for the attached load.
3. If CATV Inverter does not start within 10 seconds, turn OFF the Power switch and turn it back on.



Battery voltage is continuously present on the CATV inverter, even if the Power switch is in the OFF or “O” position. Disconnect the battery after every use to avoid constant discharge and possible damage to the battery. Do not intentionally overload or short circuit the output of CATV Inverter. Repeated short circuits may damage the inverter. Inverter fans must remain free of blockage. Do not operate the CATV Inverter outside of its operating range to prevent over temperature protective shutdown.

## 7. Inverter Shutdown

If CATV Inverter shutdown becomes necessary at any time, observe the following procedure:

1. Operate the Power switch to the OFF or “O” position.
2. Disconnect the battery harness and the AC output connector from the CATV Inverter.

## 8. Replacement Parts

The CATV Inverter contains a fuse that is field serviceable. This is the internal 40A fuse. Additional replacement parts are also listed below.

460-038-10: Fuse, Maxi Blade. Use Littlefuse Inc or equivalent replacement.

874-046-20: Single Battery Harness.

538-531-10: Battery Terminal Covers. Red and Black sold in pair.

874-018-21: Extended Battery Runtime Harness.



The CATV Inverter contains a single internal fuse to protect against excessive DC input current conditions. This fuse is field-serviceable. This fuse is an automotive grade fuse and may be replaced with an off-the-shelf model of equivalent value. Do not replace this fuse while in operation. Do not place a larger size fuse than the current rated fuse installed from the factory. Disconnect the Battery and AC Output connectors before attempting repair. Repair must be done by certified technicians.



## 9. Troubleshooting

This troubleshooting guide has been designed to help you quickly locate and resolve common powering problems. The table assumes normal operation of the CATV Inverter at any given time. If the problem cannot be resolved, please contact a Multilink representative.

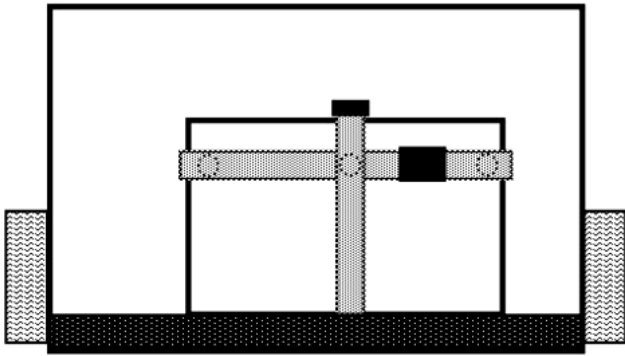
Operating Conditions	Corrective Action
No output voltage	<ul style="list-style-type: none"> <li>• Verify output connection is seated properly.</li> <li>• Verify the switch on the PIM is set to MAIN.</li> <li>• Verify battery connection is seated properly.</li> <li>• Verify battery voltage is at least 10.5VDC.</li> <li>• Verify Power switch is turned ON.</li> <li>• Verify output is not overloaded or contains a short circuit.</li> <li>• Inverter may be overheated and is in over temperature shutdown. Shutdown and allow inverter to cool.</li> </ul>
LED not illuminated	<ul style="list-style-type: none"> <li>• Verify battery voltage is at least 10.5VDC.</li> <li>• Verify internal fuse has not opened.</li> </ul>
Fans not running or excessively noisy	<ul style="list-style-type: none"> <li>• Verify battery voltage is at least 10.5VDC.</li> <li>• Do not block airflow to fans.</li> <li>• Do not operate if fans are not running.</li> </ul>

## 10. Specifications

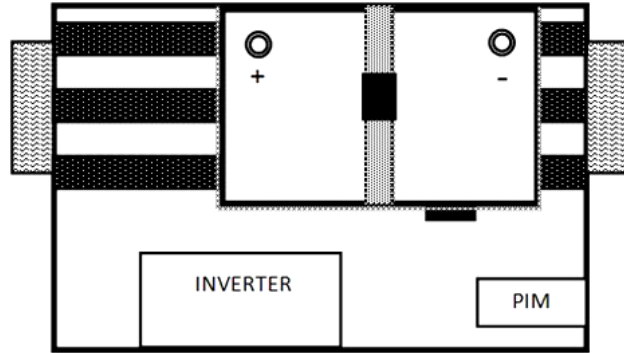
Parameter	Specification	Notes
Output Capacity	300VA	Do not overload or short circuit
Cooling System	Forced Air	
Operating Temperature	-40°C – to + 55°C 5% to 95% relative humidity	Extreme temperatures and/or extended runtime may cause inverter to enter over temperature protective shutdown
Mechanical (W x H x D)	8.25" x 3.0" x 10"	
Weight	5 Lbs	
<b>DC Input</b>		
Connections	Anderson Power Pole PP75 Connectors	Keyed for protection
Voltage	12.0VDC Nominal	10.5VDC to 14.4VDC
Current	30A nominal	40A current limiting
Inverter Acceptance Voltage	10.5VDC	
Voltage Indicator	Tri-Color LED	<u>Green</u> : ON, 12VDC or greater <u>Amber</u> : Low battery warning, 11.5VDC or less <u>Red</u> : Low battery state, 10.5VDC or less
Protection	Internal Fuse	40A
<b>AC Output</b>		
Output Power Connection	Amp Power Lock Connectors	Keyed for protection
Phases	Single phase 2-wire	
Voltage	90VAC Nominal	Model Specific
Voltage Regulation	-8/+2%	DC input voltage dependant
Current Capacity	3.4A at 90VAC nominal	5.0A at 60VAC nominal
Rated Frequency	60Hz	±5%
Voltage Waveform	Modified Square Wave	Quasi or full sine wave capable
Load Power Factor	0.90	
Over Current Protection	Real-time voltage fold-back	
Overload Capability	150%	
Protection	Instantaneous AC Output short circuit detection	Automatic recovery

## 11. Toolbox Installation

INSTRUCTIONS FOR BATTERY PLACEMENT IN CONTAINER.



FRONT VIEW



TOP VIEW

- UNBUCKLE THE STRAPS AND PLACE THE STRAP THAT GOES UNDER THE BATTERY FLAT ACROSS THE FOAM ON THE BOTTOM OF THE CONTAINER.
- PLACE BATTERY ON TOP OF STRAP AND CENTER BETWEEN THE 3 BOLTS, SHOWN IN THE FRONT VIEW AS DOTTED CIRCLES.
- CONNECT STRAPS AROUND THE BATTERY BOTH HORIZONTALLY AND VERTICALLY AND BUCKLE STRAPS.
- PULL STRAPS TIGHT TO SECURE BATTERY TO PORTABLE CONTAINER.



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