

Field Tools
24V Supply

101-0028

**Operation &
Specifications
Manual**



General Description

The Field Tools 24V Supply provides portable power to loop powered devices. It is a fully contained power source that takes the low voltage from three “AAA” alkaline batteries and increases it to a highly filtered 24 volts DC. Using batteries for the power source eliminates isolation concerns as well as the need for a power connection to AC or a USB port. The voltage conversion is done using a high efficiency switching DC-DC converter to maximize battery life. Simply connect the two mini-clips to the power input of your loop powered device. A push-button is used to enable or disable the 24 volts while a status LED indicates the active operating mode. An internal 250 ohm loop resistor, HART protocol modem clip points, and current meter leads with standard banana jacks make the 24V Supply a complete loop transmitter power solution.



24V Supply Features

- Highly filtered 24 volt power source for loop devices
- Up to 30mA capacity, perfect for 4-20mA transmitters
- Battery power eliminates galvanic isolation concerns
- Includes an internal 250 ohm loop resistor to allow for HART protocol
- HART modem mini-grabber clip points for easy modem connection to the loop
- Mini-clips for easy connection to the loop device power terminals
- All connection leads included - no need for extra test leads or alligator clips
- Long battery life, greater than 6 hours continuous at 12mA load
- Status LED indicates when batteries are getting low
- Able to maintain output even with weak batteries to maximize battery life
- Uses easy to find low cost standard “AAA” alkaline batteries
- Short circuit protection disconnects the output if shorted or over-current detected
- Compact durable enclosure stands up to rugged field use

Safety Considerations



Warning

To prevent loss or injury only use the 24V Supply as specified in the manual.

- Never apply more than 30 volts between any two terminals or leads.
- Never operate with the battery cover and cover screws removed or loose.
- Do not use if the leads become damaged.
- Disconnect all connections before removing the battery cover.
- Do not operate around explosive gas, vapor, or dust.
- Contact Microflex, LLC for servicing or repairs.

Replacing or Installing Batteries



Always disconnect all leads and connections to the 24V Supply before removing the battery cover.

1. Loosen and remove the two cover screws and cover to access the battery holder.
2. Remove and replace all three “AAA” alkaline batteries.
3. Replace the cover and screws. Do not over-tighten the screws to prevent damage to the 24V Supply enclosure.

For best performance the batteries should be replaced as soon as the low battery indication is noticed (flashing status LED while connected).

24V Supply Block Diagram

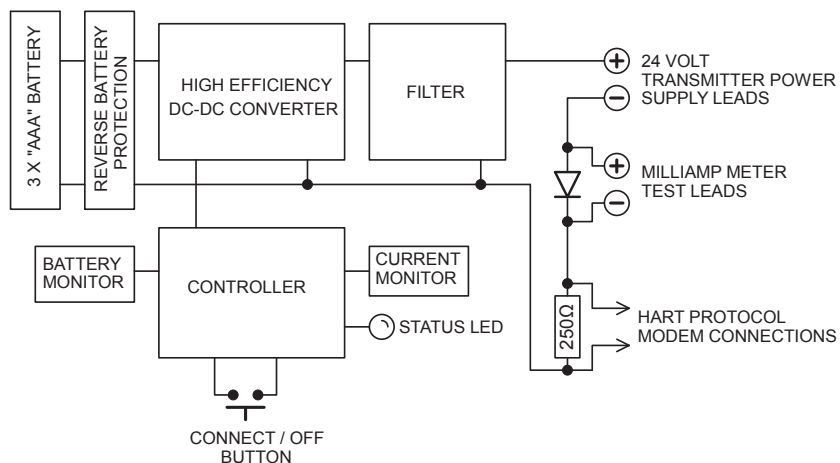


Figure 1: Block Diagram

Connecting to a Loop Device

The Field Tools 24V Supply is a fully contained power source for loop powered transmitters. Internal batteries eliminate the need for external connections to AC power or USB ports as a power source while providing complete galvanic isolation.

Connect the red clip to power or loop (+) and the black lead to power or loop (-) on your transmitter. See *Figure 2 Device Connections* for details. The transmitter can be powered with or without the milliammeter connected. The power loop is not opened when the meter is removed or not attached.

With the 24V Supply clips attached to the transmitter, press the 24V Supply connect button to enable power to the transmitter. The status LED will be ON while the 24V Supply output is active. If the LED is not ON solid while active, refer to *Status LED Operation* in this manual.

To remove power from the transmitter press the connect button. The LED will be OFF while the 24V Supply output is inactive.

The 24V Supply includes a 250 ohm loop resistor that will drop a portion of the available 24 volts. The voltage dropped across the resistor depends on the current requirements for the loop transmitter. Open circuit voltage, with no transmitter attached, is 24 volts +/- 2%.

Measuring Loop Current

The 24V Supply includes leads to simplify connection to a DC current meter for loop current measurements. The current meter leads have safety insulated banana plugs that can be plugged directly into a standard current meter. An internal diode allows the meter to be connected or disconnected without interrupting the loop supply or opening the loop. See *Figure 2 Device Connections* for details.

HART Protocol Modem Connections

A HART modem or HART communicator can be connected to the 24V Supply loop using the two loop-terminals provided next to the current meter leads. The loop terminals allow standard HART modem mini-clips to be easily connected across an internal 250 ohm loop resistor.

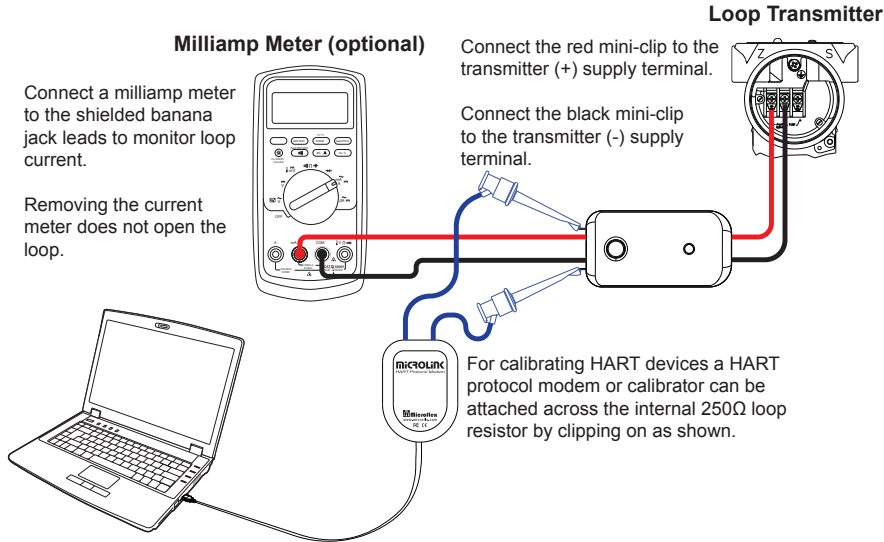


Figure 2: Device connections

Status LED Operation

The Status LED provides quick feedback of the 24V Supply operating mode. The LED can indicate when the battery is getting low and needs to be replaced or when the output is shorted or connected to a load that exceeds the 30 milli-amp maximum.

LED Off

If the status LED is off, the 24V Supply is not connected or not supplying power to the output. If the LED remains off after the button is pressed, the internal batteries need to be replaced. For details refer to the section on “Replacing Batteries” in this manual.

LED On

When the 24V Supply is active and providing power to the output, and no fault conditions are detected, the LED will be ON solid.

LED Fast Flash then Off

If an over-current condition is detected, more than 30mA or shorted, the output will be disconnected and the led will flash for about 2 seconds. Remove the overload or shorted condition and press the connect button to restore the active output.

LED Slow Flash

A slow flashing status LED indicates that the output is connected but the internal supply is low and the batteries need to be replaced. The 24 volt output may not be fully regulated when the batteries are low. Replace the internal three “AAA” alkaline batteries if they are low to ensure a stable power output. For details refer to “Replacing Batteries” in this manual.

Auto Power Off

To help reserve battery life the 24V Supply will automatically disconnect and power down after 30 minutes. Press the connect button to re-connect.

Specifications

Output

Open Loop Voltage24V +/- 2%
Load Regulation0.25%
NoiseLess than 50mV P-P @ 20mA
Current30mA max
Short Circuit / Overload Protection Auto-disconnect if load is > 30mA
Leads3' (1 meter) high flexibility test lead wire
TerminationMini-Grabber clips

Current Meter Leads

Leads 2 Feet (0.6 Meter) high flexibility test lead wire
TerminationShielded banana plugs, Red (+), Black (-)

HART Protocol Support

Connection Type clip loop terminals (.087" x .055" hole)
250Ω Loop ResistorIncluded internally

Battery

Type3 x 1.5V "AAA" alkaline
Operating Life > 6 hours with 12mA load
Battery Supply Range (DO NOT USE 3V CELLS)..... 2.0V to 5.5V
Low Battery IndicatorStatus LED will flash slow while output is active
Low Battery Level 2.49V
Auto Off duration 30 minutes

Enclosure

Molded ABS Plastic
Weight (including leads and batteries)..... 6 ounces
Enclosure Dimensions1.70" x 3.25" x 1.13"

Environmental

Operating Temperature-30°C to 50°C (-22°F to 122°F)
Storage Temperature-40°C to 70°C (-40°F to 158°F)
Humidity0 to 95% (non-condensing)

Dimensions

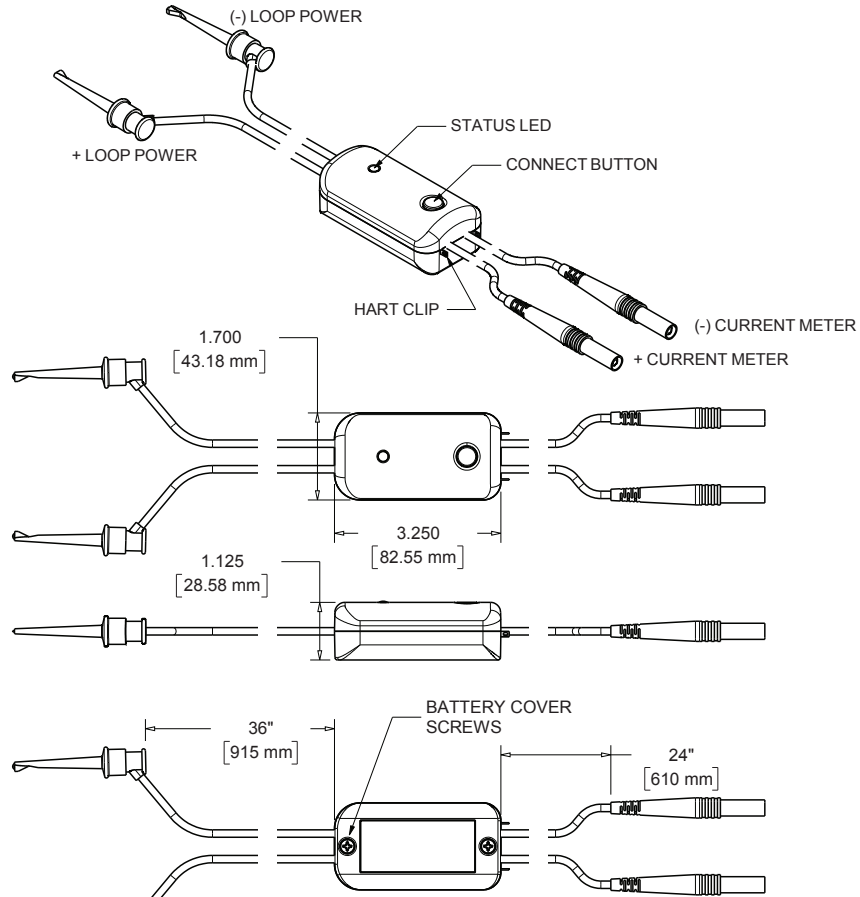


Figure 3: Dimensions

Limited Warranty

Microflex, LLC warrants this unit against defects in materials and workmanship for a period of one year from the date of shipment. Microflex, LLC will, at its option, repair or replace equipment that proves to be defective during the warranty period. This warranty includes parts and labor.

A Return Authorization (RA) number must be obtained from the factory and clearly marked on the outside of the package before equipment will be accepted for warranty work.

Microflex, LLC believes that the information in this manual is accurate. In the event that a typographical or technical error exist, Microflex, LLC reserves the right to make changes without prior notice to holders of this edition. The reader should consult Microflex, LLC if any errors are suspected. In no event should Microflex be liable for any damages arising out of or related to this document or the information contained in it.

EXCEPT AS SPECIFIED HEREIN, MICROFLEX, LLC MAKES NO WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CUSTOMER'S RIGHT TO RECOVER DAMAGES CAUSED BY FAULT OR NEGLIGENCE ON THE PART OF MICROFLEX, LLC SHALL BE LIMITED TO THE AMOUNT THEREFORE PAID BY THE CUSTOMER. MICROFLEX, LLC WILL NOT BE LIABLE FOR DAMAGES RESULTING FROM LOSS OF DATA, PROFITS, USE OF PRODUCTS, OR INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF ADVISED OF THE POSSIBILITIES THEREOF. This limitation of the liability of Microflex will apply regardless of the form of action, whether in contract or tort, including negligence. Any action against Microflex, LLC must be brought within one year after the cause of action accrues. The warranty provided herein does not cover damages, defects, malfunctions, or service failures caused by owners failure to follow Microflex's installation, operation, or maintenance instructions; owners modification of the product; owner's abuse, misuse, or negligent acts; and power failure or surges, fire, flood, accident, actions of third parties, or other events outside reasonable control.

Microflex, LLC
2202 Red Bird Lane
Brookshire, Texas 77423
USA

Phone 281-855-9639
Fax 832-422-4391
www.microflx.com

