

User Manual



EMF Wire Scout

V1.6

An AC Magnetic Field Wiring Error Detector For Electricians

Designed By: Mitch Marchand and Eddie Hiscock

Built By: Eddie Hiscock

IMPORTANT

1. This device is designed to be used by **license electricians** to aide in finding wiring errors that create AC Magnetic fields such as:
 - a. shared neutral connections between branch circuits and
 - b. circuits with neutral to ground connections.
2. This device is only to be used on **indoor de-energized circuits**. Using this device on any energized circuit will cause the device to fail.

Special Note Bluebox tester.

The EMF Wire Scout is more sensitive then the Bluebox tester.

If Buzzer rings and LED is illuminated this finds all the wiring errors that would be found with the Bluebox tester (approximately < 100 Ohm of resistance).

If the buzzer does not ring or faint ring but LED is illuminated this means there is between 100 and 220 ohms of resistance. This type of wiring error would not be of found using Bluebox tester.

Recommend fixing wiring errors with buzz and LED illuminated first.

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Purpose

The Wire Scout is an electrician's tool used to help identify branch circuits that have been miss wired in the following ways:

1. Interconnected branch circuit neutrals.
2. Neutral to Ground connections in a circuit.

Both above scenarios are violations of the National Electrical Code and the Canadian Electrical Code.

This tool is only be used on de-energized circuits. Using the Wire Scout on energized circuits will damage the device.

The Wires Scout connects to the neutral bus via the white alligator clip and ground bus via the green alligator clip. When the device is turned on injects operated using a 12VAC power supply the inject current of approximately 0.5 amps into the neutral conductor of a branch circuit.

Safety Precautions

1. Do not use the device outside.
2. Do not use the device in wet conditions.
3. DO not use the device on energized circuits. It is highly recommended that the electrical panel being worked on is de-energized completely before beginning work.
4. Use insulated gloves when handling the live leads of the Wire Scout.
5. Device to be used by a licensed electrician.

For Support

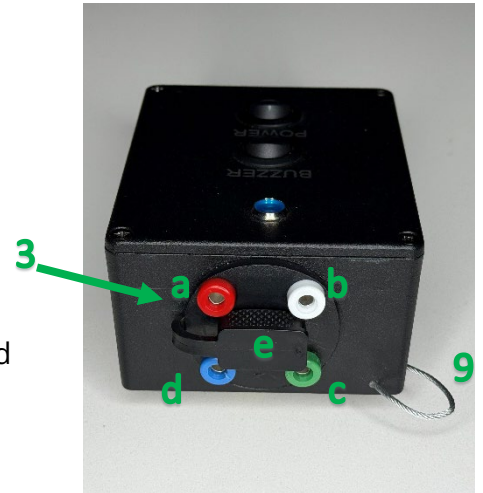
Contact: hello@emfaware.ca

Specifications

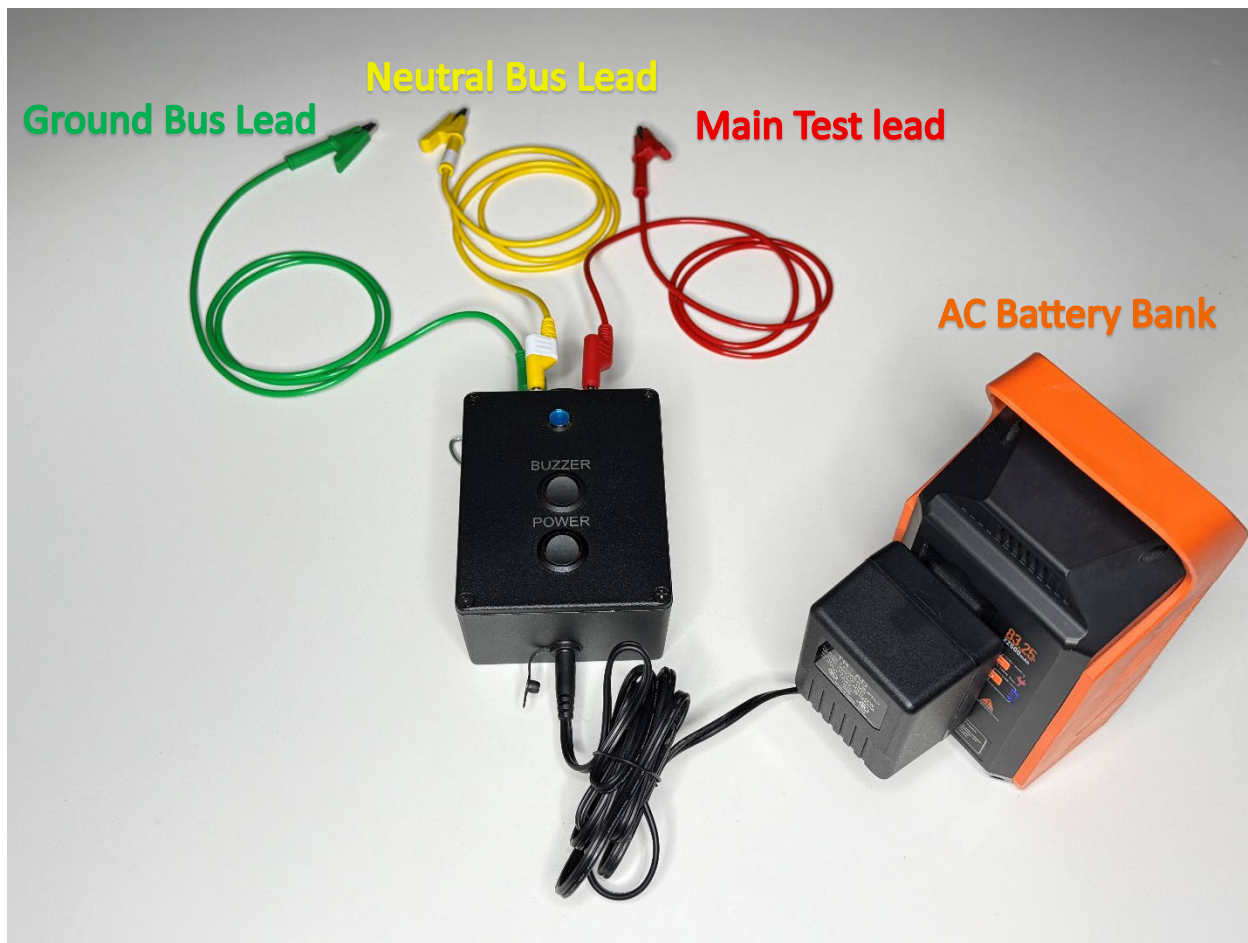
Power Supply: 120VAC Input and 12V AC Output @ 0.5 Amps

Product Overview

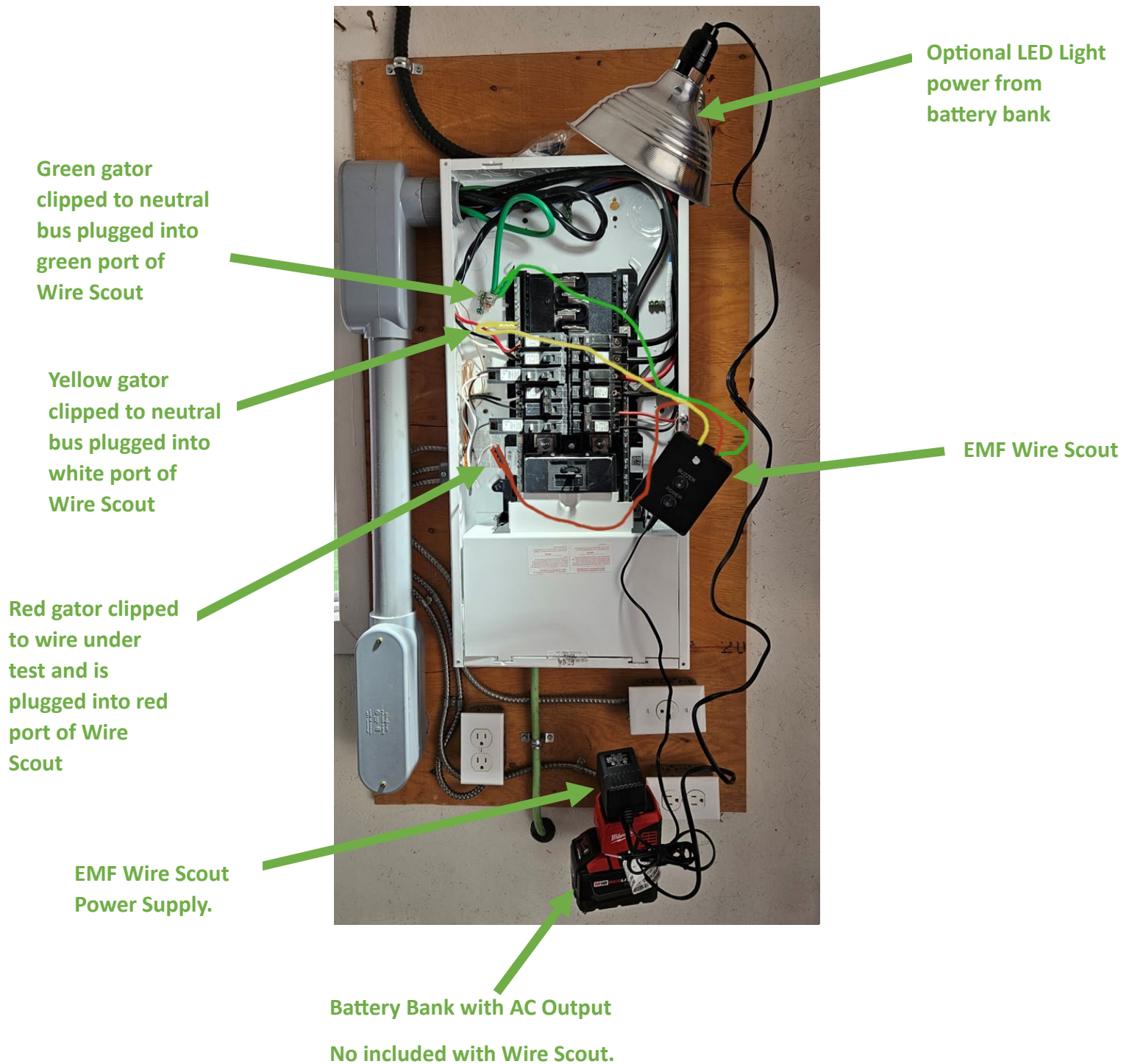
1. Power Supply
2. Wire Scout Enclosure
3. Test Lead Ports.
 - a. Red = Active Test Lead
 - b. White = Typically Neutral Bus Lead
 - c. Green = Typically Ground Bus Lead
 - d. Blue = Optional Lead - Typically neutral feeder lead
 - e. Legacy test lead port.
4. AC Power Input
5. Wire Error Indicating Light
6. Wire Error Indicating Buzzer On/Off
7. Main Power On / Off
8. Colored Test Leads (Red, Yellow, Green, Black, Blue)
9. Wire loop for hanging Wire Scout.



Typical Hookup



Setup Connections



Basic Wire Error Detection Procedure

For Identifying interconnected branch circuit neutrals and neutral to ground connections wiring errors that result in elevated AC magnetic field exposures.

Proper personal protective equipment must be worn while performing the this which include at a minimum rubber soled shoes, safety glasses and insulated gloves.

1. Turn off all individual branch circuit breakers and the main breaker in the electrical panel.
2. Confirm the power is off using a multimeter on both branch circuits and the electrical panel you're working on.
3. Connect the Wire Scout as follows: plug the **yellow test lead** into the white port and attach its alligator clip to the neutral bus; plug the **green test lead** into the green port and attach its alligator clip to the ground bus; and **plug the red test lead** into the red port. The red test lead will be used to test selected wires. Keep the following in mind:
 - a. An external battery pack with ac plug or other AC power is required to power Wire Scout.
 - b. A battery-operated light may be needed to perform this work.
4. Turn on power and activate the buzzer switch on Wire Scout.
5. To test a branch circuit:
 - a. Disconnect the branch circuit's neutral from the neutral bus (.
 - b. Touch the red gator clip to the ground bus to check buzzer and light are working.
 - c. Perform a continuity test: Connect the red gator clip to the lifted branch circuit neutral from 5a. If you hear a buzz or see a light then disconnect and reconnect the yellow and green gator clips one at a time, noting any changes in sound or light. Refer to the table for interpretation of continuity test.

Branch Neutral Continuity Test		Continuity Test Interpretation		
Lifted Neutral To Ground Bus Continuity	Lifted Neutral To Neutral Bus Continuity	Neutral-Ground Wire Error	Neutral-Neutral Wire Error	Tag and Label Lifted Neutral Conductor
No	No	No	No	
Yes	No	Yes	No	N-G
No	Yes	No	Yes	N-N
Yes	Yes	Maybe	Maybe	Wire Error Present Not Sure What Type. Could be N-N, N-G, or Both.

[EMF Wire Scout Basic Wire Error Detection Procedure Demo](#)



- d. Reconnect the branch circuit neutral and tighten neutral bus terminal screw.
6. Repeat step 5 for additional branch circuits.
 7. Double-check that all neutral wires are securely returned to the neutral bus, and ensure that all screw terminals on the neutral bus are tightened.
 8. Re-energize main breaker and turn on branch circuit breakers one at a time.