FieldTest 420 User Manual

**1. Introduction**

The FieldTest 420 is a portable, battery-powered 4–20mA loop signal generator designed for technicians working in industrial automation and controls. It provides a reliable test current for troubleshooting and calibration of sensors, transmitters, actuators, and PLC/DCS inputs.

**2. Safety Information**

- Only trained personnel should operate this device.  
- Ensure test circuits are de-energized before connecting.  
- Do not exceed 24VDC loop voltage.  
- Keep device away from moisture and extreme temperatures.  
- Disconnect power when not in use.

**3. Device Overview**

Front Panel & Controls:  
- LCD Display – Shows output current, battery level, and menu options.  
- Rotary Knob – Adjusts current output smoothly between 4–20mA.  
- 5-Way Joystick (UP, DOWN, LEFT, RIGHT, CENTER) – Menu navigation and function selection.  
- Output Terminals (+ / –) – Connect to control loop.  
  
Internal Features:  
- 12V Rechargeable Li-Ion Battery with charging circuit.  
- DC–DC Boost Converter provides 24VDC loop supply.  
- Current Regulator controlled by microcontroller (Arduino/STM32).

**4. Operating Instructions**

Powering On:  
1. Flip the Power switch on, the LCD lights up.  
2. The screen will display the FieldTest 420 splash screen, then the main menu.  
  
Generating 4–20mA Signal:  
1. Connect test leads from Output Terminals to the device under test (DUT).  
2. Select Manual Mode from the menu.  
3. Turn the Rotary Knob to adjust current between 4.00mA and 20.00mA.  
4. The LCD will show real-time current output.  
  
Preset Test Modes:  
- Sweep –Sweeps between 4-20mA, you can pause the output and change the time base

- Manual – Outputs 4-20mA, based off the potentiometer

- Ramp Mode – Moves from 4-20mA, pause to change time base.

**5. Battery & Charging**

- Battery status is shown on the LCD.  
- When low, recharge using the USB-C charging port.  
- Charging indicator:  
 - Red LED – Charging.  
 - Green LED – Fully charged.

**6. Maintenance**

- Clean device with a dry cloth.  
- Do not open enclosure unless trained, as internal circuits are sensitive.  
- Fully recharge every 3 months if stored unused.

**7. Troubleshooting**

| Issue | Possible Cause | Solution |  
|----------------------|--------------------------------|--------------------------------|  
| No display on power-up | Battery drained | Recharge battery |  
| Output not detected | Loose leads / DUT not powered | Check wiring & loop voltage |  
| Incorrect current reading | DUT input resistance too high | Verify load < 500Ω |  
| Device shuts down | Battery low / Overload | Recharge or reduce load |

**8. Technical Specifications**

- Output Current Range: 4.00 – 20.00mA  
- Loop Voltage Supply: 24VDC (internal boost)  
- Accuracy: ±0.05mA  
- Load Compliance: Up to 500Ω  
- Battery: 12V Li-Ion rechargeable  
- Display: 2” TFT LCD, 240x320 resolution  
- Dimensions: Portable handheld unit  
- Weight: ~350g

**9. Warranty & Support**

This device is provided as a prototype for testing and educational use. Warranty and service availability may be limited. For questions or support, contact the developer.