NCE NCE5240205

NCE BD20 Block Detector/DCC Module Instruction Manual

Model: NCE5240205

Product Overview

The NCE BD20 Block Module Detector/DCC is designed to detect DCC current draw within a specific block of your model railway layout. This device is crucial for advanced layout control, such as signaling systems or occupancy detection. It operates by sensing the current flowing through the track section it monitors.
Key features include:

- DCC Current Detection: Monitors DCC current draw in a block, ensuring optimal power management.
- Isolated Design: No direct electrical connection to the track, enhancing safety and reliability.
- No External Power Required: Operates independently for most functions, simplifying installation.
- High Current Rating: Suitable for DCC power up to 20 Amps, handling heavy loads.
- Versatile Mounting: Panel or PCB mount options for flexible installation in various layouts.

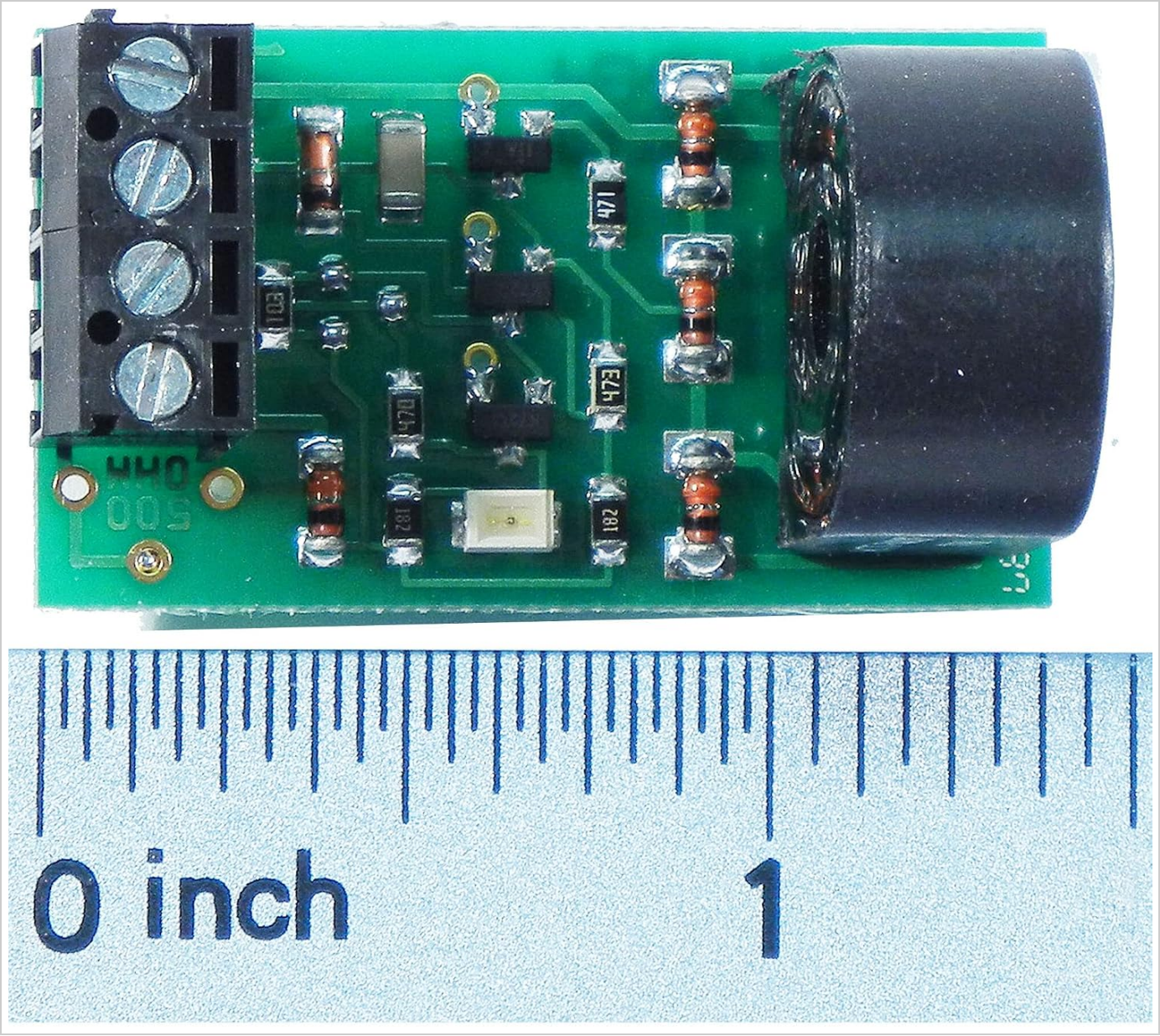

Figure 1: The NCE BD20 Block Detector Module. This image displays the compact circuit board with its screw terminals on the left, various electronic components, and a large black toroidal coil on the right. A ruler is visible at the bottom, indicating the module's approximate length is just over 1 inch (approximately 2.5 cm).

Setup and Installation

The NCE BD20 is designed for straightforward integration into your Digital Command Control (DCC) layout. Follow these steps for proper installation:

1. **Isolation:** Ensure the track section you intend to monitor is properly isolated from adjacent sections. The BD20 operates by detecting current in an isolated block.
2. **Connection to Track:** Connect the track wires from the isolated block to the appropriate screw terminals on the BD20 module. Refer to the module's labeling for correct polarity, though for basic detection, polarity may not be critical.
3. **Integration with Control System:** The BD20 is designed to connect with NCE's AIU01 (Accessory Interface Unit) or Mini Panel for relaying detection information to your DCC system. Consult the documentation for your specific NCE accessory for detailed wiring instructions.
4. **Power Requirements:** For most detection operations, the BD20 does not require an external power supply, drawing power directly from the DCC track signal. However, if you intend to light an LED or operate a relay directly from the BD20's output, an external DC power source (5-12 Volts) will be necessary for those specific functions.

5. **Mounting:** The module supports both panel and PCB mount options. Secure the module in a location that is protected from physical damage and provides easy access for wiring.

Operating Principles

The NCE BD20 functions as a current detector. When a locomotive or other DCC-equipped rolling stock enters the isolated track block, it draws current from the DCC track bus. The BD20 senses this current draw and provides an output signal indicating occupancy.

- **Current Detection Range:** The module is capable of detecting DCC current ranging from 0.01 Amps up to 20 Amps. This wide range allows it to detect even very small current draws, such as those from a single locomotive with lights, or larger draws from multiple locomotives.
- **Output Signal:** The BD20 provides a digital output signal that can be used by other NCE components (like the AIU01) or external relays/LEDs to indicate block occupancy. This signal is typically a low-voltage trigger.
- **Isolation:** A key design feature is its electrical isolation from the track. This means the detection circuit does not interfere with the DCC signal on the rails, ensuring reliable operation and preventing potential shorts or signal degradation.

Maintenance

The NCE BD20 Block Detector is a solid-state electronic device designed for long-term, reliable operation with minimal maintenance. Due to its robust construction and lack of moving parts, routine maintenance is generally not required.

- **Cleaning:** If the module becomes dusty, gently wipe it with a dry, soft cloth. Avoid using liquids or abrasive cleaners.
- **Connections:** Periodically check all wiring connections to ensure they are secure and free from corrosion. Loose connections can lead to intermittent detection issues.
- **Environment:** Ensure the module is installed in a dry environment, away from excessive heat, humidity, or direct sunlight, which could affect its performance and lifespan.

Troubleshooting

If you encounter issues with your NCE BD20 Block Detector, consider the following troubleshooting steps:

- **No Detection:**
  - Verify that the track section is properly isolated. Any electrical connection to adjacent blocks will prevent accurate detection.
  - Check all wiring connections to the BD20 and to your AIU01/Mini Panel. Ensure they are secure and correctly terminated.
  - Confirm that there is DCC power on the track section being monitored.
  - Ensure the locomotive or rolling stock is actually drawing current (e.g., lights are on, motor is active). Some unpowered rolling stock will not trigger detection unless equipped with resistor wheelsets.
- **Intermittent Detection:**
  - Inspect track joints and rail cleanliness in the isolated block. Dirty track or poor rail joiners can cause intermittent current flow.
  - Check for loose wiring connections at the BD20 or other connected devices.
- **False Detection:**
  - Ensure there are no unintended electrical paths or shorts in the isolated block.

- Verify that the current draw from the detected item is sufficient and consistent.

If problems persist, consult the NCE website or contact NCE technical support for further assistance.

Specifications

Feature	Detail
Model Number	NCE5240205
Brand	NCE
Current Rating	0.01 to 20 Amps (DCC)
Power Source	DCC Track Power (for detection); 5-12 Volts DC (for external LED/Relay operation)
Isolation	Electrically isolated from track
Mounting Type	PCB Mount / Panel Mount
Product Dimensions	8.7 x 5.9 x 0.86 inches (approximate)
Item Weight	0.8 ounces
UPC	816757010632, 791209284642

Warranty and Support

For information regarding product warranty, technical support, or additional resources, please refer to the official NCE Corporation website or contact their customer service directly. Keep your purchase receipt as proof of purchase for any warranty claims.
NCE Official Website: www.ncedcc.com