CANmod.temp

General Information

- Functionality: The device supports up to four thermocouples, providing temperature sensor data through both CAN bus and USB.
- Included Components: The package contains the CANmod.temp module and a USB dust cover. Thermocouple sensors and a mini USB adapter are not included.
- Firmware: Free firmware upgrades are available via USB to add new features.
- Configuration: Configuration is managed using files based on a widely-used open source JSON schema, similar to the CANedge.
- Software: An open-source editor tool is provided for easy device configuration, available in both offline and online versions.
- Safety: The product is certified (CE, FCC, IC, and RoHS); certification documents are available in the Docs.
- Warranty: One-year warranty is included.
- Support: Free, rapid, and high-quality support is available.
- Origin: Manufactured in Denmark.

Temperature Sensor (Thermocouple) Features

- Channels: Supports up to four thermocouple sensors (plus ambient temperature via cold-junction measurement).

- Module: Uses a professional-grade MAX31856MUD+ precision thermocouple converter.
- Temperature Range: Measures from -210°C to +1800°C, depending on thermocouple type.
- Output Format: Reports temperature in degrees Celsius using automated edge linearization.
- Accuracy: Delivers laboratory-grade voltage measurement accuracy with cold-junction compensation.
- Resolution: Provides 1°C resolution (in one CAN frame) and optional 0.01°C resolution (in two CAN frames). Note that 0.01°C resolution usually exceeds practical probe accuracy.
- Protection: Thermocouple inputs are safeguarded against overvoltage up to ±45V.
- Supported Types: Compatible with thermocouple types B, E, J, K, N, R, S, and T (configurable).
- Filtering: Supports line frequency filtering at 50Hz or 60Hz (configurable).
- Fault Detection: Communicates thermocouple faults (such as open circuits or over/under temperature) via CAN.
- Cold Junction Accuracy: ±0.7°C (maximum, between -20°C and +85°C).
- Isolation: When measuring from conductive surfaces, isolated thermocouple probes are required.

Data Parameters

- CAN Signals: Transmits temperature and fault status data (see Docs or DBC file for complete list).
- Thermocouple Temperatures: Reports temperature of each probe at 5 Hz.
- Ambient Temperature: Reports ambient temperature via the internal cold-junction at 5 Hz.
- Fault Reporting: Updates fault status for each sensor at 5 Hz.

CAN Bus Features

- Channels: Includes a single CAN channel.
- Operating Modes: Can broadcast data or provide it on request.
- Standard: Complies with ISO 11898, supporting baud rates from 5K to 1 Mbit/s.
- Identifiers: Adheres to CAN 2.0A (11-bit ID) and 2.0B (29-bit ID) specifications.
- Termination: Termination can be toggled using a switch below the DB9 connector.
- Retransmission: Automatically retransmits frames lost due to arbitration or errors.

- Transceiver Protection: Protected against +/- 25kV HBM ESD, +/-12kV IEC ESD, +/-14V bus faults, and short circuits. The common mode input voltage is +/-12V. Includes TXD dominant timeout to prevent network blocking during failures.

Configuration Options

- Bit Rate: Select from standard bit rates (5K to 1M) or customize bit-timing.
- Enable/Disable: CAN messages can be enabled or disabled individually.
- Identifier Customization: Each CAN ID (11- or 29-bit) can be individually configured.
- Push/Poll Mode: Configure each CAN message to operate in push or poll mode.
- Frequency: Set individual CAN message prescaling to reduce frequency as needed.
- Thermocouple Type: Specify the thermocouple type for each channel (e.g., Type K, Type J, etc.).
- Line Noise Filtering: Select 50 Hz (EU) or 60 Hz (USA) filtering, including harmonics.

Electrical Specifications

- Input Supply: Accepts +5V to +26V DC through the DB9 connector in standalone or add-on mode. Alternatively, power can be supplied via USB for firmware/config updates or real-time streaming.
- Power Consumption: Extremely low (less than 1W), preventing battery drainage concerns.
- Protection: Includes reverse voltage protection on the CAN-bus supply and transient voltage event protection on supply lines.

Mechanical Design

- Enclosure & Weight: Compact aluminum enclosure (65 x 48 x 24 mm, excluding flanges and connectors), weighing 80 grams.
- Front Connector: Standard D-sub 9 (DB9) connector.
- Rear Connectors: Four miniature female thermocouple connectors.
- Pin-Out: Refer to the product manual for DB9 connector pin-outs.
- USB: Standard mini USB connector for configuration, firmware updates, and streaming (USB cable not included).
- Status LEDs: Three external LEDs display module status: Power, CAN bus, and Memory.
- Operating Temperature: -25°C to +70°C for the CANmod.temp module.

- IP Rating: IP 40.
- Mounting: The module can be mounted using velcro strips, zip-ties, or a mounting kit.