

# CM 2201 Single Point Circuit Management System

CSA:  
Class I, Division 2, Groups A, B, C, D  
Class I, Zone 2, Groups IIC  
Temperature Code T4, 135°C

## Applications

- The Nelson Single Point Circuit Management System (referenced to as "CM-2201") is a microprocessor based digital control and monitoring system that has been specifically designed for stand-alone or networked electric heat tracing applications.
- This system provides temperature control and heater cable monitoring while communicating additional information to operations personnel such as temperature alarms, voltage and current alarms, ground fault leakage, sensor failures and communications failures.

## System Components

- The circuit management system is housed in a NEMA 4X durable molded fiberglass polyester enclosure that can be wall or rack mounted.
- The system is provided with dual pole solid-state heater switching and is environmentally hardened for use in various plant locations.
- The standard versions of the CM-2201 can be installed in Class 1, Division 2 hazardous locations without special requirements. Up to 256 individual systems can be connected to a single RS-485 data highway allowing communications to a host device.
- The CM-2201 is fully compatible with PC based communications software via Modbus® RTU protocol.
- All alarm and control functions can be accessed from the central location.

## Features

- Easy to Use Interface
  - The 2 line, 16 characters/row, alphanumeric LCD display enables the use of English language prompts for setpoint entry and operation. There are no cryptic codes or key press combinations to remember.
- On/Off or Proportional Control
  - The desired control mode can be easily selected via the front panel user interface.
- Ground Fault Alarm and Trip Settings
  - Separate alarm and trip settings for ground fault interrupt allow alarming of developing faults prior to circuit interruption
- Dual RTD Input
  - The optional second RTD can easily be configured in a variety of ways, including working with one RTD / two RTDs and High Temperature Cutout.
- Programmable Auto Test Cycle
  - The user can select an interval from 1 to 24 hours to have the unit automatically check the heater operating current and ground fault conditions.
  - This allows problems to be detected and fixed before the heating system is needed.
- Host Communications
  - The RS-485 Modbus® RTU communications capability is included as a standard feature.
  - There are no expensive "daughter boards" or firmware updates required.
- 2 Line, 16 Characters/row: LCD Display
- Temperature Input Range: -50°C to +500°C (-58°F to + 932°F)
- Enclosure: NEMA Type 4X
- Current Rating: 30A max (resistive load only)
- Ambient Temperature: -40°C to + 40°C (-40°F to +104°F); Start up at -20°C (-4°F)



- Current Monitoring: 0.1 to 40A
- Ground Fault Monitoring: 10mA to 500mA
- Voltage Range: 100Vac to 277 Vac
- Temperature Input
  - Range: -50 to +500°C (-58 to +932°F)
  - Accuracy: ±2°C
  - Repeatability: ±1°C
  - RTD: 100 ohm platinum, 3-wire RTD, (lead compensated up to 20 ohms)
  - RTD Configuration: Single, Backup, Highest, Lowest, Average or High Temperature Cutout
  - RTD Fail-safe: Heater ON or OFF
- Heater Switching
  - Configuration: Two-pole, dual SSR per phase, 800 amp, 1 cycle inrush
  - Ratings: 100-277 Vac, 30A continuous
  - Line Frequency: 50 or 60Hz
  - Current Measurement: 0.1 to 40A 3%±0.1A
  - GF Measurement: 10 to 500mA 5%±2mA
  - Voltage Measurement: 0 to 300Vac 3%±2V
- Control Power
  - Power Requirement: Control power from heater voltage, 110-277 Vac, 12VA max
- Communications
  - Port:(1) RS-485
  - Protocol: Modbus® RTU
  - Transmission Rate: up to 115Kbps
  - Wiring: 2-wire, shielded, twisted pair
  - Maximum Wiring Run: 4,000 feet without repeater
  - Modules per Network: Up to 256
- Measured Values
  - Temperature: -50 to +500°C (-58 to +932°F)
  - Minimum Temperature: -50 to +500°C (-58 to +932°F)
  - Maximum Temperature: -50 to +500°C (-58 to +932°F)
  - Heater Current: 0.1 to 30A
  - Ground Fault Current: 10 to 500mA
  - Min. Heater Voltage: 90Vac
  - Maximum Heater Voltage: 300Vac
  - Weight: 4.0kg (8.9lb)

For custom configurations or modifications of CM2201, consult Nelson Heat Trace. Nelson Heat Tracing Systems products are supplied with a limited warranty.

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NELSON™

CONTROL AND MONITORING SYSTEMS: CIRCUIT MANAGEMENT SYSTEMS

## CSA:

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Temperature Code T4, 135°C

- User Interface
  - Display: 16-character x 2-line LCD Alphanumeric display
  - Panel Indicators:
    - Power On
    - Heater On
    - Serial Communication Active
    - System Failure
    - Process Alarm
  - Keypad:
    - 9 touch keys, polyester faceplate
    - Actual, Alarm, Program, Reset
    - Select Up, Select Down, Select Right, Select Left
    - Enter
    - Security: Controller parameters password protected
- Environment
  - Operating Temperature: -40°C to +40°C Starting at -20°C
  - Conformal Coating: Boards conformal coated for hostile environments
- Enclosure
  - Type: NEMA Type 4X Molded Fiberglass Polyester enclosure
  - Size: 10"H x 8"W x 6"D
  - Features: Quick release latches to open door.
- Alarm Output
  - Alarm: Normally Open contacts
  - One DC opto-isolated contact
  - One AC opto-isolated contact
  - Alarm Rating: DC contact: 30Vdc/100mA max
  - AC contact: 24-277 Vac @ 0.5A max
  - Alarm Output: LED Indication
- Alarm Function
  - Temperature: High Temperature Alarm / Low Temperature Alarm
  - Current: Low Current Alarm / High Current Alarm
  - Ground Fault Current: Ground Fault Current Alarm / Ground Fault Current Trip
  - Voltage: High Voltage Alarm / Low Voltage Alarm
  - Hardware: Self-Check Failure / Switch Fail / RTD Failure / Power Failure
- User-Definable Options
  - Heater Name or Tag: 16 Character Alphanumeric
  - Temperature Units: °C or °F
  - Control Method: ON/OFF with Deadband or Proportional
  - Deadband: 1 to 5°C (1 to 10°F)
  - Power Limit: 20% to 100% in 10% steps, off
  - Soft Start: 10 to 999s, off
  - Auto Check: 1 to 720hrs, off
  - Temperature Setpoint: -50 to 500°C (-58 to +932°F), off, none
  - High Temp. Alarm: -50 to 500°C (-58 to +932°F), off
  - Low Temp. Alarm: -50 to 500°C (-58 to +932°F), off
  - High Current Alarm: 0.1 to 30A, off
  - Low Current Alarm: 0.1 to 29A, off
  - Ground Fault Alarm: 10 to 495mA, off
  - Ground Fault Trip: 15 to 500mA, off
  - High Voltage Alarm: 95V to 280V, off
  - Low Voltage Alarm: 85V to 270V, off
  - Override: ON/OFF
  - Alarm Contacts: Solid State – Normally Opened

## Certifications and Compliances

- UL Standard: 50 Ed. 12, 916 Ed. 4
- CSA Standard: C22.2 No. 213-16, C22.2 No. 94-R2011, C22.2 No. 142-R2014
- cCSAus Certified: LR91382
- Other Standards: ANSI/ISA 12.12.01-2015

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