C&H

M214 4-CHANNEL PRECISION DC REFERENCE M-MODULE

The M214 provides four precision four-wire voltage references in a single-wide M-module format. Each voltage reference is independent and individually optically isolated to allow independent thermocouple simulation. An on-board microcontroller provides precise control of the voltage references, including automatic temperature compensation.
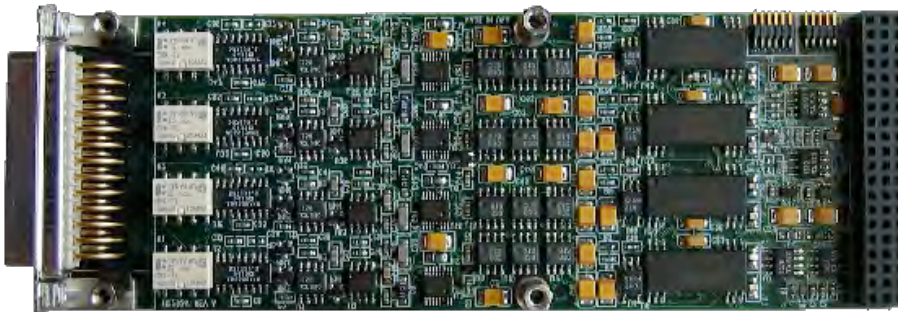
Overview:

The module has individual and individually optically isolated bipolar outputs with three voltage ranges to provide flexible output resolution options. Exceptional accuracy is ensured with on-board temperature measurement and automatic temperature compensation. All calibration constants or stored in on-board non-volatile memory.

An external analog input can be used for external temperature sensing. All outputs are short circuit protected.

Voltage control registers are double-buffered to allow fast continuous updates without waiting for internal operations.

Front Panel I/O:

- 25-Pin female (socket) D-subminiature right angle connector (CONEC part number 164A10989X or equivalent).

- Any standard 25-pin male (plug) D-subminiature connector will mate with it.

I/O Signals:
- HIx Source Output (High Side)
- LOx Source Output (Low Side)
- SENSEHIx Sense Input (High Side)
- SENSELOx Sense Input (Low Side)
- AIN External Analog Input (0 to 5V)
- +5VOUT Ext. Sensor Ref. Power
- GND External Ground Reference
- CHGND Chassis Ground*

* CHGND is capacitive coupled to GND

M Module Compliance

Complies with ANSI/VITA Std. 12-1996 for single-wide M Modules, with the exception of +5V power consumption (see note 4)

Data Transfers: 16 bit

Compatible with VXI, LXI, PXI, VME, PCI, cPCI, Ethernet and other M Module carriers.

Applications
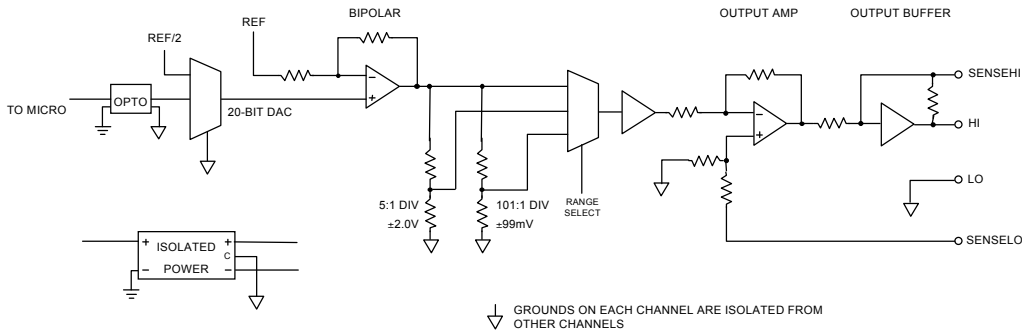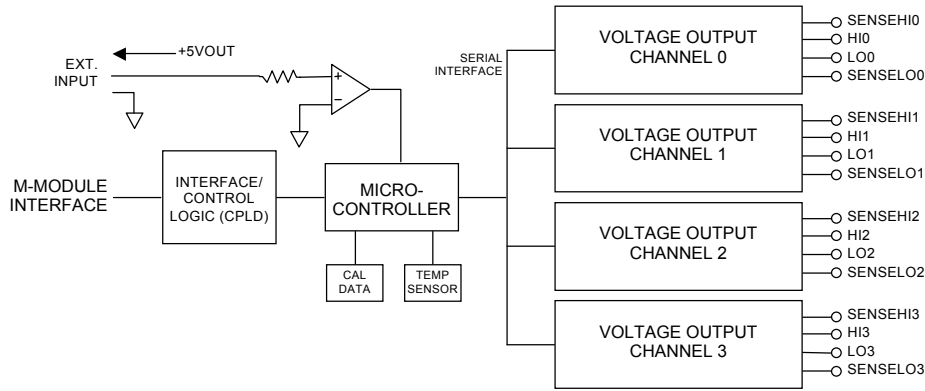
- Thermocouple simulation
- Precision voltage source

Ordering Information

M214 M-Module   11029260-0001

Additional Information

User Manuals for C&H carriers and this module can be found on our website at www.chtech.com.

VOLTAGE OUTPUT CHANNEL 0 — SENSEHI0, HI0, LO0, SENSELO0
VOLTAGE OUTPUT CHANNEL 1 — SENSEHI1, HI1, LO1, SENSELO1
VOLTAGE OUTPUT CHANNEL 2 — SENSEHI2, HI2, LO2, SENSELO2
VOLTAGE OUTPUT CHANNEL 3 — SENSEHI3, HI3, LO3, SENSELO3

EXT. INPUT +5VOUT
M-MODULE INTERFACE
INTERFACE/ CONTROL LOGIC (CPLD)
MICRO-CONTROLLER
SERIAL INTERFACE
CAL DATA   TEMP SENSOR

TO MICRO — OPTO — REF/2 — REF — 20-BIT DAC — BIPOLAR — OUTPUT AMP — OUTPUT BUFFER — SENSEHI, HI, LO, SENSELO
5:1 DIV ±2.0V   101:1 DIV ±99mV   RANGE SELECT
ISOLATED POWER
GROUNDS ON EACH CHANNEL ARE ISOLATED FROM OTHER CHANNELS

Specifications:

Voltage Source Outputs:

Output Voltage Ranges	±10.0V, ±2.0V, & ±99mV
Voltage Resolution	
±10.0V range	19.1μV
±2.0V range	3.81μV
±99mV range	0.188μV
Voltage Accuracy [1,2]	±(0.01% of setting + 0.005% of range + 15μV)
Linearity Error	±0.0015%
Output Current	±10ma min
Programming Time [3]	6.5ms max
Slew Rate	100V/s

+5VOUT

Voltage Accuracy	±1.0%
Thermal Coefficient	20ppm/°C
Output Current	30ma min

AIN (Analog Input)

Data Resolution	10bits
A/D Conversion Error	0.5 LSB
Input Range (operational)	±5V
Input Voltage (no damage)	±20V
Accuracy	±(1.5% + 10mV)
Input Current	800nA max

On-board Temperature

Data Resolution	10bits
Accuracy	±3°C

Power:

+5V	1200 ma [4]
+12V	20 ma
-12V	15 ma

Temperature:

Operating	0°C to 50°C
Storage	-40°C to 70°C

Notes:

1. The output level is automatically temperature compensated by the on-board processor. The specified accuracy is typically maintained for a wider temperature difference; however, it is not guaranteed. Unit should be allowed to stabilize for a minimum of 5 minutes after power-up.
2. Accuracy may be somewhat degraded at the limits of each range. Stay within 98% of full scale for specified accuracy.
3. Register write to start of output change.
4. The +5V power consumption exceeds the ANSI/VITA 12-1996 Specification for M-modules. Be sure check the specifications of the M-module carrier and system environment to ensure that it can handle the rated current load and heat dissipation.