CMM-2CH-10A60V

Datasheet

DOCUMENT INFORMATION

Author: madi1

Date: 01.08.2023

Current Revision: 1.0

History

Revision	Date	Author	Change Log
1.0	01.08.2023	madi1	Initial Release

TABLE OF CONTENTS

CMM-2CH-10A60V

This module offers two separately isolated channels for current measurements over a wide range from 1µA to 10A. Ethernet and CAN-FD are available for communication.

Current is measured in six automatically selected ranges as listed in the table below:

Range number	Current range lower end	Current range upper end	Lower range threshold	Higher range threshold
0	1µA	100µA	-	110µA
1	100µA	1mA	90µA	1.1mA
2	1mA	10mA	0.9mA	11mA
3	10mA	100mA	9mA	110mA
4	100mA	1A	90mA	1.1A
5	1A	10A	900mA	

1. Mechanical details

Module dimensions	160mm x 100mm (Eurocard)
19" specification	5 TE x 3 HE

2. Ambient conditions

Ambient operating temperature	5…50°C
Storage temperature	-20…70°C
Humidity	5…80% noncondensing

3. Current Paths

	Min	Typ	Max	Unit	Remarks
DC current			10	A	
Worst case DC current			16	A	25° Ambient Temperature with airflow >2m/s
Single pulse current			50	A	max. 100ms
Voltage across current in/out when module is off			60	V	max. 100ms
Leakage current @ OFF			100	µA	60V across module , temperature 25°C
Isolation rating	-150		150	V	Maximum allowed voltage difference between module supply and current path
Reverse current continuous			4	A	
Reverse current single pulse			30	A	Max. 100ms

4. Module Supply

Connect the power supply between +24V-CON and GND-CON.

It is strongly recommended not to use the DUT power supply to power the CMM.

Please note that the current path is interrupted when the module is unpowered.

	Min	Typ	Max	Units	Remarks
Supply voltage	20	24	26	V	+24V-CON to GND-CON
Supply current (Ethernet port active)		110		mA	Supply voltage = 24V
Supply current (Ethernet port inactive)		98		mA	Supply voltage = 24V
Supply inrush current		3		A	Inrush current for < 1ms @ dU/dt ≈ 20V/ms, 24V supply

Typical inrush current waveform

Abbildung 1: Module supply voltage (green) and supply current (red)

5. DC Accuracy and resolution

The module's accuracy is verified for DC currents during in-house calibration.

The module may of course be re-calibrated. See chapter "Calibration Recommendation" for more info.

	Typ	Max	Units	Remarks
Accuracy uncalibrated	0,5	2	%	% of respective range's maximum current
Accuracy calibrated	0,2	1	%	% of respective range's maximum current
Resolution range 0	40,4		nA	
Resolution range 1	404		nA	
Resolution range 2	4,04		µA	
Resolution range 3	40,3		µA	
Resolution range 4	403		µA	
Resolution range 5	4,03		mA	

6. DC Voltage Drop

The following table lists the voltage across the module's current input and output pins for specific current values. These are typical values, measured at room temperature at the connector pins of one channel.

	Typ	Units	Remarks
Drop @ 100µA	50 (Prototype)	mV	Range 0
Drop @ 1mA	50 (Prototype)	mV	Range 1
Drop @ 10mA	50 (Prototype)	mV	Range 2
Drop @ 100mA	60 (Prototype)	mV	Range 3
Drop @ 1A	70 (Prototype)	mV	Range 4
Drop @ 10A	150 (Prototype)	mV	Range 5
Drop @ 16A	250 (Prototype)	mV	Range 5

7. Ethernet

The module supports 10Mbit/s and 100Mbit/s Ethernet on the RJ45 front connector.
Default IP: 192.168.222.1

8. CAN-FD

The module provides a CAN-FD interface on the front via a 9-pin D-Sub connector as well as on the backplane connector.

Supported nominal bit rates	500 kbit/s, 1 Mbit/s
Supported data bit rates	1 Mbit/s, 2 Mbit/s, 4 Mbit/s
Default settings	1 Mbit/s nominal, 4 Mbit/s data, no bit rate switch

120Ω on-board termination is available via jumper.

9. Backplane connector

Connector type: Harting 09041326921

Please make sure you use all connector pins for current in / current out. A backplane-pcb is available for easy connection with just two pins per current measurement channel.

Pin	Signal	Pin	Signal
A2	+24V module supply	C2	0V module supply
A4	CAN Low	C4	CAN High
A6	Channel 0 Current In	C6	Channel 0 Current In
A8	Channel 0 Current In	C8	Channel 0 Current In
A10	Channel 0 Current In	C10	Channel 0 Current In
A12	Channel 0 Current Out	C12	Channel 0 Current Out
A14	Channel 0 Current Out	C14	Channel 0 Current Out
A16	Channel 0 Current Out	C16	Channel 0 Current Out
A18	Channel 0 Current Out	C18	Channel 0 Current Out
A20	Channel 1 Current In	C20	Channel 1 Current In
A22	Channel 1 Current In	C22	Channel 1 Current In
A24	Channel 1 Current In	C24	Channel 1 Current In
A26	Channel 1 Current Out	C26	Channel 1 Current Out
A28	Channel 1 Current Out	C28	Channel 1 Current Out
A30	Channel 1 Current Out	C30	Channel 1 Current Out
A32	Channel 1 Current Out	C32	Channel 1 Current Out

10. Calibration Recommendation

IRS recommends a recalibration within 2 years.

The calibration should be performed for each channel at multiple calibration points for all 6 ranges. IRS recommends measuring at least the following currents.

Range	Calibration Points
100 uA	20 uA, 40 uA, 60 uA, 80 uA, 100 uA
1 mA	0.2 mA, 0.4 mA, 0.6 mA, 0.8 mA, 1 mA
10 mA	2 mA, 4 mA, 6 mA, 8 mA, 10 mA
100 mA	20 mA, 40 mA, 60 mA, 80 mA, 100 mA
1 A	0.2 A, 0.4 A, 0.6 A, 0.8 A, 1 A
10 A	2 A, 4 A, 6 A, 8 A, 10 A

Current values should be captured with the function (IRS.CMM_MM.Lib.Gateway).GetMinMaxAverage. This function returns the value averaged since last read.

Before capturing a valid value, enable the calibration current, perform a dummy read and wait 100 ms.

The fluctuations of the power source used should not exceed 0.1% of the nominal value.