C-DIAS DMS Module CAI 025

For two resistance bridges
2mV/V, 20mV/V

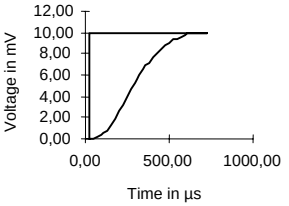
For each connector, a measurement bridge can be connected with a 4-wire cable in 2mV/V or 20mV/V resolution. The supply voltage for the bridge is 5V. The minimum resistance is 100Ω per bridge.

Technical Data

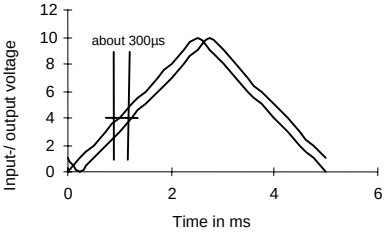
Input specifications

Number of channels	2 (4-wire connection)	
Measurement range	2mV/V or 20mV/V	
Measurement value	0 – 16000	
Resolution	14-bit	
Conversion time per channel	≤1ms	
Input filter	Cutoff frequency 1kHz (1ms)	Low pass 3 system
Supply voltage	5V / ±2,5%	
Maximum voltage supply capacity	100mA maximum, short circuit proof	
Analog measurement precision	±0,3% of maximum Measurement value	
Repeating accuracy	2mV/V ±0,3%	20mV/V ±0,2%
Linearity error	2mV/V ±0,6%	20mV/V ±0,2%

Step response input filter CAI 025
for resistance bridges 2mV/V



Delay of input signals CAI 025



Electrical requirements

Power supply from C-DIAS bus	5V / +24V	
Current consumption of C-DIAS bus (+5V supply)	Typically 75mA	Maximum 100mA
Current consumption of C-DIAS bus (+24V supply)	Typically 140mA	Maximum 210mA

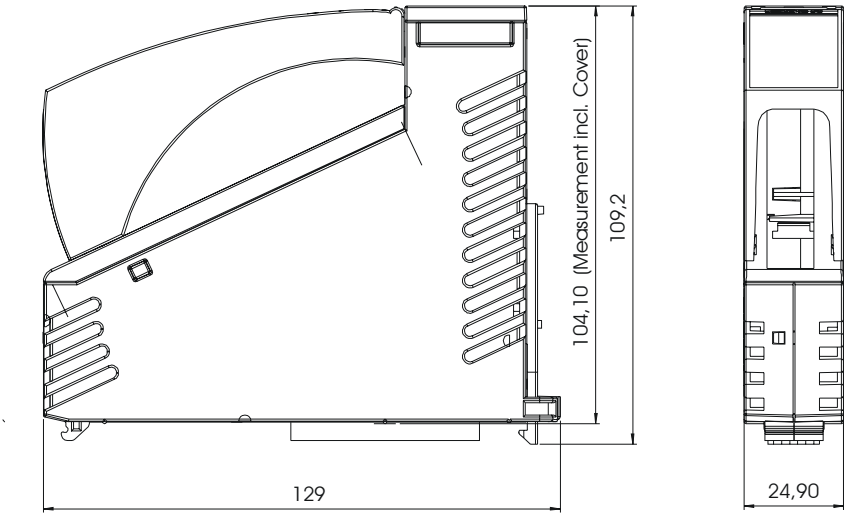
Miscellaneous

Article number	12-009-025
Hardware version	1.x
Standardization	UL (E247993)

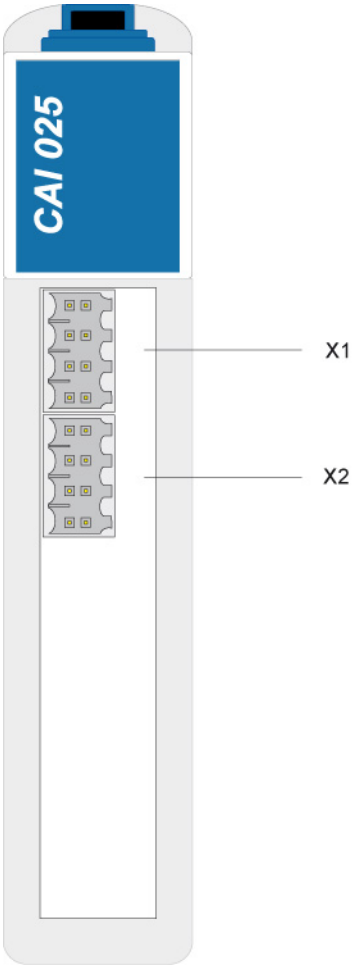
Environmental conditions

Storage temperature	-20 – +85°C	
Operating temperature	0 – +60°C	
Humidity	0 – 95%, uncondensed	
EMV stability	According to EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150m/s²
Protection	EN 60529	IP 20

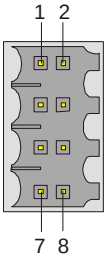
Mechanical Dimensions



Connector Layout



X1:

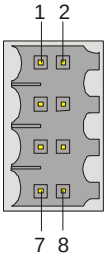


Pin	Assignment
1	Bridge input 1-
2	Bridge input 1+
3	AGND
4	+5V supply voltage
5	Bridge input 1-
6	Bridge input 1+
7	AGND
8	+5V supply voltage

Bridge 2 mV/V

Bridge 20 mV/V

X2:



Pin	Assignment
1	Bridge input 2-
2	Bridge input 2+
3	AGND
4	+5V supply voltage
5	Bridge input 2-
6	Bridge input 2+
7	AGND
8	+5V supply voltage

Bridge 2 mV/V

Bridge 20 mV/V

Only one connector per measurement bridge is allowed. The minimum resistance per bridge is 100Ω.

Applicable connectors

X1, X2: 8-pin. Weidmüller plug B2L3,5/8

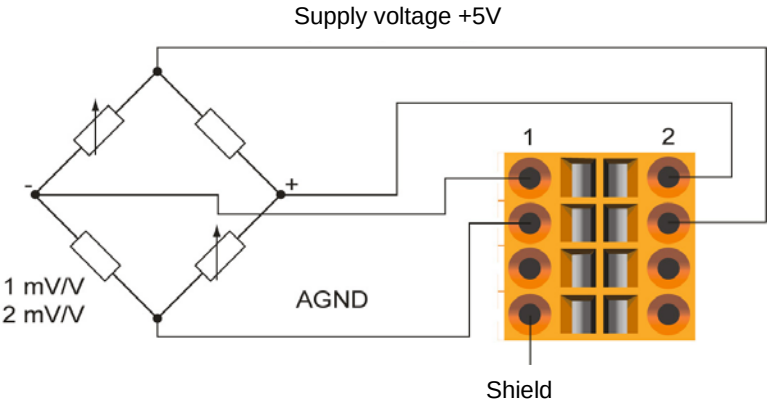
The complete C-DIAS CKL 046 connector set with spring terminals is available from Sigmatek under the article number 12-600-046.

Wiring Guidelines

The signals recorded by the analog modules are very small, as compared to the digital signals. To ensure error-free operation, a careful wiring method must be followed:

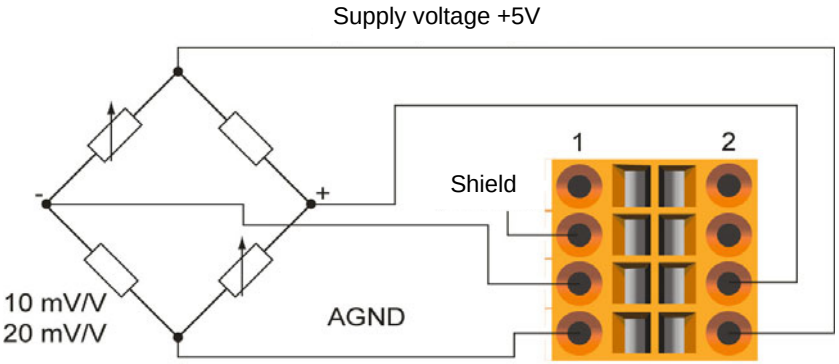
- The DIN rail must have an adequate mass connection.
- The connection lines to the source of the analog signals must be as short as possible and parallel wiring to digital signal lines must be avoided.
- The signal lines must be shielded.
- The shielding should be connected to a shielding bus. If no shielding bus is available, the shield can also be clamped to the connectors (see below).

With 2mV/V Measurement Bridge Circuit



Connection diagram 1

With 20mV/V Measurement Bridge Circuit



Connection diagram 2

Addressing

Address	RD/WR	Function / Bits
$00	RD16	14-bit reference voltage for the analog measurement value
$02	RD16	Analog measurement value, Channel 1; 14-bit
$04	RD16	Analog measurement value, Channel 2; 14-bit
$06	RD16	Analog measurement value, Channel 3; 14-bit
$08	RD16	Analog measurement value, Channel 4; 14-bit
$16	WR8	ADC-DAC configuration: Bit 7 Enable 10 V reference
$16	RD8	ADC-DAC Status: Bit 0 10 V reference OK Bit 7 10 V reference enabled
$18	RD8	PLL status register Bit 1 = PLL online Bit 0 = PLL lock (PLL latched)
$19	RD8/WR8	PLL configuration register Bit 0...3: Period of the PLL base time in ms
$1A	RD8	Reserved
$1B	RD8	Xilinx Version

Calibration data (the serial EEPROM is organized by bite)

Address	DATA	Description
$00	$xx	Check sum
$01	123	Identification
$02	5	Module group 5 = CAI
$03	15	Module version
$04	4	Number of channels
$05	10	Hardware version $10 = HW 1.0
$06-$3F	0	FILL
$10		Serial number
		AI calibration data 0 – 10Vref
$40	$xxxx	Check sum
$42	12345	Identification
$44	16	Length of the following data blocks in WORD
$46	4	Number of channels
$48		AI0 Offset = Reference voltage at the time of calibration
$4A		AI0 Multiplicand is not used
$4C		AI0 Divisor is not used
$4E		AI1 Offset
$50		AI1 Multiplicand
$52		AI1 Divisor
$54		AI2 Offset
$56		AI2 Multiplicand
$58		AI2 Divisor
$5A		AI3 Offset
$5C		AI3 Multiplicand
$5E		AI3 Divisor
$60		AI4 Offset
$62		AI4 Multiplicand
$64		AI4 Divisor
$66-$FF	0	FILL