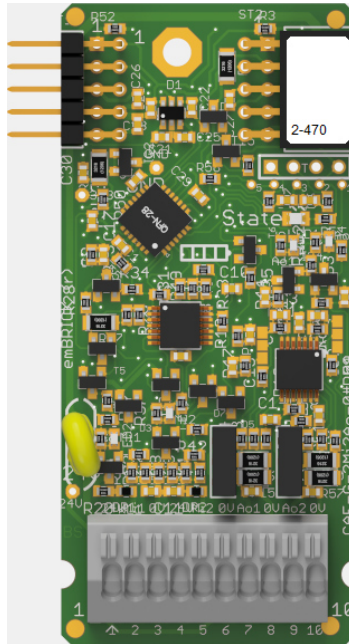


CAE_G_2Mi2Ao_01



1.1 Description

ID: 2-470

Order No.: CAE_G-2Mi2Ao-01 (-p)

Terminal: push-in (for $\leq 0.5\text{mm}^2$)

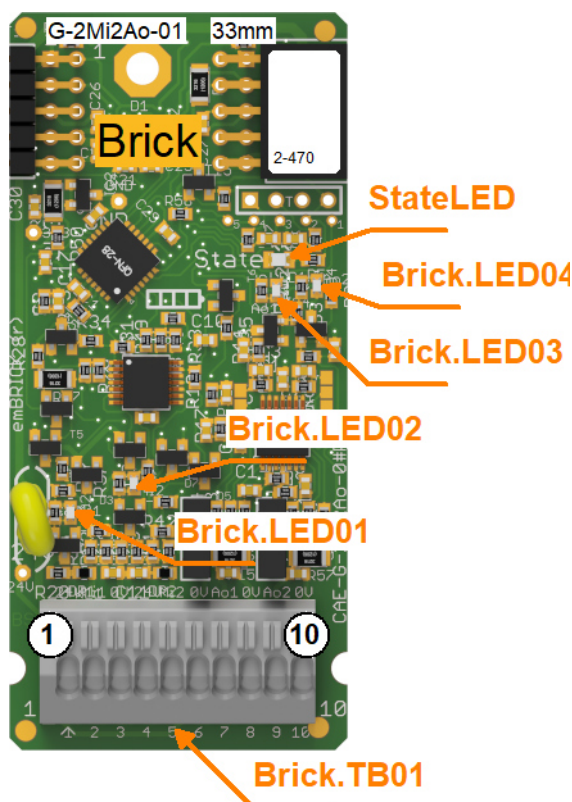
Size: 3 eU (33mm x 72mm)

BBFCP: 1-1-1

Weight: 20g

This module offers 2 multifunctional inputs and 2 analog outputs. The inputs can be configured via software as analog inputs (partly voltage (both channel) / current (only one channel) selectable) or as digital/counting inputs. If so both channel supports a software sectable pull up. The outputs are factory configured with solder bridges as voltage outputs.

1.2 Connectors and Indication-/Operation-Elements



1.2.1 Terminal block (TB)

The following Illustration the technical details for Terminal blocks are listed. The location of a specific block is documented with the ID (left coloumn) in the preavious Illustrations.

ID	Model	Model / Series	Grid	Num. of term.	connection	elec. usage
Brick.TB01	Cage Terminal	WAGO250	2.5mm	10	up to 0.5mm² or 0,8mm	signal level

1.2.2 Terminal assignment

Here the assignment of individual terminals and there affilation to terminal blocks (Te block), terminal numbers (Te no.) and short description (T.desc.) aswell as there electrical function and usage are explained.

The associated mechanical and electrical properties are stated with the specific terminal block in the previous chapter. The position of a terminal is dedicated through the "Te block" and the actual terminal number (Te no.) or the therminal description (T.descr.) in the previous Illustration respectively. In the coloumn "usage" the technical-/ device-functional use is listed.

Te block	Te no.	T. descr.	Function	Usage
Brick.TB01	1	24V	Sensor supply +24V	Multi Eingang 1
Brick.TB01	2	MI	MultInput	Multi Eingang 1
Brick.TB01	3	0V	Ground	Multi Eingang 1

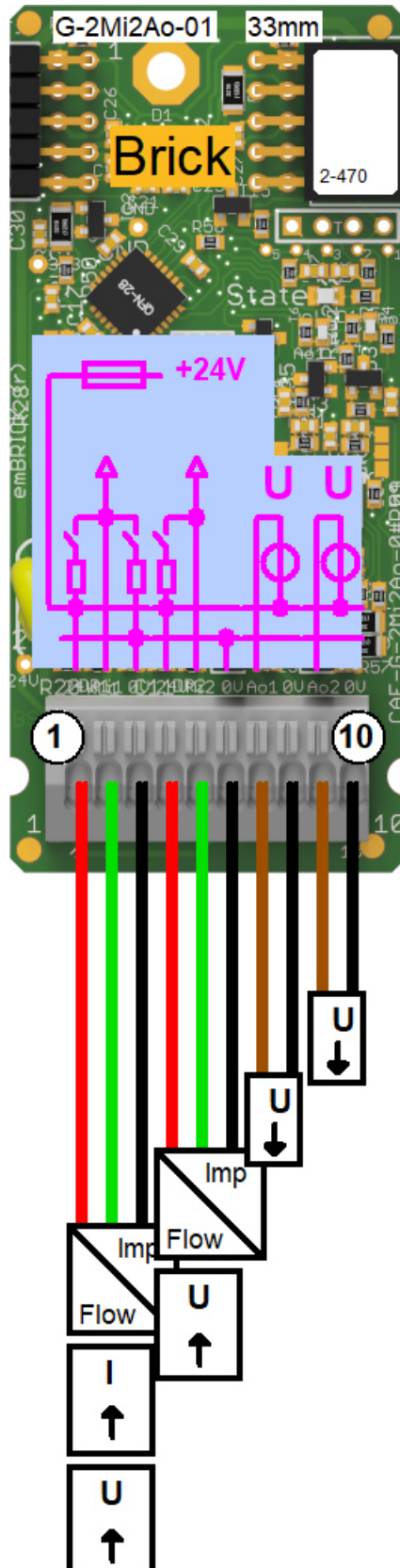
Brick.TB01	4	24V	Sensor supply +24V	Multi Eingang 2
Brick.TB01	5	MI	Multilnput	Multi Eingang 2
Brick.TB01	6	0V	Ground	Multi Eingang 2
Brick.TB01	7	OUT	Voltage Output	Analog output 1
Brick.TB01	8	0V	Ground	Analog output 1
Brick.TB01	9	OUT	Voltage Output	Analog output 2
Brick.TB01	10	0V	Ground	Analog output 2

1.2.3 LED Indications

ID	Type	Specification	Type / Usage
Brick.LED01	SMD-LED	green	Shows state of Multi Eingang 1
Brick.LED02	SMD-LED	green	Shows state of Multi Eingang 2
Brick.LED03	SMD-LED	green	Shows state of Analog output 1
Brick.LED04	SMD-LED	green	Shows state of Analog output 2
Brick.StateLED	SMD-LED	yellow	communicationstate Brick

1.3 Input-/Output Scheme

The following diagram shows the adaption of the control unit. To avoid overlapping, some wires are displayed interrupted and dashed.



1.4 Technical Data

1.4.1 Digital Inputs

The control unit has the following digital inputs / switch inputs:

Identifier	Multi Eingang 1
Type	Input for ext. isolated contact, NPN switching against GND
Low Volt.	< 5,1V
High Volt.	> 5,6V
Input Current	ca. 6mA
Component	-
Remark	

Identifier	Multi Eingang 1
Type	signalinput for ext. 24V
Low Volt.	< 5,1V
High Volt.	> 5,6V
Input Current	> 1mA @24V
Component	-
Remark	dauerhaft 24V überlastungsfest

Identifier	Multi Eingang 2
Type	Input for ext. isolated contact, NPN switching against GND
Low Volt.	< 5,1V
High Volt.	> 5,6V
Input Current	ca. 6mA
Component	-
Remark	

Identifier	Multi Eingang 2
Type	signalinput for ext. 24V
Low Volt.	< 5,1V
High Volt.	> 5,6V
Input Current	> 1mA @24V
Component	-
Remark	dauerhaft 24V überlastungsfest

1.4.2 Analog Inputs

The control unit has the following analogue inputs / measuring inputs:

Identifier	Multi Eingang 1
Type	Current Input
Range	0/4 ... 20mA, 2/3-wire
Input/Load Resistor	175 Ohm
Resolution	10 Bit

Accuracy	0.5%
Linearity	0.2%
Filter	400 Hz
Linearization	
Model / Series	
Remark	Stromfest bis dauerhaft 25mA @ U < 5,0V

Identifier	Multi Eingang 1
Type	Voltage Input
Range	0 ... 10V
Input/Load Resistor	>50k
Resolution	10 Bit
Accuracy	0.5%
Linearity	0.2%
Filter	10 Hz
Linearization	
Model / Series	
Remark	dauerhaft 24V überlastungsfest

Identifier	Multi Eingang 2
Type	Voltage Input
Range	0 ... 10V
Input/Load Resistor	>50k
Resolution	10 Bit
Accuracy	0.5%
Linearity	0.2%
Filter	10 Hz
Linearization	
Model / Series	
Remark	dauerhaft 24V überlastungsfest

1.4.3 Analog Outputs

The control unit has the following analog outputs:

Identifier	Analog output 1
Type	voltage output, 2/3 wire
Range	0 ... 10V
max. Voltage	
max. Current	
Filter	
Component	
Remark	

Identifier	Analog output 2
Type	voltage output, 2/3 wire

Range	0 ... 10V
max. Voltage	
max. Current	
Filter	
Component	
Remark	

1.4.4 Pulse and Counting Inputs

The control unit has the following pulse inputs / counter inputs:

Identifier	Multi Eingang 1
Type	Impuls/Digital input, universal 2/3 wire
Threshold	5,1 / 5,6V
Input Circuit	n-switching
Sensitivity	rising slope
Gate Time (Frequ.Mode)	10ms ... 65s
Resolution (Per.Mode)	1 ... 50ms
Filter	hardware, 1st order, fcut off = approx. 1.5kHz
Component	-
Remark	dauerhaft 24V überlastungsfest

Identifier	Multi Eingang 2
Type	Impuls/Digital input, universal 2/3 wire
Threshold	5,1 / 5,6V
Input Circuit	n-switching
Sensitivity	rising slope
Gate Time (Frequ.Mode)	10ms ... 65s
Resolution (Per.Mode)	1 ... 50ms
Filter	hardware, 1st order, fcut off = approx. 1.5kHz
Component	-
Remark	dauerhaft 24V überlastungsfest

1.4.5 User Notes

- Blinking behavior StateLED:
 - Each Morse code is 3 seconds long!
 - not initialized = flashing continuously at approx. 5Hz
 - no communication = short-long-short
 - too little communication = short-short-short
 - disturbed communication = short-long-long
 - OK = continuous flashing at approx. 1Hz (0.6-1.5Hz)

1.4.6 Technican Notes

- Make sure that only after the initialization or startup of the application the multi inputs should be change the selected state.
- The Multi-Inputs must both be configured the same way, either both as digital input or both as analog input, otherwise the measured value of the analog input will be wrong due to crosstalk / interference between the two input channels.

1.5 Process Data Image

1.5.1 Outgoing Process Data (from bus master to this brick)

Byte	Function	rCAssign
00..01	Analog_Output 1 0...15000 Dig. \equiv 0...20.0 mA or 0...15100 Dig. \equiv 0...10.0 V	...+eB_W0,0,...
02..03	Analog_Output 2 0...15000 Dig. \equiv 0...20.0 mA or 0...15100 Dig. \equiv 0...10.0 V	...+eB_W1,0,...
04..05	Pulse Input 1 Control Bit 15-10: MODE<4:0>: Pulse Input operating Mode 110010 = Mode Period Duration with Time Grid 50ms 110001 = Mode Period Duration with Time Grid 49ms ... 000010 = Mode Period Duration with Time Grid 2ms 000001 = Mode Period Duration with Time Grid 1ms 000000 = Mode Fixed Gate Time Bit 9-0MSET<9:0>: Mode Settings in Mode "Period Duration": Filter Period in ms, to filter out contact chattering (Little Endian): 11 1111 1111 = Filter Period 1023ms ... 00 0000 0000 = Filter Period 0ms in Mode "Fixed Gate Time": Mode Settings has no effect	...+eB_W2,0,...
06..07	Pulse Input 1 Attribute Bit 15-0: ATTR<15:0>: Additional Pulse Input Attributes in Mode "Period Duration": Timeout for 0-setting (Little Endian): 1111 1111 1111 1111 = 65535 * Time Grid ... 0000 0000 0000 0000 = 0 in Mode "Fixed Gate Time": Gate Time in ms (Little Endian): 1111 1111 1111 1111 = 65535ms ... 0000 0000 0000 0000 = 0ms	...+eB_W3,0,...
08..09	Pulse Input 2 Control Bit 15-10: MODE<4:0>: Pulse Input operating Mode 110010 = Mode Period Duration with Time Grid 50ms 110001 = Mode Period Duration with Time Grid 49ms ... 000010 = Mode Period Duration with Time Grid 2ms 000001 = Mode Period Duration with Time Grid 1ms 000000 = Mode Fixed Gate Time Bit 9-0MSET<9:0>: Mode Settings in Mode "Period Duration": Filter Period in ms, to filter out contact chattering (Little Endian): 11 1111 1111 = Filter Period 1023ms ... 00 0000 0000 = Filter Period 0ms in Mode "Fixed Gate Time": Mode Settings has no effect	...+eB_W4,0,...
10..11	Pulse Input 2 Attribute Bit 15-0: ATTR<15:0>: Additional Pulse Input Attributes in Mode "Period Duration": Timeout for 0-setting (Little Endian): 1111 1111 1111 1111 = 65535 * Time Grid ... 0000 0000 0000 0000 = 0 in Mode "Fixed Gate Time": Gate Time in ms (Little Endian): 1111 1111 1111 1111 = 65535ms ... 0000 0000 0000 0000 = 0ms	...+eB_W5,0,...
12	Input Mode Control Mi1-Config1: mode Input 1 Mi1-Config2: mode Input 2 Mi2-Config1: mode Input 3	...+eB_B12,0,0,.. ...+eB_B12,0,1,.. ...+eB_B12,0,2,.. ...+eB_B12,0,3,.. ...+eB_B12,0,4,.. ...+eB_B12,0,5,.. ...+eB_B12,0,6,...

Multi-Input	Min1 Mi1- Config1	Min2 Mi1- Config2	Min3 Mi2- Config1	Input Type			
				Voltage 0..10V	Current 0/4..20mA	Pulse or Digital- Input	Pulse or Digital-Input + PullUp
1	0	0	x	active	Not active	active	Not active
	0	1	x	Not active	active	Not active	Not active
	1	0	x	Not active	Not active	Not active	Active
	1	1	x	X			
2	x	x	0	active	Not active	active	Not active
	x	x	1	Not active	Not active	Not active	Active

X = not permitted

...+eB_B12,0,7,...

1.5.2 Incoming Process Data (from this brick to the bus master)

Byte	Function	rCAssign
00..01	Analog Input 1 0...894 Dig. \equiv 0...20 mA ... or 0...933 Dig. \equiv 0...10 V	...+eB_W0,0,...
02..03	Analog Input 2 0...933 Dig. \equiv 0...10 V	...+eB_W1,0,...
04..05	Puls Input Sum 1 Bit 15-14: TR<1:0>: Time Reference; 2 Bit Counter that counts up every millisecond. Can be used to compensate the clock deviation of the emBRICK®-module. Bit 13-0: Pulse Input Sum Value; Increments on falling edge; Resets to zero on overflow (Little Endian): 11 1111 1111 1111 = 16383 ... 00 0000 0000 0000 = 0	...+eB_W2,0,...
06..07	Puls Input Difference 1 Bit 15-0: PIDV<15:0>: Pulse Input Difference Value in Mode "Fixed Gate Time": Displays all fallen edges monitored in the timeframe defined in Pulse Input Attribute x	...+eB_W3,0,...
08..09	Puls Input Sum 2 Bit 15-14: TR<1:0>: Time Reference; 2 Bit Counter that counts up every millisecond. Can be used to compensate the clock deviation of the emBRICK®-module. Bit 13-0: Pulse Input Sum Value; Increments on falling edge; Resets to zero on overflow (Little Endian): 11 1111 1111 1111 = 16383 ... 00 0000 0000 0000 = 0	...+eB_W4,0,...
10..11	Puls Input Difference 2 Bit 15-0: PIDV<15:0>: Pulse Input Difference Value in Mode "Fixed Gate Time": Displays all fallen edges monitored in the timeframe defined in Pulse Input Attribute x	...+eB_W5,0,...
12	Input Image Bit 0 = digital status of Inp. 1 Bit 1 = digital status of Inp 2	...+eB_B12,0,.. ...+eB_B12,1,.. ...+eB_B12,2,.. ...+eB_B12,3,.. ...+eB_B12,4,.. ...+eB_B12,5,.. ...+eB_B12,6,.. ...+eB_B12,7,...

1.6 History

On the following page you will find a list of changes that have been made to the product.

1.6.1 History

Date	Entry scope (HW, SWappl, SWapi, Release)	Entry type (Enhancement, Improvement, Bugfix, Release)	Version	Status (development, implemented, tested)	Responsible	Reason for the modification	Items of the modification	Impact for (end-)customer	Comment	location in model/source
xxxx-xx-xx		Release	0.99	tested	NSt					

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