CIO 308

CAN bus-based I/O module

Data sheet

4921240554D

DEIF Improve Tomorrow

1. Product description

1.1 Application

The CIO series is a range of external I/O modules for some DEIF controllers. These are used when the demand for inputs and outputs exceeds the capacity of the controller.

The CIO 308 supports:

- 8 multi-functional inputs
- Selectable as:
  - Digital Input, 0(4) to 20 mA
  - 0 to 10 V, RMI, Pt100, Pt1000
  - Thermocouple type E, J, K, N, R, S or T
- Wire break detection
- CAN bus interface
- LEDs to indicate status and input state
- 12/24 V DC supply

1.1.1 Host controllers

The CIO modules need a host controller to send and receive their information. The controllers that are listed below support CIO modules:

Type	SW version	CIO 116 quantity	CIO 208 quantity	CIO 308 quantity
AGC-4 Mk II	From 6.08*	5	5	5
AGC-4	From 4.59	3	3	3
AGC 150	From 1.00	3	3	3
ASC 150	From 1.15	3	3	3
AGC 200	From 4.59	3	3	3

NOTE For software versions 6.00 to 6.07, the AGC-4 Mk II can have three of each type of CIO module.

1.2 Common functions

Status output

The status output relay is active when the CIO module works correctly and communication to the host controller is established. The microprocessor is supervised by a watchdog.

NOTE The status output can be re-configured as an output.

Status LED

The status LED (LED1) indicates the operation status of the module and the status output

CAN LED

The CAN LED (LED2) indicates the status of the CAN bus communication to the host controller.

CAN bus end resistor

The CIO module has a built-in 120 ohm end-termination for the CAN bus line, which can be activated via the switch (S1).

Input LEDs

All 8 inputs have a green LED next to the input terminal to indicate the state of the input.

Input type	LED	Description
Digital input	On	Input is active
	Off	Input is inactive
0(4) to 20 mA	On	Within input range 4 to 20 mA
	Off	Outside input range 4 to 20 mA (LED is flashing when in protection mode: >30 mA)
0 to 10 V	On	Within input range 0.2 to 10 V
	Off	Outside input range 0.2 to 10 V
RMI	On	Within input range 10 to 2500 Ω
	Off	Outside input range 10 to 2500 Ω
Pt100 sensor	On	Within selected input range (low range -50 to 250°C or high range: -200 to 850°C)
	Off	Outside selected input range (low range -50 to 250°C or high range: -200 to 850°C)
Pt1000 sensor	On	Within selected input range (low range -50 to 250°C or high range: -200 to 850°C)
	Off	Outside selected input range (low range -50 to 250°C or high range: -200 to 850°C)
Thermocouple	On	Within input range of selected type of thermocouple
	Off	Outside input range of selected type of thermocouple

ID selector

The ID selector is used to give CIO modules of the same type different IDs. All three types of CIO modules can use IDs from 1 to 15, and different module types may use the same ID.

USB connection

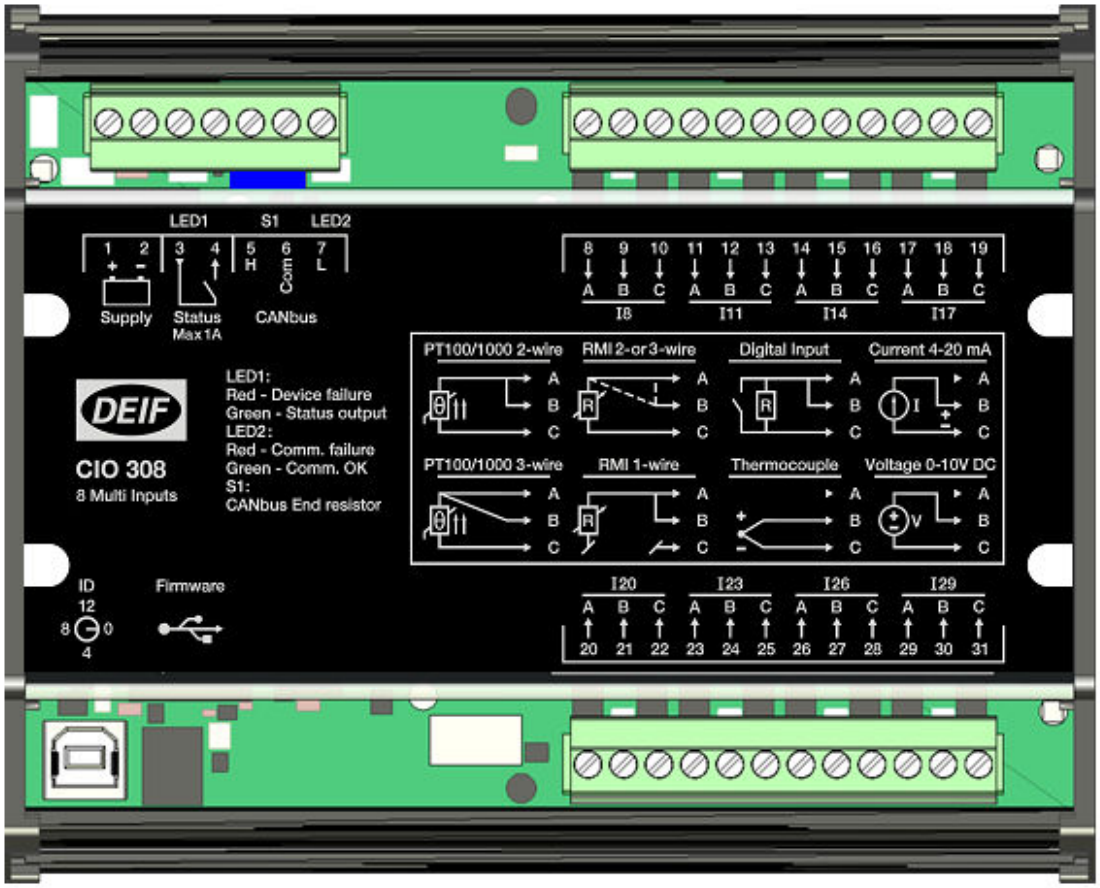
The USB port can only be used to update the firmware of the module. Configuration is not possible via this port.

NOTE To update the firmware, the CIO module ID switch must be set to ID 0.

CAN bus

The CAN bus interface is intended for DEIF host controllers only. It will be possible to have additional CAN bus communication devices (J1939 or CANopen) on the same CAN bus line but not acting as a host for the CIO module. It is described in the manual of the host controller if it supports this feature.

2. CIO 308 hardware



Terminal	Name	Description	Comment
1	+	+12/24 V DC	Power supply
2	-	0 V DC	
3	Status	Common	Status output (configurable)
4		Normally open	
5	H	CAN H	CAN bus interface
6	Com	CAN Com	
7	L	CAN L	

Terminal	Name	Description	Comment	
8	I8	Input A	Multi-input 8	Multi-input group 1
9		Input B		
10		Input C		
11	I11	Input A	Multi-input 11	
12		Input B		
13		Input C		
14	I14	Input A	Multi-input 14	
15		Input B		
16		Input C		
17	I17	Input A	Multi-input 17	
18		Input B		
19		Input C		
20	I20	Input A	Multi-input 20	Multi-input group 2
21		Input B		
22		Input C		
23	I23	Input A	Multi-input 23	
24		Input B		
25		Input C		
26	I26	Input A	Multi-input 26	
27		Input B		
28		Input C		
29	I29	Input A	Multi-input 29	
30		Input B		
31		Input C		

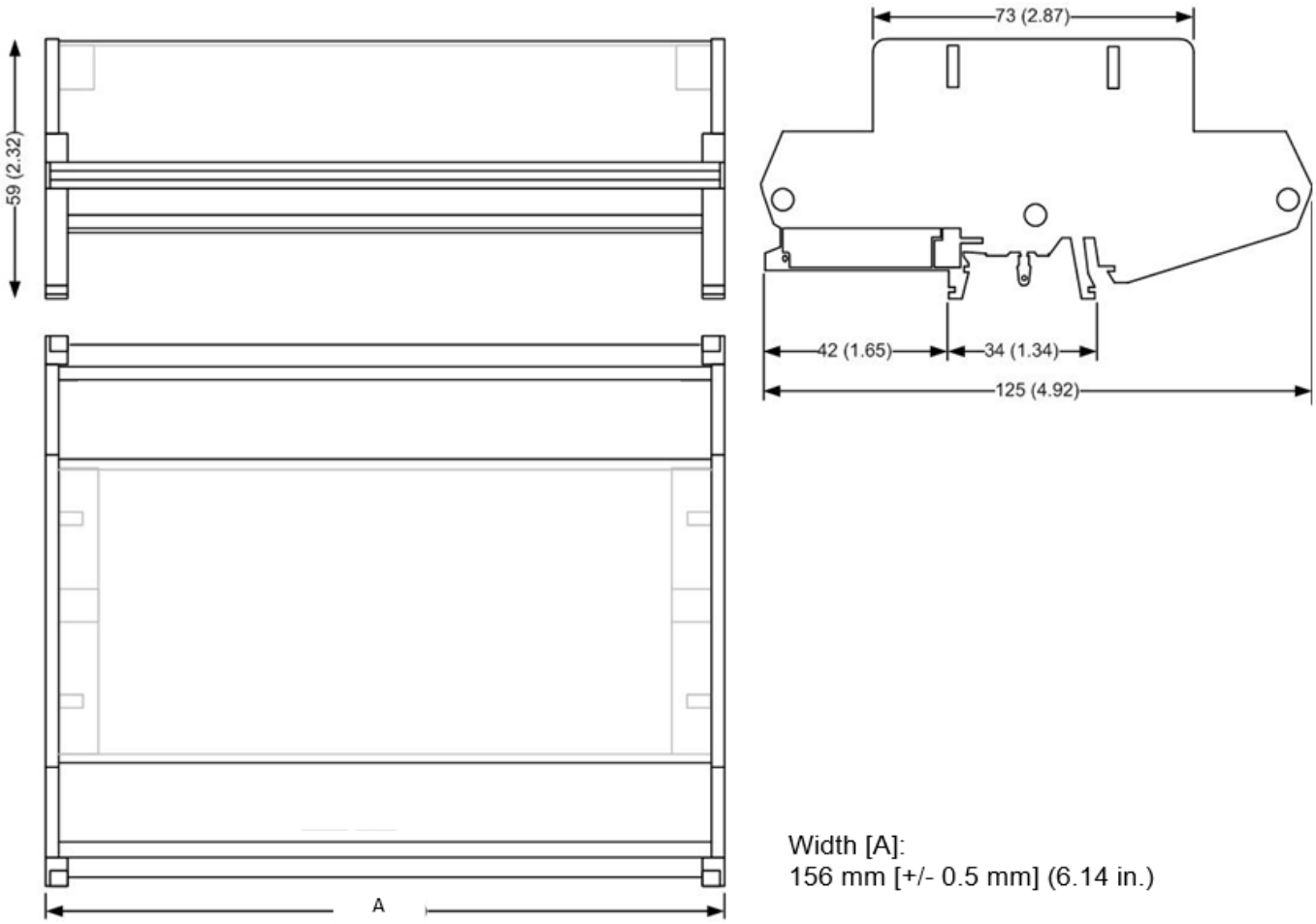
3. Technical specifications

Category	Specifications
Operating temperature	-40 to 70°C (-40 to 158°F) to IEC 60068-2-1/2 **UL/cUL Listed:** Max. surrounding air temperature 70°C (158°F)
Storage temperature	-40 to +70 °C (-40 to +158 °F)
Climate	97 % RH to IEC 60068-2-30
Operating altitude	Max. 4000 meters above sea-level
Aux. supply	Nominal 12/24 V DC (operational 9.0 to 36 V DC) 0 V DC for maximum 30 ms when coming from at least 12 V DC (cranking dropout) 0 V DC for maximum 100 ms when coming from at least 24 V DC (cranking dropout) The aux. supply input is to be protected by a 2 A slow-blow fuse. If protection against load dump is required, use a 12 A slow-blow fuse. **UL/cUL Listed:** 10 to 32.5 V DC
Consumption	Min. 1.4 W Max. 2 W
Load dump	ISO 16750-2 Test A (24 V DC system) SAE J1113-11 Pulse 5 A Power supply ports: Test 1 to 123 V at 1 Ω for 100 ms Test 2 to 174 V at 8 Ω for 350 ms
Status output	Solid state output Maximum 30 V AC or DC Temperature from -40 to +40 ºC max. 1 A resistive load Temperature from +40 to +70 ºC max. 0.8 A resistive load
Multi-inputs	Digital input: Dry contact inputs, 3 V DC internal supply Wire-break detection with maximum resistance for ON detection: 100 Ω Current: Range 0(4) to 20 mA Accuracy: ±10 uA + 0.25 % actual reading Voltage: Range 0 to 10 V DC Accuracy: ±10mV + 0.25 % actual reading Pt100/1000 (Low range): Range -50 to 250°C Accuracy: ±1°C + 0.25 % actual reading* Pt100/1000 (High range): Range -200 to +850°C Accuracy: ±2°C + 0.25 % actual reading*

Category	Specifications
	RMI, 2 or 3 wire (system ground used as second wire): Range 0-2500 Ω Accuracy: ±2 Ω + 0.25 % actual reading* RMI, 1 wire (system ground used as second wire): Range 0-2500 Ω Accuracy: ±5 Ω + 0.25 % actual reading
Thermocouple type, range and tolerance	E: -200 to 1000°C ±2°C + 0.25 % actual reading * J: -210 to 1200°C ±2°C + 0.25 % actual reading * K: -200 to 1372°C ±2°C + 0.25 % actual reading * N: -200 to 1300°C ±2°C + 0.25 % actual reading * R: -50 to 1768°C ±2°C + 0.25 % actual reading * S: -50 to 1768°C ±2°C + 0.25 % actual reading * T: -200 to 400°C ±2°C + 0.25 % actual reading * **NOTE** * twisted pair and shielded cable is recommended to achieve specification and optimisation of immunity-noise.
Internal sensor for cold junction compensation (CJC)	Accuracy: ±1°C in the operating temperature range: -40°C to 70°C
Galvanic separation	Between supply and other IOs: 600 V 50 Hz for 1 minute. Between CANbus interface and other IOs: 600 V 50 Hz for 1 minute. Between status relay output and other IOs: 600 V 50 Hz for 1 minute.
Mounting	DIN rail mounting inside a cabinet or other enclosure Compatible DIN rails: • TS35/top hat 35 mm (this rail type is used in all product tests) According to EN 50022 • G-type rail According to EN 50035, BS 5825, DIN 46277-1 **UL/cUL Listed:**To be installed in accordance with the NEC (US) or the CEC (Canada)
Connections	Minimum 0.2 mm^2 (24 AWG) multi-stranded Maximum 2.5 mm^2 (12 AWG) multi-stranded Firmware port: USB-B **UL/cUL Listed:** Use min. 90 °C copper conductors only
Terminals tightening torque	Minimum 0.5 Nm (4.4 lb-in) Maximum 0.6 Nm (5.3 lb-in) **UL/cUL Listed:** 0.5 Nm (4.4 lb-in)
Approvals	CE UL/cUL Listed to UL508 and CSA C.22.2 No. 142-M1987 UL/cUL Recognized to UL6200 and CSA C.22.2 No. 14-13 (pending)
Weight	333 g (0.73 lbs)
Safety	IEC/EN 60255-27, CAT III, 50 V, pollution degree 2
Protection	IP20 - IEC/EN 60529 NEMA type 1

Category	Specifications
	UL/cUL Listed: Type complete device, Open Type 1
EMC/CE	EN 61000-6-1/2/3/4 IEC/EN 60255-26 IEC 60533 power distr. zone IACS UR E10 power distr. zone
Vibration	Test performed with CIO module mounted on top hat 35 mm DIN rail 3 to 13.2 Hz: 2 mmpp 13.2 to 100 Hz: 0.7 g To IEC 60068-2-6 To IACS UR E10 10 to 58.1 Hz: 0.15 mmpp 58.1 to 150 Hz: 1 g To IEC 60255-21-1 Response (class 2) 10 to 150 Hz: 2 g To IEC 60255-21-1 Endurance (class 2) 3 to 8.15 Hz: 15 mmpp 8.15 to 35 Hz: 2 g To IEC 60255-21-3 Seismic (class 2)
Shock	Test performed with CIO module mounted on top hat 35 mm DIN rail 10 g, 11 msec, half sine To IEC 60255-21-2 Response test (class 2) 30 g, 11 msec, half sine To IEC 60255-21-2 Withstand test (class 2) 50 g, 11 msec, half sine To IEC 60068-2-27
Bump	Test performed with CIO module mounted on top hat 35 mm DIN rail 20 g, 16 msec, half sine To IEC 60255-21-2 (class 2)
Material	All plastic materials are self-extinguishing according to UL94 (V1)

3.1 Unit dimensions in mm (inches)



Width [A]:
156 mm [+/- 0.5 mm] (6.14 in.)

4. Ordering

4.1 Available variants

Type	Variant no.	Description	Item no.	Note
CIO 308	01	CIO 308 - 8 multi-inputs	2912890260	8 × multi-inputs

4.2 Order specifications

Variants

Mandatory information		
Item no.	**Type**	**Variant no.**

Example

Mandatory information		
Item no.	**Type**	**Variant no.**
2912890260-01	CIO 308	01

4.3 Legal information and disclaimer

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the engine/generator etc. controlled by the specific extension, the company responsible for the installation or the operation of the extension must be contacted.

NOTE The CIO module is not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

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