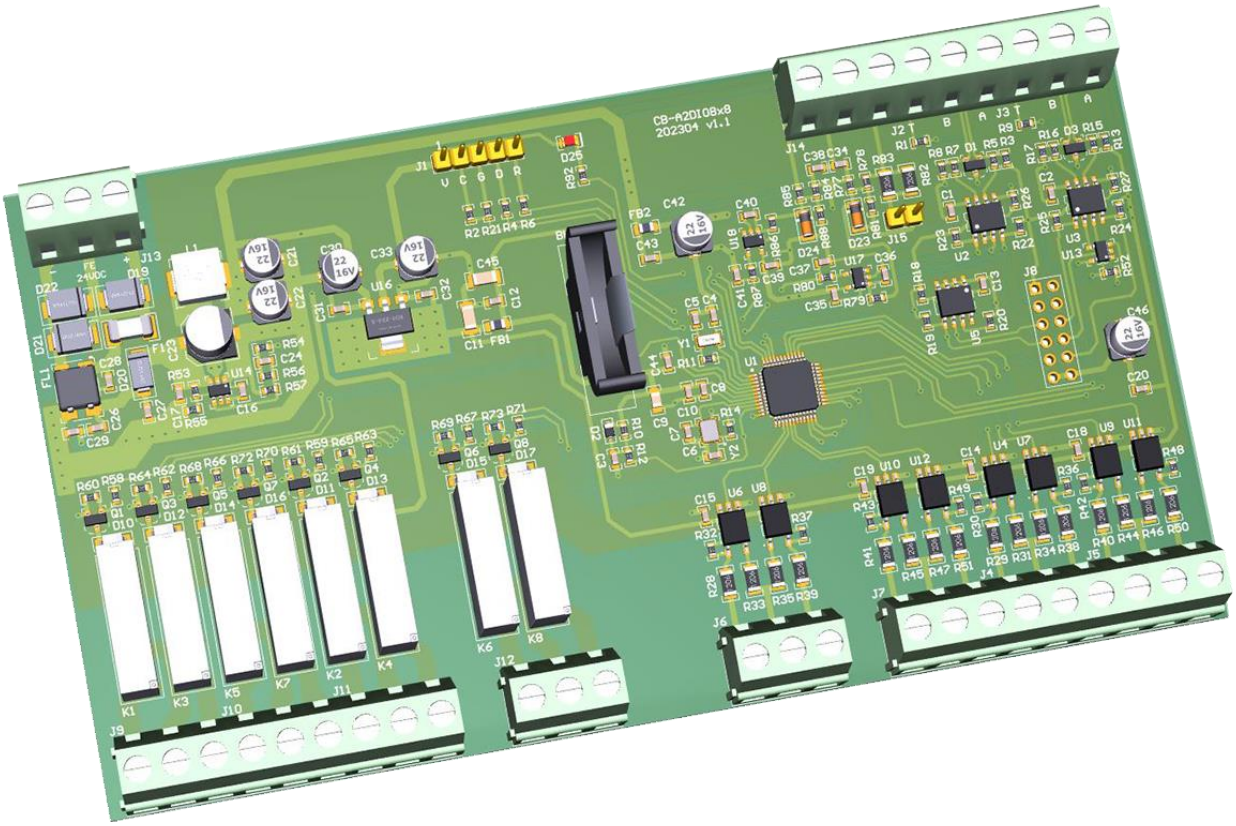
Programmable controller board

DIN rail mounting (9 din)



User Manual

Model: *CB-A2DIO8X8*

Version: *v1.1*

Date: *14.04.2023*

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1. Description

The CB-A2DIO8X8 control board is designed to monitor up to 8 (4 pairs) digital inputs and control 8 (4 pairs) relay outputs. It has the ability to measure temperature with an external NTC 10K sensor and also has one 0-10V or 4-20mA input.

The programmable controller board is designed to fit in GAINTA's D9MG case and measures 156.2mm x 86.9mm.

It can be used for process automation in various industries such as home and hotel automation, as a room control unit, greenhouse control and monitoring unit, as well as for process and conveyor control.

Table 1: Specifications

SPECIFICATIONS	
Analog inputs	2
Number of discrete inputs	8
Number of discrete outputs	8
RS485 ports	2
Control board supply voltage	12-24V DC
Control board supply current	Max. 1.0A
Operating temperature	-20 / +70 ^{0}C

The programmable controller board has two RS485 ports, one of which acts as a master and the other as a slave. This allows you to have an expandable architecture by daisy chaining more than one device or using different remote sensors or drivers that can be controlled through the main RS485 port. In the latest configuration, the RS485 slave port can be connected to a remote server for monitoring purposes. By default, the RS485 ports use the Modbus RTU protocol.

2. Main components

On Figure 1 shows a general view of the printed circuit board of the control module, and the labels display the main components on it, which will be discussed below.

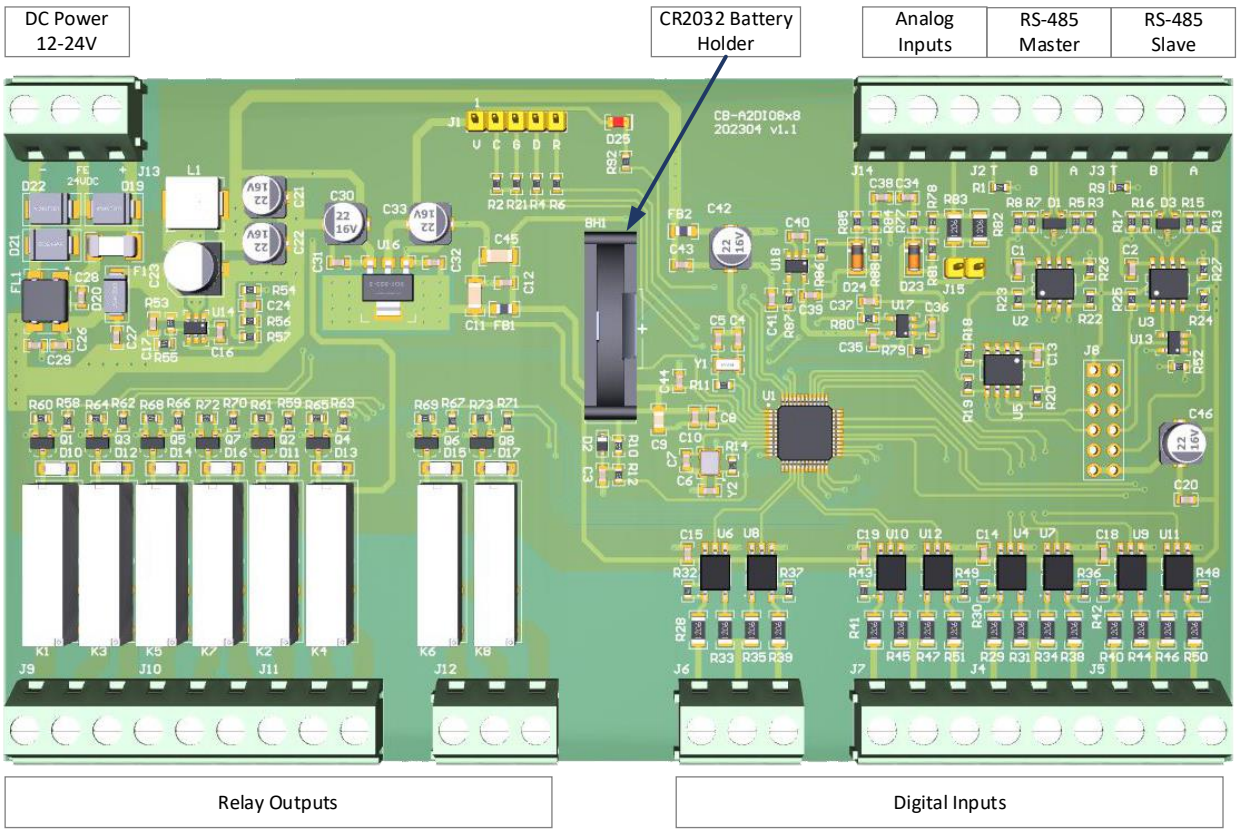

Figure 1: General view of the control board

Table 2: Connection points

Number	Connector	Description
1	J13	DC power supply connector: 12-24V DC up to 1.0A
2	J14	Two channel analog inputs connector
3	J2, J3	RS485 interface connectors
4	J6, J7, J4, J5	Digital inputs connectors
5	J9, J10, J11, J12	Relay outputs connectors
6	BH1	Battery holder - suitable for CR2032 battery
7	J8	An expansion connector that shares the I2C bus and the UART used for the RS485 slave interface.

3. Wiring connections

The board is powered by a 12-24V DC source using a 3-wire circuit - VDD, GND and FE (functional ground). Figure 2 shows power supply connection points.

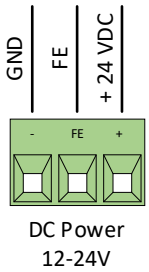

Figure 2: DC power supply connector

The two analog inputs are measured by a 12-bit ADC at up to 500 kS/s each. The connection diagram for analog channels is shown in Figure 3.

Analog channel 1 is intended to measure the input signal either in voltage mode in the range of 0-10V or in current mode in the range of 4-20mA. The mode is selected by closing jumper ***J15*** on the board; when the jumper is open, the voltage mode is selected.

Analog channel 2 is intended for temperature measurement using an NTC-10K remote thermistor. The accuracy of temperature measurement depends on the parameters of the NTC-10K thermistor.

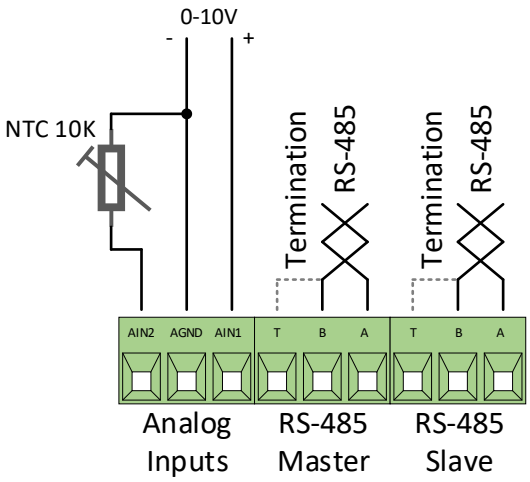

Figure 3: Analog and RS485 connectors

There are two RS485 connectors to which wires A and B of the RS485 bus are connected, and in the case when the device is at the end of the bus, by shorting the T terminal to the B terminal we add a 120 Ohm bus terminator. The connection diagram is shown in Figure 3.

The control board has 4 pairs of NO relay outputs for controlling external devices. Each relay contact has switching capability of 5.0A at 250VAC. Actually, the board has 8 independent relays with NO contacts. The relay connections are shown in Figure 4.

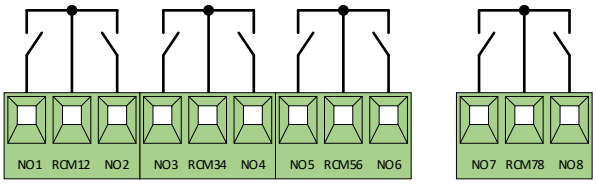

Figure 4: Relay outputs connectors

The control board has 4 pairs of optically isolated high speed digital inputs that can process both receive and source input signals per pair. The digital input can monitor signals up to 1.0MHz. The digital input connections are shown in Figure 5.

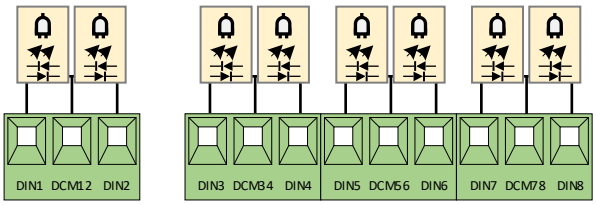

Figure 5: Digital inputs connectors