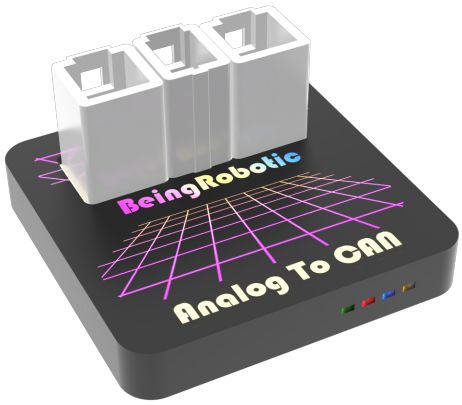
AnalogToCan-Controller

1 Overview

- Analog to Can Converter
- 8 programmable Input
- 1 Can-bus Line
- 2 Pwm Power Output
- Programmable controller (PID, MPC ...)
- Over-the-air updates
- WiFi Connection
- RTC



2 Description

- AnalogToCan represents the evolution of the Analog to Digital converter, offering the ability to convert analog signals to digital or pulse and transmit them via Can-bus or Wifi using TCP connection.
- The device is designed to handle voltages up to 28V, making it suitable for a wide range of automotive and industrial applications. Despite its powerful capabilities, it weighs less than 50g, making it ideal for applications in the racing and industry.
- The module has 8 programmable input ranges (0-5V or 0-12V), the device ensures 12-bit resolution for both 5V and 12V sensors. Each input benefits from dedicated supply voltage for stabilized sensor operation, effectively reducing noise.
- Input accuracy is enhanced through the application of software filters to each input. These filters include IIR, FIR, and custom options, effectively reducing input noise and aliasing to a minimum.
- The module features a Can-Bus line that facilitates streaming data from sensors. The Can-Bus can achieve maximum speed and has the capability to activate resistance termination on the software side, eliminating the need for wiring modifications.
- The presence of two PWM outputs make board suitable to became a Can-bus actuator, capable of controlling actuators like servos or electrical motor relays. The output stage can deliver up to 2A, providing substantial power.
- Combined input and output capabilities, the board can function as a sophisticated controller. It allows effortless implementation of custom control algorithms or fine-tuning using our pre-implemented PID + feedforward controller.
- The module can also serve as a Can-packet forwarder, enabling compatibility for devices that were not originally designed for the Can-bus line.
- The device's modular design is facilitated by its versatile connector. Depending on your requirements, you can easily configure the connectors to support the desired number of Can-bus actuators or input channels.

- An outstanding feature of the board is its capability for over-the-air updates via Wifi. This ensures you stay up-to-date with the latest firmware and can conveniently modify the device's behavior through our website.

- In a future software update, the ability to stream collected data from input signals or Can to a remote server will be introduced. This feature will enable real-time environmental monitoring, along with the capability to remotely send commands to alter actuator behavior.

- The board's immense potential for customization is remarkable, but its standout feature remains its user-friendly configuration.

3 Expansion board

- Real Time Clock expansion board and Tamper Battery module can be installed on request, they permits to have very precise time reference for most critical applications.

4 Software Configurator

The purchase of this module offers access to dedicated online BeingRobotic software for optimizing module configuration. This configuration can be customized based on the user's experience and can be adjusted at any time using any internet-connected device: PC, smartphone, or tablet.
The software provides an intuitive and visual interface to easily modify software parameters. After making parameter changes, it allows for a direct update of the board through the web interface.
For example, fine-tuning a PID controller, configuring filters for analog inputs, determining PWM output usage, or deciding signal recombination can be easily accomplished using the software. An example of the intermediate-level interface is provided below.
The expert version also enables the inclusion of custom C scripts for highly personalized, high-level applications, such as Kalman filtering, sensor fusion, MPC, and other personalized options.

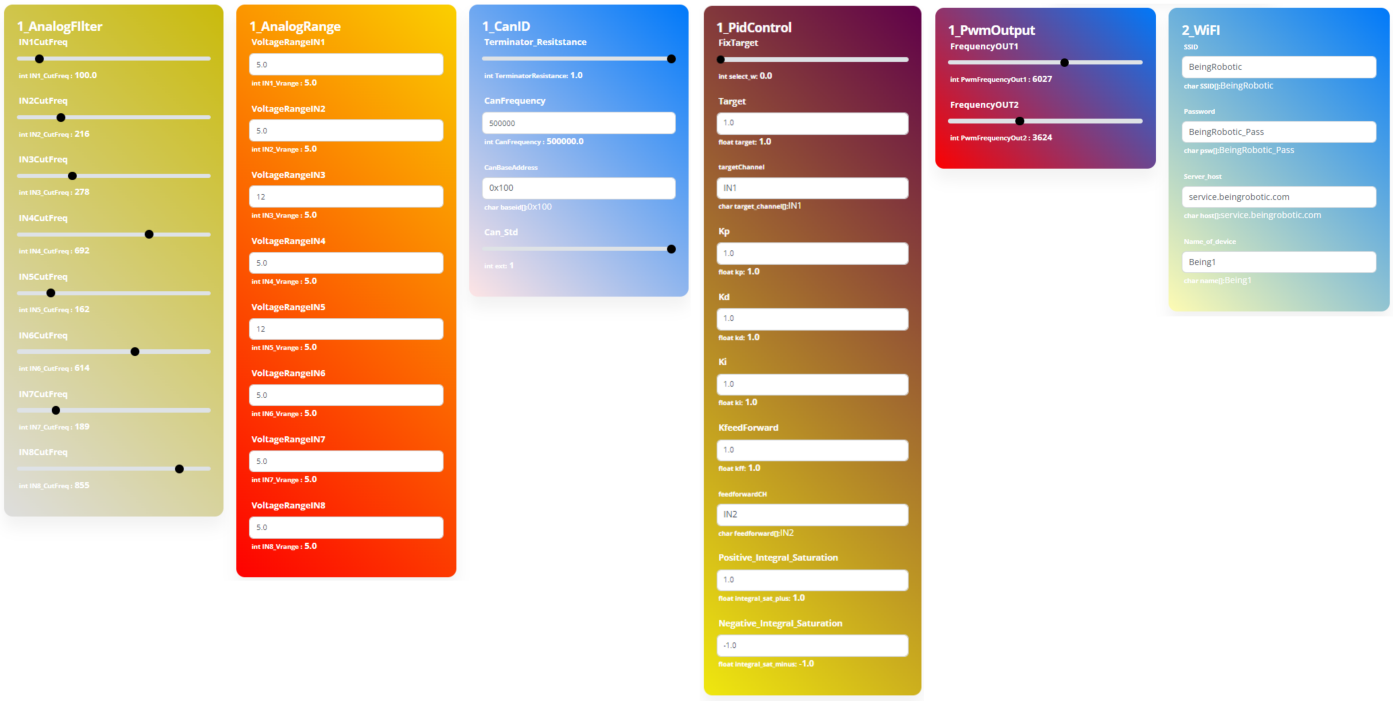


Figure 1: Example of interface from BeingRobotic.com

For more information visit BeingRobotic.com

5 Technical specification

	Value	Unit
Electrical		
VIN With output Sensor 5V and 12V and Pwm output active	12V-28V	
VIN With output Sensor 5V and Pwm output active	6V-28V	
VIN With output Sensor 5V active	5V-28V	
Maximum current sensor 5V	1.8	A
Maximum current sensor 12V	1.8	A
Maximum tot current sensor + pwm	2.1	A
Maximum current protection(resettable fuse)	2.1A Constant, Peak 4A	
Inversion supply polarity protection	Full on Power Connector (2)	
Dimensions	48.0*48.0*23.0	$mm * mm * mm$
Weight	50	g
Temperature range	-20 ÷ 85	C
RTC precision if present	50	us
Input stage		
Analogic/Digital input	8	N
Programmable input gains	2 level for 5V or 12V sensor	N
Resolution	12	bit
Analog conversion speed	1000	Kb/s
Input filter		
IIR Filter configurable each channel	yes	N
FIR Filter configurable each channel	yes	N
Custom Filter each channel	yes	N
Can Bus		
Can-bus Line	1	N
Can-bus speed Min	33.3	Kb/s
Can-bus speed Typ	33.3-100-125-250-500-1000	Kb/s
Can-bus speed Max	1000	Kb/s
Max data stream on CAN	1000	Kb/s
Software Terminator resistance	1	N
Output stage		
Pwm output	2	N
Max Current	2	A
Full bridge use	1	N
Half bridge use	2	N
Max Frequency Pwm	1@resolution 1/96	Mhz
Std Frequency Pwm	96@resolution 1/1024	Khz
Frequency range	0.001 - 1000	Khz
Control		
Standard PID Controller with feedforward	yes	N
Possibility to implement your own control	yes	N
Control loop max frequency	1000	Khz
Wifi		
Encypted remote update	yes	N
Connection to remote host	yes	N
Max data stream on Wifi	20	Kb/s
Band	2.4	Ghz

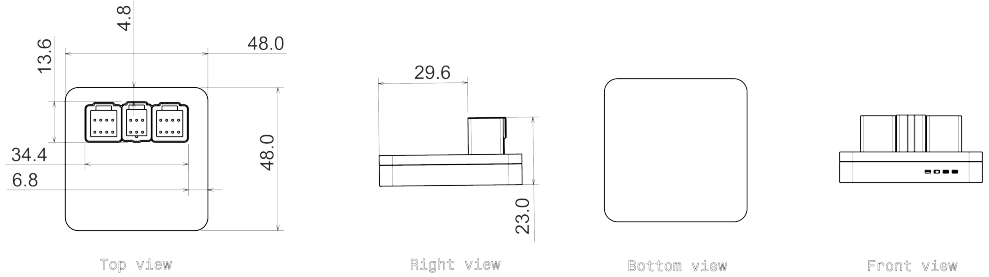
6 Pinout

Connector 1	Input 1
Pin	Signal
1	Sensor 5V
2	Sensor 12V
3	Sensor GND
4	Sensor GND
5	IN1
6	IN2
7	IN3
8	IN4

Connector 2	Power
Pin	Signal
1	12-28V
2	OUT2
3	CAN-H
4	GND
5	OUT1
6	CAN-L

Connector 3	Input 2
Pin	Signal
1	Sensor 5V
2	Sensor 12V
3	Sensor GND
4	Sensor GND
5	IN5
6	IN6
7	IN7
8	IN8

7 Dimensions



8 Note

The informations in the datasheet are subjected to changes depending on the service requested. The manufacturer assumes no responsibility for any illegal use of the product. The product must only be used in an environment free of risks for the user and the surrounding people. The product must be kept away from heat sources. The product must be used by competent persons in the matter. The product is only for motorsports use. The manufacturer discharges itself from any type of responsibility.