SIOC

OVERVIEW

The **SIOC** control unit (**S**ecure **IO C**ontroller) is a programmable controller designed to operate as slave unit in "automotive" environment with a high degree of reliability and safety.
It offers the possibility to realize, together with a master unit, a master/slave control system with PL-d (ISO EN 13849, this matches to SIL-3 of IEC ISO 61508) safety level without the need of certifying the application software on the master unit.
This goal is reached because the SIOC units handle all the security critical parts of the system by themselves: the logic that defines the safety-relevant part of the system is programmed using a very simple (and easy to analyze) Instruction List (IL) language (simplified IEC1131 IL) and the communication over the CAN-bus is based on the CANOpen EN50325-5:2010 security protocol.

SPECIFICATIONS

- CPU n.1: Microchip PIC24HJ128GP506 (40Mips, 16 bit Core, Internal memory: 8 kByte RAM, 128 kByte Flash)
- CPU n.2: Microchip PIC18F4580 (10Mips, 8 bit Core, Internal memory: 1.5 kByte RAM, 32 kByte Flash, 256 byte EEPROM)
- CAN-bus full 2.0B (11 bit or 29 bit ID), programmable baud-rate from 125Kbit/s to 1Mbit/s, redundant CANOpen protocol
- Serial interface: RS485, with baud-rate programmable from 1.2 to 115.2 kbit/s

CERTIFICATIONS

- PL-d ISO EN 13849, or SIL-3 IEC ISO 61508
- UNECE n. 10 rev. 5
- IP6K8 according to ISO 20653:2013

OUTPUTS

- 8 digital safety outputs (dual control, activation by both CPUs) with diagnostic and feedback, 4 outputs can be used as PWM (4A max.) or as analog outputs (0..Vbatt)
- 2 digital outputs with diagnostic and feedback (4A max.)
- 2 PWM outputs (4A max.) with integrated current feedback and diagnostic
- 2 PWM outputs (voltage or current PWM, 4A max.) with diagnostic
- 4 analog outputs with 0..Vbatt range (Danfoss) with diagnostic
- 1 current source output, programmable from 0.2mA to 20mA
- 5 V d.c. (100mA max.) regulated power supply output for external sensors

INPUTS

- 2 programmable analog inputs (0..5V, 0..25mA) with 12 bit resolution
- 2 programmable analog inputs (0..5V, 0..25mA) with 10 bit resolution
- 1 analog input with 12 bit resolution, range 0..4A (can be used for the 6 PWM outputs that do not have integrated current measurement)
- 8 RPM inputs (2kHz) configurable for high/low-side operation; they can be used as digital ON/OFF inputs, too
- up to 36 digital ON/OFF inputs configurable for high/low-side operation (18 of them can be alternatively used as input or output resource)

OPTIONAL

- Real Time Clock with rechargeable battery
- 32KByte EEPROM

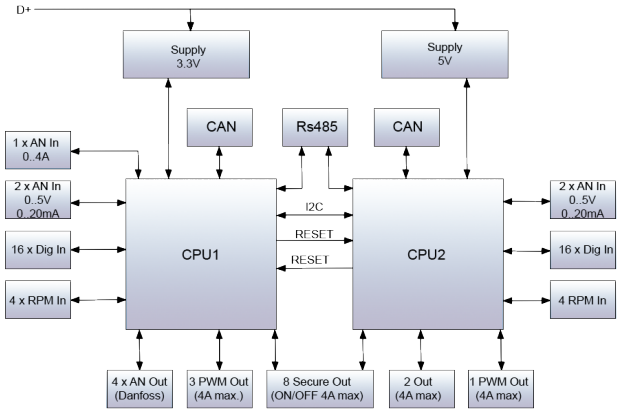
OPERATING CONDITIONS

- Supply voltage: 8 .. 30 Vdc
- Operating temperature range: -40 .. +70 °C
- Storage temperature range: -40 .. +85 °C
- Max. humidity level: 95% (without condensation)
- Protection grade: IP68 certified (with connector plugged)
- Weight: 720 g

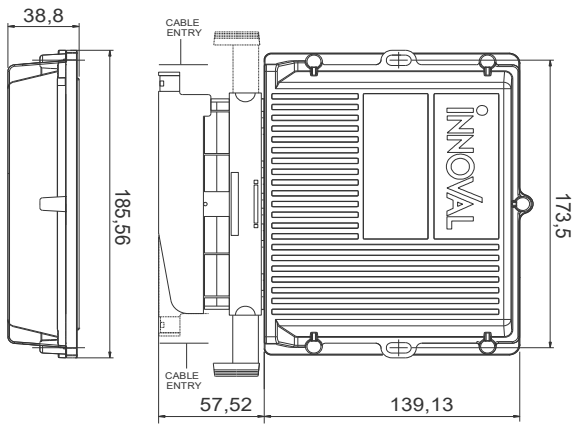
REMARKS

This product uses the following Open Source softwares:
- Kernel Realtime FreeRTOS (www.freertos.org)
- CANopenNode CANOpen Stack (sourceforge.net/projects/canopennode)

BLOCK DIAGRAM



MECHANICAL DRAWING



Remark: cable exit is possible on both sides.