

## NOVASAR MICRO SYSTEM - NMS

### DESCRIPTION

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Date: 16Aug20 | V.1.00

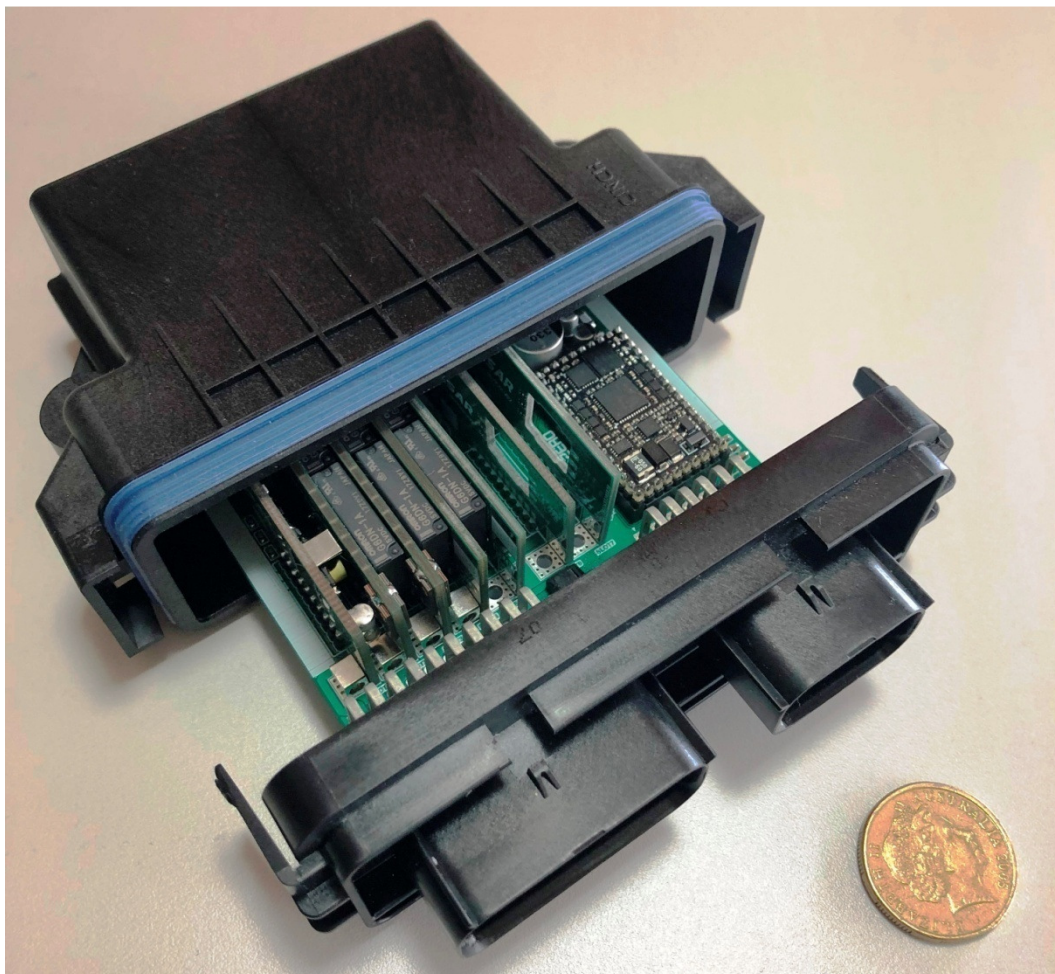
*Commercial-in-Confidence*

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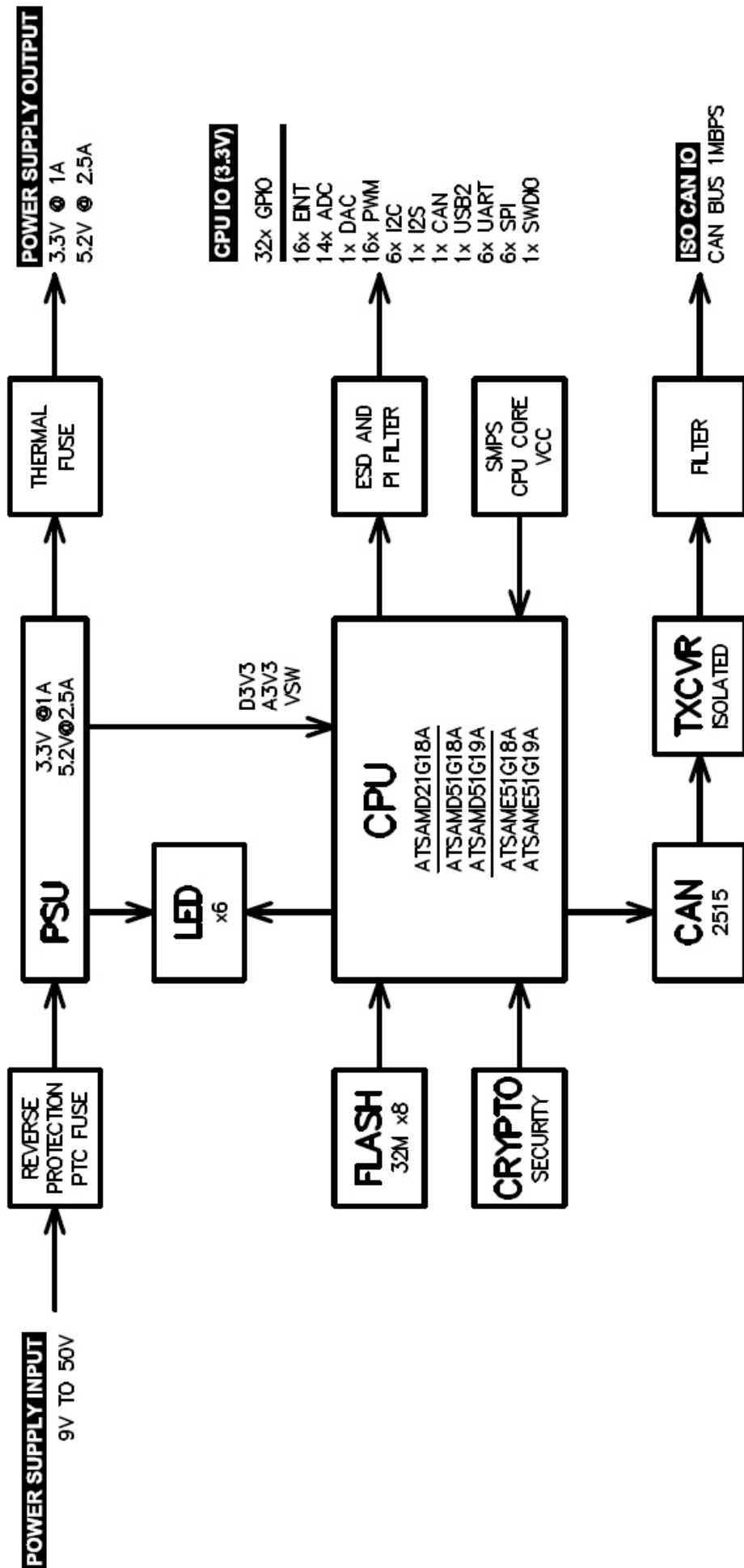
The Novasar Micro System - NMS is a ruggedized IoT expandable processing node with flexible and scalable IO and powerful CPU options supporting the Zephyr RTOS, Atmel's Studio 7 Development environment and Arduino IDE and libraries.

The design provides a compact, ingress-protected IPC67/ IP69K enclosure and management system, with 32 IO interfaces for controlling and networking devices across various applications.

The unit offers additional features to accommodate a future road map where other potential features can be included at a later date enabling a future proof product solution for Automotive, Industrial, Military and Marine environments.

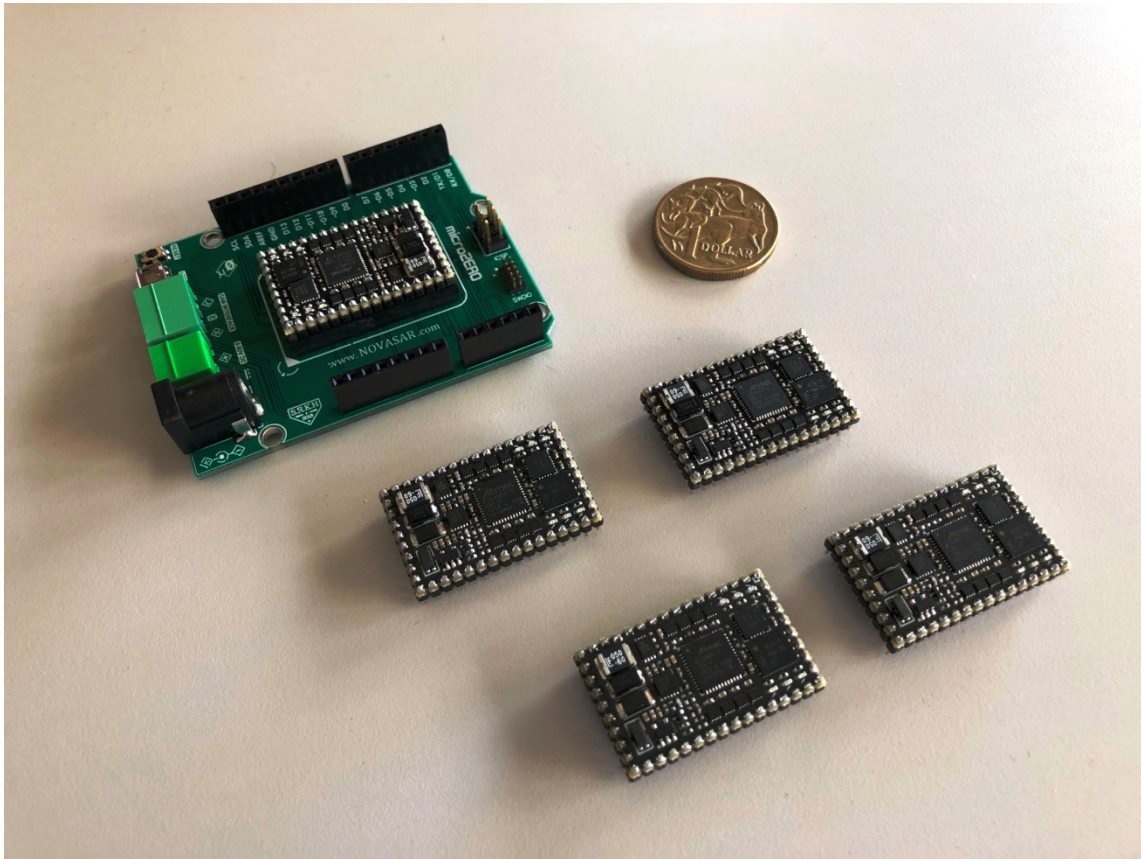


*The Novasar Micro System is based on a compact, ingress-protected IPC67/ IP69K enclosure.*

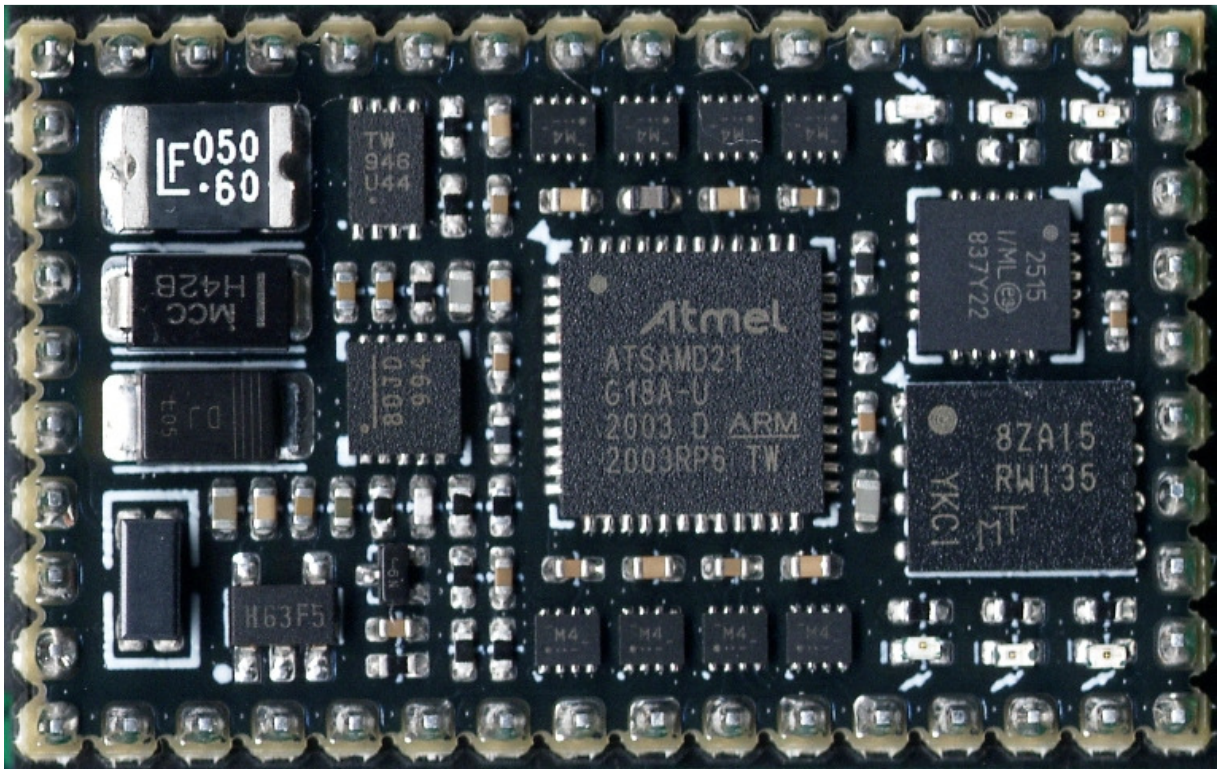


Block Diagram of NUZ (Novasar Micro Zero) processor module showing onboard PSU and processor resources.





**NUZ (Novasars Micro Zero) Processor module options** - SAMD21G18, SAMD21G19, SAMD51G18, SAMD51G19 and SAME51G19. Pictured also is the Arduino-compatible development board where modules are plugged into this board, to be used natively in the Arduino development environment.



**NUZ Processor module** - close up of the ATSAM21G18A version based on 0402 and CSP QFN packages with on board isolated CAN and high voltage (48V) 3.3/5V power supplies.





## Interface connector A pin outs

Capability	Pin Number	Product Capability
GND (PGND)	1A 2A 3A	-VE power input. Ground Return for signal and power.
+VE (PWR)	7A 8A 9A	+VE power input. A positive input between 9-48V.
CAN 1 LOW	4A	CAN1 Interface low signal.
CAN 1 HIGH	10A	CAN1 Interface high signal.
RS485-	5A	Optional RS485 - signal for a half duplex RS485 network pair.
RS485+	11A	Optional RS485 + signal for a half duplex RS485 network pair.
USB-/CAN 2 LOW	6A	USB- signal or CAN2 low interface (SAME51G19)
USB+/CAN 2 HIGH	12A	USB+ signal or CAN2 high interface (SAME51G19)

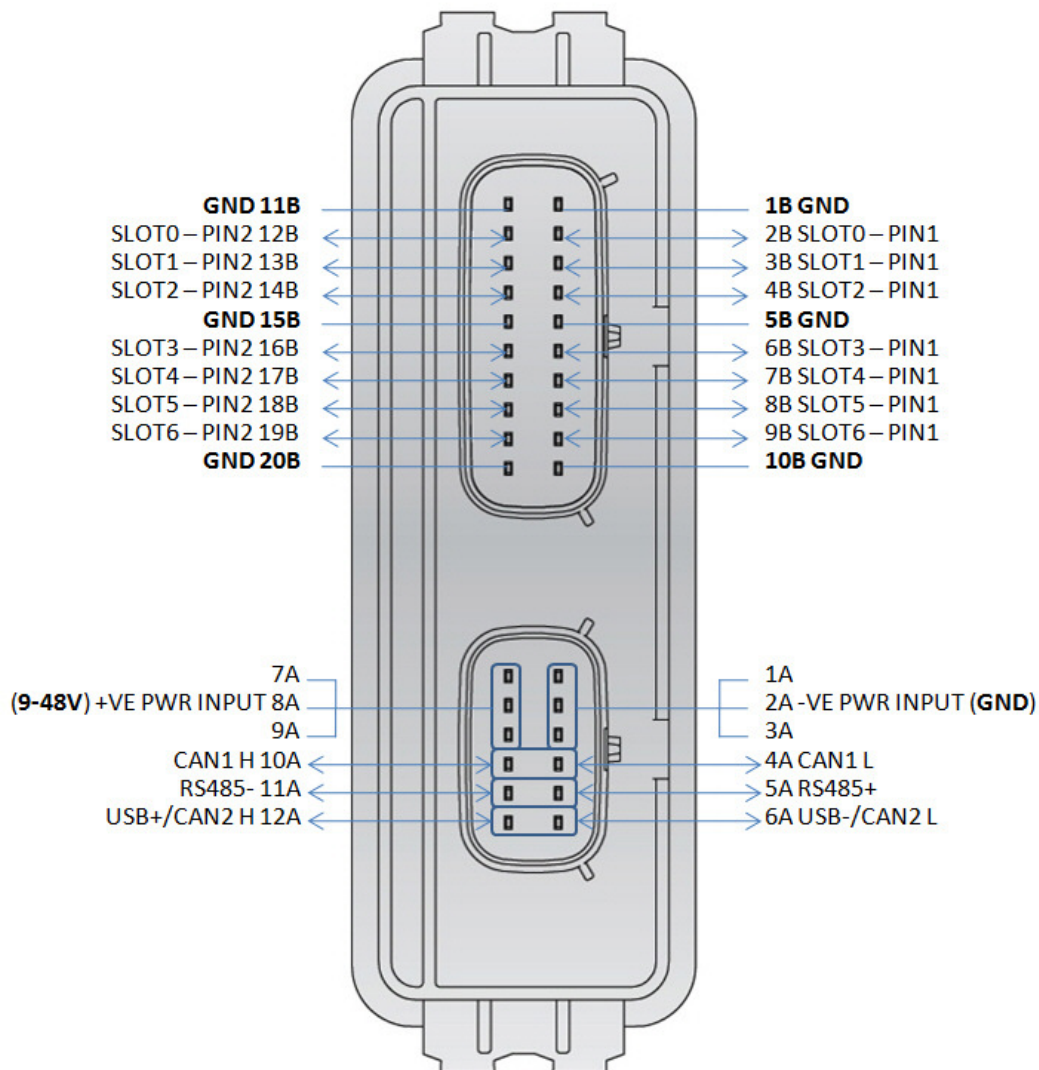
## Interface connector B pin outs

Capability	Pin Number	Product Capability
GND (PGND)	1B 11B	Ground Return for signal and power.
Power IO (10A), Digital IO, Analog IO and Differential	2B	SLOT 0 - PIN 1 (MAX 10A) - Paired with SLOT 0 - Pin 2 on 12B This pin connects the card in slot 0 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 0 - PIN 2 on 12B.
Power IO (10A), Digital IO, Analog IO and Differential	12B	SLOT 0 - PIN 2 (MAX 10A) - Paired with SLOT 0 - Pin 1 on 2B This pin connects the card in slot 0 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 0 - PIN 1 on 2B.
Power IO (10A), Digital IO, Analog IO and Differential	3B	SLOT 1 - PIN 1 (MAX 10A) - Paired with SLOT 1 - Pin 2 on 13B This pin connects the card in slot 1 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 1 - PIN 2 on 13B.
Power IO (10A), Digital IO, Analog IO and Differential	13B	SLOT 1 - PIN 2 (MAX 10A) - Paired with SLOT 1 - Pin 1 on 3B This pin connects the card in slot 1 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 1 - PIN 1 on 3B.
Power IO (10A), Digital IO, Analog IO and Differential	4B	SLOT 2 - PIN 1 (MAX 10A) - Paired with SLOT 2 - Pin 2 on 14B This pin connects the card in slot 2 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 2 - PIN 2 on 14B.
Power IO (10A), Digital IO, Analog IO and Differential	14B	SLOT 2 - PIN 2 (MAX 10A) - Paired with SLOT 2 - Pin 1 on 4B This pin connects the card in slot 2 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 2 - PIN 1 on 14B.
GND (PGND)	5B 15B	Ground Return for signal and power
Power IO (10A), Digital IO, Analog IO and Differential	6B	SLOT 3 - PIN 1 (MAX 10A) - Paired with SLOT 3 - Pin 2 on 16B This pin connects the card in slot 3 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 3 - PIN 2 on 16B.
Power IO (10A), Digital IO, Analog IO and Differential	16B	SLOT 3 - PIN 2 (MAX 10A) - Paired with SLOT 3 - Pin 1 on 6B This pin connects the card in slot 3 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 3 - PIN 1 on 6B.
Power IO (10A), Digital IO, Analog IO and Differential	7B	SLOT 4 - PIN 1 (MAX 10A) - Paired with SLOT 4 - Pin 2 on 17B This pin connects the card in slot 4 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 4 - PIN 2 on 17B.



<i>Power IO (10A), Digital IO, Analog IO and Differential</i>	17B	SLOT 4 - PIN 2 (MAX 10A) - Paired with SLOT 4 - Pin 1 on 7B This pin connects the card in slot 4 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 4 - PIN 1 on 7B.
<i>Power IO (10A), Digital IO, Analog IO and Differential</i>	8B	SLOT 5 - PIN 1 (MAX 10A) - Paired with SLOT 5 - Pin 2 on 17B This pin connects the card in slot 5 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 5 - PIN 2 on 17B.
<i>Power IO (10A), Digital IO, Analog IO and Differential</i>	18B	SLOT 5 - PIN 2 (MAX 10A) - Paired with SLOT 5 - Pin 1 on 7B This pin connects the card in slot 5 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 5 - PIN 1 on 8B.
<i>Power IO (10A), Digital IO, Analog IO and Differential</i>	9B	SLOT6 - PIN 1 (MAX 10A) - Paired with SLOT 6 - Pin 2 on 19B This pin connects the card in slot 6 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 6 - PIN 2 on 19B.
<i>Power IO (10A), Digital IO, Analog IO and Differential</i>	19B	SLOT6 - PIN 2 (MAX 10A) - Paired with SLOT 6 - Pin 1 on 9B This pin connects the card in slot 6 to the front panel connector B and supports high current IO, Analog or digital IO, or a differential pair with SLOT 6 - PIN 1 on 9B.
<i>GND (PGND)</i>	10B 20B	Ground Return for signal and power

### Novasars Micro System Interface connectors A and B



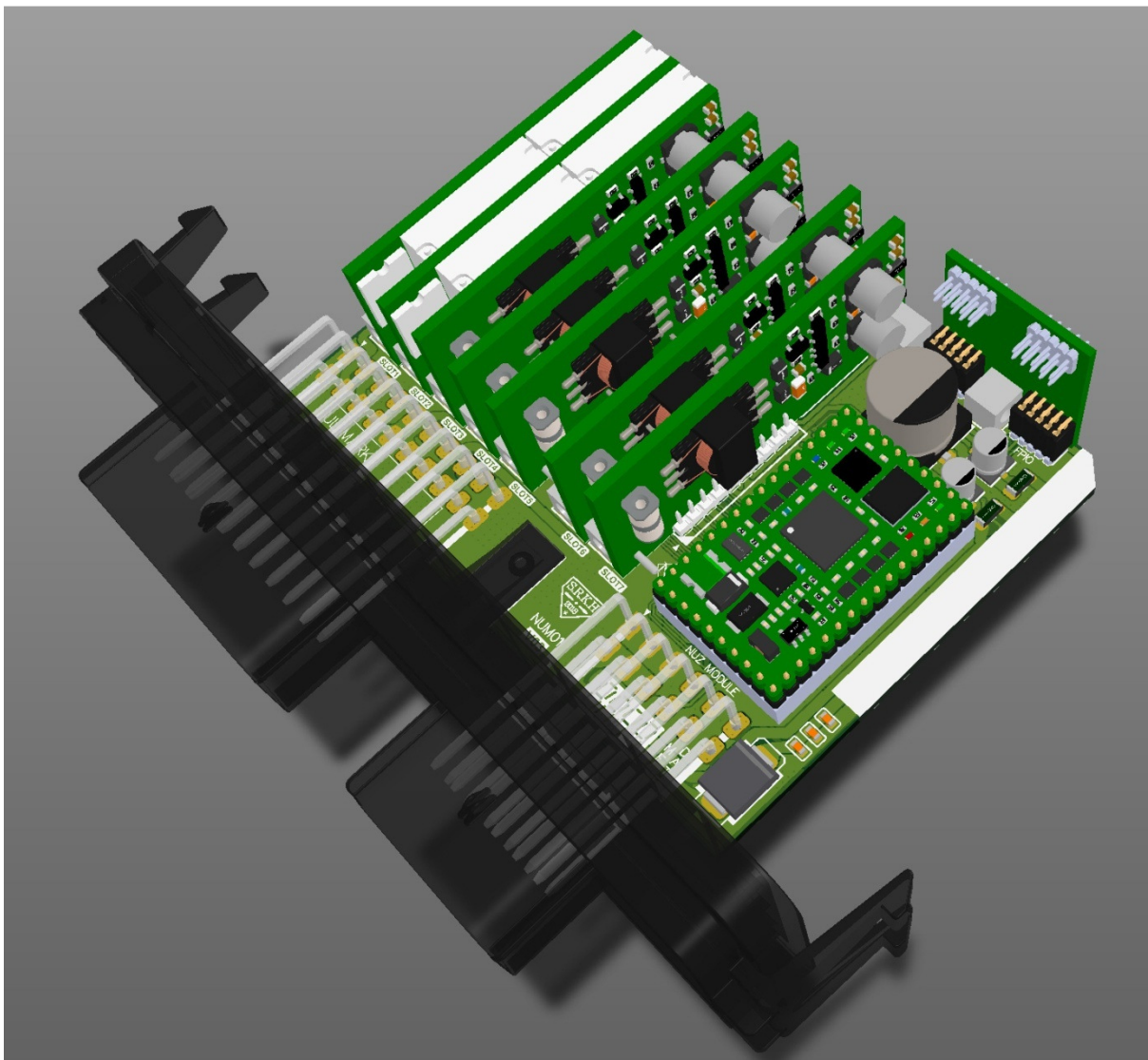
## Method of IO

The Novasar Micro System uses small interface cards that are capable of high current (10A) and are firmly secured into the Micro Motherboard, capable of accommodating hostile and hazardous industrial environments. Each card can accommodate the required circuitry to provide an interface and protection through the IO connector and enables a simple, modular, scalable IO system.

Cards can easily be swapped out to support service, backwards compatibility, additional functionality or customisation through configuration.

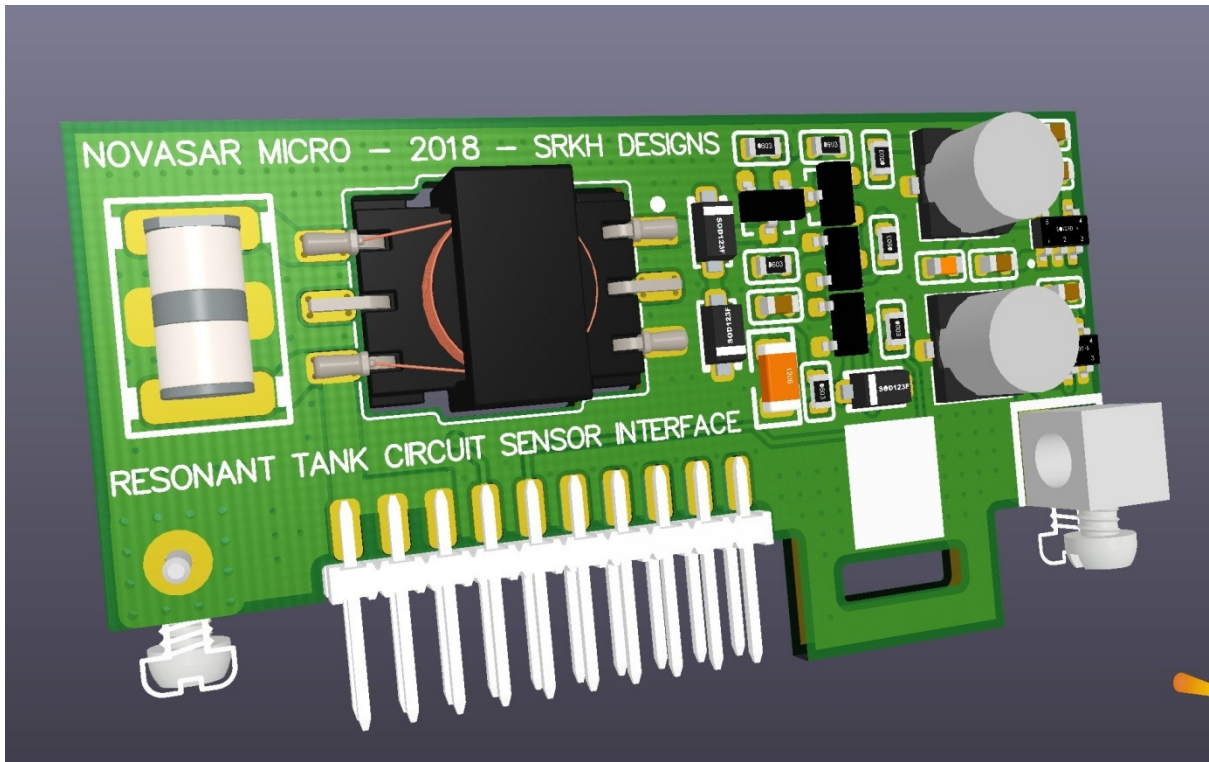
Each unit supports wide-operating input power (9-28V), has native built-in networking (CAN) and supports various telemetry capabilities.

The Enclosure is IP67- and IP69K-rated and can accommodate potting if required.



*A populated enclosure with interface cards and a SAME51G19A processor module.*





**Plug in interface board** - A total of 7 cards are supported in the Cinch ME IP67 enclosure.



**Multi channel relay board (top) and tank circuit inductive loop vehicle detector (bottom).**