ANTARES 4

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Antares 4

The Antares 4 is Cosworth's latest generation high-performance control and logging system tailored specifically for 4-cyl DI applications. It features two microprocessors, one dedicated to control and the other for data collection and data logging. In addition, four Field Programmable Gate Arrays (FPGAs) provide class-leading performance.

Up to four configurable GDI injector drivers and 16 configurable injector/PWM drivers, combined with eight IGBT ignition outputs and 8 logic level coil driving outputs make it capable of controlling multiple-pulse GDI fuelling on engines up to four cylinders, or fully sequential port injection fuelling on engines up to 8 cylinders and 16 Injectors. Combined GDI and PFI fuelling is supported for engines up to four cylinders.

Dual fly-by-wire capability is included along with provision for Stepper and DC motors.

The Antares 4 crank and camshaft pattern recognition system allows the ECU to be used with virtually any OEM timing wheel. This sophisticated pattern recognition algorithm also facilitates synchronisation during slow and uneven cranking conditions.

The Antares 4 provides multiple functions for many of its pins:

- Unused injector and IGBT ignition outputs can be used as digital outputs.
- Unused digital inputs can be used as 12-bit analogue inputs.
- H-bridge outputs can be used in either full or half bridge mode.
- H-bridge outputs can be combined to drive a stepper motor or used to provide additional high or low-side drive capability.

All these features are configurable in software.

For reliability the Antares 4 includes reverse-battery, over-voltage protection as standard. Sensor supply and signal ground pins are also protected against short circuits to battery positive and negative.

Advanced software features include:

- In cylinder pressure monitoring
- Closed loop knock control
- Traction control
- Launch control
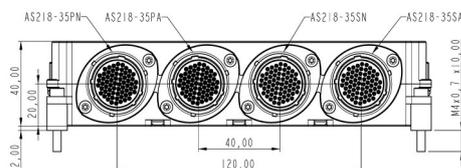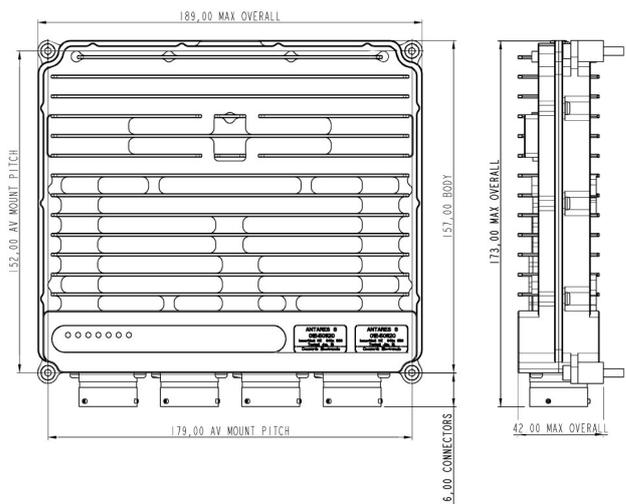
The Antares 4 is designed to function up to a maximum RPM of 16,000rpm when running GDI, or 22,000rpm when running with port fuelling only. There are upto two lambda sensor inputs, which will accept NTK/Bosch style wideband sensors. There are also upto two specialised knock inputs with a software enabled gain stage.

The wide range of functionality makes the Antares 4 capable of working with almost any combination of coil, injector, OEM sensor, and actuator to deliver optimal engine performance.

- Integrated gearshift strategies
- Variable valve timing of up to four camshafts (including BMW VANOS)
- Ultra high speed data logging
- Scrutineering modes for single make championships

Specifications

Electrical Data

Supply Voltage	6.0V-16.5V Reverse battery, over-voltage and load dump protection
Ethernet	1x 1000MB/s PC Setup 2 x 100MB/s Ethernet Expansion[1] 1x 100MB/s EtherCat
CAN Ports	Up to 3 CAN ports Max BAUD rate: 1MBit/s 64x message buffers per port Software selectable 120Ω resistor
LIN Ports	2 LIN Master Ports
Serial Debug Port	1x Bi-directional RS232 Fixed at 115200 BAUD
Serial Ports	1x Bi-directional RS232 Split Function Tx and Rx Logger side Max BAUD rate: 115200 1x Bi-directional RS232 control side Max BAUD rate: 115200
Status LEDs	7x LEDs

Mechanical Data

Material	6082-T6 Anodised Aluminium
Dimensions	189 X 40 X 157MM
Weight	1100g
Electrical Connectors	Deutsch Autosport
Temperature Rating	Operating -20 to +70°C Storage -30 to +80°C
IP Rating	IP65

Ordering Information

Part Number

01E-501154	Antares 4
60E-501130	Antares Comms Loom (C1 only)
03A-06927	Antares Bench loom
Deutsch AS6-18-35SN	C1 mating connector
Deutsch AS6-18-35SA	C2 mating connector
Deutsch AS6-18-35PN	C3 mating connector
Deutsch AS6-18-35PA	C4 mating connector

Technical Data

Engine configuration	1 to 4 Cylinders (GDI) 1 to 8 Cylinders (PFI) 4 stroke N/A or Forced Induction
Digital outputs	8x logic level driven TTL 16x Peak-Hold (all support PWM)
Digital inputs	Upto 10x General Purpose, Wheel Speed, Switch or 0-5V analogue alternate function (12 bit, 10kHz cut off)
Data logging	Up to 4GB memory Continuous Logger: 1kHz logging rate Burst logger: 200kHz[2]
Crank and cam sensors	Single Crank input, Single dedicated cam input, 4x general purpose VCAM Hall effect or Inductive
GDI Injector drivers	4x GDI outputs with boosted voltage
PFI Injector / PWM drivers	See 18
Thermocouple inputs	2x Type K (12-bit)
Analogue inputs (Up to 1kHz)	19x (12bit) 1x PT1000 (12bit)
Analogue inputs (High speed 200kHz)	Up to 4x (12bit)
Knock Sensor Inputs	2x 5kHz-30kHz Bandpass filter Software gain (x1 or x30) 200kHz Sample Rate
Lambda Inputs	2x Wideband Closed Loop Lambda Inputs, Support for NTK, Bosch LSU/ADV
Auxiliary outputs	3x full H-bridge (20A peak)
Ignition drivers	8x IGBT internal clamp (+430V, 20A) 8x logic level driven (TTL)
Internal Monitoring	Battery voltage Internal device temperatures Excitation voltages Injector current Ignition current H-Bridge Current H-Bridge Temp

[1] FlexRay support requires custom software development - contact Cosworth Applications Engineer for further details.

[2] Subject to applied Token.

Product Variant Matrix

Variant	Antares 4 – Plus	Antares 4 – Pro	Antares 4 – Ultra
AC Customer	Included	Included	Included
AC Developer	Optional	Optional	Optional
In cylinder Pressure Monitoring	N/A	N/A	4x Cylinder @ 200kHz
RLU Logging	YES	YES	YES
Logging Capacity (MiB)	1,024	2,048	4,096
Bandwidth Low Speed (bytes/sec)	50,000	50,000	150,000
Bandwidth High Speed (bytes/sec)	10000000	10000000	10000000
No. of AIN	20	20	20 +4 (HS 200kHz)
No. of DIN	10	10	10
Logging Tables	1+1	1+1	1+2
HS Burst Tables	1	1	2
Telemetry Tables	N/A	N/A	1
Math Channels	150	300	500
Logic Channels	YES	YES	YES
CAN Ports	3	3	3
Ethernet Displays	24	24	48
Full Qualifying Mode	YES	YES	YES
I/O Expansion	CAN/EtherCAT	CAN/EtherCAT	CAN/EtherCAT
Ethernet Ports	3	3	3
EtherCAT Ports	1	1	1
LIN Ports	2	2	2
Setup Locking	Optional	Optional	Optional
Lambda	2	2	2
Thermocouple	2	2	2
Knock Sensors	2	2	2

LED Indicator Definitions

Legend	Colour	LED Modes	LED Definitions
(power)	Red	Off Single (1Hz, 250ms On, 750ms Off) Flash Blinking	No Power to the Unit Initialising and looking for clock sync Sync achieved unit operational
(warning)	Red	Off On	Normal running condition Logger error or no dataset (logging config) loaded (During startup the LED performs a quick light test)
(disk)	Red	Off On	Normal running condition Logger full and overwriting data (During startup the LED performs a quick light test)
(laptop)	Green	Off On (10Hz 50ms On 50ms Off Flickering	1000Base T Ethernet Port 2, No connection established Connection established Communication active
(network)	Green	Off On 10Hz 50ms On 50ms Off Flickering	100Base T Ethernet Port 1, No connection established Connection established Communication active
(network)	Green	Off On 10Hz 50ms On 50ms Off Flickering	100Base T Ethernet Port 3, No connection established Connection established Communication active
(ethercat)	Green	Off On Flickering	EtherCAT Port, no connection established Connection established Communication active

Installation

When you install the Antares 4:

- Make sure that the unit is protected against severe vibrations by mounting using supplied AV mounting kit. Also make sure that the unit is not fouling other structures which may experience severe vibrations. The warranty will be void if mounted differently.

- Make sure that the unit is positioned in an area with an ambient temperature of less than 70°C or with sufficient cooling air flow to prevent over heating.

- Make sure that the unit is mounted away from sources of electrical interference.

- Make sure that the unit is mounted in position where unit will not come into contact with water.

- Do not ground the case. Use the ground pins provided by the Autosport connectors.

Connector Information

All pin outs are grouped in function order, rather than pin order.

C1 Connector

Connector	Mating Connector
AS218-35PN-943B	AS618-35SN

C1 Pinout

Pin	Signal	Description
C1-18	BATT+	Battery Positive (all pins must be connected)
C1-26	BATT+	
C1-27	BATT+	
C1-29	BATT+	
C1-35	BATT+	
C1-36	BATT+	
C1-38	BATT+	
C1-44	BATT+	
C1-61	BATT-	Battery Negative (all pins must be connected)
C1-54	BATT-	
C1-46	BATT-	
C1-37	BATT-	
C1-28	BATT-	
C1-20	BATT-	
C1-19	BATT-	
C1-12	BATT-	
C1-11	BATT-	
C1-6	BATT-	
C1-50	ETHTX+1	Ethernet 1 Expansion 100BaseT.
C1-42	ETHTX-1	
C1-41	ETHRX+1	
C1-33	ETHRX-1	
C1-47	CANH_CTRL-LOG	CAN—shared CAN port between Logger and Control. Software selectable 120Ω termination.
C1-55	CANL_CTRL-LOG	
C1-30	SerialDBG_TX_LOG	RS232 serial, Logger side only (debug and alternative firmware loading)
C1-22	SerialDBG_RX_LOG	
C1-24	Serial1_TX_LOG	RS232 serial, Logger side only (auxiliary device comms. For example, Telemetry streams)
C1-32	Serial1_RX_LOG	
C1-13	Serial2_TX_CTRL	RS232 serial, Control side only (firmware loading, auxiliary device comms)
C1-21	Serial2_RX_CTRL	

C1 Pinout (continued)

Pin	Signal/alternative use	Description
C1-5	INJHS1/PWM1	
C1-2	INJHS2/PWM3	4x High Side Injector outputs
C1-43	INJHS3/PWM5	Please refer to capabilities and combinations as shown on page 18
C1-10	INJHS4/PWM7	
C1-4	INJLS1/PWM2	
C1-1	INJLS2/PWM4	4x Low Side Injector outputs for GDI & PF
C1-51	INJLS3/PWM6	Please refer to capabilities and combinations as shown on page 18
C1-17	INJLS4/PWM8	
C1-58	INJLS9/PWM17	
C1-59	INJLS10/PWM18	
C1-25	INJLS11/PWM19	
C1-34	INJLS12/PWM20	8x Low Side Injector general purpose outputs
C1-66	INJLS13/PWM21	Please refer to capabilities and combinations as shown on page 18
C1-62	INJLS14/PWM22	
C1-64	INJLS15/PWM23	
C1-65	INJLS16/PWM24	

C1 Pinout (continued)

Pin	Signal/alternative use	Description		
C1-57 C1-49	HBA1/PWM33	1 x half-H bridge output 50kHz current logging[1]	1x full-H bridge 50kHz[1] current logging	2 Channels may be used to form a stepper motor output (4 pins) Maximum current 20A, Maximum operating frequency 10kHz Current measurement with up to 50kHz[1] is available.
C1-63 C1-56	HBB1/PWM34	1 x half-H bridge output 50kHz current logging[1]		
C1-53 C1-60	HBA2/PWM35	1 x half-H bridge output 50kHz[1] current logging	1x full-H bridge 50kHz[1] current logging	
C1-45 C1-52	HBB2/PWM36	1 x half-H bridge output 50kHz current logging[1]		
C1-16 C1-23	IGN1/PWM43	4 x IGBT outputs Mode1: Inductive Ignition high voltage coil drive Mode2: PWM output. The driver cannot pull down to 0V. The low voltage level will be around 1.2V. PWM output with limited frequency of 1kHz. (Future) Mode3: Analog Input with limited bandwidth 10Hz, and resolution (10bit ADC) (Only suitable when no IGBT outputs are being used) Output capabilities: 20A peak, 3A continuous, 430V		
C1-9 C1-15	IGN2/PWM44			
C1-8 C1-14	IGN3/PWM45			
C1-3 C1-7	IGN4/PWM46			
C1-39	DOUT1/PWM51	4 x logic level outputs (TTL) Mode1: TTL Ignition drive Mode2: PWM output with max frequency of 10kHz Output capabilities: Source 5V clamped to 25mA with a thermal fuse shutting down if overstressed, auto recovering Sink 0V @ 3.5A		
C1-31	DOUT2/PWM52			
C1-48	DOUT3/PWM53			
C1-40	DOUT4/PWM54			

[1] Hardware arrangements in place, subject to software release

= doubled up pins to split current load. Same function on either pin.

All pin outs are grouped in function order, rather than pin order.

C2 Connector

Connector	Mating Connector
AS218-35PA-943B	AS618-35SA

C2 Pinout

Pin	Signal/alternative use	Description
C2-24	ETH1000+1	Ethernet Port 2 (high speed) 1000BaseT for high speed PC comms (logger and calibration interface) and download data logging
C2-32	ETH1000-1	
C2-16	ETH1000+2	
C2-23	ETH1000-2	
C2-15	ETH1000+3	
C2-9	ETH1000-3	
C2-3	ETH1000+4	
C2-8	ETH1000-4	
C2-13	CANH_LOG	CAN— Logger/Toolset only Software selectable 120Ω termination.
C2-12	CANL_LOG	
C2-22 C2-14	N/C	
C2-1	ECATTX+	EtherCat master for system expansion.
C2-6	ECATTX-	
C2-7	ECATRX+	
C2-2	ECATRX-	
C2-26	EXTPSU1	4x fixed protected 5V supply outputs. Each output is independently protected and clamps the current at 50mA if required.
C2-18	EXTPSU2	
C2-25	EXTPSU3	
C2-17	EXTPSU4	
C2-4	EXTPSU11	4x Software selectable 5V/VBatt supply outputs. When in 5V mode each output is independently protected and clamps the current at 50mA if required. If any of those outputs are used in VBatt mode those outputs are grouped together. The current is clamped at 700mA. If overstressed a thermal shutdown protects and shuts down all outputs which are set to VBatt mode.
C2-5	EXTPSU12	
C2-10	EXTPSU13	
C2-11	EXTPSU14	

Pin	Signal/alternative use	Description
C2-33	DIN1/AIN	4x general purpose digital inputs Mode1: Switch Inputs Mode2: Rate measurement (wheel, shaft, etc)., Software selectable 3kΩ pull-up resistor to 5V Mode3: 0-5V analogue alternate function (12 bit, 10kHz cut off) Mode4: VCAM capability Capabilities: Max sampling rate for switch type inputs: 10ms Max sampling rate for specific strategies such as transmission control switch type inputs: 1ms Thresholds are software configurable between 0V and 5V
C2-41	DIN2/AIN	
C2-56	DIN3/AIN	
C2-53	DIN4/AIN	
C2-55	DIN5/AIN	4 x general purpose digital inputs Mode1: Switch Inputs Mode2: Rate measurement (wheel, shaft etc), Software selectable 3kΩ pull-up resistor to 5V Mode3: 0-5V analogue alternate function (12 bit, 10kHz cut off) Mode4: 220Ω Pull down for current signal based wheel speed sensors (Bosch DF11i) Capabilities: Max sampling rate for switch type inputs: 10ms Max sampling rate for specific strategies such as transmission control switch type inputs: 1ms Max input pulse train 10KHz Thresholds are software configurable between 0V and 5V
C2-45	DIN6/AIN	
C2-52	DIN7/AIN	
C2-58	DIN8/AIN	
C2-31	N/C	
C2-40		
C2-54		
C2-59		
C2-60	PROT-GND2	2x Protected sensor grounds grouped together Driver clamps at 3.5A and eventually shuts down if thermally overloaded
C2-65	PROT-GND2	
C2-64	PROT-GND1	1x Protected GND reserved, but not exclusively for cam and crank, Driver clamps the current at 3.5A and eventually shuts down if thermally overloaded.

C2 Pinout (continued)

Pin	Signal/alternative use	Description
C2-47	KNOCK1	2x Dedicated Knock inputs, 5kHz-30kHz Bandpass filter
C2-50	KNOCK2	Software controlled gain (x1 or x30)
C2-48 C2-46	N/C	
C2-49	LAMIP1	Lambda 1 Wideband sensor input (see page 20)
C2-42	LAMVS1	Only use dedicated Trim input (C2-36) for connecting to Lambda 1 Trim (Bosch) or Label resistors (NTK)
C2-63	LAMIP2	Lambda 2 Wideband sensor input (see page 20)
C2-57	LAMVS2	Only use dedicated Trim input (C2-35) for connecting to Lambda 2 Trim (Bosch) or Label resistors (NTK)
C2-66	CAM	Hall effect or inductive engine position inputs
C2-62	CRANK1	
C2-61	N/C	
C2-44	TCPOS1	2x Type K thermocouple inputs, voltage range −4.5mV to +45mV
C2-51	TCNEG1	
C2-43	TCPOS2	
C2-34	TCNEG2	
C2-28	AIN1	6x Analogue inputs (12 bit) with redundant ADC processing to be used for FBW related sensors (PPS, TPS)
C2-27	AIN2	
C2-39	AIN3	Mode1: general purpose analogue input with software selectable 3kΩ pull-up resistor to 5V, 250 Hz low pass filter
C2-29	AIN4	
C2-37	AIN5	
C2-38	AIN6	
C2-36	LamTrim1	2x Analogue inputs (12 bit) (Dedicated to Lambda Trim)
C2-35	LamTrim2	Lambda trim inputs are for compensation Resistors (Bosch LSU)
C2-30	DOUT5/PWM55	4 x logic level Digital outputs (TTL) Mode1: TTL Ignition drive Mode2: PWM output with max frequency of 10kHz Output capabilities:
C2-20	DOUT6/PWM56	
C2-21	DOUT7/PWM57	Source 5V clamped to 25mA with a thermal fuse that shuts down if overstressed, auto-recovering
C2-19	DOUT8/PWM58	Sink 0V @ 3.5A

All pin outs are grouped in function order, rather than pin order.

C3 Connector

Connector	Mating connector
AS218-35SN-943B	AS618-35PN

C3 Pinout

Pin	Signal/alternative use	Description
C3-59	EXTPSU5	6x fixed protected 5V supply outputs. Each output is independently protected and will clamp the current at 50mA if required.
C3-60	EXTPSU6	
C3-61	EXTPSU7	
C3-64	EXTPSU8	
C3-65	EXTPSU9	
C3-66	EXTPSU10	
C3-62	EXTPSU15	6x Software selectable 5V/VBat supply outputs. When in 5V mode each output is independently protected and will clamp the current at 50mA if required. If any of those outputs are used in VBat mode those outputs are grouped together. The current is clamped up 700mA. If overstressed a thermal shutdown protect and shuts down all outputs which are set to VBat mode. When in 12V mode the following grouping applies: Group 2: EXTPSU15, EXTPSU16, EXTPSU17 and EXTPSU18 Group 3: EXTPSU19, EXTPSU20, EXTPSU21 and EXTPSU22
C3-50	EXTPSU16	
C3-63	EXTPSU17	
C3-49	EXTPSU18	
C3-2	EXTPSU19	
C3-6	EXTPSU21	
C3-16	CANH_CTRL	CAN— ECU Control/CalTool only Software selectable 120Ω termination.
C3-15	CANL_CTRL	
C3-14 C3-13	N/C	
C3-7	ETH2_TX+/FP1	Mode1: Ethernet port 3, 100BaseT, connected to internal Ethernet Hub Mode2: FlexRay[1]
C3-3	ETH2_TX-/FM1	
C3-9	ETH2_RX+/FP2	
C3-8	ETH2_RX-/FM2	
C3-44	PROT-GND3	2x individually Protected sensor ground groups Driver clamps at 3.5A and eventually shuts down if thermally overloaded
C3-51	PROT-GND3	
C3-52	PROT-GND4	
C3-58	PROT-GND4	
C3-34 C3-25 C3-43 C3-35	N/C	

[1] FlexRay support requires custom software development - contact Cosworth Applications.

C3 Pinout (continued)

Pin	Signal/alternative use	Description
C3-53	AIN7	Analogue inputs (12 bit) with redundant ADC processing to be used for FBW related sensors (PPS, TPS)
C3-45	AIN8	Mode1: general purpose analogue input with software selectable 3KΩ pull-up resistor to
C3-41	AIN9	Analogue inputs (12 bit) Mode1: general purpose analogue input with software selectable 3KΩ pull-up resistor to 5V, 250 Hz low pass filter
C3-42	AIN10	
C3-32	AIN11	
C3-33	AIN12	
C3-23	AIN13	
C3-24	AIN14	
C3-47	AIN15	
C3-39	AIN16	
C3-31	AIN17	
C3-22	AIN18	
C3-46	AIN19	
C3-38	N/C	
C3-29		
C3-30		
C3-37		
C3-28		
C3-21	PT1000 1 / AIN	PT1000 / 12 Bit AIN
C3-1	N/C	
C3-5		
C3-11		
C3-20		
C3-12		
C3-4	AIN HS1/CPM1	4x Optional (Ultra Upgrade) Analogue inputs (12 bit) Mode1: general purpose analogue input with software selectable 3KΩ pull-up resistor to 5V, 30kHz low pass filter Mode2: High speed or Cylinder pressure sensors (/CPMCYL#), 200kHz logging rate
C3-18	AIN HS2/CPM2	
C3-10	AIN HS3/CPM3	
C3-17	AIN HS4/CPM4	
C3-26	N/C	
C3-19		
C3-27		
C3-36		

C3 Pinout (continued)

Pin	Signal/alternative use	Description
C3-57	ScopeOut1	Programable digital scope outputs, for CAM, Crank, and Knock. (Requires custom firmware, contact Cosworth for details).
C3-56	ScopeOut2	
C3-54 C3-55	N/C	
C3-48	DIN HS1/AIN	2 x general purpose high speed digital inputs e.g. Turbospeed (no cut off Filter) Mode1: Switch Inputs Mode2: Rate measurement (wheel, shaft etc), Software selectable 3kΩ pull-up resistor to 5V Mode3: 0-5V analogue alternate function (12 bit, no low pass filtering) Capabilities: Max sampling rate for switch type inputs: 10ms Max sampling rate for specific strategies such as transmission control switch type inputs: 1ms Maximum pulsetrain 100kHz Thresholds are software configurable between 0V and 5V
C3-40	DIN HS2/AIN	

All pin outs are grouped in function order, rather than pin order.

C4 Connector

Connector	Mating Connector
AS218-35SA-943B	AS618-35PA

C4 Pinout

Pin	Signal/alternative use	Description
C4-4	N/C	
C4-1		
C4-51		
C4-17		
C4-10		
C4-5		
C4-58		
C4-25		
C4-59	INJLS17/PWM25	4x low side injector general purpose outputs
C4-64	INJLS18/PWM26	
C4-34	INJLS19/PWM27	Please refer to capabilities and combinations as shown on page 19
C4-43	INJLS20/PWM28	
C4-62	N/C	
C4-63		
C4-65		
C4-66		

C4 Pinout (continued)

Pin	Signal/alternative use	Description		
C4-60	HBA3/PWM37	1 x half-H bridge output 50kHz[1] current logging	1x full-H bridge 50kHz[1] current logging	Maximum current 20A, Maximum operating frequency 10kHz Current measurement with up to 50kHz[1] is available.
C4-54				
C4-46	HBB3/PWM38	1 x half-H bridge output 50kHz[1] current logging		
C4-53				
C4-41	N/C			
C4-32				
C4-31				
C4-40				
C4-36				
C4-18				
C4-2	IGN5/PWM47	4 x IGBT outputs		
C4-6		Mode1: Inductive Ignition high voltage coil drive		
C4-3	IGN6/PWM48	Mode2: PWM output. The driver cannot pull down to 0V. The low voltage level is around 1.2V. PWM output with limited frequency of 1kHz.		
C4-7				
C4-8	IGN7/PWM49	Mode3: Analog Input with limited bandwidth, and resolution (10bit ADC)		
C4-14				
C4-9	IGN8/PWM50	Output capabilities:		
C4-15		20A peak, 3A continuous		
C4-24	N/C			
C4-16				
C4-23				
C4-22				

[1] Hardware arrangements in place, subject to software release

= double the amount of pins to relief current draw per pin.

C4 Pinout (continued)

Pin	Signal/alternative use	Description
C4-55		
C4-38		
C4-61		
C4-47	N/C	
C4-29		
C4-30		
C4-37		
C4-21		
C4-33	EXTPSU20	2x Software selectable 5V/VBat supply outputs. When in 5V mode each output is independently protected and will clamp the current at 50mA if required. If any of those outputs are used in Vbat mode those outputs will be grouped together. The current will be clamped up 700mA. If overstressed a thermal shut down will protect and therefor shutdown all outputs together which are set to 12V mode.
C4-42	EXTPSU22	Only when set to 12V mode the following grouping will apply: Group 1: EXTPSU11, EXTPSU12, EXTPSU13 and EXTPSU14 Group 2: EXTPSU15, EXTPSU16, EXTPSU17 and EXTPSU18 Group 3: EXTPSU19, EXTPSU20, EXTPSU21 and EXTPSU22
C4-35	BATT+	
C4-44	BATT+	Battery Positive (all pins must be connected)
C4-45	BATT+	
C4-52	BATT+	
C4-11	BATT-	
C4-12	BATT-	
C4-13	BATT-	Battery Negative (all pins must be connected)
C4-19	BATT-	
C4-26	BATT-	
C4-27	BATT-	
C4-49	PROT-GND5	
C4-50	PROT-GND5	2x individually Protected sensor ground groups
C4-56	PROT-GND6	Driver clamps at 3.5A and eventually shuts down if thermally overloaded
C4-57	PROT-GND6	
C4-48	N/C	
C4-39		
C4-20	LIN1	LIN Bus Master 1
C4-28	LIN2	LIN Bus Master 2

Injector Wiring Guide

The ECU provides a highly flexible level of connectivity for fuel injectors.

- 4x High Side GDI injector, which are contained on C1 for Antares 4, they must be used with one of the 4 corresponding low side output if GDI is desired (Mode1).
- Up to 16x high or low impedance PFI injectors are supported if PFI-only mode is chosen.
- GDI and PFI can be combined with 4 GDI and 8 PFI injectors.
- Alternatively the output of every injector can be used for general purpose PWM functions including Lambda heater.

Please refer to the limits for each mode as shown below.

Mode 1: GDI, Boost supply + Control
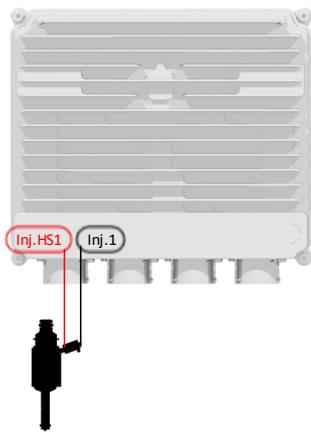
-Connected in Pairs

-Max. Boost Current 14A

-Max. Boost Voltage 90V

-Max. Peak Current 7A

-Max. Hold Current 5A

-50kHz Current Logging[1]

Availability: 4x

Mode 2: PFI, 12V supply + Control
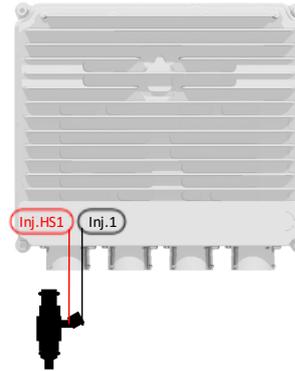
-Connected in Pairs

-Max. Peak Current 7A

-Max. Hold Current[2] 5A

-50kHz Current Logging[1]

-High and Low Impedance Support

Availability: 4x

Mode 3: PFI, control only
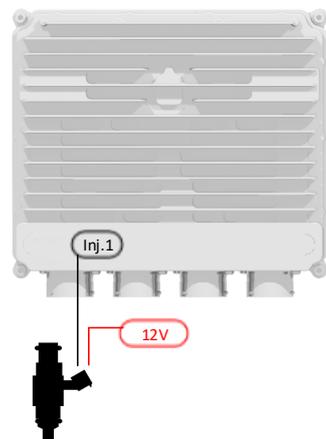
-Max. Peak Current 7A

-Max. Hold Current[2] 5A

-No High Speed Current Logging

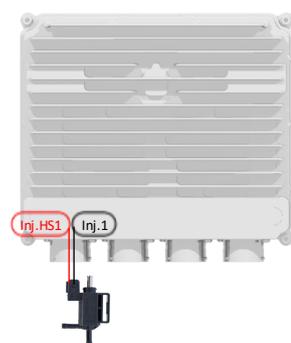-High and Low Impedance Support

Availability: 16x

Mode 4: PWM, control using high side pins
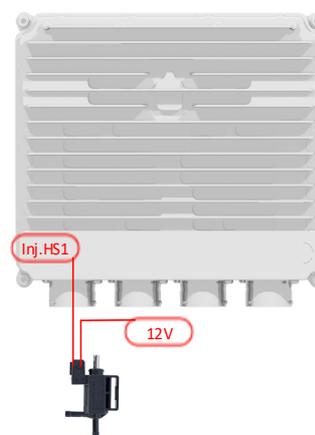
-Max. Frequency 10kHz

-No Peak and Hold available

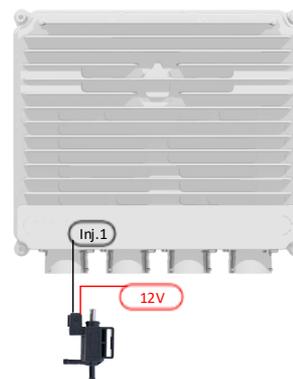-No high speed current Logging

-Max. Current 3A

Availability: 4x

Mode 5: PWM, 12V supply and control

-Max. Peak Current 7A

-Max. Hold Current[2] 5A

-Max. Frequency 10kHz

-50kHz Current Logging[1]

-Current Control available

Availability: 4x

Mode 6: PWM, control low side only

-Max. Peak Current 7.5A

-Max. Hold Current[2] 5A

-Max. Frequency 10kHz

-No High Speed 50kHz Logging

-Current Control available

Availability: 16x

Recycling and Environmental Protection

Cosworth Electronics is committed to conducting its business in an environmentally responsible manner and strive for high environmental standards.

Manufacture: Cosworth products comply with the appropriate requirements of the Restriction of Hazardous Substance (RoHS).

Battery: This equipment contains a rechargeable battery (Lithium 6.5mAh) for the Real Time Clock.
To maintain battery health especially when the ECU is not in use for long periods of time, please power on the device for a minimum of 6 hours every 12 months. In typical use the battery should last > 5 years.

Service: Should the battery need replacing the equipment may be returned to Cosworth Electronics for a battery replacement. (A charge will be made for this service).
Removal of the battery by the user may void any warranty on the equipment.

Disposal: Electronic equipment should be disposed of in accordance with the regulations in force and in particular in accordance with the Waste in Electrical and Electronic Equipment directive (WEEE).

To remove the battery for recycling:
Remove the case cover(s).
Remove the printed circuit boards from the case.
Remove the battery from the printed circuit board.
Dispose of the battery in accordance with regulations in force.

COSWORTH

Enabling Greatness for over 65 years