

CANlink 4002: Control Module

RUGGED & HIGHLY CONFIGURABLE

Designed for the Vocational market, HED's CL-4002 is a highly programmable small-to-mid-size microcontroller that offers high speed processing and large memory capacity along with configurable I/O.



RUGGED RELIABILITY

Made for severe-duty mobile applications, these microcontrollers are IP67 and IP6K9K sealed and are resistant to shock and vibration - ensuring performance regardless of the operating environment.

PROGRAMMABLE + CONFIGURABLE

Configurable I/O allows outputs to be programmed as inputs and inputs to be configured as multiple input types through software configurability - giving you the ultimate flexibility.

TOTAL VEHICLE CONTROL

Our controllers can be used as a master or client and operate in J1939¹ CAN or CANopen systems. We offer programming tools or provide a BSP to allow OEMs to use their own tools.

READY TO GET STARTED?

Connect with our team of experts to discuss your project and discover how HED can provide tailored control solutions for your vehicles.



-40C to +85C



Optional Bluetooth



Integrated Security



IP67 + IP6K9K sealed



Configurable I/O



Shock & Vibration Resistant

CL-4002 CONTROL MODULE | Product Specifications

HARDWARE	
Overview	Arm™ Cortex-M7 Microcontroller running at 160 MHz
MCU	S32K322
Flash	2MB
RAM	256KB
INTERFACES	
CAN	2x CAN-FD ports
Bluetooth™	Bluetooth™ 5.1 Compliant - <i>optional</i>
Accelerometer	3-axis (2g to 16g selectable range)- <i>optional</i>
MECHANICAL	
Housing Material	Nylon 6/6 15% glass filled
Installation	Panel mount
Connectors	1x Deutsch 18-pin DT
Dimensions (mm)	158.51mm x 110.52mm x 56.50mm 6.24" x 4.35" x 2.25"
Weight	0.70 lbs
Contacts	16-18 AWG: 0462-201-16141 14-16 AWG: 0462-209-16141
Plugs	Non-locking: 114017 Locking: 0413-217-1605
Wire Size	14-16 AWG or 16-18 AWG
Mounting & Torque	1/4-20" or M6 Fastener 50-55 in-lbs
Indicators	1x Blue Power 2x RGB Indicators
OPERATING SYSTEM	
Operating System	FreeRTOS
Bootup Time	150msec (approximate)
SOFTWARE FRAMEWORK & TOOLS	
Development	NXP Design Studio
Programming	C / C++
CAN Protocol	J1939 and CANopen networks ¹

ELECTRICAL	
Operating Voltage	8-32VDC
Key Switch	Standard for Start/Shutdown
Max Total I/O Available	10
Inputs	up to 10
Outputs	Digital (8) / Analog (2)
Current Draw (No I/O active)	115mA (13.8VDC) (typ) 95mA (28VDC) (typ)
Total Maximum Output Current	15A per +Battery Pin feeding bank of outputs (see pinout)
Standby Current	<0.6mA (12VDC), <1.7mA (24VDC)
Suspend Mode Current	contact us for details
PRODUCT RATINGS	
IP Class	IP67 and IP6K9K
EU/CE Compliance	CE 2014/30/EU
Vibrations	ISO 16750-3
Shock	ISO 16750-3
Solar	ISO 16750-4
Salt Fog	ISO 16750-4
Chemical	ISO 16750-5
Electrostatic Discharge	ISO 10605 ISO 13766-1
Conducted Transient Immunity	ISO 13766-1 ISO 7637-2
Starting Profile	ISO 16750-2
Reverse Polarity	ISO 16750-2
EMC	ISO 13766-1 EN 13309 EN 50498 CISPR 25
Temperature Range	Operating: -40C to +85C (Output current limits may require moderate derating for temperatures above +70C) Storage: -40C to +85C
FCC / ISED Compliance	FCC Part 15 (b) and ISED Canada

¹ Capable of interfacing with J1939 devices but HED does not currently offer a standard J1939 Client.

Part Number Details

CL-4002- HHH -FF-IIOODD-CCCN	(HHH)	Firmware Options (FF)	(II)	(00)	(DD)	Custom Suffix (CCCN)	
	Hardware Configuration*	CANopen Client	BSP Master	# of Inputs	# of Digital Outputs	Reserved for Future Options	Customer Number
CL-4002-105-FF-020800-CCCN	105	50	B0	02	08	00	CCC NNN
CL-4002-106-FF-020800-CCCN	106	50	B0	02	08	00	CCC NNN
CL-4002-101-B0-020800-CCCN	101	n/a	B0	00	04	00	CCC NNN

Standard Part Numbers Available

	CANopen Client Part Numbers	BSP Master Part Numbers
Plus Model – Full Feature	CL-4002-105-50-020800	CL-4002-105-B0-020800
Base Model – Limited Outputs	CL-4002-106-50-020800	CL-4002-106-B0-020800
Flex Model - Limited I/O with Bluetooth	n/a	CL-4002-101-B0-000400



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CL-4002 STANDARD CONFIGURATIONS AVAILABLE

Configuration	Inputs	Digital Outputs	CAN PORTS	QSPI Flash	Bluetooth	Accelerometer	Daughterboard Connectors	Configuration Notes
CL-4002-105	2x	8x	2x	yes	no	no	yes	Full Featured I/O as shown below
CL-4002-106	2x	8x	2x	yes	no	no	yes	No 5VDC Sensor Supply No 20mA Inputs and RTD Inputs Limited VTD Analog Inputs
CL-4002-101	0x	4x	2x	yes	yes	yes	no	Limited Sourcing Outputs (4x) No Sinking Output or 0-10V Analog Outputs Remaining I/O has been depopulated

18 PIN DEUTSCH PINOUT CONFIGURATIONS DETAILS

PIN	CL-4002-105 Configuration (Plus)	CL-4002-106 Configuration (Base)	CL-4002-101 Configuration (Flex)
Pin 1	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 / Output DOUT/PWM(-) (2A) (Bank 1)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 (Bank 1)	Unused
Pin 2	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 / Output DOUT/PWM(-) (2A) (Bank 1)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 (Bank 1)	Unused
Pin 3	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1/VTD2/FREQ/20mA/RTD1 (Bank 1)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1/VTD2/FREQ (Bank 1)	Unused
Pin 4	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1/VTD2/FREQ/20mA/RTD1 (Bank 1)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1/VTD2/FREQ (Bank 1)	Unused
Pin 5	Battery (-)	Battery (-)	Battery (-)
Pin 6	Battery (+) CPU- Unswitched and Output Pins 1-4 (Max 15A) with VTD2	Battery (+) CPU- Unswitched and Output Pins 1-4 (Max 15A) with VTD2	Battery (+) CPU- Unswitched with VTD2
Pin 7	CAN1-L / Wake-up from Suspend	CAN1-L / Wake-up from Suspend	CAN1-L / Wake-up from Suspend
Pin 8	CAN1-H / Wake-up from Suspend	CAN1-H / Wake-up from Suspend	CAN1-H / Wake-up from Suspend
Pin 9	CAN2-L	CAN2-L	CAN2-L
Pin 10	CAN2-H	CAN2-H	CAN2-H
Pin 11	Key Switch STB with VTD2 / Controlled Shutdown	Key Switch STB with VTD2 / Controlled Shutdown	Key Switch STB with VTD2 / Controlled Shutdown
Pin 12	Battery (+) Outputs Pins 15-18 (Max 15A) with VTD2	Battery (+) Outputs Pins 15-18 (Max 15A) with VTD2	Battery (+) Outputs Pins 15-18 (Max 15A) with VTD2
Pin 13	Input STB/STG/TRI/VTD1/VTD2/FREQ/20mA/RTD2 / 5V Sensor Supply / Output Analog (0-10V)	Input STB/STG/TRI/VTD1/VTD2/FREQ	Unused
Pin 14	Input STB/STG/TRI/VTD1/VTD2/FREQ/20mA/RTD2 / 5V Sensor Supply Ground / Output Analog (0-10V)	Input STB/STG/TRI/VTD1/VTD2/FREQ	Unused
Pin 15	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI (Bank 2)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 (Bank 2)
Pin 16	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI (Bank 2)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 (Bank 2)
Pin 17	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI (Bank 2)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 (Bank 2)
Pin 18	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI (Bank 2)	Output DOUT/PWM/ECC+(5A) / Input STB/STG/TRI/VTD1 (Bank 2)
Bank 1	Each pin within bank can be independently configured as Output or any Input type.	Each pin within bank can be independently configured as Output or any Input type.	Each pin within bank can be independently configured as Output or any Input type.
Bank 2	Each pin within bank can be independently configured as Output or any Input type.	Each pin within bank can be independently configured as Output or any Input type.	Each pin within bank can be independently configured as Output or any Input type.

VTD1 = 0-5.5VDC
VTD2 = 0-35VDC
RTD1 = 0-500ohms
RTD2 = 0-2Kohms

