

CANlink 450: Control Module

HIGH-DENSITY I/O. FLEXIBLE VEHICLE CONTROL.

Designed for complex mobile equipment applications, HED's CL-450 combines high-density, configurable I/O with three J1939 CAN ports in a rugged controller designed for standalone, master-controller, or distributed I/O applications.



HIGH-DENSITY VEHICLE CONTROL

Manage complex vehicle functions with up to 36 inputs and 33 outputs in a single controller. High I/O capacity makes the CL-450 well suited for applications requiring centralized control of numerous sensors, switches, and actuators.

FLEXIBLE + CONFIGURABLE I/O

Adapt the controller to a wide range of application requirements with software-configurable I/O supporting digital, analog, frequency, PWM, RTD, 4–20 mA, and other input types. Flexible outputs provide digital or PWM control with current feedback options.

MULTI-NETWORK INTEGRATION

Connect across multiple vehicle networks with three J1939 CAN ports. The CL-450 can serve as a standalone controller, master controller, or distributed I/O module to support a variety of vehicle control architectures.

READY TO GET STARTED?

Connect with our team of experts to discuss your vehicle architecture, I/O requirements, and control strategy



36/33
Inputs / Outputs



3

J1939
CAN Ports

CL-450 CONTROL MODULE | Product Specifications

HARDWARE	
Overview	Power Architecture® 32-bit microcontroller running at up to 120 MHz
MCU	SPC5607B
Flash	1.5 MB
RAM	96 KB
INTERFACES	
CAN	3x J1939 CAN ports
MECHANICAL	
Housing Material	PC-ABS
Installation	Panel mount
Connectors	DT16-18SA-K004 DT16-18SB-K004 DT16-18SC-K004 DT16-18SD-K004 DT16-18SE-K004 Note: Unused pins required to be sealed to maintain module sealing
Dimensions (mm)	11.21" × 7.97" × 1.54"
Weight	Approximately 1.75 lb
Sealing Plugs	Non-locking: 114017 Locking: 0413-217-1605
Wire Size	14-16 AWG or 16-18 AWG
Sockets	16–18 AWG: 0462-201-16141 14–16 AWG: 0462-209-16141
PRODUCT RATINGS	
IP Class	IP67
EU/CE Compliance	No
Temperature Range	Operating: -40C to +70C Storage: -40C to +85C
SOFTWARE FRAMEWORK & TOOLS	
Programming	CANLink® Presto™ graphical programming; ladder logic is not supported
CAN Protocol	J1939
STANDARD CONFIGURATIONS AVAILABLE	
CL-450-101-10 – Master Controller	For standalone or master-controller applications requiring high-density I/O and connectivity across three J1939 CAN networks.
CL-450-101-20 – CANLink® Client	For use as a distributed I/O module within a CANLink® vehicle control system.

ELECTRICAL	
Operating Voltage	8-32 VDC
Key Switch	Yes
Max Total I/O Available	69
Inputs	• 22x switch-to-battery inputs • 4x 12-bit analog inputs with software-configurable dual ranges • 4x software-configurable inputs supporting: • Switch to battery • Switch to ground • 12-bit analog • Frequency • PWM • Pulse counter • AB quadrature encoder • 6x software-configurable inputs supporting: • Switch to battery • Switch to ground • 12-bit analog • RTD • 4–20 mA
Outputs	• 33x configurable I/O pins • Software-configurable as digital or PWM outputs • Up to 3A per output, subject to channel grouping and total-current limitations • 8 outputs with two-wire current feedback • 25 outputs with estimated current feedback • Output pins may alternatively be configured as switch-to-battery or switch-to-ground inputs • Configurable output/input banks: 4, 4, 4, 4, and 17 pins • All pins within a bank must use the same I/O configuration
5V Sensor Supply	250 mA (max)
Output Rating	Up to 3A per output, subject to grouping and total-current limitations

Maximum output current depends on the number of active channels, operating mode, output grouping, and thermal conditions.



CL-450 CONTROL MODULE | Pinouts

18 PIN DEUTSCH PINOUT CONFIGURATIONS DETAILS

PIN	CONNECTOR A	CONNECTOR B	CONNECTOR C
Pin 1	Input #1 STB/STG/ Output #1 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 1)	Input #14 STB/STG/ Output #9 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 2)	Input #27 STB/STG/ Output #17 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 3)
Pin 2	Input #2 STB/STG/ Output #2 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 1)	Input #15 STB/STG/ Output #10 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 2)	Input #28 STB/STG/ Output #18 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 3)
Pin 3	Input #3 STB/STG/ Output #3 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #16 STB/STG/ Output #11 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #29 STB/STG/ Output #19 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)
Pin 4	Input #4 STB/STG/ Output #4 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #17 STB/STG/ Output #12 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #30 STB/STG/ Output #20 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)
Pin 5	BAT(-) Module ³	BAT(-) Module ³	BAT(-) Module ³
Pin 6	Unswitched BAT(+) Module ⁴ and Outputs 1-8	BAT(+) Outputs 9-16	BAT(+) Outputs 17-24
Pin 7	CAN1-H	CAN2-H	CAN3-H
Pin 8	CAN1-L	CAN2-L	CAN3-L
Pin 9	Input #5 STB/STG/ Output #5 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #18 STB/STG/ Output #13 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #31 STB/STG/ Output #21 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)
Pin 10	Input #6 STB/STG/ Output #6 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #19 STB/STG/ Output #14 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #32 STB/STG/ Output #22 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)
Pin 11	Switched BAT(+) Input #7 Battery Voltage	Input #20 STB	Input #33 STB
Pin 12	Return(-) Outputs 7 & 8	Return(-) Outputs 15 & 16	Return(-) Outputs 23 & 24
Pin 13	Input #8 STB/STG/ Output #7 DOUT(+)/PWM(+)/CC ^{1,2} (Bank 1)	Input #21 STB/STG/ Output #15 DOUT(+)/PWM(+)/CC ^{1,2} (Bank 2)	Input #34 STB/STG/ Output #23 DOUT(+)/PWM(+)/CC ^{1,2} (Bank 3)
Pin 14	Input #9 STB/STG/ Output #8 DOUT(+)/PWM(+)/CC ^{1,2} (Bank 1)	Input #22 STB/STG/ Output #16 DOUT(+)/PWM(+)/CC ^{1,2} (Bank 2)	Input #35 STB/STG/ Output #24 DOUT(+)/PWM(+)/CC ^{1,2} (Bank 3)
Pin 15	Input #10 STB	Input #23 STB	Input #36 STB
Pin 16	Input #11 STB	Input #24 STB	Input #37 STB
Pin 17	Input #12 STB	Input #25 STB	Input #38 STB
Pin 18	Input #13 STB	Input #26 STB	Input #39 STB
Note ¹	Quad FET devices are used, so output current is limited in groups of 4 output pins. If only 1 of 4 outputs is active, max current is 3.0A in PWM and Digital mode. If all 4 outputs are active, max current per output is limited to 2.0A in PWM mode and 2.5A in Digital mode. PWM mode assumes 250Hz. Output current may be increased per channel up to individual max current of 3.0A if not all channels are active simultaneously or other channels are at a reduced current. Please contact HED if further information is needed. It is strongly recommended to level the total output current across each of the groups as much as possible for best thermal performance. Output pin groups are: A1/A2/A13/A14, A3/A4/A9/10, B1/B2/B13/B14, B3/B4/B9/B10, C1/C2/C13/C14, C3/C4/C9/C10		
Note ²	Module output current capacity is limited to 12.5A total for each 8 outputs combined on each A, B and C connector. Output current total for outputs 1-8 is 12.5A, outputs 9-16 is 12.5A and outputs 17-24 is 12.5A.		
Note ³	Battery (-) must be connected to all four BAT(-) Module pins of module for outputs to function properly.		
Note ⁴	Unswitched vehicle battery must be connected to properly store data to EEPROM when module is configured as a master module. Module will draw less than 1mA after turning itself off. This feature is only available on versions of this module that are Master Module capable.		
Bank 1 - Bank 5	All output pins in each bank must all be configured same. Either all pins in a bank as outputs, all as STB inputs, or all as STG inputs. Bank 1 is comprised of 4 pins, Bank 2 4 pins, Bank 3 4 pins, Bank 4 4 pins, and Bank 5 17 pins. If user does not follow these rules, the pins will not function properly. Outputs may function correctly, but inputs may not.		



CL-450 CONTROL MODULE | Pinouts

18 PIN DEUTSCH PINOUT CONFIGURATIONS DETAILS

PIN	CONNECTOR D	CONNECTOR E
Pin 1	Input #40 STB/STG/ Output #25 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 4)	Input #55 VTD1(0-5.5V)/VTD2(0-35V)
Pin 2	Input #41 STB/STG/ Output #26 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 4)	Input #56 VTD1(0-5.5V)/VTD2(0-35V)
Pin 3	Input #42 STB/STG/ Output #27 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #57 VTD1(0-5.5V)/VTD2(0-35V)
Pin 4	Input #43 STB/STG/ Output #28 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #58 VTD1(0-5.5V)/VTD2(0-35V)
Pin 5	BAT(-) Module ³	5VDC Sensor Supply Ground Input #59 5VDC Sensor Supply Ground voltage
Pin 6	BAT(+) Outputs 25-33	5VDC Sensor Supply (250mA) Input #60 5VDC Sensor Supply voltage
Pin 7	Input #44 STB/STG/ Output #29 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #61 STB
Pin 8	Input #45 STB	Input #62 STB
Pin 9	Input #46 STB/STG/ Output #30 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #63 STB/STG/VTD(0-5.5V)/RTD(500Ohms)/20MA
Pin 10	Input #47 STB/STG/ Output #31 DOUT(+)/PWM(+)/ECC ^{1,2} (Bank 5)	Input #64 STB/STG/VTD(0-5.5V)/RTD(500Ohms)/20MA
Pin 11	Input #38 STB	Input #65 STB/STG/VTD(0-5.5V)/FREQ/Count/PWM/Encoder(1A)
Pin 12	Return(-) Outputs 32 & 33	Input #66 STB/STG/VTD(0-5.5V)/FREQ/PWM/Count/Encoder(1B)
Pin 13	Input #49 STB/STG/ Output #32 DOUT(+)/PWM(+)/CC ^{1,2} (Bank 4)	Input #67 STB/STG/VTD(0-5.5V)/RTD(500Ohms)/20MA
Pin 14	Input #50 STB/STG/ Output #33 DOUT(+)/PWM(+)/CC ^{1,2} (Bank 4)	Input #68 STB/STG/VTD(0-5.5V)/RTD(2KOhms)/20MA
Pin 15	Input #51 STB	Input #69 STB/STG/VTD(0-5.5V)/FREQ/PWM/Count/Encoder(2A)
Pin 16	Input #52 STB	Input #70 STB/STG/VTD(0-5.5V)/RTD(2KOhms)/20MA
Pin 17	Input #53 STB	Input #71 STB/STG/VTD(0-5.5V)/RTD(2KOhms)/20MA
Pin 18	Input #54 STB	Input #72 STB/STG/VTD(0-5.5V)/FREQ/PWM/Count/Encoder(2B)
Note ¹	Quad FET devices are used, so output current is limited in groups of 4 output pins. If only 1 of 4 outputs is active, max current is 3.0A in PWM and Digital mode. If all 4 outputs are active, max current per output is limited to 2.0A in PWM mode and 2.5A in Digital mode. PWM mode assumes 250Hz. Output current may be increased per channel up to individual max current of 3.0A if not all channels are active simultaneously or other channels are at a reduced current. Please contact HED if further information is needed. It is strongly recommended to level the total output current across each of the groups as much as possible for best thermal performance. Output pin groups are: D1/D2/D13/D14, D3/D4/D9/D10	
Note ²	Module output current capacity is limited to 12.5A total for each 8 outputs combined on D connector. Output current total for outputs 25-33 is 12.5A.	
Note ³	Battery (-) must be connected to all four BAT(-) Module pins of module for outputs to function properly.	
Bank 1 - Bank 5	All output pins in each bank must all be configured same. Either all pins in a bank as outputs, all as STB inputs, or all as STG inputs. Bank 1 is comprised of 4 pins, Bank 2 4 pins, Bank 3 4 pins, Bank 4 4 pins, and Bank 5 17 pins. If user does not follow these rules, the pins will not function properly. Outputs may function correctly, but inputs may not.	

Setting Harness Code in EEPROM:

- Transmit the following message to change Harness Code.
 - KK = old Harness Code
 - HH = new Harness Code
 - MMMM = Module ID = 0x010B (267)

00EF0002	MM	MM	KK	00	84	00	00	HH
----------	----	----	----	----	----	----	----	----

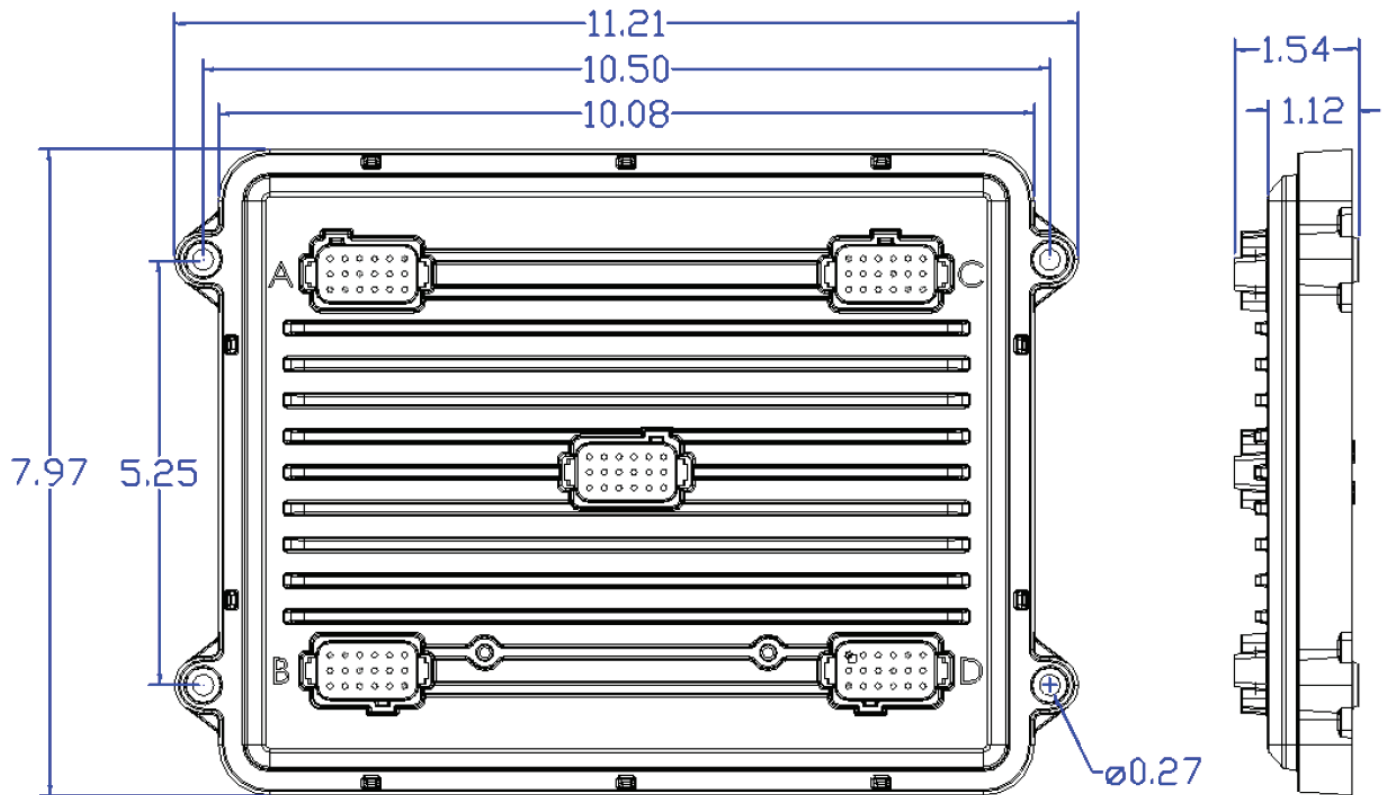
- To verify new Harness Code has been set:
 - Cycle power to module.
 - Below message is sent by module on power-up.
 - HH = new Harness Code

00EF0001	--	--	--	HH	--	--	--	--
----------	----	----	----	----	----	----	----	----



CL-450 CONTROL MODULE | Dimensions + Mounting Details

CL-450 DIMENSIONS



CL-450 MOUNTING REQUIREMENTS

The CL-450 shall be mounted using a 1/4" or M6 button head bolt. Mounting fasteners shall be tightened to 72 to 100 in-lb (8.1 to 11.3 N·m). Do not exceed the specified torque range, as excessive torque may damage the module, mounting hardware, or mounting structure.

The use of a pre-applied thread-locking patch is optional and may be used to improve fastener retention. If a thread-locking feature is desired, a pre-applied thread-locking patch is the recommended method. Liquid thread-locking compounds shall not be used as they may cause permanent damage to the plastic enclosure, potentially compromising the integrity of the mounting system.

