

CANLink[®] CL-450-101-XX Module

CL-450-101-10 : Master I/O

CL-450-101-20 : Client I/O



The CL-450 is a solid-state microprocessor based module and member of the HED[®] CANLink[®] multiplexed control family. Delivered in an HED custom enclosure, this unit provides a high density and flexible I/O count in a compact and economic package.

The CL-450 is designed for use as a multi-purpose stand alone unit or as a master controller or I/O module in a distributed system.

The HED[®] CL-450 can be programmed using HED[®]'s do-it-yourself CANLink[®] Presto[™] programming tool or directly by HED[®] engineering, and is designed for use with the CANLink[®] Conductor[™] software tool for diagnostics and field troubleshooting.

36 Inputs and 33 Outputs including:

- Powerful 32-bit processor
- Programmable using Presto[™] tool. Ladder Logic not supported.
- (22) switch to battery inputs
- (4) 12-bit analog inputs, dual range software configurable
- (4) Inputs software configurable as switch to battery, switch to ground, 12-bit analog, frequency, PWM, Pulse Counter or AB Quadrature Encoder
 - AB Quadrature Encoder feature not yet available. It will be available with a future firmware and Orchestra update. Contact HED for details.
- (6) Inputs software configurable as switch to battery, switch to ground, 12-bit analog, RTD or 4-20mA
 - Analog range is 0-5.5VDC. Other ranges are possible, but are set at HED. Contact HED for info.
 - RTD range are 0-500 or 0-2K ohm (3 pins each). Other ranges are possible, but are set at HED. Contact HED for info.
 - Frequency max is 10KHz at 50% duty cycle
- (33) pins software configurable as Digital or PWM outputs (8 as 2-Wire Current Feedback and 25 as estimated current feedback) (up to 3A)¹, or switch to battery input or switch to ground input
 - Option for outputs to be software configured as STB or STG inputs in banks of 4, 4, 4, 4 and 17 output pins. All pins in a bank must be configured to same I/O type. Either all as outputs, all as STB inputs, or all as STG inputs.
- (4) Current Return pins for measuring output current
- (1) 5VDC Regulated Sensor Supply (250mA)
- Client Harness Codes* are set in EEPROM. Default is 0x0F (15)
 - Harness Code can be changed with CAN message (see page 4)
- (3) J1939 CAN ports

Specifications	
Enclosure:	HED
Mating Connectors: Deutsch	DT16-18SA-K004 ; DT16-18SB-K004 DT16-18SC-K004 ; DT16-18SD-K004 ; DT16-18SE-K004 0462-201-16141 (socket for 16-18 AWG wire) 0462-209-16141 (socket for 14-16 AWG wire) 114017 Sealing Plug or 0413-217-1605 Locking Sealing Plug Note: Unused pins required to be sealed to maintain module sealing
Operating Voltage:	8-32 VDC
Operating Temperature:	-40°C to 70°C
Storage Temperature:	-40°C to 85°C
IP Rating:	IP67
PC Boards:	The printed circuit boards are designed for high EMI/RFI protection. The boards are conformal coated with a silicone coating for further water/moisture protection. All inputs and outputs are protected against shorts to Battery(+) or Battery(-). 100% of the boards are functionally tested before shipment. * Harness codes are used to identify I/O module location and function to the master controller.

CL-450-101-XX Module

Connector A		Connector B	
Pin	Function	Pin	Function
1	Input #1 STB/STG/ ^{Bank1} Output #1 DOUT(+)/PWM(+)/ECC ^{1,2}	1	Input #14 STB/STG/ ^{Bank2} Output #9 DOUT(+)/PWM(+)/ECC ^{1,2}
2	Input #2 STB/STG/ ^{Bank1} Output #2 DOUT(+)/PWM(+)/ECC ^{1,2}	2	Input #15 STB/STG/ ^{Bank2} Output #10 DOUT(+)/PWM(+)/ECC ^{1,2}
3	Input #3 STB/STG/ ^{Bank5} Output #3 DOUT(+)/PWM(+)/ECC ^{1,2}	3	Input #16 STB/STG/ ^{Bank5} Output #11 DOUT(+)/PWM(+)/ECC ^{1,2}
4	Input #4 STB/STG/ ^{Bank5} Output #4 DOUT(+)/PWM(+)/ECC ^{1,2}	4	Input #17 STB/STG/ ^{Bank5} Output #12 DOUT(+)/PWM(+)/ECC ^{1,2}
5	BAT(-) Module ³	5	BAT(-) Module ³
6	Unswitched BAT(+) Module ⁴ and Outputs 1-8	6	BAT(+) Outputs 9-16
7	CAN1-H	7	CAN2-H
8	CAN1-L	8	CAN2-L
9	Input #5 STB/STG/ ^{Bank5} Output #5 DOUT(+)/PWM(+)/ECC ^{1,2}	9	Input #18 STB/STG/ ^{Bank5} Output #13 DOUT(+)/PWM(+)/ECC ^{1,2}
10	Input #6 STB/STG/ ^{Bank5} Output #6 DOUT(+)/PWM(+)/ECC ^{1,2}	10	Input #19 STB/STG/ ^{Bank5} Output #14 DOUT(+)/PWM(+)/ECC ^{1,2}
11	Switched BAT(+) Input #7 Battery Voltage	11	Input #20 STB
12	Return(-) Outputs 7 & 8	12	Return(-) Outputs 15 & 16
13	Input #8 STB/STG/ ^{Bank1} Output #7 DOUT(+)/PWM(+)/CC ^{1,2}	13	Input #21 STB/STG/ ^{Bank2} Output #15 DOUT(+)/PWM(+)/CC ^{1,2}
14	Input #9 STB/STG/ ^{Bank1} Output #8 DOUT(+)/PWM(+)/CC ^{1,2}	14	Input #22 STB/STG/ ^{Bank2} Output #16 DOUT(+)/PWM(+)/CC ^{1,2}
15	Input #10 STB	15	Input #23 STB
16	Input #11 STB	16	Input #24 STB
17	Input #12 STB	17	Input #25 STB
18	Input #13 STB	18	Input #26 STB

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

2) Module output current capacity is limited to 12.5A total for each 8 outputs combined on each A and B connector. Output current total for outputs 1-8 is 12.5A and outputs 9-16 is 12.5A.

3) Battery (-) must be connected to all four BAT(-) Module pins of module for outputs to function properly.

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.

Bank1 through Bank5: 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. Bank1 is comprised of 4 pins, Bank2 4 pins, Bank3 4 pins, Bank4 4 pins, and Bank5 17 pins. If user does not follow these rules, the pins will not function properly. Outputs may function correctly, but inputs may not.

CL-450-101-XX Module

Connector C		Connector D	
Pin	Function	Pin	Function
1	Input #27 STB/STG/ ^{Bank3} Output #17 DOUT(+)/PWM(+)/ECC ^{1,2}	1	Input #40 STB/STG/ ^{Bank4} Output #25 DOUT(+)/PWM(+)/ECC ^{1,2}
2	Input #28 STB/STG/ ^{Bank3} Output #18 DOUT(+)/PWM(+)/ECC ^{1,2}	2	Input #41 STB/STG/ ^{Bank4} Output #26 DOUT(+)/PWM(+)/ECC ^{1,2}
3	Input #29 STB/STG/ ^{Bank5} Output #19 DOUT(+)/PWM(+)/ECC ^{1,2}	3	Input #42 STB/STG/ ^{Bank5} Output #27 DOUT(+)/PWM(+)/ECC ^{1,2}
4	Input #30 STB/STG/ ^{Bank5} Output #20 DOUT(+)/PWM(+)/ECC ^{1,2}	4	Input #43 STB/STG/ ^{Bank5} Output #28 DOUT(+)/PWM(+)/ECC ^{1,2}
5	BAT(-) Module ³	5	BAT(-) Module ³
6	BAT(+) Outputs 17-24	6	BAT(+) Outputs 25-33
7	CAN3-H	7	Input #44 STB/STG/ ^{Bank5} Output #29 DOUT(+)/PWM(+)/ECC ^{1,2}
8	CAN3-L	8	Input #45 STB
9	Input #31 STB/STG/ ^{Bank5} Output #21 DOUT(+)/PWM(+)/ECC ^{1,2}	9	Input #46 STB/STG/ ^{Bank5} Output #30 DOUT(+)/PWM(+)/ECC ^{1,2}
10	Input #32 STB/STG/ ^{Bank5} Output #22 DOUT(+)/PWM(+)/ECC ^{1,2}	10	Input #47 STB/STG/ ^{Bank5} Output #31 DOUT(+)/PWM(+)/ECC ^{1,2}
11	Input #33 STB	11	Input #48 STB
12	Return(-) Outputs 23 & 24	12	Return(-) Outputs 32 & 33
13	Input #34 STB/STG/ ^{Bank3} Output #23 DOUT(+)/PWM(+)/CC ^{1,2}	13	Input #49 STB/STG/ ^{Bank4} Output #32 DOUT(+)/PWM(+)/CC ^{1,2}
14	Input #35 STB/STG/ ^{Bank3} Output #24 DOUT(+)/PWM(+)/CC ^{1,2}	14	Input #50 STB/STG/ ^{Bank4} Output #33 DOUT(+)/PWM(+)/CC ^{1,2}
15	Input #36 STB	15	Input #51 STB
16	Input #37 STB	16	Input #52 STB
17	Input #38 STB	17	Input #53 STB
18	Input #39 STB	18	Input #54 STB

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: C1/C2/C13/C14, C3/C4/C9/C10, D1/D2/D13/D14, D3/D4/D9/D10

2) Module output current capacity is limited to 12.5A total for each 8 outputs combined on each C and D connector. Output current total for outputs 17-24 is 12.5A and outputs 25-33 is 12.5A.

3) Battery (-) must be connected to all four BAT(-) Module pins of module for outputs to function properly.

Bank1 through Bank5: 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. Bank1 is comprised of 4 pins, Bank2 4 pins, Bank3 4 pins, Bank4 4 pins, and Bank5 17 pins. If user does not follow these rules, the pins will not function properly. Outputs may function correctly, but inputs may not.

CL-450-101-XX Module

Connector E	
Pin	Function
1	Input #55 VTD1(0-5.5V)/VTD2(0-35V)
2	Input #56 VTD1(0-5.5V)/VTD2(0-35V)
3	Input #57 VTD1(0-5.5V)/VTD2(0-35V)
4	Input #58 VTD1(0-5.5V)/VTD2(0-35V)
5	5VDC Sensor Supply Ground Input #59 5VDC Sensor Supply Ground voltage
6	5VDC Sensor Supply (250mA) Input #60 5VDC Sensor Supply voltage
7	Input #61 STB
8	Input #62 STB
9	Input #63 STB/STG/VTD(0-5.5V)/RTD(500Ohms)/20MA
10	Input #64 STB/STG/VTD(0-5.5V)/RTD(500Ohms)/20MA
11	Input #65 STB/STG/VTD(0-5.5V)/FREQ/Count/PWM/Encoder(1A) ¹
12	Input #66 STB/STG/VTD(0-5.5V)/FREQ/PWM/Count/Encoder(1B) ¹
13	Input #67 STB/STG/VTD(0-5.5V)/RTD(500Ohms)/20MA
14	Input #68 STB/STG/VTD(0-5.5V)/RTD(2KOhms)/20MA
15	Input #69 STB/STG/VTD(0-5.5V)/FREQ/PWM/Count/Encoder(2A) ¹
16	Input #70 STB/STG/VTD(0-5.5V)/RTD(2KOhms)/20MA
17	Input #71 STB/STG/VTD(0-5.5V)/RTD(2KOhms)/20MA
18	Input #72 STB/STG/VTD(0-5.5V)/FREQ/PWM/Count/Encoder(2B) ¹

1) AB Quadrature Encoder feature not yet available. It will be available with a future firmware and Orchestra update. Contact HED for details.

Note: Different I/O combinations may be available. Please refer to specific CL-450-1XX-XX data sheet for I/O number designations for use within Composer™. Data sheets available on HED® website.

Setting Harness Code in EEPROM:

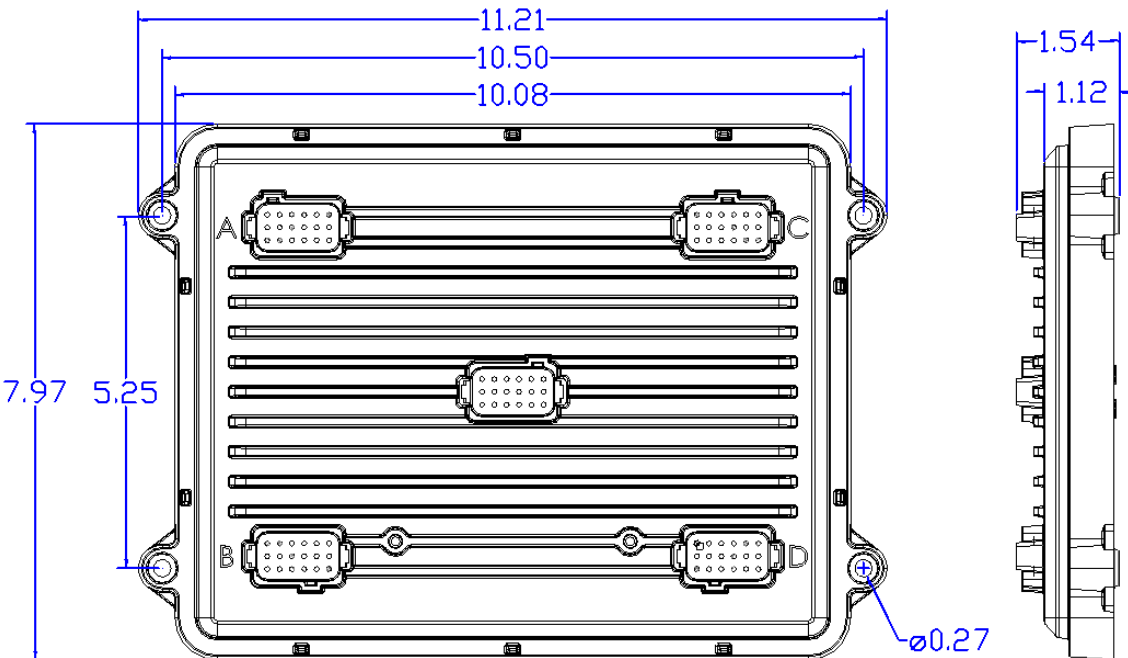
- Transmit the following message to change Harness Code.
 - KK = old Harness Code
 - HH = new Harness Code
 - MMMM = Module ID = 0x010B (267)

00EF0002	MM	MM	KK	00	84	00	00	HH
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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	--	--	--	--
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Mounting Hardware

1/4" – 20
SHCS or BHCS

Torque to 72-100 in-lbs

Note: For high vibration applications a thread locking patch or liquid is advisable.