Hydro Electronic Devices, Inc.

# Technical Data Sheet

## CANLink® CL-451-100-XX Module

### CL-451-100-10 : CANLink Master I/O
### CL-451-100-20 : CANLink Client I/O
### CL-451-100-30 : J1939 Client I/O

### Up to 17 Inputs or 16 Outputs (17 total I/O):

- Powerful 32-bit processor
- Programmable using Presto™ tool. Ladder Logic not supported.
- (4) pins software configurable as PWM outputs with estimated current feedback (up to 3A)[1], or switch to battery or switch to ground input
- (3) pins software configurable as PWM outputs with estimated current feedback (up to 3A)[1], or switch to battery, switch to ground or 10-bit analog input
- (1) pin software configurable as PWM output with estimated current feedback (up to 3A)[1], or switch to battery, switch to ground, 10-bit analog or frequency input
    - Analog range is 0-5.5VDC. Other ranges are possible, but are set at HED. Contact HED for info.
- (8) pins software configurable as PWM outputs with estimated current feedback (up to 3A)[1] or switch to battery input or switch to ground input
    - All 8 pins must be configured to same I/O type. Either all as Outputs, all as STB Inputs, or all as STG Inputs
- (1) software configurable switch to battery or 10-bit analog input
- Client Harness Codes* are set in EEPROM. Default is 0x0F (15)
    - Harness Code can be changed with CAN message (see page 2)
- (1) J1939 CAN port

The CL-451 is a solid-state microprocessor based module and member of the HED® CANLink® multiplexed control family. Delivered in a Deutsch enclosure, this unit provides a high density I/O count in a compact and economical package.

Designed for use as a stand alone unit or as part of a distributed system.

The HED® CL-451 can be programmed using HED®'s do-it-yourself CANLink® Composer™ programming tool or directly by HED® engineering, and is designed for use with the CANLink® Conductor™ software tool for diagnostics and field troubleshooting.

| Specifications | |
|---|---|
| Enclosure: | Deutsch standard EEC-325x4 PCB enclosure |
| Mating Connectors: Deutsch | DTM06-12SA<br>DTM06-12SB<br>WM-12S (wedge) – Two needed (one per connector)<br>0462-201-20141 20AWG sockets<br>0413-204-2005 Sealing Plugs – Unused pins are required to be sealed to maintain module sealing |
| Operating Voltage Range: | 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.<br>The boards are conformal coated with a silicone coating for further water/moisture protection.<br>All inputs and outputs are protected against shorts to Battery(+) or Battery(-).<br>100% of the boards are functionally tested before shipment.<br>* Harness Codes are used to identify I/O module location and function to the master controller. |

CANLINK®

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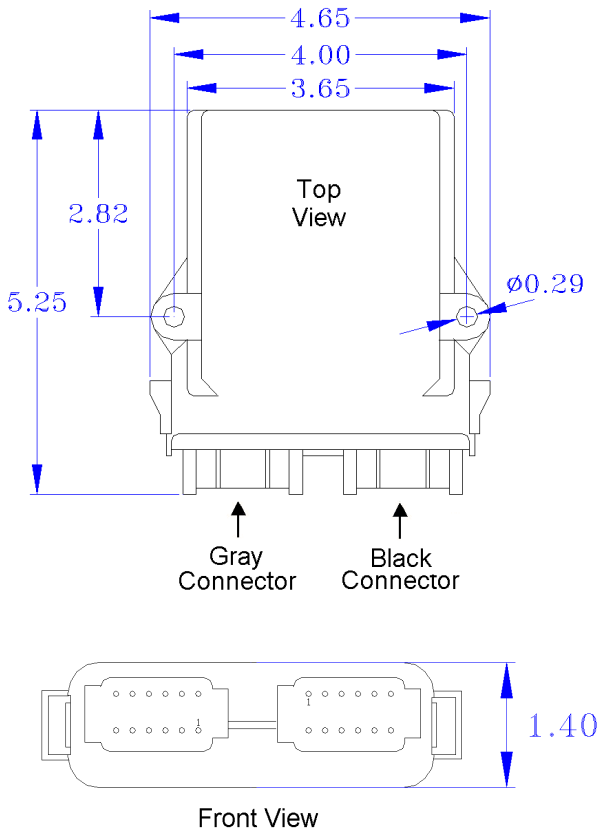
# Specifications

## CL-451-100-XX Module

| DTM13-12PA (Gray) or -12PC (Green) | | DTM13-12PB (Black) or -12PD (Brown) | |
|---|---|---|---|
| **Pin** | **Function** | **Pin** | **Function** |
| 1 | Input #1 STB/STG/<br>Output #1 DOUT(+)/PWM(+)/ECC[1,2] | 1 | Input #9 STB/STG/<br>Output #9 DOUT(+)/PWM(+)/ECC[1,2] |
| 2 | Input #2 STB/STG/<br>Output #2 DOUT(+)/PWM(+)/ECC[1,2] | 2 | Input #10 STB/STG/<br>Output #10 DOUT(+)/PWM(+)/ECC[1,2] |
| 3 | Input #3 STB/STG/VTD/<br>Output #3 DOUT(+)/PWM(+)/ECC[1,2] | 3 | Input #11 STB/STG/VTD/FREQ/<br>Output #11 DOUT(+)/PWM(+)/ECC[1,2] |
| 4 | Input #4 STB/STG/VTD/<br>Output #4 DOUT(+)/PWM(+)/ECC[1,2] | 4 | Input #12 STB/STG/VTD/<br>Output #12 DOUT(+)/PWM(+)/ECC[1,2] |
| 5 | Input #5 STB/STG/[3]<br>Output #5 DOUT(+)/PWM(+)/ECC[1,2] | 5 | Input #13 STB/STG/[3]<br>Output #13 DOUT(+)/PWM(+)/ECC[1,2] |
| 6 | Input #6 STB/STG/[3]<br>Output #6 DOUT(+)/PWM(+)/ECC[1,2] | 6 | Input #14 STB/STG/[3]<br>Output #14 DOUT(+)/PWM(+)/ECC[1,2] |
| 7 | Input #7 STB/STG/[3]<br>Output #7 DOUT(+)/PWM(+)/ECC[1,2] | 7 | Input #15 STB/STG/[3]<br>Output #15 DOUT(+)/PWM(+)/ECC[1,2] |
| 8 | Input #8 STB/STG/[3]<br>Output #8 DOUT(+)/PWM(+)/ECC[1,2] | 8 | Input #16 STB/STG/[3]<br>Output #16 DOUT(+)/PWM(+)/ECC[1,2] |
| 9 | CAN1-L | 9 | Input #17 STB/VTD |
| 10 | CAN1-H | 10 | Switched BAT(+)<br>Input #18 Battery Voltage |
| 11 | BAT(-) Module[5] | 11 | BAT(-) Module[5] |
| 12 | Unswitched BAT(+) Module[4]<br>and Outputs 1-8 | 12 | BAT(+) Outputs 9-16 |




Note: Different I/O combinations are available. Please refer to specific CL-451-1XX-XX data sheet for I/O number designations for use within Composer™. Data sheets available on HED® website.

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 1.5A in PWM mode and 2.0A 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. Output pin groups are A1-A4, A5-A8, B1-B4, B5-B8. It is strongly recommended to level the total output current across each of the groups as much as possible for best thermal performance.

2) Module output current capacity is limited to 10A total for each 8 outputs combined on each A and B connector. Output current total for outputs 1-8 is 10A and outputs 9-16 is 10A.

3) These 8 pins must have all I/O assigned in as same I/O type. Either all as Outputs, all as STB Inputs, or all as STG Inputs.

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.

5) Battery (-) must be connected to both BAT(-) Module pins of module for outputs to function properly.

### Setting Harness Code in EEPROM:

1. Transmit the following message to change Harness Code.
   a. KK = old Harness Code
   b. HH = new Harness Code
   c. MMMM = Module ID = 0x00FE (254)

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

To verify new Harness Code has been set:

2. Cycle power to module.

3. Below message is sent by module on power-up.
   a. HH = new Harness Code

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



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