DVC41(12 Sourcing Output Module) Rev. P2.0

DESCRIPTION

The DVC41 slave module is a 12 Sourcing Output module that is designed to operate in conjunction with a DVC10 master module. The 12 Sourcing outputs can be configured to drive substantial loads up to 3 amps. The DVC41 can also be configured to drive LED outputs. The outputs are short protected and have built in open detection. The DVC41 communicates to the Master Module through the CAN Bus (high-speed serial communication bus) and utilizes the RS-232 port for setting the MAC ID (node) number and for device monitoring. The controller is packaged in a small rugged enclosure and encapsulated to withstand extreme harsh environments.

Two connectors P8 and P9 are provided for electrical connections. P8 (30 pin) is the main input and output connector which protrudes out the side of the enclosure. P9 is a standard Device-Net Compatible (CAN Bus 2.0B) 5 pin connector.

The status of each output is displayed by a green LED located on the top of the module. If the output is activated, the corresponding LED will light. If the output is being used and has an open circuit, then the corresponding LED will blink slowly (once a second). If the output is shorted, the corresponding LED will blink fast (four times a second). A Module Status (R/G LED) and a Network Status (R/G LED) LED are also located on the top of the module (see **INDICATIORS** section below for further details).

FEATURES

- **All outputs are sourcing.**
- **Outputs are programmable to work with heavy loads or light loads (LED's).**
- **Controller Area Network (CAN 2.0B) provides high-speed serial communications with up to 16 other CAN compatible devices.**
- **Rugged encapsulated enclosure withstands harsh environments commonly found in mobile applications.**
- **User friendly display shows output and communication status.**
- **RS-232 communication used for troubleshooting and node assignment.**
- **Rugged power supply operates over the full range 8.0Vdc to 32Vdc with reverse polarity protection and transient protection up to 1.5K Watts Peak Pulse Power Dissipation.**
- **Compact & rugged packaging.**

OUTPUTS – QTY (12)

OUTPUT OPERATION

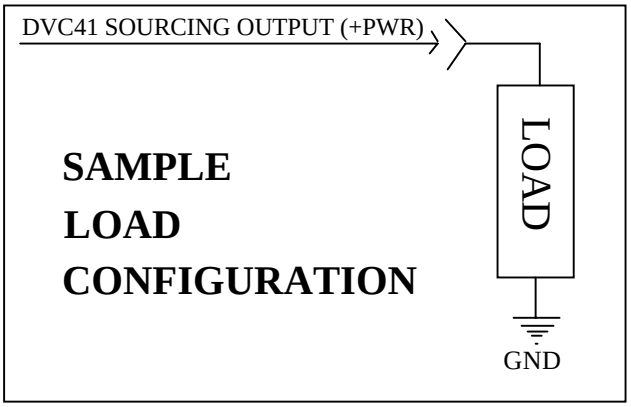
A. All outputs are sourcing.
   1. Vehicle +Power will be applied to the output when the output is activated.

B. Maximum Output Load = 3amps.

C. Each output has a corresponding indicator to tell whether the output is on, off, shorted or open (see **INDICATORS** below for more details).
   Note – The output will not detect an OPEN circuit when in LED mode.

D. Short Circuit Operation
   1. Output is turned off.
   2. Short Circuit is detected only when the output is being commanded to activate.
   3. If after 10 seconds the output command goes away and the output is no longer shorted, then the next output command will clear the short and try to activate the output.

E. Open Circuit Operation
   1. Output is turned off.
   2. Only detected when the output is commanded off.
   3. Opens are reset immediately but only in the commanded off state.



PROGRAMMABLE FEATURES

A. DVC41 programmable features are set by using the DVC Programming Tool and then stored in the DVC10 Master Module.
   1. Each output can be named (16 characters).
   2. Normal load mode – Used for driving all loads up to 3amps.
   3. LED output mode – Used for driving LED's or low current indicators.
      Note – Not using LED mode to drive LED's or low current indicators can cause the outputs to dimly light when turned off.

B. The MAC ID and Baud Rate settings are set at each DVC41 module through the RS-232 serial port.
   Note – All DVC41 modules will ship from HCT with the MAC ID set to 41 and a Baud Rate set to 125k unless otherwise noted.

COMMUNICATIONS

A. The DVC41 has two communication ports:
   1. Can Bus 2.0B – This port is used to communicate to the DVC10 Master Module. A DeviceNet protocol is used.
   2. RS-232 serial port is used for:
      a. Setting MAC ID and Baud Rate.
      b. Monitoring the functions of the DVC41.

POWER SUPPLY

A. The DVC41 Power Input has the following features:
   1. Range - +8.0Vdc to +32Vdc
   2. Reverse polarity protection and transient protection up to 1.5K Watts Peak Pulse Power Dissipation
   3. Power is supplied to the module through P8 (not the Can Bus).
   4. +POWER IN 1 - This input supplies power to the DVC41 controller and outputs 1, 2, 3, and 4.
   5. +POWER IN 2 - This input supplies power to outputs 5, 6, 7, and 8.
   6. +POWER IN 3 - This input supplies power to outputs 9, 10, 11, and 12.
   7. GND (PWR) - This is the DVC41 main common (usually connects to chassis ground).

INDICATORS

A. Output Status (Qty 40) (Green)
   1. Off – output is off.
   2. On – output is being activated.
   3. Open Circuit – blinks once per second.
   4. Short Circuit – blinks 4 times per second.

B. Module Status (MS) (Qty 1) (R/G) –
   1. Off – There is no power applied to the Module.
   2. On green – The module is operating in a normal condition.
   3. Flashing green – Device in standby state. May need commissioning.
   4. Flashing red – Recoverable Fault.
   5. On red – Module has an unrecoverable fault.
   6. Flashing Red/Green – Device is in self-test.

C. Network Status (NS) (Qty 1) (R/G) –
   1. Off - Device in not on-line.
   2. Flashing green – Device in on-line but has not established connection to other nodes.

3. On green – Device in on-line and has established connection to other nodes.
4. Flashing red – One or more connections are in a timed-out state.
5. On red – The device has detected an error that has rendered it incapable of communicating on the network.

PACKAGING

A. Physical Size - 6.2L" x 4.75W" x 1.65H" encapsulated module.
B. Each module has two mounting holes 4.0" a part. Each mounting hole has an I.D. of 0.325".
C. Weight – 1 lb. 6 oz.

CONNECTORS

A. The DVC41 uses the Metri-Pack 150 series (or compatible) sealed electronic header designed for severe under-hood environments.
   1. 30-pin Header (P8)
B. 5-pin CAN Bus (DeviceNet compliant) connector (P9).
   1. Pins are gold plated brass machined from solid stock.
   2. Protection rating – Nema 1,3,4,6P, and IEC IP 68.

MATING CONNECTORS

A. Mates to the 30-pin Metri-Pak Connector (P8):

1. Connector, 30-pin Female (P8)	Delphi Packard	P/N – 12048455
2. Terminals, Female	Delphi Packard	P/N – 12103881
3. Plugs	Delphi Packard	P/N – 12034413-B
4. Terminal Crimp Tool	Delphi Packard	P/N – 12039500
5. Extraction Tool	Delphi Packard	P/N – 12094429
6. DVC Series 30-pin Connector Kit	HCT	P/N - 999-10085

Includes the following:

1 - Connector, 30-pin (P8) Delphi Packard
30 - Terminals, Delphi Packard
20 – Plugs, Delphi Packard

B. Mating for CAN Bus connector (P9)
   1. 5-pin Female Mini-style DeviceNet compliant connector.
C. Mating to the RS-232 Port – The RS-232 port is accessed through the 30-pin connector at (P8). A DVC Serial Port Adapter is available to connect to the 30-pin Female mating connector. A DVC RS-232 Cable can be used to interface from the DVC Serial Port Adapter to a PC. Drawings for these two cables are supplied for user assembly; otherwise they are available from HCT.

   * Note – The DVC Slave Serial Port Adapter comes with a plug. The plug is used to keep the cable weather-tight when not connected to peripherals.

1. DVC Slave Serial Port Adapter	HCT	P/N - 999-10082
2. DVC RS-232 Cable Assembly	HCT	P/N - 999-10075

ENVIRONMENTAL

- Operating Temperature - -40 Celsius to 70 Celsius
- Storage Temperature - -40 Celsius to 85 Celsius

POLLED IO DATA

Vendor ID……..62
Product Code…….41
Product Type…….x67
Produced IO Data……..2
Consumed IO Data……4

	Produced IO Data	Consumed IO Data	Consumed IO Data
Word	**Byte 0**	**Byte 0**	**Byte 1**
Byte Offset	0	0	2
Name	Outputs	Shorts	Opens
Bit 0	HS1	Sht01	Opn01
Bit 1	HS2	Sht02	Opn02
Bit 2	HS3	Sht03	Opn03
Bit 3	HS4	Sht04	Opn04
Bit 4	HS5	Sht05	Opn05
Bit 5	HS6	Sht06	Opn06
Bit 6	HS7	Sht07	Opn07
Bit 7	HS8	Sht08	Opn08
Bit 8	HS9	Sht09	Opn09
Bit 9	HS10	Sht10	Opn10
Bit 10	HS11	Sht11	Opn11
Bit 11	HS12	Sht12	Opn12
Bit 12	-	-	-
Bit 13	-	-	-
Bit 14	-	-	-
Bit 15	-	-	-