# DVC750

## 1 Description

The DVC750 expansion module is a multi-I/O DVC expansion module designed to operate in conjunction with a DVC710 master controller module. The large number of additional, individually configurable inputs and outputs make it ideal for more complex applications that need multiple proportional and digital outputs. Several +5VDC regulated user reference outputs are also provided at the connector to supply power to external sensors, Joysticks, etc. The DVC750 communicates with the DVC710 controller through the HCT CAN Bus and utilizes a separate RS-232 port for monitoring, diagnostics and setting features such as the MAC ID number etc. The controller is packaged in the standard DVC series enclosure and fully encapsulated to withstand the fluid power harsh operating environments.

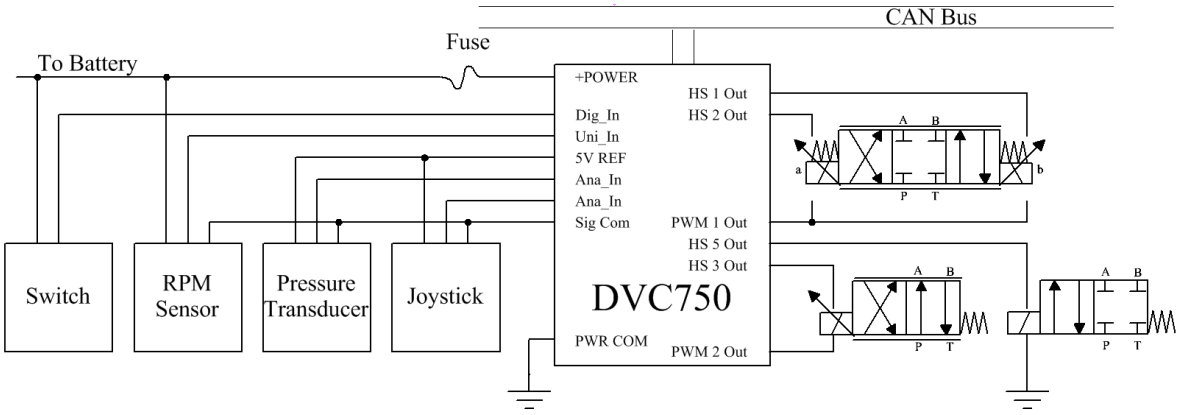

## 2 Features

- 8ea, Individually programmable discreet inputs (On / Off)
- 4ea, 0 – 5 Volt Analog Inputs
- 2ea, 0 – 5 Volt Analog / Pulse Inputs
- 6ea, 3 Amp sourcing discreet outputs
- 3ea, Up to 3 Amp Sinking proportional outputs
- 6ea, Programmable Function Curves
- Rs232 Port for setup and diagnostics
- 1ea,CAN Port for system communication
- Water / Oil proof enclosure
- Industrial operating temperature range
- 12 or 24 Volt systems
- SAE J1939 Load Dump compliant
- Rugged, fully encapsulated module may be mounted virtually anywhere
- Environmental; IP68
- CE Certified

## 3 Applications

- Mobile, Industrial, Agricultural, Marine or any other Hydraulic Equipment

## 4 Simplified Connection Diagram



# 5 Connector Information

**Pin Out**

| 30 Pin Cinch, (P16) | | | | | |
|---|---|---|---|---|---|
| **Pin** | **Function** | **Pin** | **Function** | **Pin** | **Function** |
| A1 | RXD | B1 | SIG COM | C1 | 5V REF OUTPUT |
| A2 | TXD | B2 | SIG COM | C2 | ANA/PULSE 1 INPUT |
| A3 | | B3 | SIG COM | C3 | SIG COM |
| D1 | 5V REF OUTPUT | E1 | 5V REF OUTPUT | F1 | 5V REF OUTPUT |
| D2 | ANA/PULSE 2 INPUT | E2 | ANA 1 INPUT | F2 | ANA 2 INPUT |
| D3 | SIG COM | E3 | SIG COM | F3 | DIG 1 INPUT |
| G1 | 5V REF OUTPUT | H1 | 5V REF OUTPUT | J1 | DIG 4 INPUT |
| G2 | ANA 3 INPUT | H2 | ANA 4 INPUT | J2 | DIG 5 INPUT |
| G3 | DIG 2 INPUT | H3 | DIG 3 INPUT | J3 | DIG 6 INPUT |
| K1 | + POWER IN | | | | |
| K2 | DIG 7 INPUT | | | | |
| K3 | DIG 8 INPUT | | | | |

| 18 Pin Cinch, (P17) | | | | | |
|---|---|---|---|---|---|
| **Pin** | **Function** | **Pin** | **Function** | **Pin** | **Function** |
| A1 | + POWER IN | B1 | HS 1 OUTPUT | C1 | HS 3 OUTPUT |
| A2 | + POWER IN | B2 | HS 2 OUTPUT | C2 | HS 4 OUTPUT |
| A3 | PWM 1 OUTPUT | B3 | PWM 1 OUTPUT | C3 | PWM 2 OUTPUT |
| D1 | HS 5 OUTPUT | E1 | POWER COM | F1 | POWER COM |
| D2 | HS 6 OUTPUT | E2 | PWM 3 OUTPUT | F2 | POWER COM |
| D3 | PWM 2 OUTPUT | E3 | PWM 3 OUTPUT | F3 | POWER COM |

NOTES:

1. The Power input must be fused with an ATO 5, AGC 5 or smaller fuse

**Mating Connector information**

| HCT FACTORY ACCESSORIES | |
|---|---|
| Expansion Module Serial Port Adaptor: | 999-10082 |
| RS232 Cable Assembly: | 999-10075 |
| 48 Pin Connector Kit: | 999-10177 |
| Proto-Type Harness (3M): 30 pin connector | 999-10104 |
| Proto-Type Harness (3M): 18 pin connector | 999-10107 |

# 6 LED Indicators

| Module Status | |
|---|---|
| **LED STATE** | **MEANING** |
| Off | There is no power applied to the module. |
| On **GREEN** | The module is operating in a normal condition. |
| Flashing **GREEN** | Device is in standby state. May need servicing. |
| On **RED** | Module has an unrecoverable fault. |
| Flashing **RED** | Low Supply Voltage. |

| CAN Status | |
|---|---|
| On **GREEN** | Communication established with Master Controller |
| Flashing **GREEN** | Waiting to establish communication with the Master Controller |
| On **RED** | The device has detected an error that has rendered it incapable of communicating on the network. |
| Flashing **RED** | One or more messages are in a timed out state. |

| PWM A – PWM C | |
|---|---|
| **LED STATE** | **MEANING** |
| Off | PWM Output not enabled |
| **RED**, **YELLOW**, **GREEN** | Red through Yellow and Green indicate 0% to 100% PWM being supplied to the output. |
| Flashing **GREEN** | PWM Output Open circuit detected |
| Flashing **RED** | PWM Output Short circuit detected |

| HSOUT 1 – HSOUT 6 | |
|---|---|
| **LED STATE** | **MEANING** |
| Off | HS Output Off |
| On **GREEN** | HS Output On |
| Flashing **GREEN** (2Hz) | HS Output Short Detected |
| Flashing **GREEN** (1Hz) | HS Output Open Detected |

| DIG 1 – DIG 8 | |
|---|---|
| **LED STATE** | **MEANING** |
| Off | Dig Input Off (false) |
| On **GREEN** | Dig Input On (true) |

# 7 Electrical Characteristics

## Absolute Maximum Ratings

Absolute Maximum Ratings indicate limits beyond which damage to the device may occur.

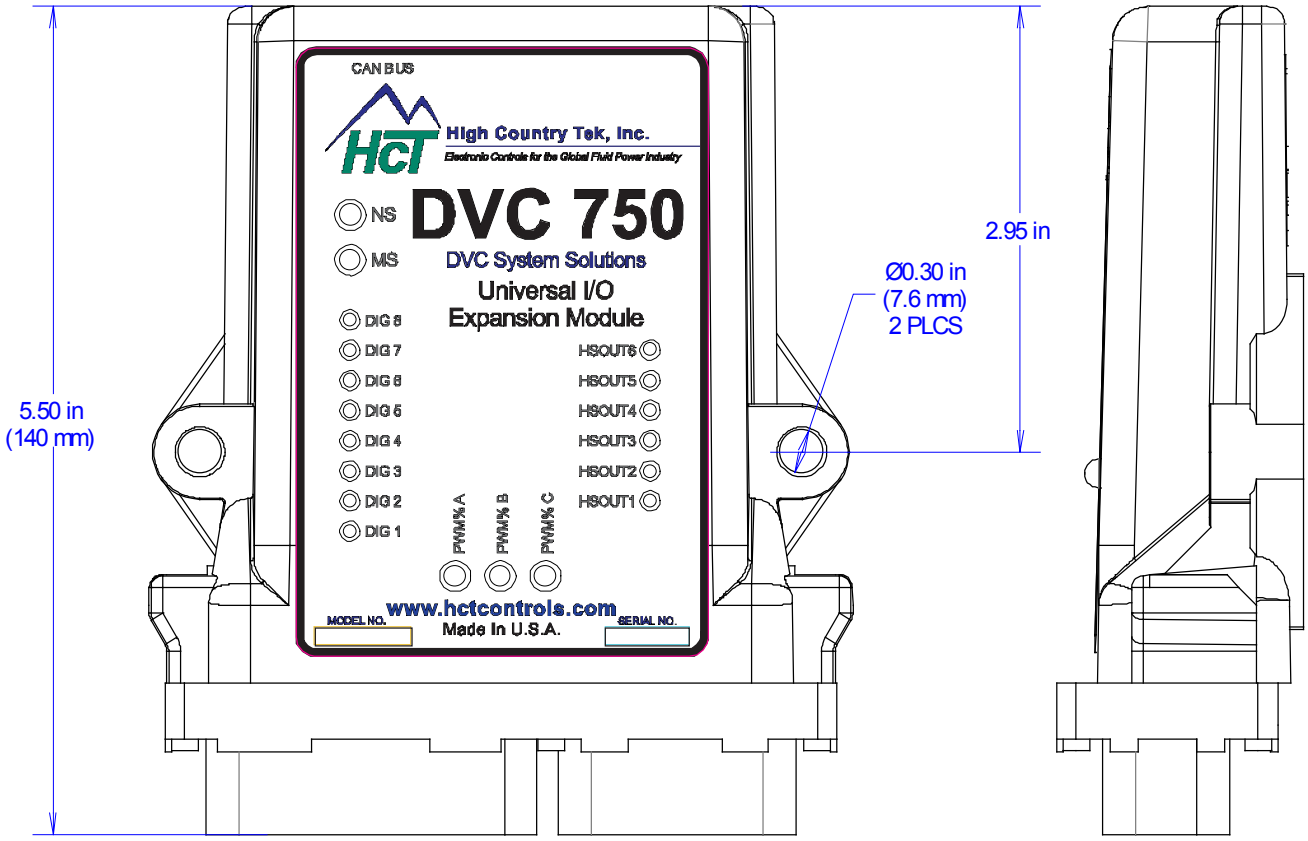
| | |
|---|---|
| **Supply Voltage** | +/-32$V_{DC}$ |
| **Rs232 Port** | Rxd,RTS = +/-15$V_{DC}$ Txd = +/-8$V_{DC}$ |
| **CAN Ports** | +/-14$V_{DC}$ |
| **Voltage at Input / Output Pin** | +/-32$V_{DC}$ |
| **Current at Input Pin** | +22mA |
| **Current at Output Pin** | 3,000 mA |
| **Current at 5V REF** | 120mA (total all outputs) |
| **Temperature** | |
| **Operating** | -40°C to +85°C |
| **Storage** | -40°C to +100°C |

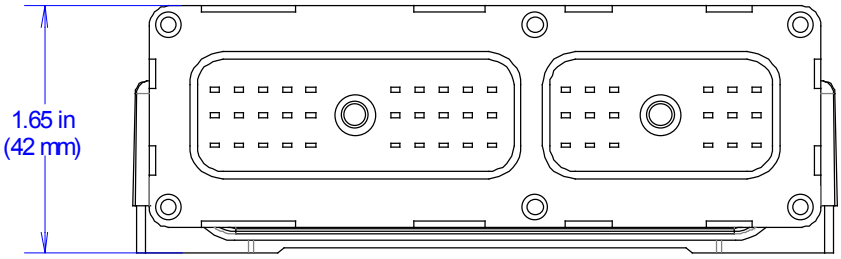
## Recommended Operating Parameters / Pin Functions

| Pin | Name | Function/Features | Range |
|---|---|---|---|
| K1, a1, a2 | POWER IN | Positive Power Supply Input | +12$V_{DC}$ to +28$V_{DC}$ |
| C2, D2 | Ana/Pulse Inputs (Note: 3) | Analog<br>Digital<br>Pulse (RPM)<br>Counter | 0-5Volts |
| C1, D1, E1, F1, G1, H1 | 5V REF | Reference Output | 5Volts, 500mA |
| E3, G3, H3, J1, J2, J3, K2, K3 | Digital Inputs (Note: 4) | On / Off. | 0 to +Supply |
| E2, F2, G2, H2 | Analog Inputs (Note: 3) | Analog<br>Active Low Digital | 0-5Volts<br>0 to +Supply |
| b1, b2, c1, c2, d1, d2 | High Side Outputs | Sourcing Discreet Output | On = +Supply 3,000mA<br>Off = +Supply 370µA, Supply = 28$V_{DC}$<br>Off = +Supply 180µA, Supply = 13.6$V_{DC}$ |
| a3, b3, c3, d3, e2, e3 | PWM Outputs | Sinking PWM Output | 10 bit resolution, 0 to +Supply<br>0 to 3,000 mA (current range dependent) |

**Notes:**
1, Maximum continuous current allowed on any single connector Pin = 8 Amps
2, All limits are guaranteed by testing or statistical analysis
3, Z = >100KΩ
4, Z = 32.4KΩ

# 8 Mounting




NOTES:
1, All Dimensions in Inches (Millimeters)
2, Mounting Hardware / Torque;
Use 1/4 x 20 SAE Grade 2 Bolt
Torque: 4 Foot-Pounds Dry
3 Foot-Pounds Oiled
3, Mount on flat hard surface protect from excessive heat / moving parts.
4, Electrical Data;
Operating Voltage, 9 - 30 VDC
Supply Protectoin, SAE J1455, Load Dump
5, Environmental Ratings;
Operating Temperature, -40 - 85 C
Storage Temperature, -40 - 100C
NEMA / IP Rating, NEMA 6P / IP68
6, Weight;
610g

# 9 Ordering Part Number Matrix

DVC750-□□□

- Digital Valve Controller Series Universal Expansion Module
- Proportional Output 1 configuration Code (see table)
- Proportional Output 2 configuration Code (see table)
- Proportional Output 3 configuration Code (see table)

NOTE:
For each proportional output, select the current range that includes the maximum desired current.

Select **G** if proportional is used as an on/off output. Select L or H if using EDC type valves.

Select **A** if using an Apitech / Pulsar 33 Hz digital valve.

Select **D** if using a Danfoss PVE type valve.

| Order Code | Description (Use code for range that includes the maximum desired current) |
|---|---|
| W | 31mA to 63mA |
| X | 64mA to 125mA |
| Y | 126mA to 250mA |
| Z | 251mA to 500mA |
| E | 501mA to 1000mA |
| K | 1001mA to 1670mA |
| G | 1671mA to 3000mA |
| L | 0mA to 90mA, 24Ω EDC Type |
| H | 0mA to 90mA, ($2^{ea}$ 24 Ω in series) or 91 to 150mA, 24 ohm EDC |
| A | Apitech / Pulsar 33 Hz |
| D | Danfoss PVE type valve |