Programmed with HCT's Intella Software Suite™

23 I/O (14 inputs & 9 outputs), 2 CAN interfaces
Supply voltage 9-30Vdc

The DVC710 is a robust programmable controller for solenoid-operated proportional valves. It is uniquely designed with configurable I/O and two CAN communication ports. Its powerful combination of capabilities makes this controller well suited for stand-alone applications or to be utilized as a system master module when combined with the DVC700 series expansion modules.

- Advanced stand-alone programmable controller
- Total system master controller when combined with DVC700 series expansion modules
- Selectable PID closed-loop processes for pressure/speed control
- Configurable inputs and outputs
- Configurable input and output function curves
- Two CAN bus outputs
- Current regulated PWM outputs
- Open/short detection for diagnostics
- Rugged and fully encapsulated
- SAE J1455 environment and load dump compliant
- IP67, 69K
- CE Certified

Operational Specifications

Supply Voltage	9-30 V_{DC} (recommended operating voltage +12 to +28 V_{DC}, absolute maximum +/-32 V_{DC})
Supply Current	15 Amps (recommended supply current per power pin 5 Amps, absolute maximum 8 Amps)
Operating Temperature	-40 to +85°C
Storage Temperature	-40 to +100°C
Weight	1.34 lbs (0.61 kg)
Dimensions	L: 5.50 in (140 mm) x W: 4.70 in (119 mm) x H: 1.65in (42 mm)
Enclosure	Solid potted, industry standard Deutsch enclosure with automotive connectors
NEMA / IP Rating	NEMA 6P / IP67, 69K

Communication

CAN 1	2.0B (maximum voltage +/-14V_{DC})
Baud rates	125 kb/s, 250kb/s, 500kb/s, software configurable
Protocol	SAE J1939, HCT DeviceNet
Default baud rate	250kb/s
CAN 2	2.0B (maximum voltage +/-14V_{DC})
Baud rates	125 kb/s, 250kb/s, 500kb/s, software configurable
Protocol	SAE J1939
Default baud rate	250kb/s
Serial Interface	RS232 (maximum voltage Rxd,RTS = +/-15V_{DC} Txd = +/-8 V_{DC})

Inputs

Digital (Qty 8)	Discrete high/low, software configurable
Input Range	0 to +Supply, (Impedance Z = 32.4KΩ)
Debounce Time	0 to 10 seconds, 10ms intervals, software configurable
Analog (Qty 3)	0 - 5 V_{DC} digital, (Impedance Z > 100KΩ), software configurable (Note: 2)
Universal (Qty 3)	+/-1 V_{DC}, 0 - 5 V_{DC}, 0 - 10 V_{DC}, 4 - 20 mA, digital, pulse (RPM, count, duty cycle, frequency and quadrature), software configurable (Note: 2)
Input Range	Current mode: 0 to +22 mA maximum allowable current, (Impedance Z = 120KΩ) Pulse: RPM/Pulse inputs will accept up to 24kHz on all RPM/Pulse inputs combined
NOTE:	1) Maximum voltage on any input pin +/-32 V_{DC} 2) Analog and Universal inputs have configurable calibration, center and inverse modes

Outputs

Digital (Qty 6)	3,000 mA sourcing, software configurable
Current Leakage	Off = 370µA, Supply = +28 V_{DC} Off = 180µA, Supply = +13.6 V_{DC}
Diagnostics	Open/short circuit detection
Fly back protection	Integrated
PWM (Qty 3)	**DVC710:** 0 - 3,000 mA sinking proportional 10-bit resolution, software configurable **DVC710LC:** 0 - 1,500 mA sinking proportional 10-bit resolution, software configurable
Dither Frequency	1 - 500 Hz, software configurable
Diagnostics	Open/short circuit detection
Fly back protection	Integrated
Reference Output	0 - 5 V_{DC} , (recommended 250 mA, absolute maximum 500 mA)

Standards

Environmental	SAE J1455	**Immunity**	89/336/EEC, EN 61000-6-2
Temperature	Section 4.1.3.2	ESD	EN 61000-4-2
Salt Spray	Section 4.3.3.1	EMC	EN 61000-4-3
Steam Cleaning & Pressure Washing	Section 4.5.3.2	EMC	EN 61000-4-4
Vibration	Section 4.10.4.2	RF	EN 61000-4-6
Shock	Section 4.11.3.4	**Emissions**	89/336/EEC, EN 61000-6-4
Load Dump	Section 4.13.2.2.1.a		EN 55011

Certifications

CE Mark

Pin Out

30 Pin Cinch, (P1)

Pin	Function	Pin	Function	Pin	Function
A1	RXD	B1	CAN 1 H	C1	CAN 2 H
A2	TXD	B2	CAN 1 L	C2	UNI 1 INPUT
A3	RTS	B3	SIG COM	C3	SIG COM

Pin	Function	Pin	Function	Pin	Function
D1	CAN 2 L	E1	5V REF OUTPUT	F1	DIG 1 INPUT
D2	UNI 2 INPUT	E2	UNI 3 INPUT	F2	ANA 1 INPUT
D3	SIG COM	E3	SIG COM	F3	SIG COM

Pin	Function	Pin	Function	Pin	Function
G1	DIG 2 INPUT	H1	DIG 3 INPUT	J1	DIG 4 INPUT
G2	ANA 2 INPUT	H2	ANA 3 INPUT	J2	DIG 5 INPUT
G3	SIG COM	H3	SIG COM	J3	DIG 6 INPUT

Pin	Function
K1	+ POWER IN
K2	DIG 7 INPUT
K3	DIG 8 INPUT

18 Pin Cinch, (P2)

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

Pin	Function	Pin	Function	Pin	Function
d1	HS 5 OUTPUT	e1	POWER COM	f1	POWER COM
d2	HS 6 OUTPUT	e2	PWM 2 OUTPUT	f2	POWER COM
d3	PWM 3 OUTPUT	e3	PWM 3 OUTPUT	f3	POWER COM

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DVC700 Series

Programmable System Controller

DVC710

DVC710LC

Recommended Operating Parameters / Pin Functions

Uppercase letters designates the 30-pin connector.

Lowercase letters designates the 18-pin connector.

Pin	Name	Function/Features	Range
K1, a1, a2	Power In	Positive Power Supply Input	+12V_{DC} to +28V_{DC}
C2, D2, E2	Universal Inputs (Notes: 3, 4, 6)	Analog Digital Pulse (RPM) Counter PWM Quadrature (Uni_2 & 3)	+/-1 Volt 0-5Volts 0-10Volts 4-20mA
E1	5V REF	Reference Output	5Volts, 500mA
F1, G1, H1, J1, J2, J3, K2, K3	Digital Inputs (Note: 5)	On / Off.	0 to +Supply
F2, G2, H2	Analog Inputs (Note: 3)	Analog Active Low Digital	0-5Volts 0 to +Supply
b1, b2, c1, c2, d1, d2	High Side Outputs	Sourcing Discreet Output	On = +Supply 3,000mA (0-1,500 mA Off = +Supply 370μA, Supply = 28V_{DC} Off = +Supply 180μA, Supply = 13.6V_{DC}
a3, b3, c3, d3, e2, e3	PWM Outputs	Sinking PWM Output	10 bit resolution, 0 to +Supply 0 to 3,000 mA (0-1,500 mA DVC710LC)

Notes:

1. Maximum continuous current allowed on any single connector Pin = 8 Amps

2. All limits are guaranteed by testing or statistical analysis

3. Input impedance, 100KΩ with respect to Ground (0V_{DC})

4. Input impedance, 120Ω with respect to Ground (0V_{DC})

5. Input impedance, 32.4KΩ with respect to Ground (0V_{DC})

6. RPM/Pulse inputs will accept up to 24kHz on all RPM/Pulse inputs combined

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DVC710LC

LED Diagnostic 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.
On **YELLOW**	System Disabled active
Flashing **RED**	Low Supply Voltage.

| CAN Status	
Off	There is no J1939 device (or other DVCs) in the project.
On **GREEN**	Communication established with another Master Controller
Flashing **GREEN**	Waiting to establish communication with the Expansion Modules
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.

% Current O/P	
LED STATE	**MEANING**
Off (Outputs Disabled) **GRN** (0-33%) **YEL** (34-66%) **RED** (66-100%)	
Flashing **GREEN**	PWM or High Side output Open circuit detected
Flashing **RED**	PWM or High Side output Short circuit detected

Error Status	
LED STATE	**MEANING**
Off	No errors
On **RED**	PWM 1 Open or Short Detected
On **GREEN**	PWM 2 Open or Short Detected
On **YELLOW**	PWM 3 Open or Short Detected
Flashing **YELLOW**	High Side Open or Short Detected
Multi Digit Blink Code	Application defined blink codes.

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Programmable System Controller

DVC710
DVC710LC

Physical Description

Notes:

1) All dimensions are in Inches (Millimeters).

2) Use 1/4 x 20 SAE Grade 2 bolts (M6 x 1 ISO Grade 8)
   * Torque to 4 ft-lbs (5.4 N-m) Dry
   * Torque to 3 ft-lbs (4.1 N-m) Oiled

2) Mount to a flat hard surface protected from excess heat and moving parts.

3) Factory recommended 18-22 AWG (1.02mm to 0.64mm) TXL, XSL, and GXL automotive grade wire

4) Each Power pin used must be individually fused with an ATO 5, AGC 5 or smaller fuse

DVC710
DVC System Solutions
Master Controller Module

Module Status · CAN Status · % Current O/P · Error Status

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Made In USA · SERIAL NO.

581-01-48-011

30 PIN Metri-Pak (P1)   18 PIN Metri-Pak (P2)

4.00 in
5.60 in
Ø0.29 in 2 PLCS
Mount with 1/4" or 6mm Hardware
4.67 in
1.58 in
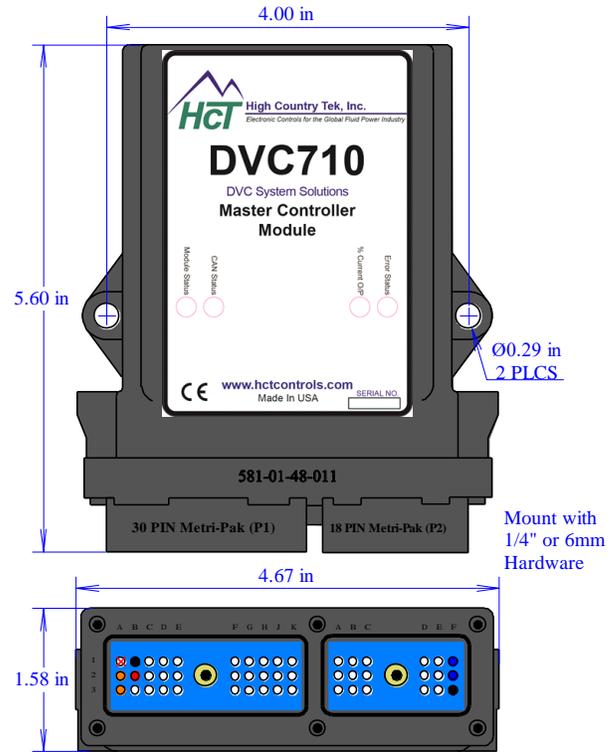
Connections

Module Connector - 48 Pin	Cinch 581-01-48-011
Mating Connector - 18 Pin	Delphi Packard 15492546-B
Mating Connector - 30 Pin	Delphi Packard 15492542-B
Mating Connector Pins	Delphi Packard 12103881

Part Number	Description
57700081	DVC710 — 3x dual channel master controller, 2x CAN Ports(0 to 3 amp output)
57700138	DVC710LC — 3x dual channel master controller, 2x CAN Ports(0 to 1.5 amp output)

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Programmable System Controller

DVC710

DVC710LC

DVC710 Output Features

|	
Output Groups (Qty 3)	Designed with 3 output groups consisting of 2x digital sourcing outputs and 1x PWM sinking output allowing the user to configure each output group in one of four different configurations. **Reference Figures 1 and 2**.
Dual Coil High-Side	To be used with proportional dual coil applications
Single Coil High-Side	Independently control a single proportional output and a single discrete output
Single Coil Low-Side	Independently control a single proportional output and two discrete outputs
High-Side Only	Independently control two discrete outputs
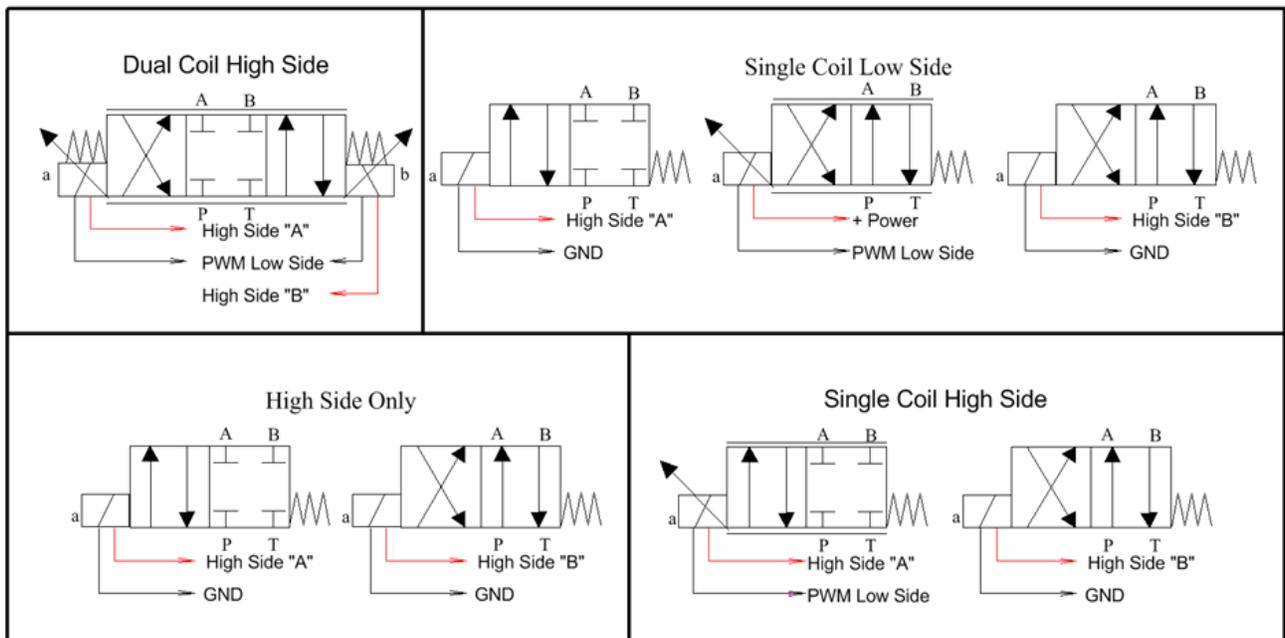
Figure 1: DVC710 output configurations.
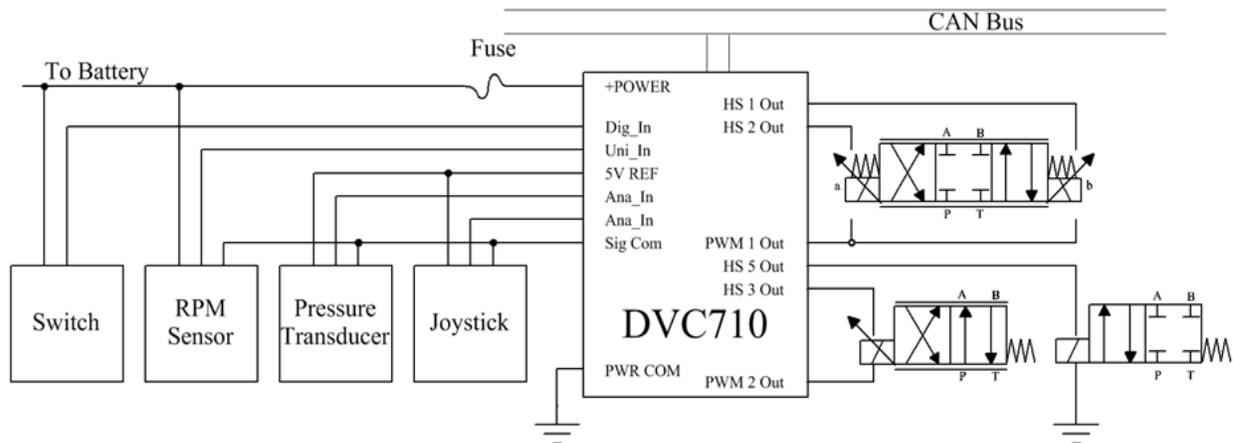
Figure 2: DVC710 example wiring diagram using two different output group configurations.

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5311 S 122nd East Ave.
Tulsa, OK 74146

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