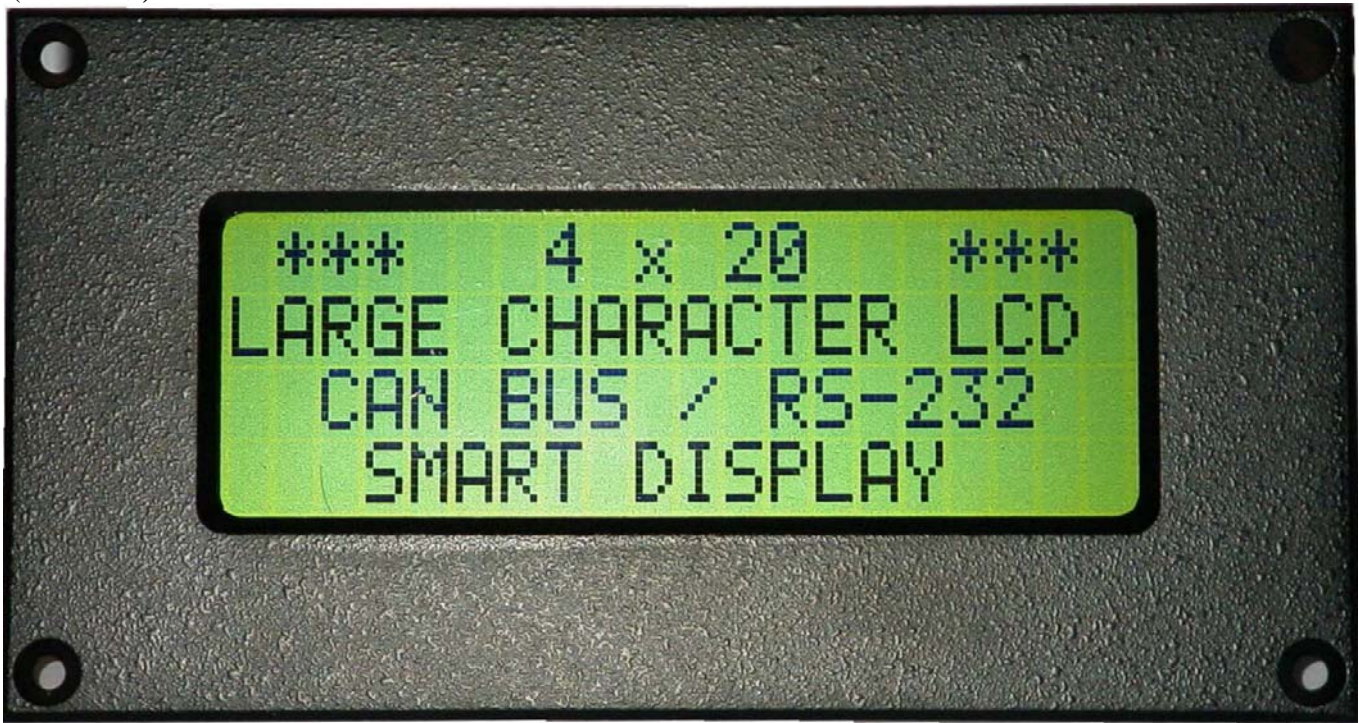




# DVC 61

*(Actual Size)*



**4 x 20 Smart Display**

**CAN Bus/RS-232/Digital Inputs**



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## Description

The DVC61 Smart Display is a large character LCD with backlight. The module interfaces to the DVC system via the CAN Bus or RS-232 serial interface. The module has a sealed metallic enclosure designed specifically for harsh industrial environments. All connections are made through a sealed 12-pin Deutsch connector. The unit has up to 10 digital inputs and operates from 8.5Vdc to 32Vdc. The LCD operates at extended temperature ranges and has a viewable transreflective coating for no cab and open cab machines.



## Features

- Easy to read 4 x 20 large character LCD Display with dark characters on a green background.
- Display has a transreflective coating that allows good readability in direct sunlight.
- Programmable Backlighting and Contrast from 0-100%.
- Up to 12 Variables can be programmed to display on each DVC61 screen.
- Up to 10 Digital Inputs
- Two serial ports to choose from; CAN Bus or RS-232, with multiple baud rate settings.
- Wide operating voltage range of 8.5V to 32Vdc.
- Rugged Enclosure withstands harsh environments commonly found in mobile applications.
- Extended operating temperature range.
- Standard ASCII character set.

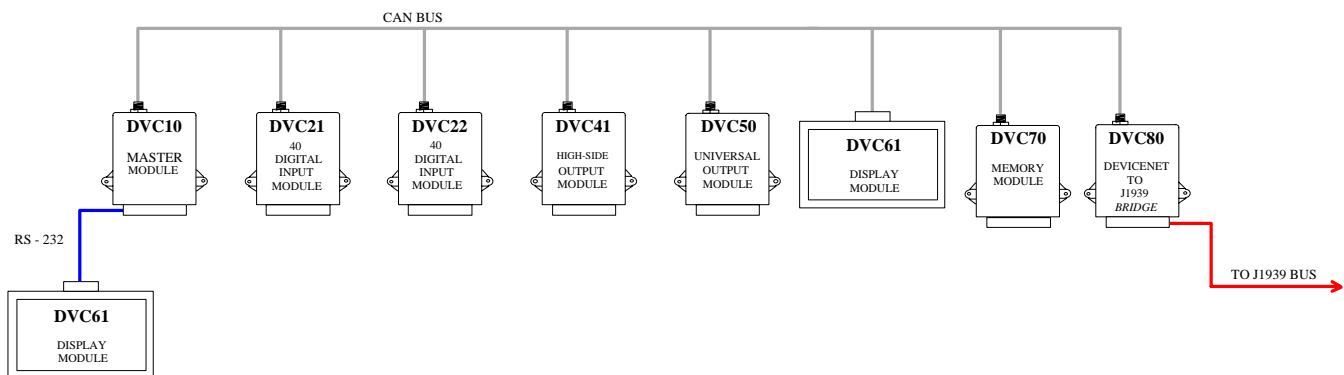
## Theory of Operation

The DVC61 Smart Display module is designed to operate from the DVC10 RS-232 port or through the DVC CAN Bus 2.0B network. The DVC61 could also be used on any system with an RS-232 connection and the correct protocol. Up to 15 DVC61 modules can be placed on any one DVC system and one of those can communicate using an RS-232 connection. When using the RS-232 connection, the DVC61 must be connected directly to the DVC10.

The DVC61 MAC ID, percent contrast, percent backlight and other settings are set by connecting the module directly to a computer through an RS-232 serial connection and by using the DVC Program Loader Monitor (see the DVC Programming User Guide). Monitoring the DVC61 digital inputs etc. is also achieved using the DVC Program Loader Monitor. Note: Contrast and backlight percentage can also be set by the users' application program. The users' application program is created when using the DVC Programming Tool (see the DVC Programming User Guide).

A multitude of screens can be programmed to display on each DVC61. When the module is in the DVC system, up to 12 variables can be displayed on each screen. The screens and variables displayed on the DVC61 are set by the users' application program. Digital inputs are also setup by the users' application program. Remember, the users' application program is created when using the DVC Programming Tool (see the DVC Programming User Guide). The users' application program is loaded into the DVC10 Master Module. The DVC10 Master Module sends this information to the DVC61 when the system is in operation.

Typical uses of the DVC61 Smart Display would be to show the status of inputs or outputs of the DVC system, or as an indicator when inputs or outputs of the system reach certain values. For example, if the engine exceeded its maximum temperature, the backlight of the display could flash on/off and a fault message could appear.



**Figure 1: DVC System Configuration**

## Digital Inputs

### Input Operation:

- There are five input pins. Each pin can be set either active high, active low, or both active high and active low (making a total of 10 inputs).
- Maximum Voltage Range: 0Vdc to 32Vdc
- Setup is achieved using the DVC Programming Tool (see the DVC Programming User Guide).
- Settings: Toggle/No Toggle  
Debounce Time (0-10.24 seconds in 10 ms increments)

See Figure 1 below for proper wiring.

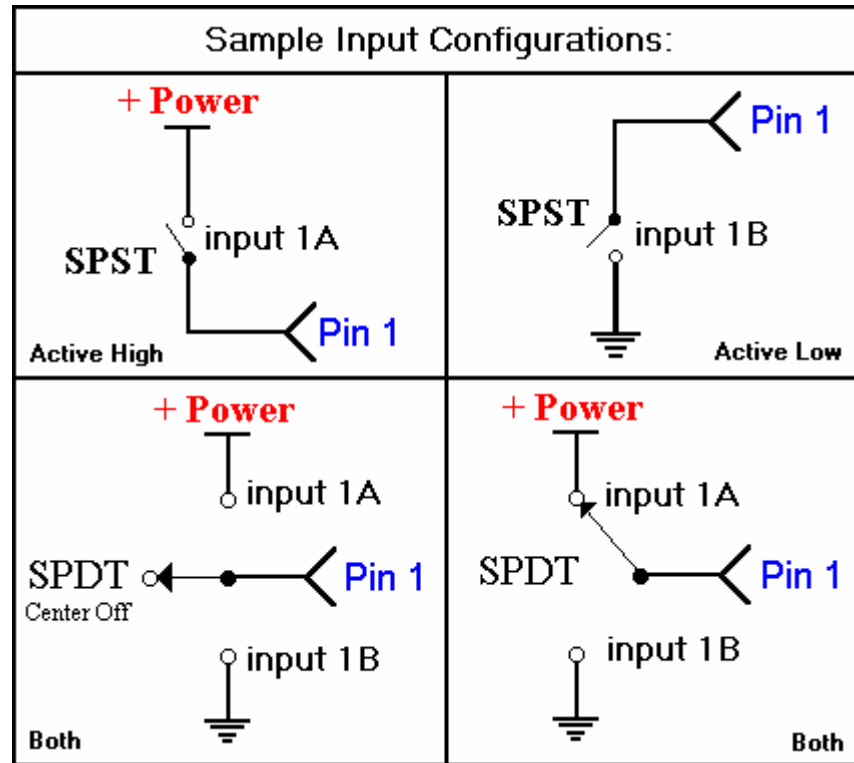


Figure 2: Sample Input Configurations

### Monitoring Inputs:

- Inputs can be monitored by connecting a DVC61 or DVC10 directly to a computer through an RS-232 connection, and by using the Program Loader Monitor (refer to the DVC Programming User Guide). Note: All modules on the CAN Bus can be monitored when connecting a computer to the DVC10.

## **Software**

*\*Note: For detailed information on DVC61 software see the DVC Programming User Guide.*

### **Programming Tool:**

- Each Digital input can be named (16 characters).
- Each Digital inputs' debounce time can be set: 0 to 10.24 seconds in 10 ms increments.
- Each Digital input can be set toggle/no toggle.
- Display Backlighting can be changed (0-100%).
- Display Contrast can be changed (0-100%).
- Up to 12 variables can be programmed to display on each DVC61 screen.
- Different screens can be programmed to display on each DVC61.

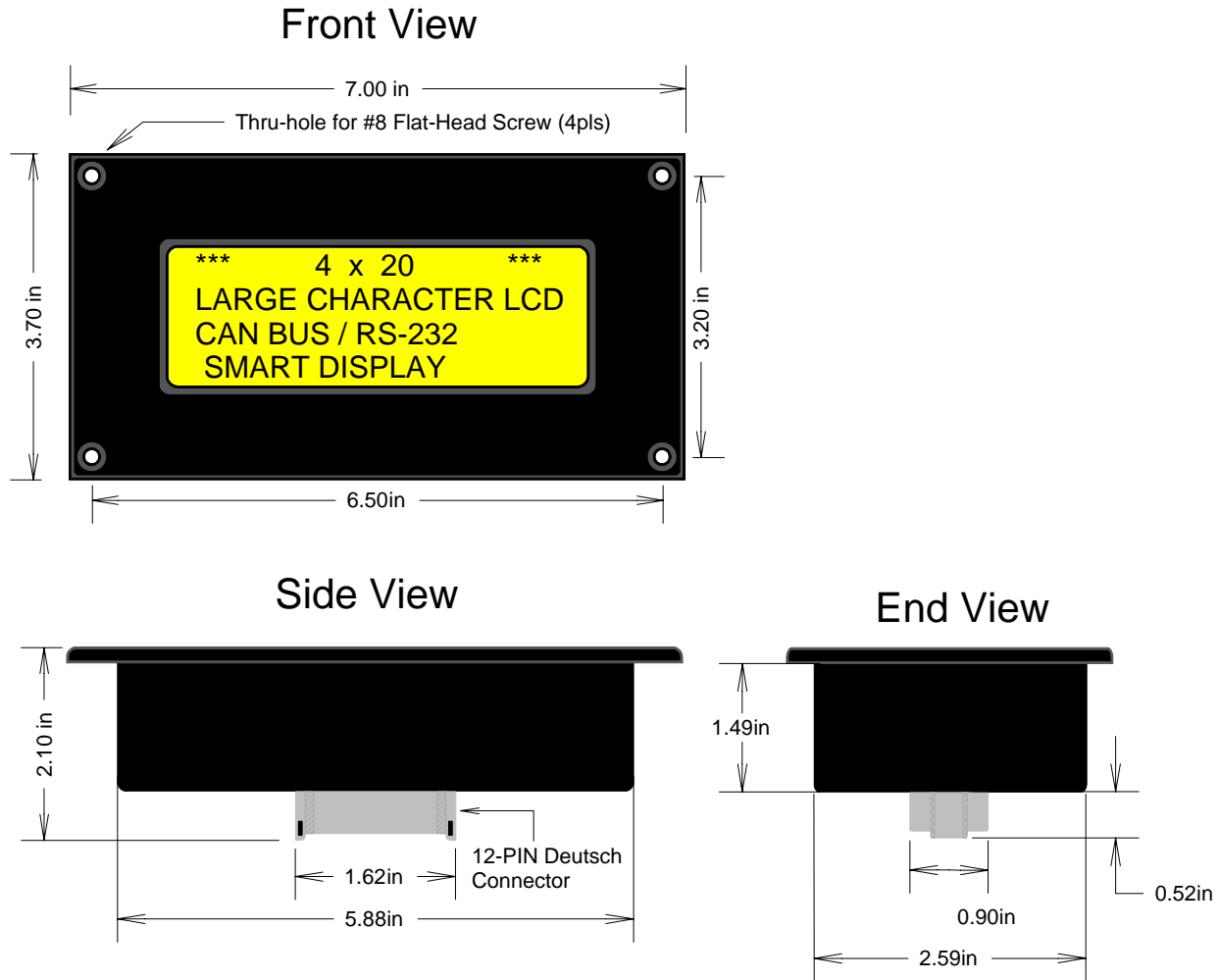
### **Program Loader Monitor:**

- MAC ID (range: 0-63) Note: every module must have a different MAC ID
- CAN Bus Baud Rate (125kbps, 250kbps, 500kbps)
- Default or Blank screen on power up. Default screen consists of High Country Tek information.
- Default Display Backlighting (0-100%) (Backlight on power up)
- Default Display Contrast (0-100%) (Contrast on power up)

*\*Note: All DVC61 modules will ship from HCT with the MAC ID set to 61 and the CAN Bus Baud Rate set to 125k unless otherwise noted.*

## Dimensions

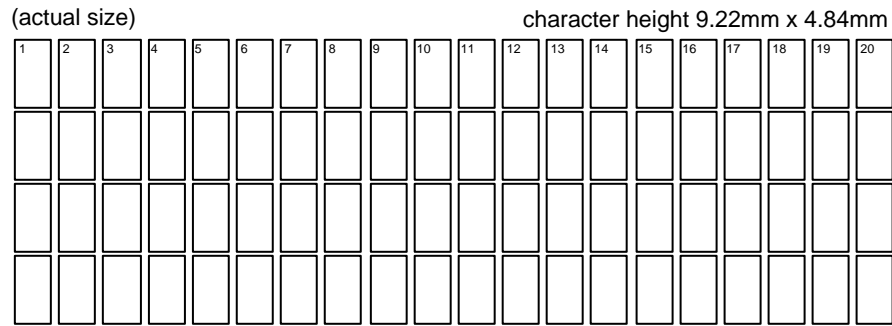
- Physical Size:  
7.0”L x 3.70”W x 2.10”H
- Weight – 0.8712 lb (13.94 oz)
- Each module has four mounting holes with centers in a square pattern with dimensions 6.50” x 3.20”. Each mounting hole is meant for a #8 Flat-Head Screw (4pls).



**Figure 3: Packaging Dimensions**



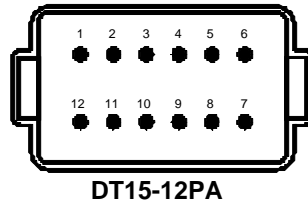
## Character Layout



**Figure 4: Character Layout**

## Wiring Connections

- 12 pin Deutsch # DT15-12PA connector designed for severe under – hood environments
- Accepts 14 AWG through 18 AWG wire



**DT15-12PA**

**Figure 5: Connector Pin Diagram**

1	INPUT 1A/1B	7	RS-232 (TXD)
2	INPUT 2A/2B	8	RS-232 (RXD)
3	+PWR	9	GROUND
4	GROUND	10	INPUT 3A/3B
5	CANH	11	INPUT 4A/4B
6	CANL	12	INPUT 5A/5B

**Table 1: Pin Assignments**

*\*Note: See the Accessories section for mating connector information.*

## Accessories

### **Mating to the 12-pin Deutsch # DT15-12PA Connector:**

- Mating Connector is made up of a Plug, Lock, and 12 Sockets:
  - Deutsch # DT06-12SA – Plug
  - Deutsch # W12S 12103881 – Locking Wedge terminal
  - Deutsch # 0462-201-16141 - Sockets
  - Deutsch # 114017 – Sealing Plug
- Universal Hand Crimp Tool
  - Deutsch # HDT-48-00
- HCT DVC61 12-pin Connector Kit    HCT P/N: 999-10088
  - 1 – Deutsch # DT06-12SA Plug
  - 1 – Deutsch # W12S Locking Wedge terminal
  - 14 – Deutsch # 0462-201-16141 Sockets

### **Mating to the RS-232 Port:**

- A DVC Slave Serial Port Adapter is available to connect to the 12-pin female mating connector. A DVC RS-232 cable can be used to interface from the DVC Slave Serial Port Adapter to a PC.

\* 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.

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

## **Electrical Characteristics**

### **Supply Voltage:**

- Range: +8.5Vdc to 32Vdc
- Reverse polarity protection and transient protection up to 1.5K Watts Peak Pulse Power Dissipation
- Power is supplied to the module through Pin 3.
- GROUND is the DVC61 main common (usually connects to chassis ground), and is connected to the module through Pin 4.

### **Current Consumption:**

- Maximum  $\cong$  0.25 A (w/ backlight on)
- Maximum  $\cong$  0.06 A (w/ backlight off)

### **Digital Inputs:**

- Maximum Voltage Range: 0Vdc to 32 Vdc
- Low: 0Vdc to 0.5Vdc  
High: 4.5Vdc to 32Vdc

## **Environmental Characteristics**

### **Overall:**

- Operating Temperature: -20°C to 70°C
- Storage Temperature: -30°C to 80°C
- Sealed metallic enclosure designed specifically for harsh industrial environments commonly found in mobile applications.

### **Connector:**

- Water does not penetrate seals when submerged in 3 feet of water. Meets requirements of DIN 40050 IP6K9K.
- Provides excellent vibration/shock reliability that is required in truck, bus and off-highway industry.
- Temperature Range: -55°C to +125°C

## **Ordering Information**

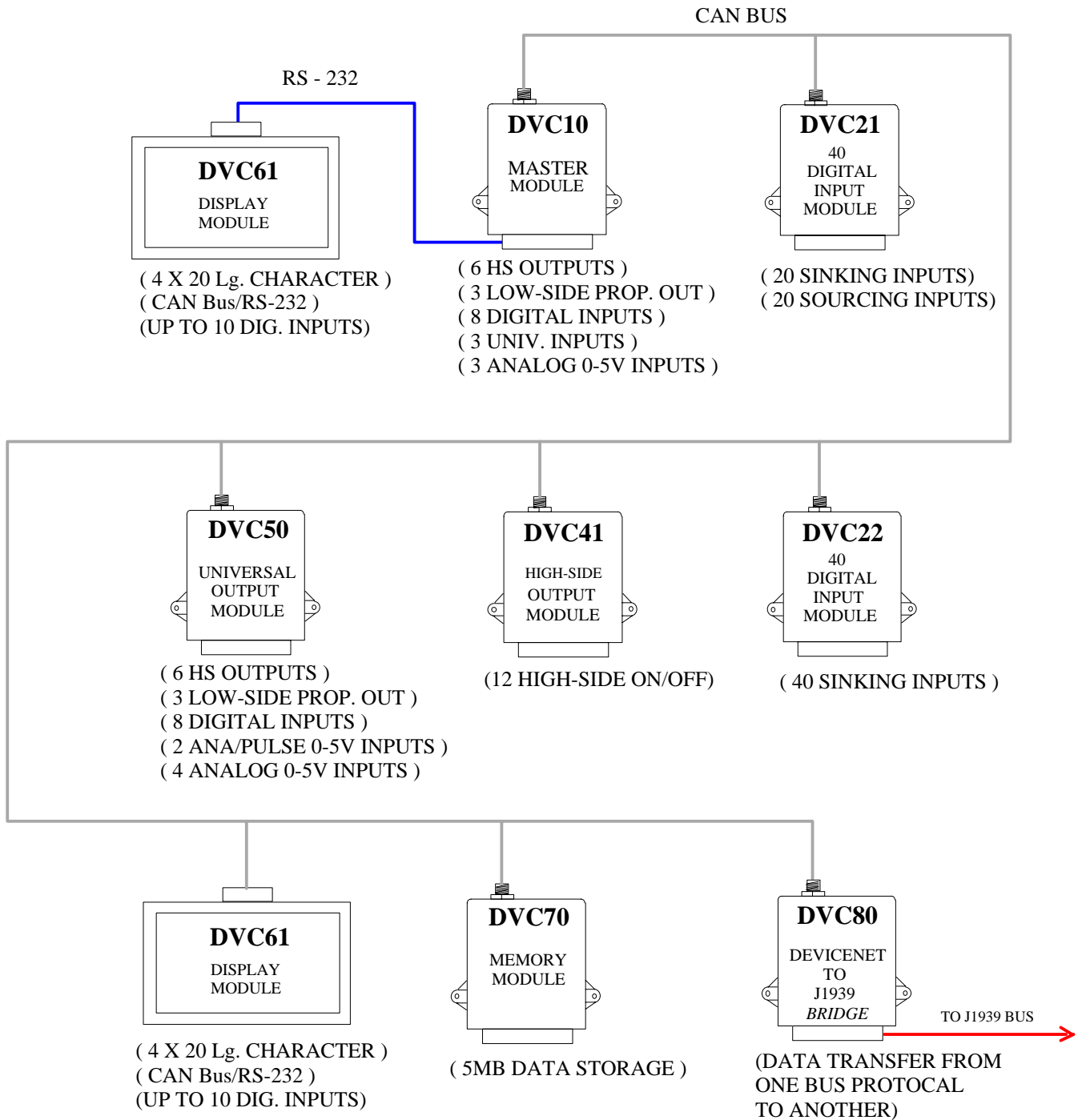
<b>HCT P/N</b>	<b>Description</b>
DVC61	Smart Display
999-10088	HCT DVC61 12-Pin Connector Kit
999-10082	DVC Slave Serial Port Adapter
999-10075	DVC RS-232 Cable Assembly

**Table 2: Ordering Information**

**High Country Tek**  
208 Gold Flat Court  
Nevada City, CA 95959  
(530) 265-3236  
highcountrytek.com  
marketing@highcountrytek.com

**Contact an HCT distributor in your area or call HCT for a distributor near you.**

## DVC System Diagram



**Figure 6: Detailed DVC System Configuration**