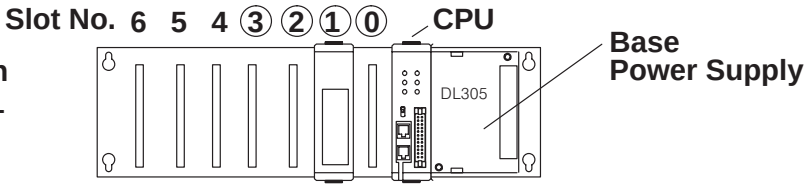
Installing the Module

Selecting a Slot for the HSC Module

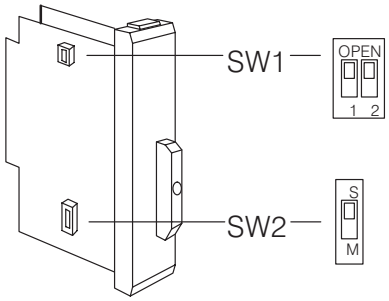
The D3-HSC can occupy Slots 0,1, 2, or 3 of any DL305 base. **The module will not function in any other slots**.The memory assignments for the HSC's inputs and outputs (to be used in your ladder logic) are affected by the slot you choose. Pages 17 through 19 of this manual show you the specific memory assignments for inputs and outputs. For example, the following diagram is of a D3-08B 8-slot base. Notice that the CPU slot has no number.

Example with HSC in Slot 1



Selecting the Response Rate

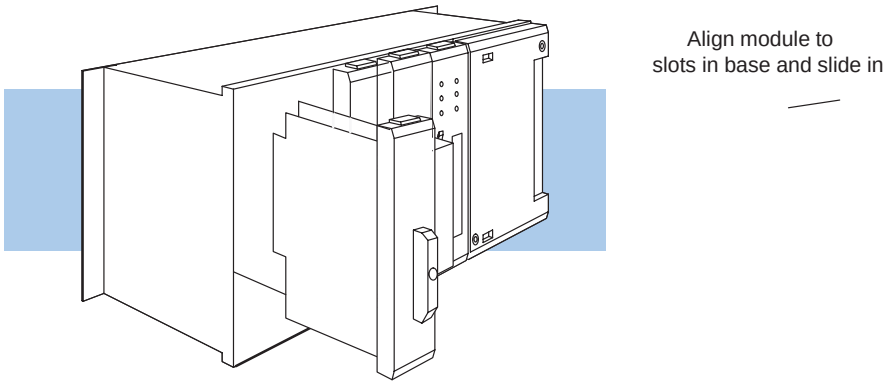
As mentioned earlier, the response rate for **counting** is dip switch selectable. Also the speed at which the **reset** input can be detected is selectable. These switches are on the component side of the module's internal circuit board. SW1 is at the top and SW2 at the bottom. Use the table below to select the rate. If the pulses are being sent at a rate higher than 500 Hz, then you need to choose the 10 kHz setting. *Be aware that the frequency response rate of SW1 must match that of SW2 if you plan to use the external reset.*



SW1	10 kHz	500 Hz
Counting Inputs: Position 1 Position 2	 OPEN OPEN	 CLOSED CLOSED
SW2		
External Reset	S Position	M Position

Inserting the Module in the Base

When inserting components into the base, align the PC board of the HSC module with the grooves on the top and bottom of the base. Push the module straight into the base until it is firmly seated in the backplane connector.



WARNING: Never connect or install a module into the base while the power is applied. Failure to remove the power prior to the installation can result in damage to the module, other installed modules, the power supply and/or the CPU itself.

Wiring the Module

General Considerations

Consider the following guidelines when connecting the field wiring to the D3-HSC.

1. There is a maximum size wire the module can accept. We recommend that you use wire that is no smaller than 22 AWG and no larger than 18 AWG.
2. Always use a continuous length of wire, do not combine wires to attain a desired length.
3. Use the shortest possible cable length.
4. Use wire trays for routing where possible
5. Avoid running wires near high energy wiring.
6. Avoid running input wiring in close proximity to output wiring where possible.
7. To minimize voltage drops when wires must run a long distance , consider using multiple wires for the return line.
8. Avoid running DC wiring in close proximity to AC wiring where possible.
9. Avoid creating sharp bends in the wires.

Soldering the Wires to the Connector Block

The D3-HSC is shipped with the connector block and snap-together wire cover packaged separately. This block fits on the 32-pin male connector slot on the front of the module. Before you connect it to the HSC, you may find it easier to solder the wires that you will be connecting from the encoders, the external power supply, the optional BCD outputs, the external reset, and two discrete outputs (OUTPUT1 and OUTPUT2). Refer to the wiring diagram on the next few pages for details.

Be careful not to create cold solder joints or place so much solder on a connecting pin that it shorts out against a neighboring pin. Make sure you refer to Page 13 for connecting the BCD outputs correctly. Note which bit of the 16-bit word goes with the each weighted position of the BCD value (4 bits per numeral). You don't want to mix up the bits; otherwise, you will get a current count number that is incorrect.

Take care also to position the wires while soldering so that the cover can be snapped securely around the wires. The cover consists of two pieces. They are held together by small screws and hex nuts. Two long-shaft thumb screws attach the cover securely to the module as a final step.

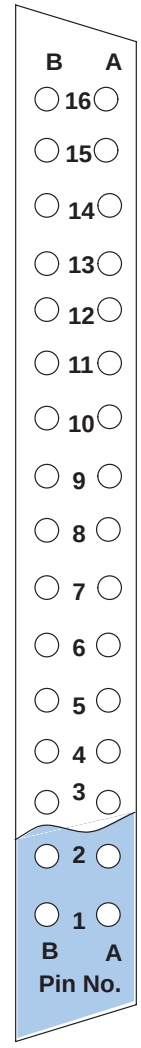
WARNING: To minimize potential shock, turn off power to the I/O base and any modules installed in the base before inserting or removing a module. Failure to do so may result in potential injury to personnel or damage to the equipment.

Wiring for UP/ DOWN Counting

On Page 10 of this manual you will be shown how to wire encoders for UP counting or for DOWN counting. Different connecting pins are used for each task.

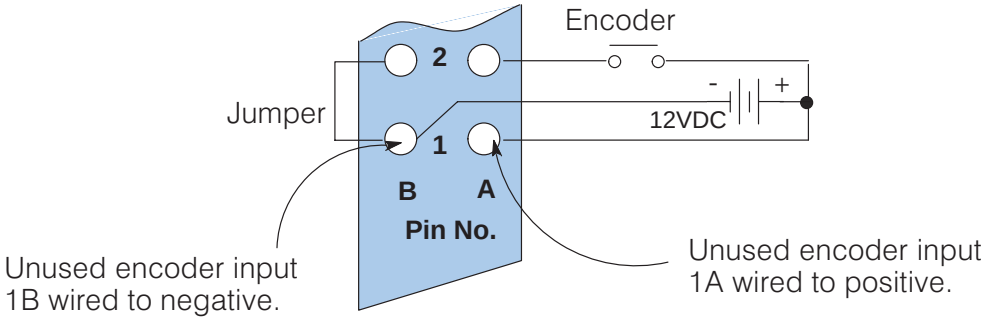
IMPORTANT: When one channel is counting (either UP or DOWN), the other channel must be held high. If you are using only one encoder, tie the (+) connecting pin for the unused input to the high (positive) side of the encoder's power supply ; and the (–) pin to the negative side.

Encoder Wiring Diagram



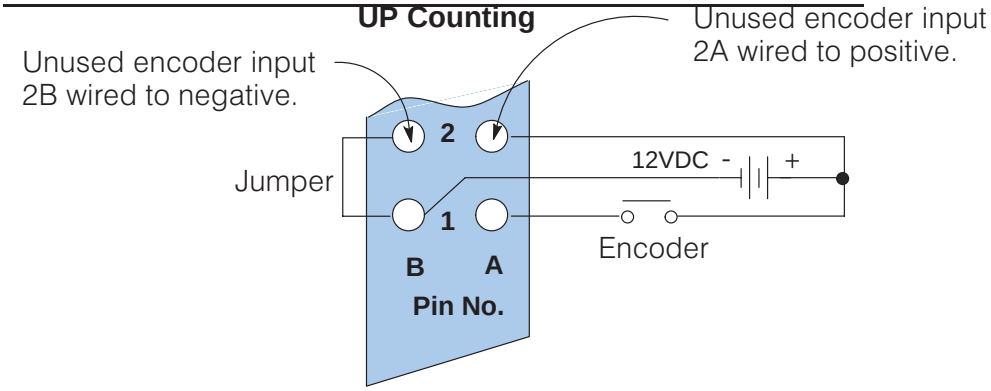
HSC Connector

DOWN Counting

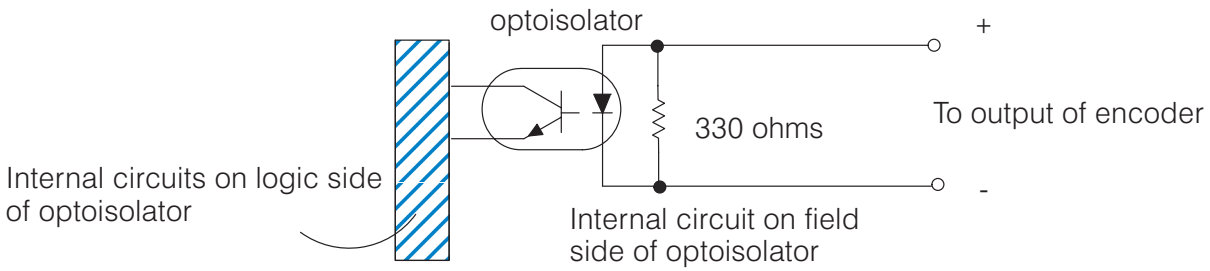


NOTE: There are two pairs of encoder connecting pins. 1A and 1B are for UP counting and 2A and 2B are for DOWN counting. You must hook your encoder to one set of pins. The unused set of pins must have the (A) pin connected to the positive side of the encoder supply, and the (B) pin connected to the negative side.

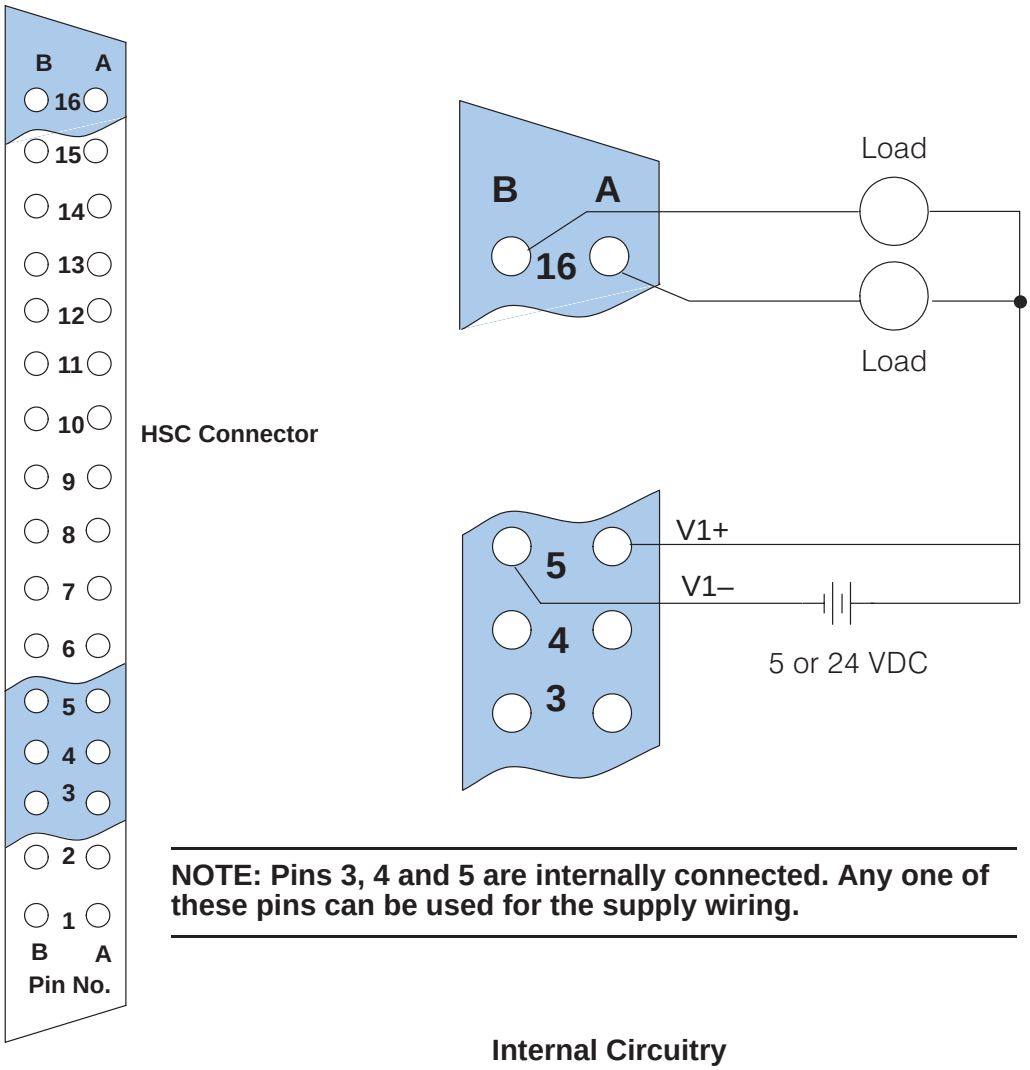
UP Counting



Internal Circuitry

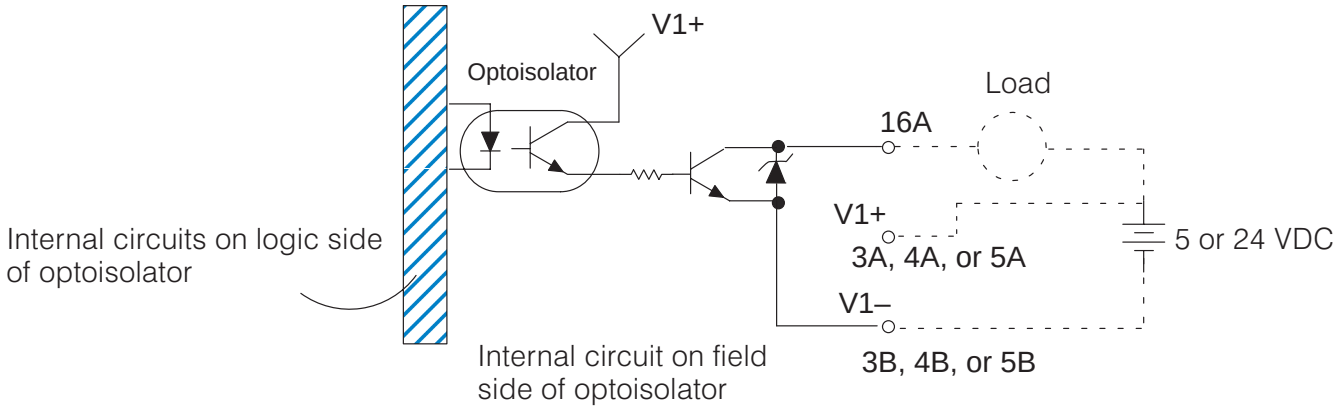


Output Wiring Diagram

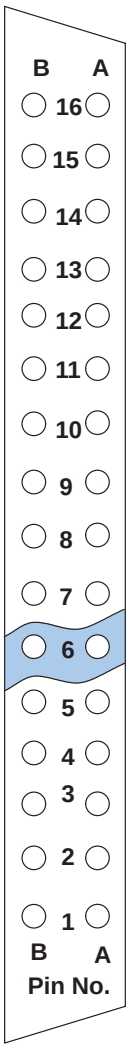


NOTE: Pins 3, 4 and 5 are internally connected. Any one of these pins can be used for the supply wiring.

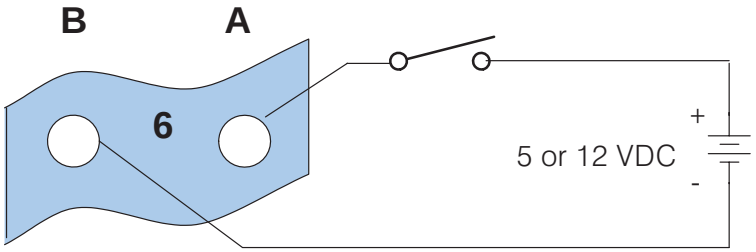
Internal Circuitry



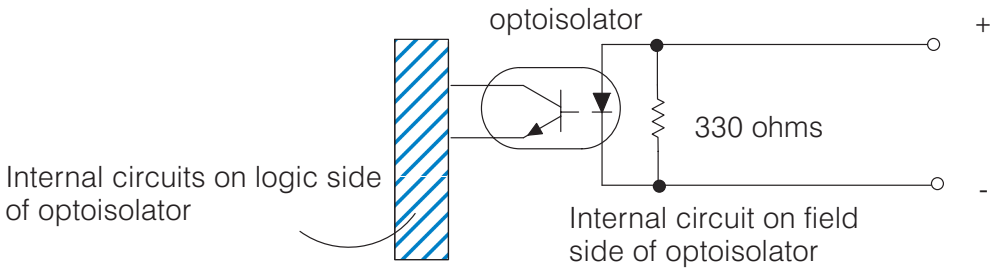
Reset Wiring Diagram



HSC Connector



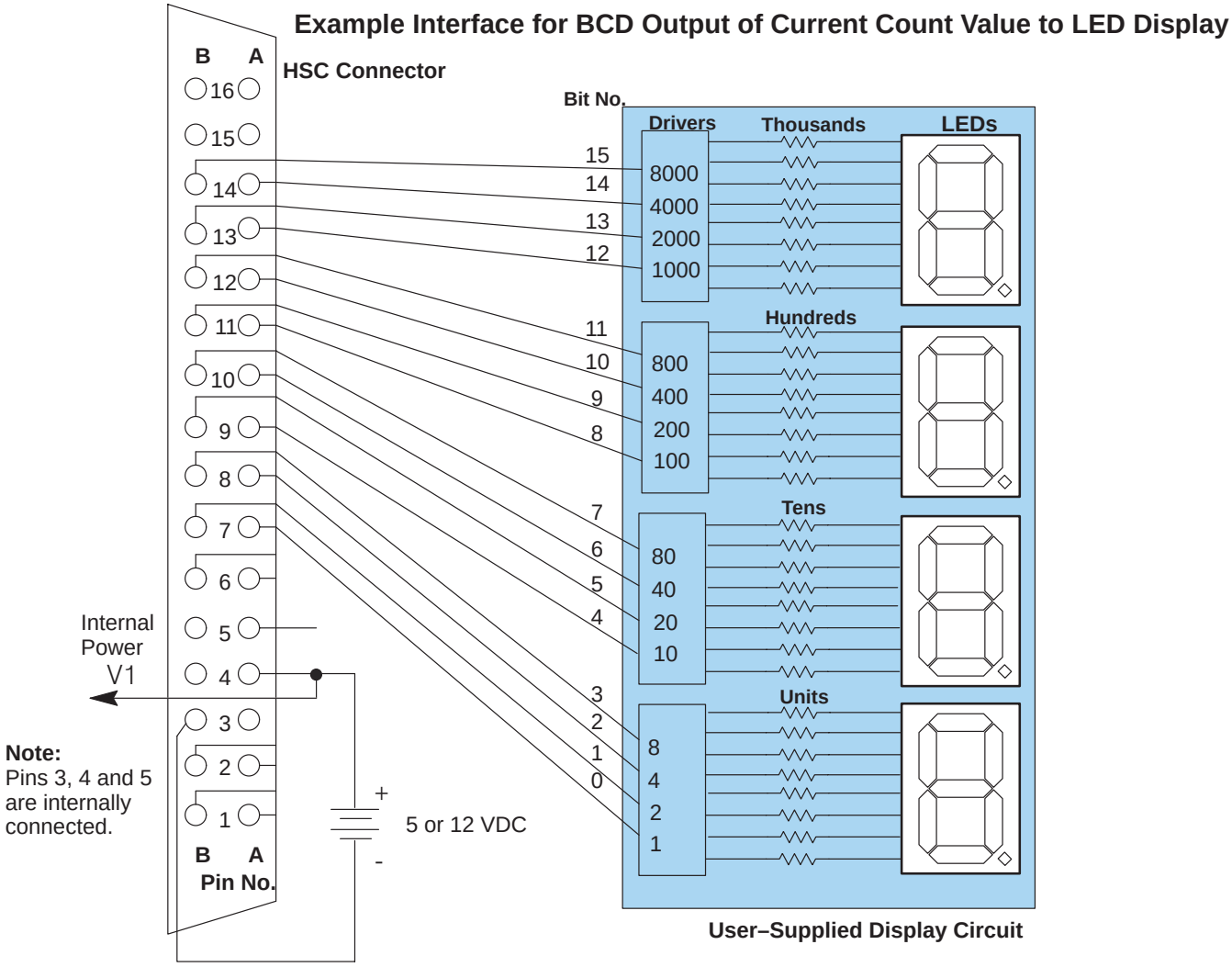
Internal Circuitry



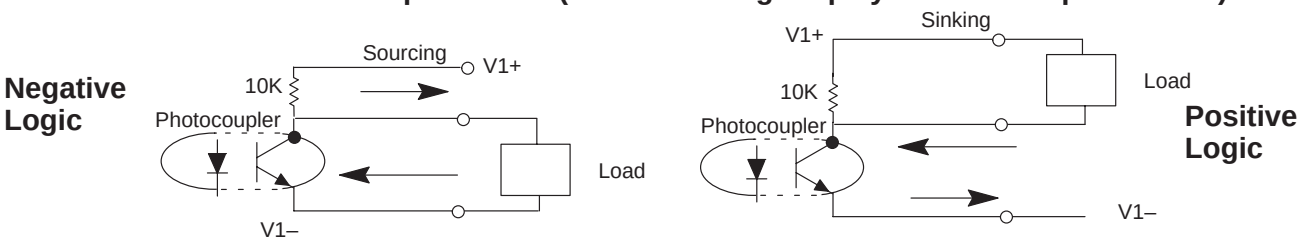
BCD Outputs

The CPU cannot read the current count directly, but there are 16 BCD outputs for driving a BCD display or connecting to a DC input module to read the current count into the CPU. The 16-connecting points (7A&B thru 14A&B) are attached to the BCD input of the drivers for visually displaying the BCD value or you can wire them to an input module. Such a configuration is completely optional, and requires that you supply the external devices. You determine the voltage level of these 16 points through your choice of an external power supply with the positive side connected to points 3A, 4A, 5A, and negative side connected to 3B, 4B, and 5B.

Example Interface for BCD Output of Current Count Value to LED Display



BCD Output Circuit (For Interfacing Display Device or Input Module)



I/O Specifications

Input Specifications	Count Input	Reset Input
Minimum Input Pulse Width	25 µs	100 µs
Signal Direction	Falling Edge	ON
Power Source Voltage	12 VDC 10%	12 VDC 10%
ON Current	10–25 mA	10–25 mA
OFF Current	3 mA max.	3 mA max.
ON Voltage	7 V min.	7 V min.
OFF Voltage	3 V max.	3 V max.

BCD Output Specifications	5 V ±5%	12V ±10%
Current Consumption	10 mA max.	25 mA max.
Ripple	1% max.	3% max.
Output Current (source) (6.0 V)	0.1 mA	0.4 mA

External Output Specifications	Rating
Output Type	NPN Open Collector
Output Voltage	5–24 VDC
Output Current	0.3 A
Leakage Current	0.05 mA max.