



# SLC™ 150 Programmable Controller High Speed Input Module – Catalog No. 1745-E155

**Description** The High Speed Input (HSI) Module allows the SLC 150 Processor Unit to count high speed input signals (up to 5KHZ). Up to four high speed input devices, each connected to a high speed input module, can be counted by the SLC 150. A variety of input voltage levels and filter delay times are selectable on the module via dip switches.

Dip Switches for selecting input filter delay time and input voltage are located below the LED cover.

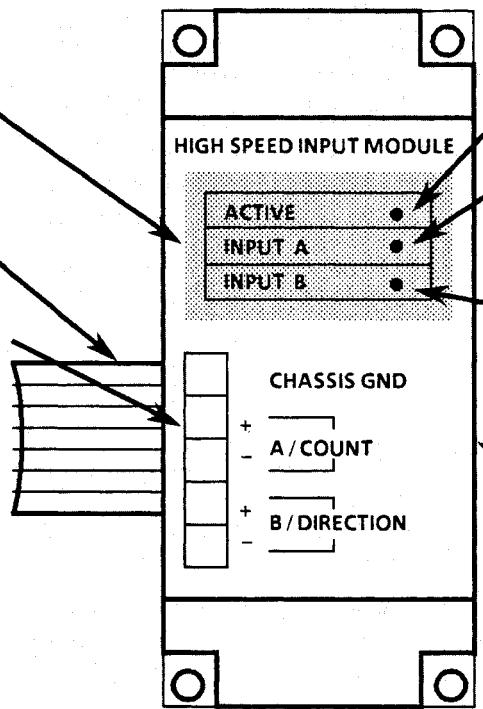
Interconnect cable for connecting module to processor unit or previous high speed input module.

Wiring terminals with self-lifting pressure plates and hinged cover.

Each time an input pulse is received at the A/COUNT terminal, the HSI/(SQO)-instruction will count up.

The B/DIRECTION terminal is used to indicate a direction change for input pulses. For example, change in rotation of a quadrature type encoder.

**NOTE:** The B/DIRECTION terminal and its function are not recognized by SLC 150 series A processor units. However, connecting the B channel of a quadrature type encoder can be used to help increase immunity to noise and shaft jitter. Direction sensing will be incorporated into future SLC processor units.



Active - ON when HSI/(SQO)-instruction is enabled in user program.

Input A - ON when high speed input module receives signal from input connected to A/COUNT terminal.

Input B - ON when high speed input module receives signal from input device connected to B/DIRECTION terminal or channel B of quadrature type encoder.

Socket for connecting next high speed input module or I/O expansion unit. An end plug is inserted in the socket and must remain inserted if the HSI module is the last module connected in your system. If you connect an I/O expansion unit or another HSI to the HSI module, you must remove the end plug.

SLC 150 High Speed Input Module.

**Programming** Publication 1745-810 is an addendum to the SLC 100 User's Manual. Refer to Publication 1745-810 for information on programming and application examples.

## High Speed Input Module – SLC 150

### Important Installation Considerations

Refer to the SLC 100 User's Manual for details on the following important installation considerations:

- The enclosure should be adequate (NEMA approved) for the environmental conditions of the particular application.
- The processor unit, expansion units, and input/output device circuits should have the same power source. The processor and expansion units should be properly grounded.
- Include an electrical disconnect in the enclosure. An isolation transformer may also be required.
- A master control relay circuit should be included to permit disabling of the I/O devices independent of the processor and expansion unit power supply circuit. One or more emergency-stop switches should also be included.
- Follow recommendations for component spacing within the enclosure, to help keep the controller temperature within the specified limits.
- Wiring should be routed to minimize the effects of electrical noise. Surge suppressors should be used for inductive loads in series with hard contacts and for other noise-generating equipment.
- Fusing should be provided to protect loads and wiring from short circuits or overloading.

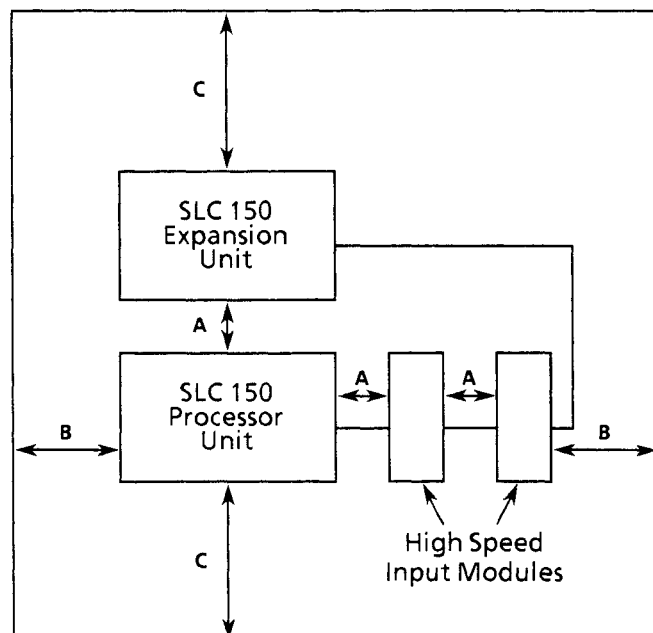
### System Layout and Recommended Spacing

The figure below shows acceptable system layouts. Follow the recommended minimum spacing to allow for convection cooling within the enclosure. Cooling air in the enclosure must be kept within a range of 0° to 60°C.

High speed input modules can be used with the SLC 150 processor unit only. Because the high speed input module has a 3" connection cable, it can only be mounted to the right of the SLC 150 processor unit.

#### Recommended Minimum Spacing

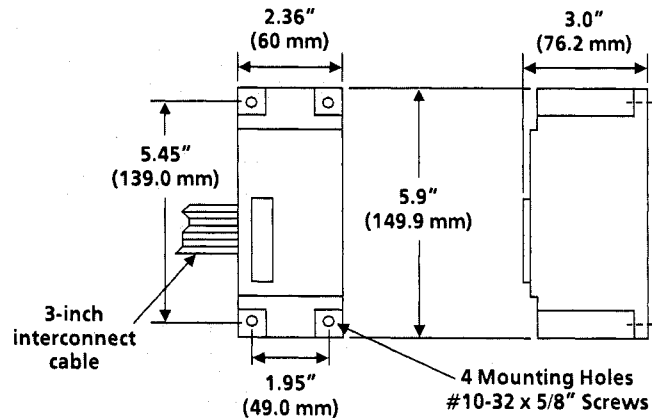
- A: 2" (51mm)
- B: 4" (102mm)
- C: 6" (152mm)



## High Speed Input Module – SLC 150

### Mounting

The high speed input module can be mounted to the back panel of your enclosure using four #10 screws. Hole locations are shown in the dimension drawing below. Dimensions are in inches and (millimeters).



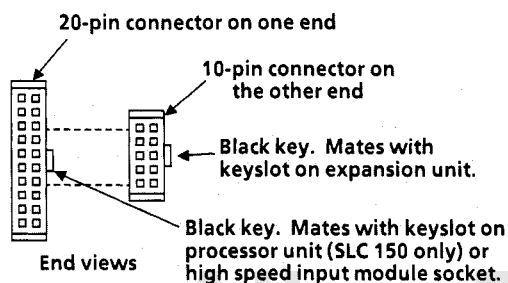
### Connection Cables

A 3" (7.62 cm) connection cable with a 20 pin connector comes attached to the high speed input module. The cable is used to connect the module to an SLC 150 processor unit or to the previous high speed input module. The high speed input module connector is the same as the 20 pin connector on the 1745-C3 interconnect cable shown below.

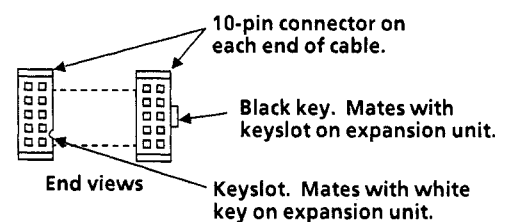
Two cables are used for interconnecting processor and expansion units: Interconnect cable 1745-C3 is a 20-pin to 10-pin cable supplied with the SLC 150 processor unit. Interconnect cable 1745-C2 is a 10-pin to 10-pin cable supplied with each expansion unit. Both cables are 18.5 inches (47 cm) long. See the figure below for cable connector details.

**Important:** Do not use cables longer than those provided. Longer cables could affect the integrity of data communications between the processor and expansion units, possibly causing unsafe operation.

#### 1745-C3 interconnect cable supplied with SLC 150 processor unit



#### 1745-C2 interconnect cable supplied with expansion units

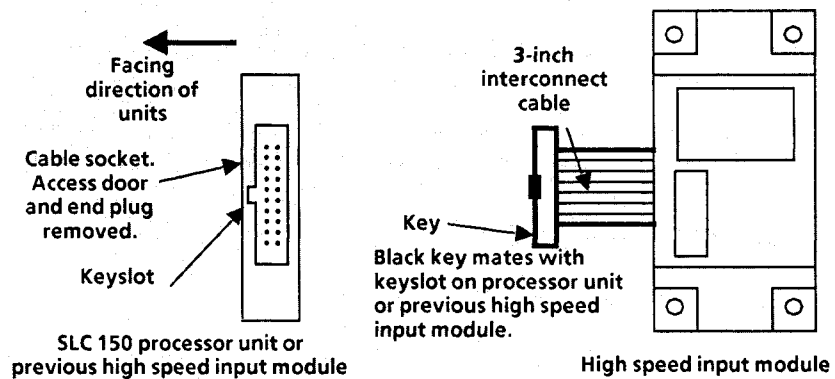


## High Speed Input Module – SLC 150

### Connection Procedures

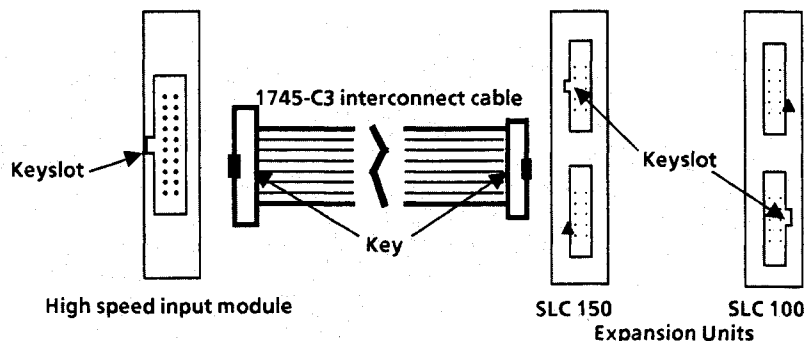
To connect the high speed input module to a processor unit or another high speed input module, **remove power to the processor unit** and follow the procedures outlined below.

1. Open the connection port access door on the processor unit (or previous high speed input module).
2. Align the black key on the 20 pin connector of the HSI module with the key slot on the processor unit (or previous high speed input module). Push the connector gently into the socket. The tabs will lock the connector in place.
3. Close the access door on the processor unit (or previous high speed input module). Note that there is a slot in the access door that will allow the connector to pass through the door when the connection is made.



To connect an I/O expansion unit to a high speed input module, use the 18.5" (47cm) 20 to 10 pin 1745-C3 interconnect cable provided with the processor unit, **remove power to the processor unit** and follow the procedures outlined below.

1. Open the connection port access door on the high speed input module.
2. Remove the end plug and align the black key on the 20 pin connector of the 1745-C3 cable with the key slot on the high speed input module. Push the connector gently into the socket. The tabs will lock the connector in place.
3. Open door on expansion unit. Align the black key on the 10 pin connector of the 1745-C3 cable with the key slot on the expansion unit. Push the connector gently into the socket. The tabs will lock the connector in place.
4. Close the access doors on the high speed input module and expansion unit. Note that there are slots in the access doors that will allow the connector to pass through the doors when the connection is made.

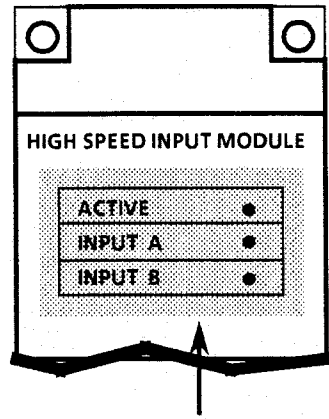


# High Speed Input Module – SLC 150

## DIP Switch Settings and Maximum Pulse Rate

The high speed input module has eight switches located under the LED cover. Lift up on the bottom of the cover to gain access to these switches. The high speed input module has two input circuits. For each input circuit you can select the input voltage range, the appropriate filter, and encoder or count function. The two input circuits are labeled A/COUNT, and B/DIRECTION. We will refer to these two inputs as Input A and Input B respectively.

The figure below explains the different DIP switch settings and the maximum pulse rate the high speed input module can count.



Lift here to gain access to the DIP switches.



→ON

Switch number 8 is the top switch and switch number 1 is the bottom switch. Move the switch to the right for the ON position.

FILTER SELECTION	SWITCH SETTING (Switches 6 & 7)
4 milliseconds input A	6 ON
4 milliseconds input B	7 ON
50 microseconds input A	6 OFF
50 microseconds input B	7 OFF

INPUT VOLTAGE LEVEL	SWITCH SETTING (Switches 1 – 4)
24 VDC input A	1 & 2 OFF
24 VDC input B	3 & 4 OFF
12 VDC input A	1 ON & 2 OFF
12 VDC input B	3 ON & 4 OFF
5 VDC input A	1 OFF & 2 ON
5 VDC input B	3 OFF & 4 ON

Maximum Pulse Rate		
HSI Modules Connected	Highest Single Frequency (Khz)	Highest Total Frequency (Khz)
1	5	5
2	4	5
3	3	5
4	2	5

Note: If maximum or total frequencies are exceeded, status bit 901-904 will be set ON.

ENCODER / COUNT * FUNCTION	SWITCH SETTING (Switch 8)
Count	8 ON
Encoder	8 OFF

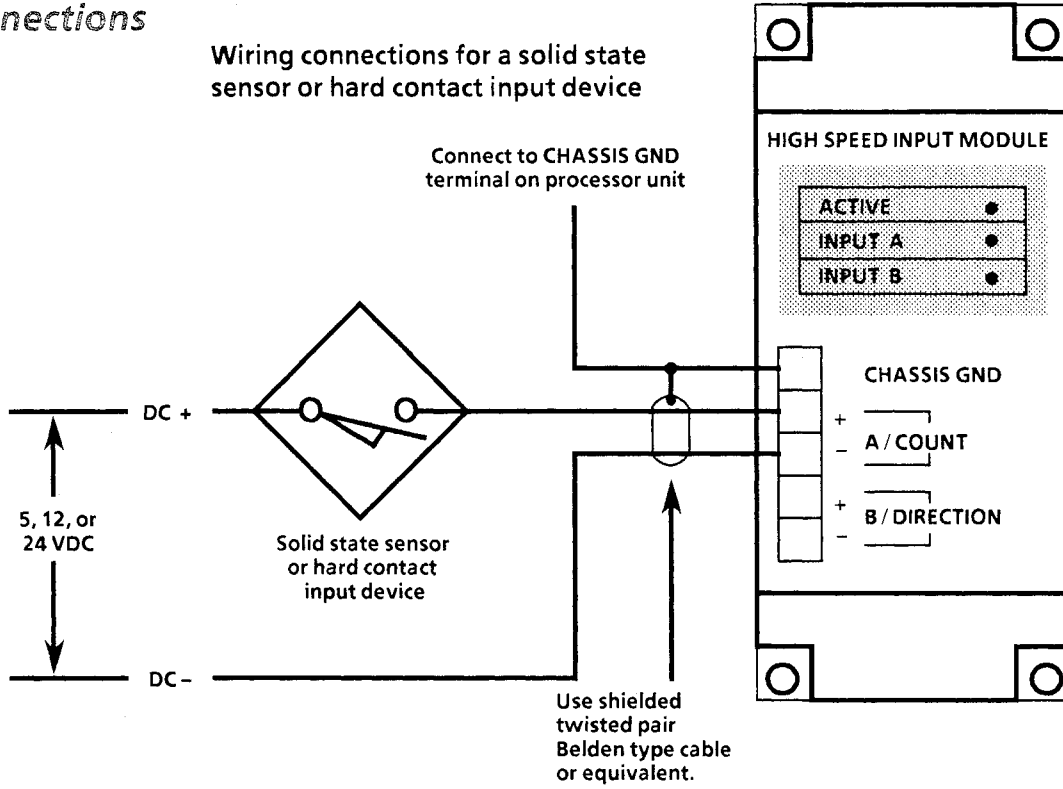
\* Select Count (#8 ON) in order to count high speed input signals received at terminal A/COUNT.  
Select Encoder (#8 OFF) in order to interface to quadrature type encoder.

Note: Switch Number 5 is not used.

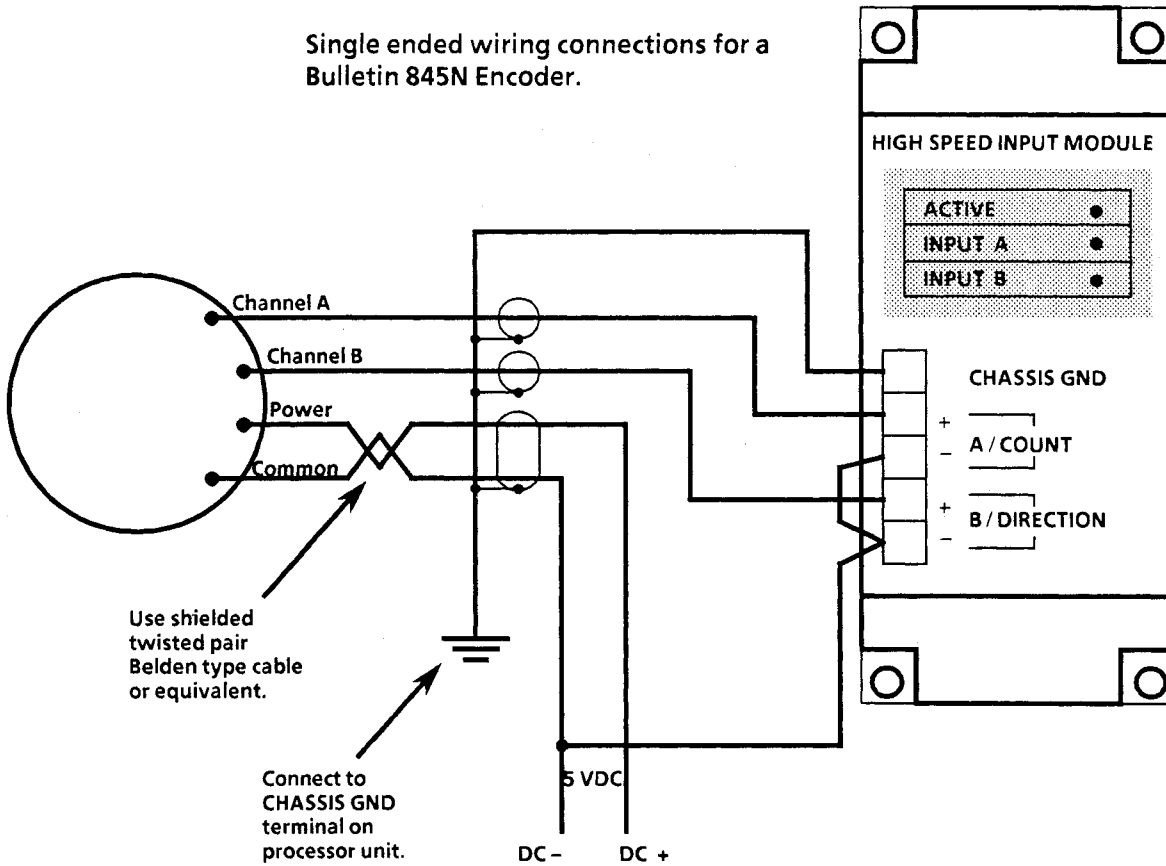
# High Speed Input Module – SLC 150

## Wiring Connections

Wiring connections for a solid state sensor or hard contact input device

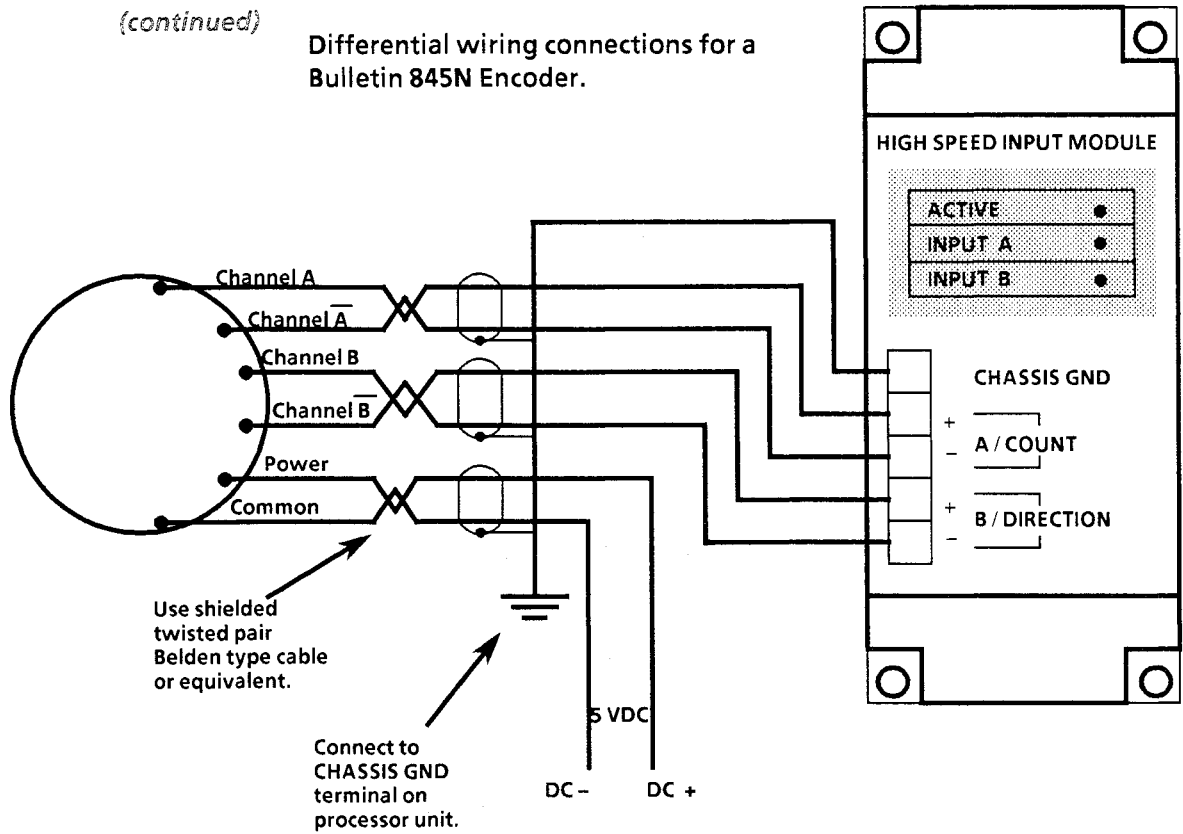


Single ended wiring connections for a Bulletin 845N Encoder.



**Wiring Connections**  
(continued)

Differential wiring connections for a Bulletin 845N Encoder.



## High Speed Input Module – SLC 150

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### Specifications

**ON State Voltage Range:**

5VDC	2-7VDC
12VDC	5-15VDC
24VDC	10-30VDC

**Maximum OFF State Voltage:**

5VDC	0.8VDC
12VDC	2VDC
24VDC	4VDC

**Maximum OFF State Leakage Current:**

1mA (all voltage levels)

**Nominal Input Current:**

5VDC	25mA
12VDC	17mA
24VDC	15mA

**Maximum Turn ON and OFF Time:**

Filter not selected – 50 microseconds  $\pm$  25%  
Filter selected – 4 milliseconds  $\pm$  25%

**Electrical-Optical Isolation:**

1500 volts between input voltage and control logic.

**Noise Immunity:**

NEMA Standard ICS 2-230

**Vibration:**

0.015 inch peak to peak displacement, 2.5g peak (max) acceleration, 1Hr/axis

**Ambient Temperature Rating:**

0°C to 60°C (operating). -40°C to 85°C (storage)

**Humidity Rating:**

5 to 95% (without condensation)

**Wiring:**

#14 to #24 AWG stranded. 3/64" insulation (max)



**ALLEN-BRADLEY**  
A ROCKWELL INTERNATIONAL COMPANY

**Industrial Control Group**  
Milwaukee, Wisconsin 53204

