RS-485 Pin Descriptions

Hirose Connector DF11-6DP-2DS(24)
Mating Connector
Hirose DF11-6DS-2C

PIN #	DESCRIPTION
1	Y / NON-INVERTING DRIVER OUTPUT
2	Z / INVERTING DRIVER OUTPUT
3	GROUND
4	GROUND
5	A / NON-INVERTING RECEIVER INPUT
6	B / INVERTING RECEIVER INPUT

RS-485 pins are often referred to by their read/write functionality

Y = Rx+

Z = Rx-

A = Tx+

B = Tx-

Encoder Inputs

The IDEA drive is equipped with inputs for a single-ended, Quadrature encoder attached to the motor it drives. Quadrature encoders have 2 output signals, A and B, which are nominally 90 electrical degrees out of phase. On each rising or falling edge, the relative logic levels of the two phases can be used to determine the direction of rotation. The decoder within the drive interprets A leading B as motion in the clockwise direction, as viewed from the front face of the motor. This means that if a rising edge is detected on phase A, and phase B is at a logical high, then the motor just rotated counter-clockwise.

The IDEA drive watches for and rising and falling transitions on phase A, and increments or decrements the position counter accordingly. Using this method, a 1000 line optical rotary encoder would have 2000 counts per revolution, and a change in position would be detected every 0.18º.

The IDEA drive line of products can be configured to use the encoder feedback in a number of ways. For further detail on the encoder functions available, please see the IDEA Drive user's manual, available at idea-drive.com.

Encoder Wiring

The encoder connector can be wired to any 2 channel quadrature encoder that operates between 3.3Vdc and 5Vdc. For encoders that work on 5VDC, power to the encoder can be supplied through pin 1 of the encoder connector, otherwise a separate 3.3Vdc power supply is required. Whether or not power is being supplied by the drive, pin 2 must be connected to the same ground as the encoder. This is internally connected to the IDEA drive's ground connection.

Pin 3 is for encoders with an index signal. This may be left unconnected, and is for future revisions which may make use of the index signal.

Pins 4 and 5 are the B and A connections, respectively. When the output shaft of the motor is rotating clockwise as viewed from the front of the motor phase A should lead phase B. Check your encoder's documentation to check if A and B need to be swapped.
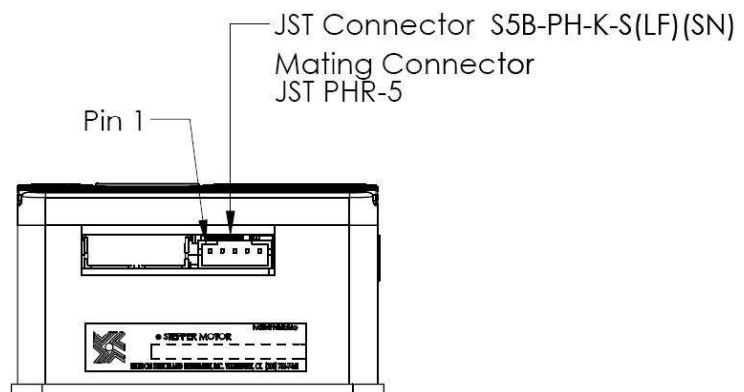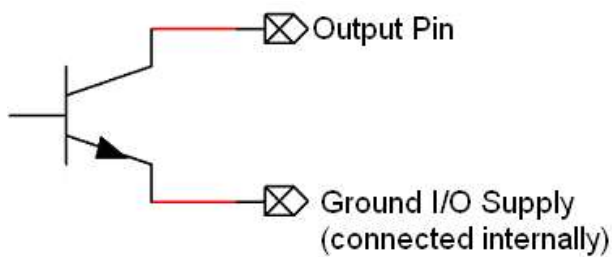

Pin #	Description
1	+5Vdc
2	Ground
3	Index
4	B
5	A

Digital I/O Pin Descriptions
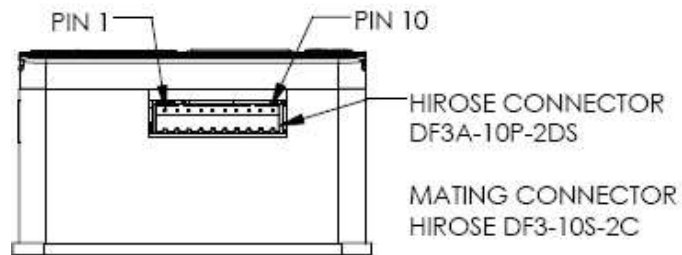
PIN POSITION	DESCRIPTION	NOTES
PIN 1	GROUND I/O SUPPLY	5 TO 24 VDC
PIN 2	+ I/O SUPPLY	5 TO 24 VDC
PIN 3	INPUT 1	
PIN 4	INPUT 2	
PIN 5	INPUT 3	
PIN 6	INPUT 4	
PIN 7	OUTPUT 1	
PIN 8	OUTPUT 2	
PIN 9	OUTPUT 3	
PIN 10	OUTPUT 4	

Open Collector Output Pin Description
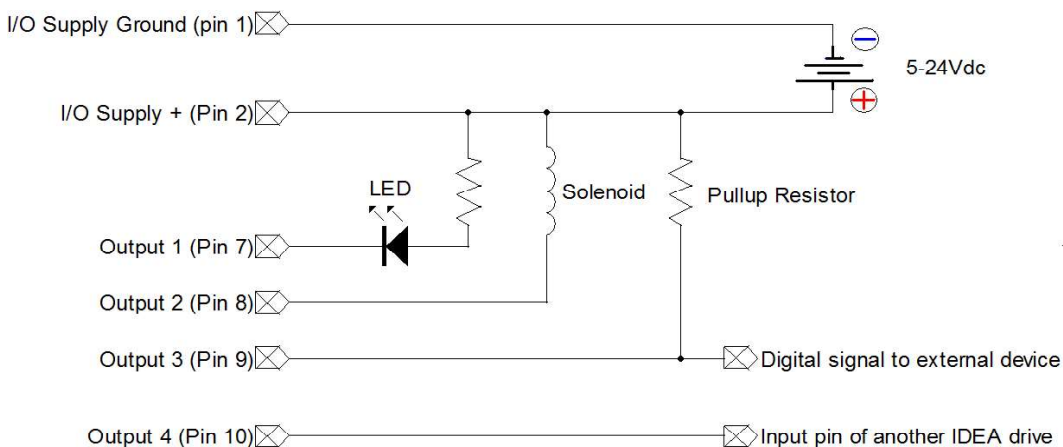

Input Pin Description
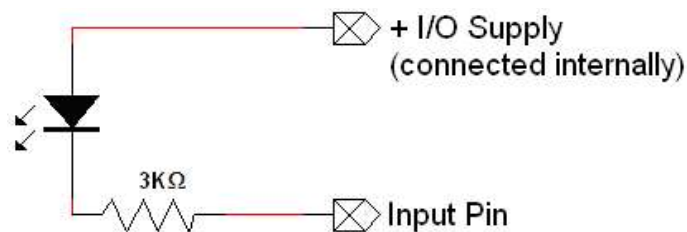
Digital I/O Wiring

The IDEA drive has four optically isolated inputs and four optically isolated open-collector outputs. A power supply is necessary to activate the opto-isolators with a voltage range of 5-24VDC. As the outputs are open-collector, they will need a pull-up resistor tied to the + I/O supply if a high level voltage is required. The outputs are capable of sinking up to 200mA each.

Note: The inputs can be used in two ways. They can be connected to logic levels that swing between I/O supply ground and + I/O supply, or they can be attached to a switch connected to I/O supply ground. In the second configuration, when the switch is open, the drive will see this as a logic high, when the switch is closed, and the input is connected to I/O supply ground, the drive will see this as a logic low.

Note: When an input is connected to a mechanical switch or relay, a phenomenon called "bounce" can occur. When the switch contact is almost closed, several electrical arcs can form. If an input is being used as an interrupt, each arc will be seen as a rising and falling edge, causing several false interrupts to trigger. Any input being used as an interrupt source should only be attached to solid state devices or a switch with debounce circuitry.

Digital Output Wiring Examples

Digital Input Wiring Examples