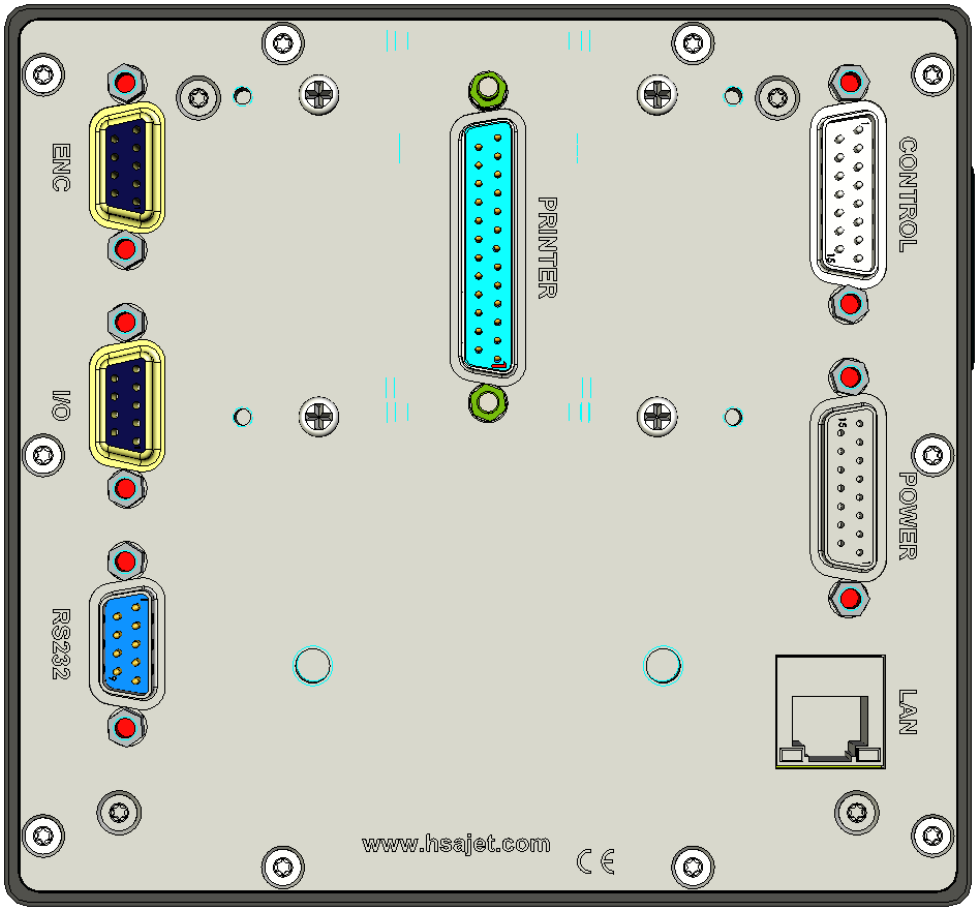
MT/MK Connector Wiring Diagrams

Version: 07-09-2011

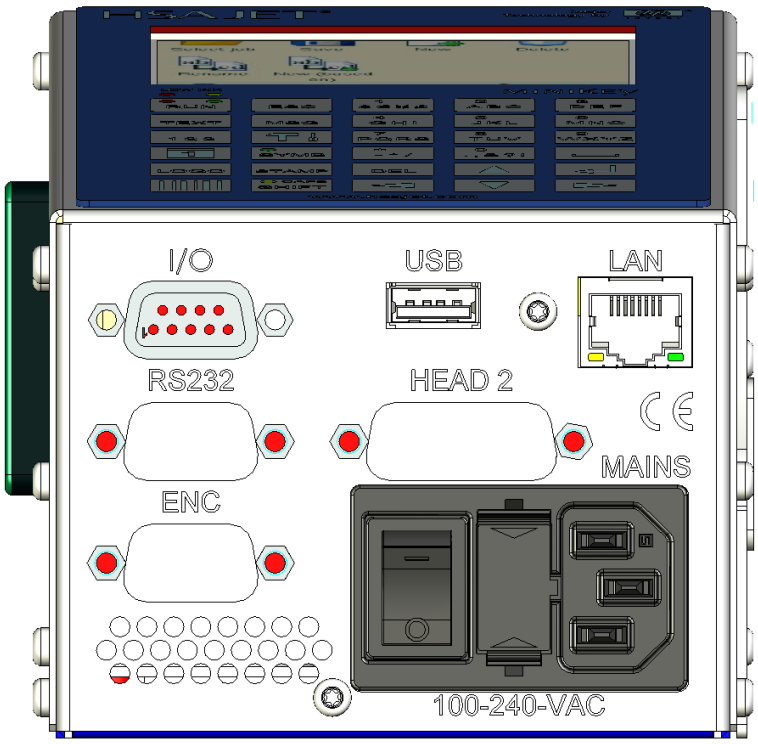
This manual supports: MTHP4 – MKHP2 – MKHP4

Index

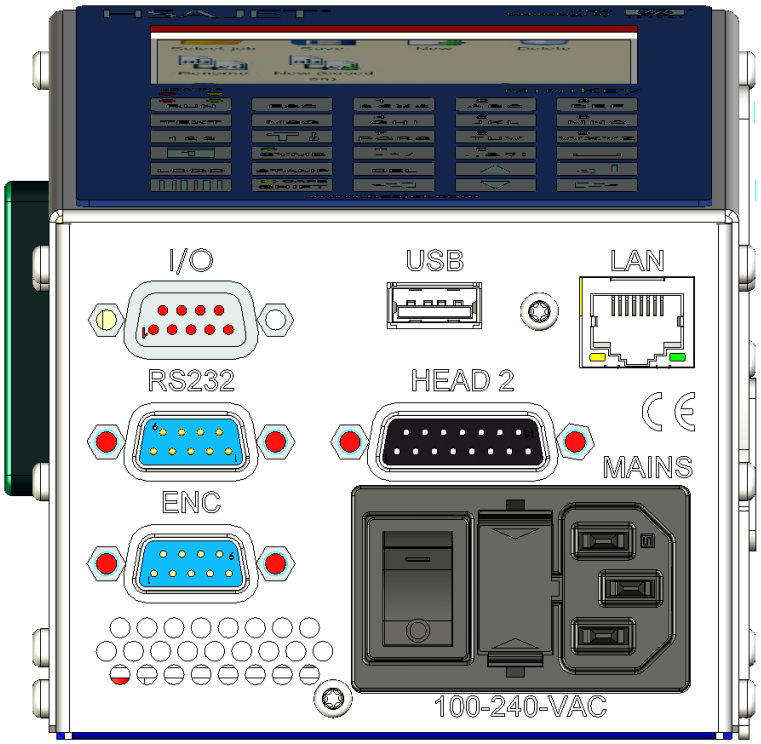
MTHP4 drawing



MKHP2 drawing



MKHP4 drawing



Fuses

MTHP4
The Minitouch controller has 5 fuses all located in the power supply box.
5V fuse is 5x20mm glass 1A T
12V fuse is 5x20mm glass 0,5A T
HV fuse is 5x20mm glass 2A T
Mains fuses are 5x20mm glass 2A T
On the power supply box there is a LED for each fuse, if the LED is off then the fuse is probably broken. If all LEDs are off it might be the mains fuses in the main socket that are broken.
The value of the fuses is related to the power available from the power supply. Use only the same value if you need more power you must use an external power supply.

You can buy the fuses from HSA or locally, if you choose locally make sure you get the right fuses, warranty does not cover replacement of burned PCB's because of wrong fuses.

HSA	Farnell	Mouser
ACEL-Fuse-0,5A-5x20	1123239	504-BK/S506-500-R
ACEL-Fuse-1A-5x20	1123241	504-BK/S506-1-R
ACEL-Fuse-2A-5x20	1123244	504-BK/S506-2-R

MKHP2 – MKHP4
The Minikey controller has 4 fuses, 2 on the outside and 2 on the inside.
On the outside are the mains fuses 5x20mm glass 2A T
The controller can supply external equipment with 5 and 12V DC from the internal power supply.
F1 is the 5V fuse and F2 is the 12V fuse both are 0,5A SMD Fast acting. The value of the fuses is related to the power available from the PCB. Use only 0,5A if you need more power you must use an external power supply.
F1 and F2 are located on the inside of the Minikey right behind the USB connector.

You can buy the fuses from HSA or locally, if you choose locally make sure you get the right fuses, warranty does not cover replacement of burned PCB's because of wrong fuses.

Part number:

HSA	Farnell	Mouser
ACEL-Fuse-0,5A-SMD	9922156	576-0451.500MRL
ACEL-Fuse-2A-5x20	1123244	504-BK/S506-2-R

I/O connector

Main function for this connector is to provide the start signal, to begin print. In the same connector are also additional inputs as well as 2 output signals. It is located on the back of the controller, as a 9-pin female D-SUB connector.

Output 1 = Active low (open collector)

Output 2 = Active low (open collector)

Input 1 = Available

Input 2 = Available

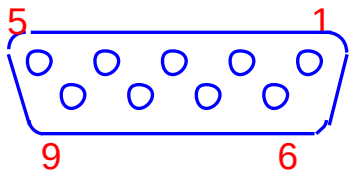
You can use either a simple mechanical switch or a photo cell for the start signal. The I/O connector can supply 5V and 12V DC for the sensor but you can use any sensor in the 3-33V range if you connect an external power source.

You can buy an I/O-ENC test box set from HSA which enables you to test:

- I/O connector - Input 1, Input 2, Output 1, Output 2, Start signal input, 5V and 12V on the I/O connector and an adjustable automatically continuous start signal is available.
- Encoder connector - Enc A & Enc B channels, Low ink, 5V and 12V and an automatically continuous encoder pulse generator is available.

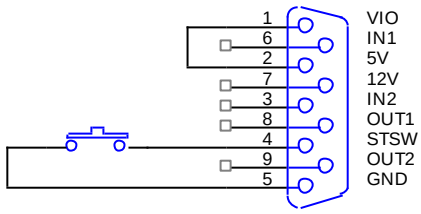
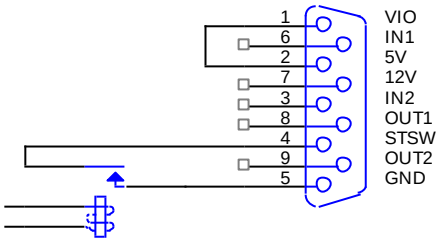
Part number:

HSA	Product category
I/O-ENC test box set	Electric spare parts

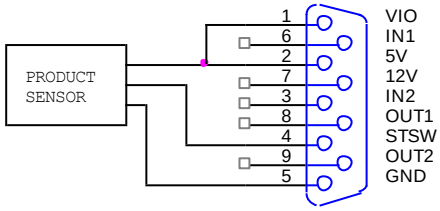
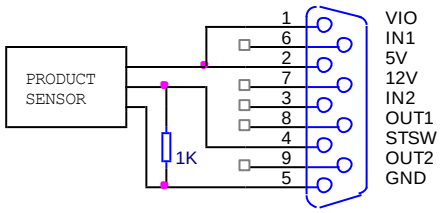


PIN	Description
1	VIO – voltage reference
2	5V
3	Input 2
4	Start signal input
5	GND
6	Input 1
7	12V
8	Output 1
9	Output 2

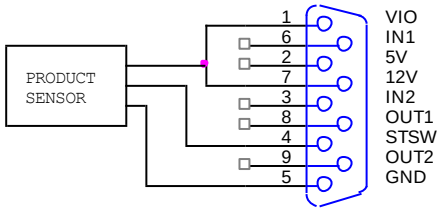
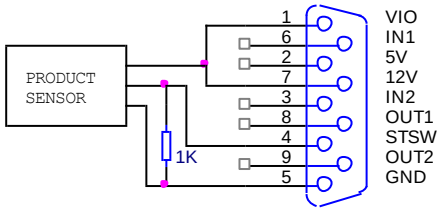
Mechanical start switch

	**Pushbutton** Loop pins 1-2 and connect the switch between pins 4 and 5 N/O contact setup as negative edge trigger N/C contact setup as positive edge trigger
	**Relay** Loop pins 1-2 and connect the switch between pins 4 and 5 N/O contact setup as negative edge trigger N/C contact setup as positive edge trigger

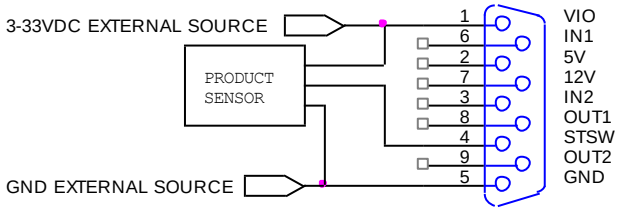
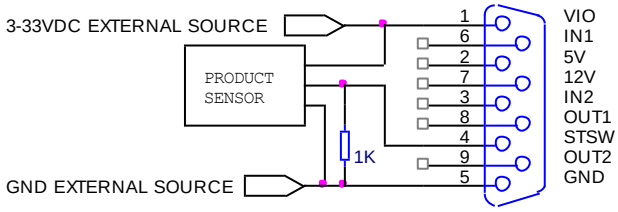
5V DC Sensor

	**5 Volt NPN or PUSH/PULL sensor** VCC to pins 1,2 Signal to pin 4 GND to pin 5
	**5 Volt PNP sensor** VCC to pins 1,2 Signal to pin 4 GND to pin 5 1 K resistor between pin 4 and 5

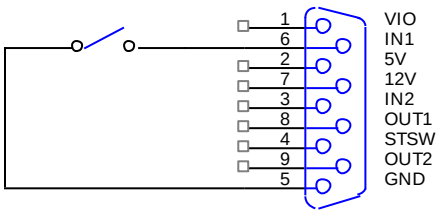
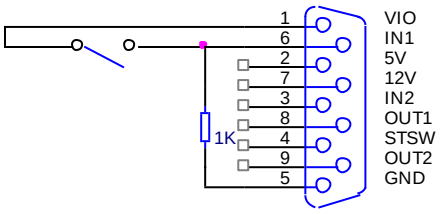
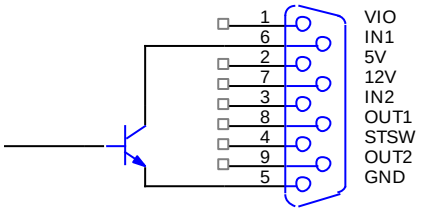
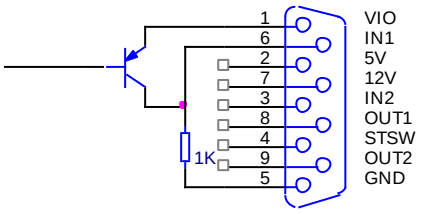
12V DC Sensor

	**12 Volt NPN or PUSH/PULL sensor** VCC to pins 1,7 Signal to pin 4 GND to pin 5
	**12 Volt PNP sensor** VCC to pins 1,7 Signal to pin 4 GND to pin 5 1 K resistor between pin 4 and 5

3-33V DC Sensor with external power source

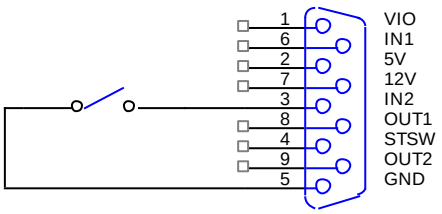
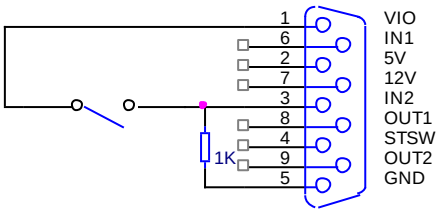
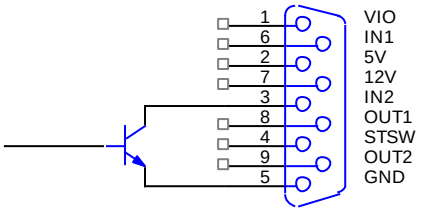
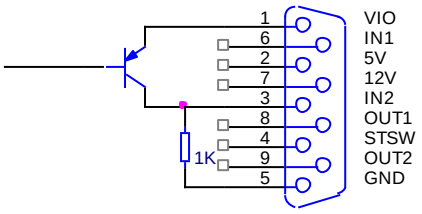
	**NPN or PUSH/PULL sensor** VCC to pin 1 Signal to pin 4 GND to pin 5
	**PNP sensor** VCC to pin 1 Signal to pin 4 GND to pin 5 1 K resistor between pin 4 and 5

Input 1

	**N/O normal open mechanical switch or relay** Connect the switch between pins 6 and 5
	**N/C normal closed mechanical switch or relay** Connect the switch between pins 1 and 6 1 K resistor between pin 6 and 5
	**NPN or PUSH/PULL output trigger** Signal to pin 6 GND to pin 5
	**PNP output trigger** VCC to pin 1 Signal to pin 6 1 K resistor between pin 6 and 5

In the hardware I/O menu on the controller you can choose the function of this input, the options are purge, or start/stop function.

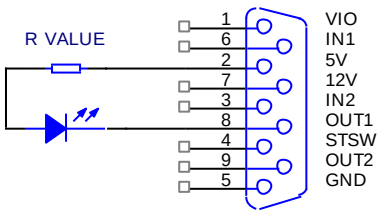
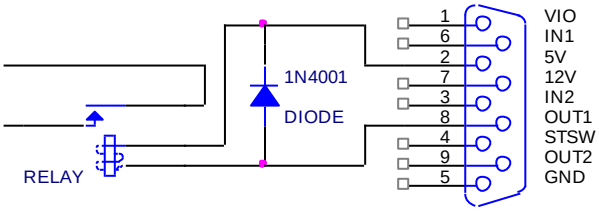
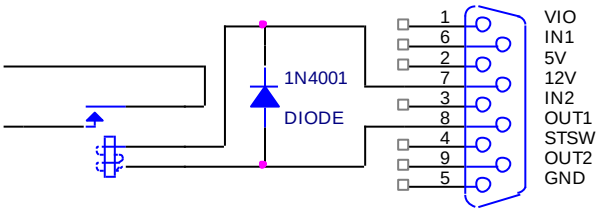
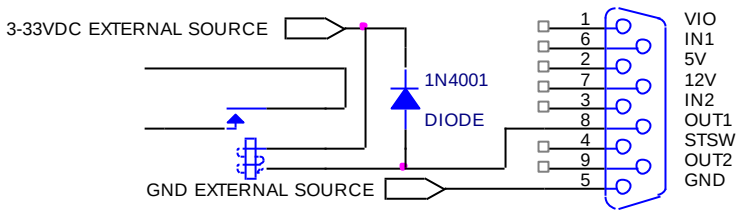
Input 2

	**N/O normal open mechanical switch or relay** Connect the switch between pins 3 and 5
	**N/C normal closed mechanical switch or relay** Connect the switch between pins 1 and 3 1 K resistor between pin 3 and 5
	**NPN or PUSH/PULL output trigger** Signal to pin 3 GND to pin 5
	**PNP output trigger** VCC to pin 1 Signal to pin 3 1 K resistor between pin 3 and 5

In the hardware I/O menu on the controller you can choose the function of this input, the options are purge, or start/stop function.

Output 1 (open collector)

Warning: Do not connect a relay with a higher voltage than the voltage already connected to the VIO pin1 you will damage the unit.

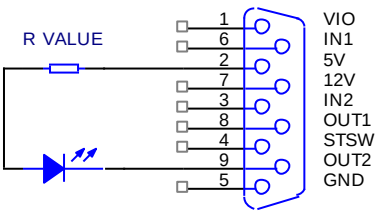
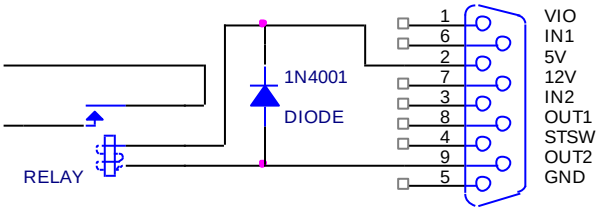
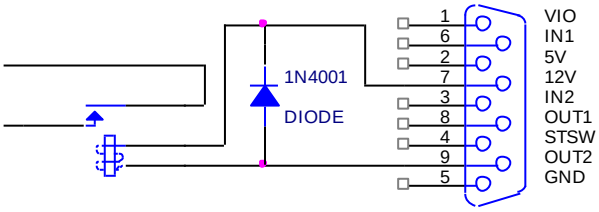
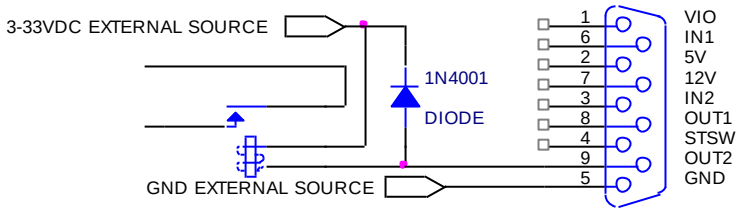
	**LED indicator** Connect the components between pins 2 and 8 The R value can be calculated using the equation below $R = \frac{5 - Ud}{Id}$ Where Ud is diode voltage and Id is diode current
	**5V DC relay** Connect the relay coil between pins 2 and 8 Some relays have a built in diode, if not please also mount the protection diode on the coil connections.
	**12V DC relay** Connect the relay coil between pins 7 and 8 Some relays have a built in diode, if not please also mount the protection diode on the coil connections.
	**3-33V DC relay with external power source** Connect the relay coil between external VCC and pin 8 Connect external GND to pin 5 Some relays have a built in diode, if not please also mount the protection diode on the coil connections.

Warning: Do not connect a relay with a higher voltage than the voltage already connected to the VIO pin1 you will damage the unit.

In the hardware I/O menu on the controller you can choose the function of this output, the options are print message signal, low ink warning and overheating warning.

Output 2 (open collector)

Warning: Do not connect a relay with a higher voltage than the voltage already connected to the VIO pin1 you will damage the unit.

	**LED indicator** Connect the components between pins 2 and 9 The R value can be calculated using the equation below $R = \frac{5 - Ud}{Id}$ Where Ud is diode voltage and Id is diode current
	**5V DC relay** Connect the relay coil between pins 2 and 9 Some relays have a built in diode, if not please also mount the protection diode on the coil connections.
	**12V DC relay** Connect the relay coil between pins 7 and 9 Some relays have a built in diode, if not please also mount the protection diode on the coil connections.
	**3-33V DC relay with external power source** Connect the relay coil between external VCC and pin 9 Connect external GND to pin 5 Some relays have a built in diode, if not please also mount the protection diode on the coil connections.

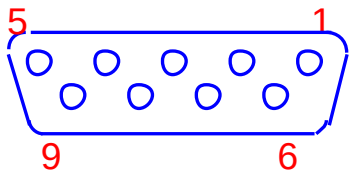
Warning: Do not connect a relay with a higher voltage than the voltage already connected to the VIO pin1 you will damage the unit.

In the hardware I/O menu on the controller you can choose the function of this output, the options are print message signal, low ink warning and overheating warning.

Encoder connector

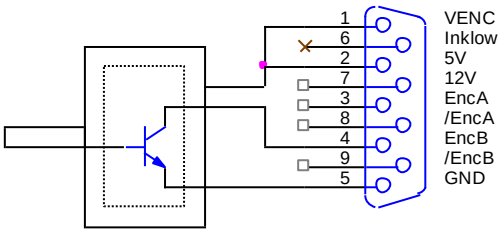
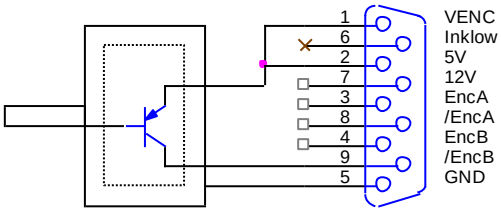
This connector is where the signals for the encoder are coming in. It is located on the back of the controller, as a 9-pin female D-SUB connector.

The encoder connector can supply 5V and 12V DC for the encoder but you can use any encoder in the 3-33V range if you connect an external power source.

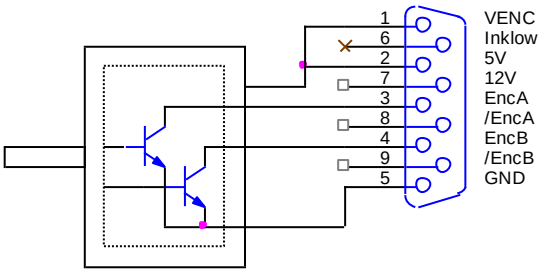
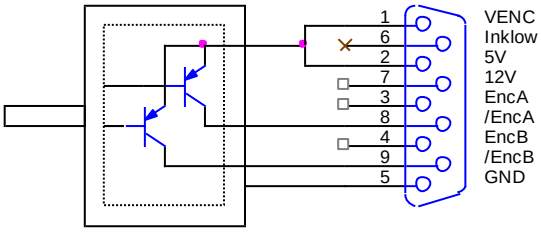


PIN	Description
1	VENC – voltage reference
2	5V
3	Encoder A
4	Encoder B
5	GND
6	Not used
7	12V
8	/Encoder A (inverted)
9	/Encoder B (inverted)

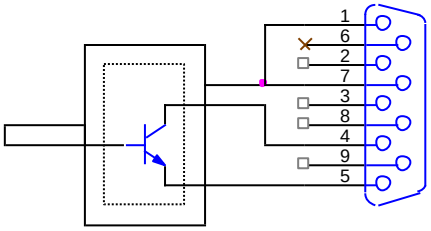
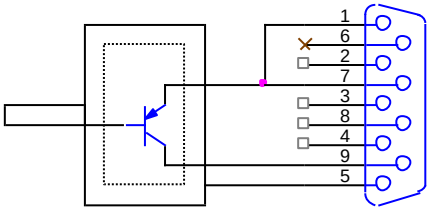
5V DC Encoder single channel

	**5V DC NPN or PUSH/PULL** VCC to pins 1, 2 Signal to pin 4 GND to pin 5
	**5V DC PNP** VCC to pins 1, 2 Signal to pin 9 GND to pin 5

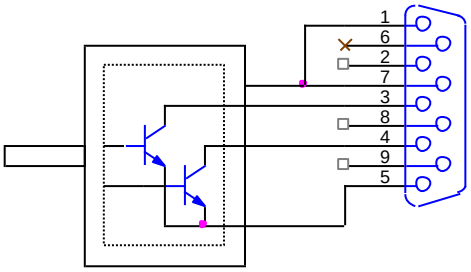
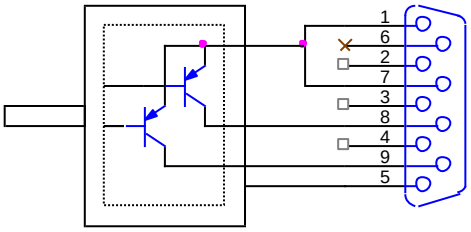
5V DC Encoder dual channel

	**5V DC NPN or PUSH/PULL** VCC to pins 1, 2 Signals to pins 3, 4 GND to pin 5
	**5V DC PNP** VCC to pins 1, 2 Signals to pins 8, 9 GND to pin 5

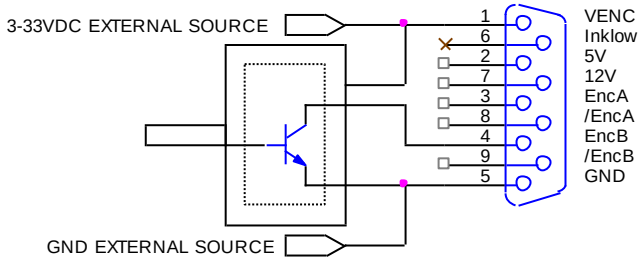
12V DC Encoder single channel

	**12V DC NPN or PUSH/PULL** VCC to pins 1, 7 Signal to pin 4 GND to pin 5
	**12V DC PNP** VCC to pins 1, 7 Signal to pin 9 GND to pin 5

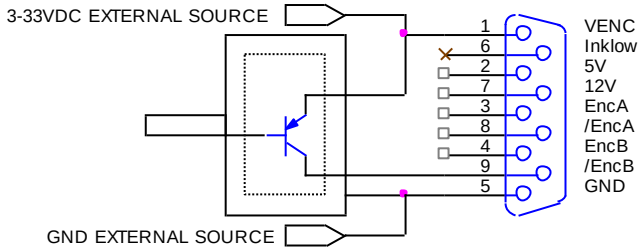
12V DC Encoder dual channel

	**12V DC NPN or PUSH/PULL** VCC to pins 1, 7 Signals to pins 3, 4 GND to pin 5
	**12V DC PNP** VCC to pins 1, 7 Signals to pins 8, 9 GND to pin 5

3-33V DC Encoder with external power source single channel

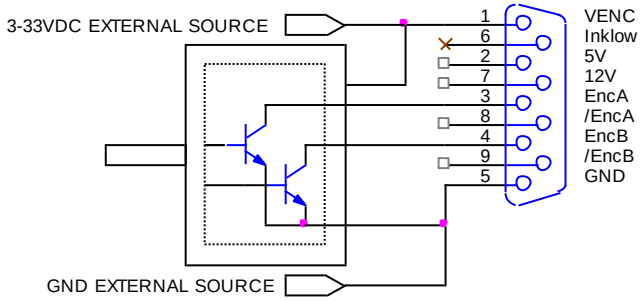


3-33V DC NPN or PUSH/PULL with external power source
VCC to pin 1
Signal to pin 4
GND to pin 5

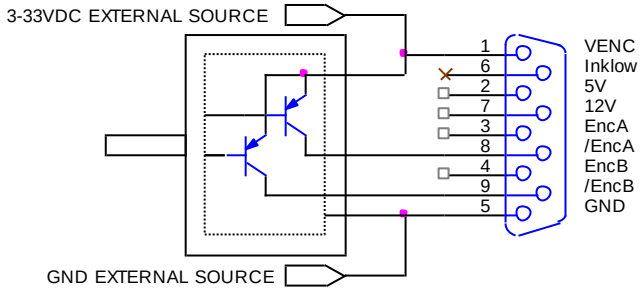


3-33V DC PNP with external power source
VCC to pin 1
Signal to pin 9
GND to pin 5

3-33V DC Encoder with external power source dual channel

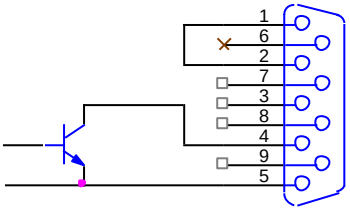
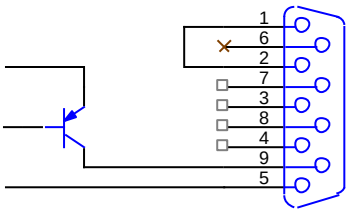


3-33V DC NPN or PUSH/PULL with external power source
VCC to pin 1
Signal to pin 3, 4
GND to pin 5

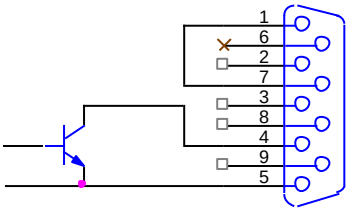
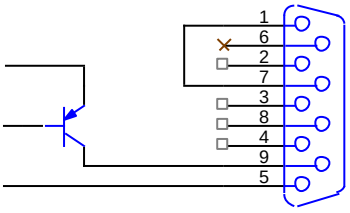


3-33V DC PNP with external power source
VCC to pin 1
Signal to pin 8, 9
GND to pin 5

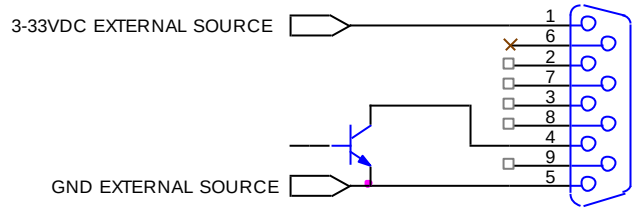
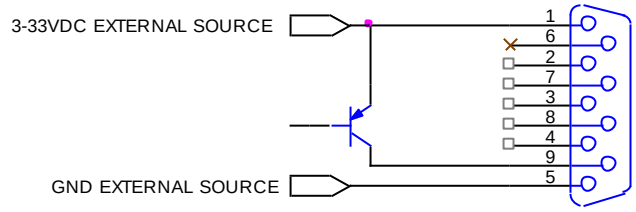
5V DC simulated encoder with external power source

	**5V DC NPN or PUSH/PULL with external power source** Loop pins 1-2 Signal to pin 4 GND to pin 5
	**5V DC PNP with external power source** Loop pins 1-2 Signal to pin 9 GND to pin 5

12V DC simulated encoder with external power source

	**12V DC NPN or PUSH/PULL with external power source** Loop pins 1-7 Signal to pin 4 GND to pin 5
	**12V DC PNP with external power source** Loop pins 1-7 Signal to pin 9 GND to pin 5

3-33V DC simulated encoder with external power source

	**3-33V DC NPN or PUSH/PULL with external power source** VCC to pin 1 Signal to pin 4 GND to pin 5
	**3-33V DC PNP with external power source** VCC to pin 1 Signal to pin 9 GND to pin 5

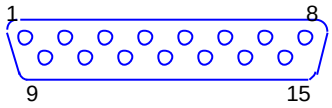
Control1 connector

This connector is an I/O extension for mailing systems and special projects. The controller can support up to 4 outputs and 4 inputs on this connector, the user can select the desired function in the Hardware I/O menu.

Output functions:
Off, print mode, printing, low ink, error, signal generator.

Input functions:
Off, purge, start/stop, print, spit enable.

The control connector can supply 5V and 12V DC for the external devices but you can use any device in the 3-33V range if you connect an external power source. Please note that this connector share power supply and fuses with the I/O and encoder connector

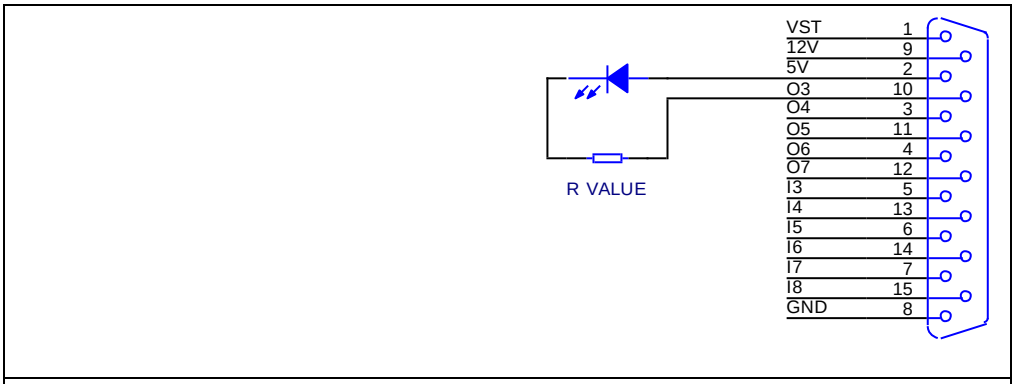


PIN	Description
1	VST – voltage reference
2	5V
3	O4 output
4	O6 output
5	I3 input
6	I5 input
7	I7 input
8	GND
9	12V
10	O3 output
11	O5 output
12	O7 output
13	I4 input
14	I6 input
15	I8 input

Control outputs

The schematics in this manual show how to connect the output called O3. The other outputs on the connector can be connected using O4 as a model, move the wire from O3 to O4-7 the other wires are the same for all outputs.

Warning: Do not connect a relay with a higher voltage than the voltage already connected to the VST pin 1 you will damage the unit. If you do not use the inputs on this connector you must connect VST to the highest voltage supply that you use on this connector.



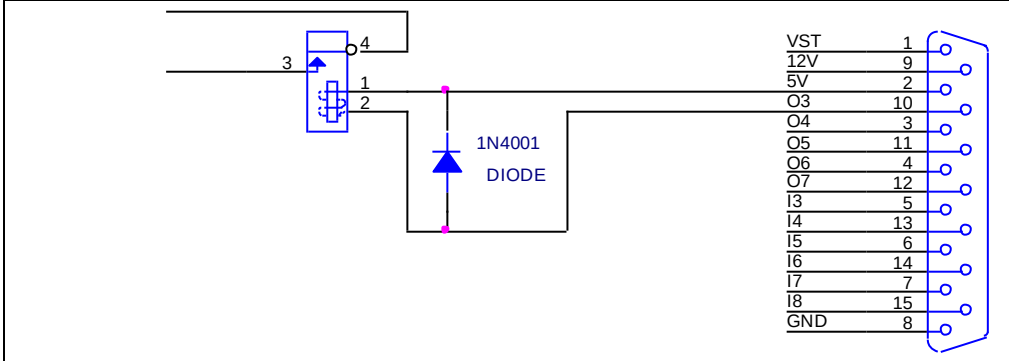
LED indicator

Connect the components between pins 2 and 10

The R value can be calculated using the equation below

$$R = \frac{5 - Ud}{Id}$$

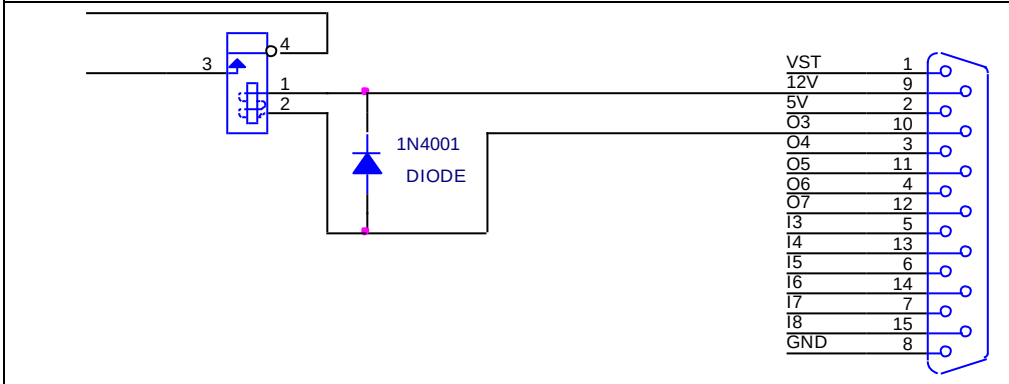
Where Ud is diode voltage and Id is diode current



5V DC relay

Connect the relay coil between pins 2 and 10

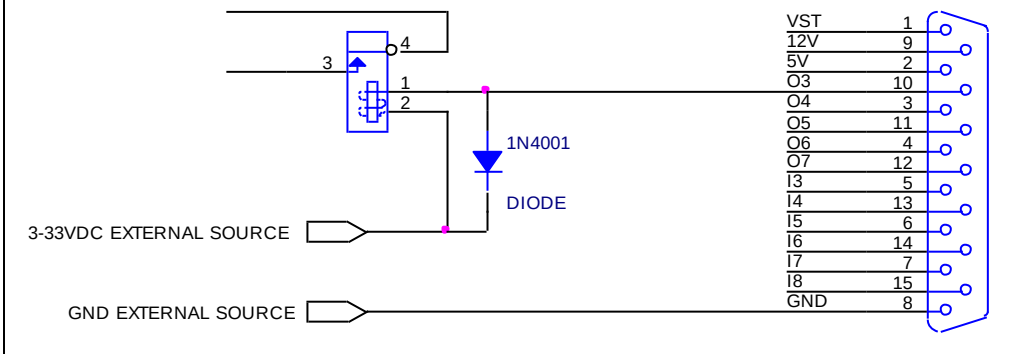
Some relays have a built in diode, if not please also mount the protection diode on the coil connections.



12V DC relay

Connect the relay coil between pins 9 and 10

Some relays have a built in diode, if not please also mount the protection diode on the coil connections.



3-33V DC relay with external power source

Connect the relay coil between external VCC and pin 10

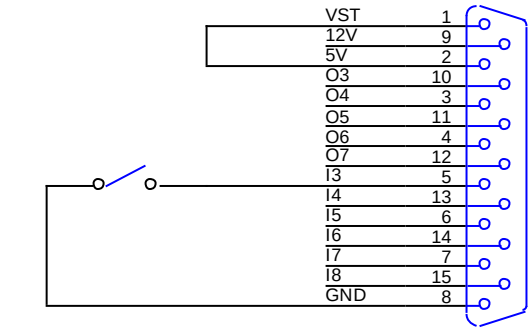
Connect external GND to pin 8

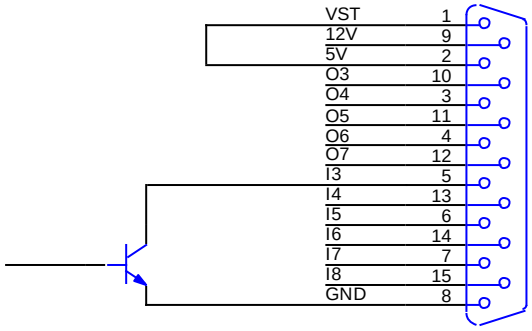
Some relays have a built in diode, if not please also mount the protection diode on the coil connections.

Warning: Do not connect a relay with a higher voltage than the voltage already connected to the VST pin 1 you will damage the unit. If you do not use the inputs on this connector you must connect VST to the highest voltage supply that you use on this connector.

Control inputs

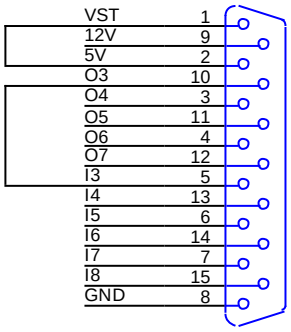
The schematics below show how to connect the input called I3 if you need other inputs on the connector you can just move the wire on I3 to I4-8 the other wires are the same for all inputs.

<table>
<tr>
<td> 
</td>
<td>N/O normal open mechanical switch or relay
Connect the switch between pins 5 and 8
Connect a reference voltage to VST in this example 5V is chosen.

(if you need to use the outputs with a higher voltage than 5 volts you must connect VST to the highest voltage that you use)</td>
</tr>
<tr>
<td></td>
<td>N/C normal closed mechanical switch or relay
You cannot use a relay of this type on this input</td>
</tr>
<tr>
<td> 
</td>
<td>NPN output trigger
Connect a reference voltage to VST in this example 5V is chosen.
Signal to pin 5
GND to pin 8</td>
</tr>
<tr>
<td></td>
<td>PNP output trigger
There is no standard option for PNP on this input. If you cannot use one of the options above you can contact support for more information.</td>
</tr>
</table>

Warning: If you need to use the outputs with a higher voltage than 5 volts you must connect VST to the highest voltage that you use.

Control output configured as signal generator triggering print

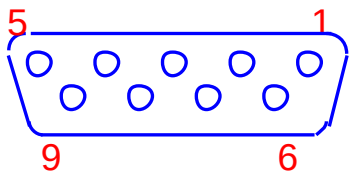
<table>
<tr>
<td> 
</td>
<td>Loop configuration
Make a loop from 5V to VST pins 1 and 2
Make a loop from the output to the input that you wish to control. In this example O3 controls I3. Loop pins 10 and 5

(if you need to use the outputs with a higher voltage than 5 volts you must connect VST to the highest voltage that you use)</td>
</tr>
</table>

RS-232 connector

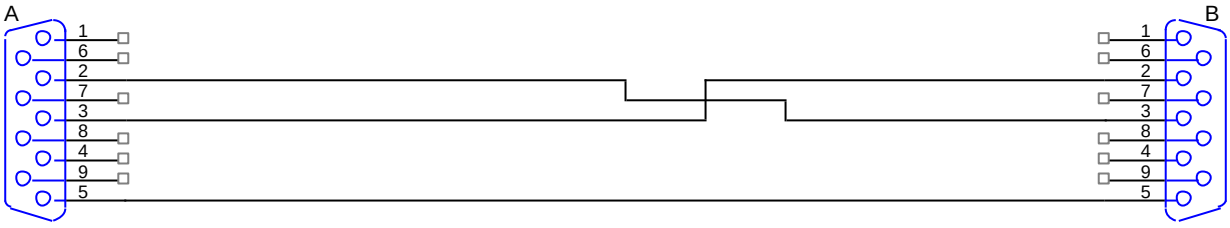
This connector is used for remote communication with the TIPC15, this section will tell you how to connect the wires, please see the remote communication manual for port setup and commands.

The connector is 9 pin Male, and the pins are configured as master. If you wish to connect from a standard PC com port you must use a crossed cable.



PIN	Description
1	
2	Rx
3	Tx
4	
5	GND
6	
7	
8	
9	

Crossed cable
Connector A pin 5 is connected to connector B pin 5
Connector A pin 2 is connected to connector B pin 3
Connector A pin 3 is connected to connector B pin 2



Support

For support please contact your local distributor or HSA Systems customer service

E-mail: techsupport@hsasystems.com

Phone: +45 66 10 34 01