TIPC15
Technical Manual
ENGLISH

Version: 19 September 2011
By: Torben Dam Jensen

Introduction

Thank you for purchasing the TIPC15 controller. You have an advanced print controller mounted with almost endless possibilities.

This document will instruct you how to get started with and install the TIPC15 controller.

For additional documentation you are recommended to study:

Manual	Description
Windows documentation	How to use Windows XP, navigate menus, change settings etc. This manual details certain settings but not generally how to use Windows.
INKdraw documentation	How to use the supplied software, INKdraw, in order to print messages
Printer installation manual	How to install and start up the print system you have with the controller

Notice

This documentation is written for distributors and integrators of HSA Systems products.
It is not generally meant for the end user.

EC Declaration of Conformity

Manufacturer:

Company Name:	HSA Systems ApS
Address:	Mileparken 16 DK 2740 Skovlunde Denmark
Tel	+45 44 94 02 22
Fax	+45 44 94 03 33

hereby declare that

Product

No.	TIPC15
Name:	TIPC15-XJ128, TIPC15-XJ500, TIPC15-HP, TIPC15-HP-P
Year:	2010

- is in conformity with

- COUNCIL DIRECTIVE of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (89/336/EEC)

- COUNCIL DIRECTIVE of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (73/23/EEC)

was manufactured in conformity with the following national standards that implements a harmonised standard:

EN 50081-1
: Electromagnetic compability - generic emission standard. Part 1: Residential, commercial and light industry.

EN 50081-2
: Electromagnetic compability - generic emission standard. Part 2: Industrial environment.

EN 50082-1
: Electromagnetic compability - generic immunity standard. Part 1: Residential, commercial and light industry.

EN 50082-2
: Electromagnetic compability - generic immunity standard. Part 2: Industrial environment.

EN 55022
: Limits and methods of measurement of radio disturbance characteristics of information technology equipment.

EN 60555-2
: Disturbances in supply systems caused by household appliances and similar electrical equipment - Part 2: harmonics.

EN 60555-3
: Disturbances in supply systems caused by household appliances and similar electrical equipment - Part 3: voltage fluctuations.

EN 60950
: Safety of information technology equipment including electrical business equipment.

Position: Manager

Company: HSA Systems ApS

Name: Per Sørensen

HSA Systems ApS
Mileparken 16
DK-2740 Skovlunde
+45 4494 0222
www.hsasystems.com

CONTENT

Hardware installation

> This chapter details the mechanical installation of the TIPC15 controller, from you receive the box until the machine is fixed.

Unpacking

Carefully cut open the plastic wrap around your Touch IPC and check that the screen is intact. Also check that there is a Windows XP sticker located next to the connector panel.

You will have received a sheet containing a full "birth certificate" of the controller - complete with serial numbers of all items. Save this sheet for later.

Mechanical Installation

The TIPC15 can be placed on a flat surface (such as a table), but typically it is fixed using the mounted plate in the back. This can be used to fix the machine to either existing brackets, a plan surface, or one of the optional mount kits available from HSA SYSTEMS.

Please refer to reference section for drawings.

Do the following to mount machine:

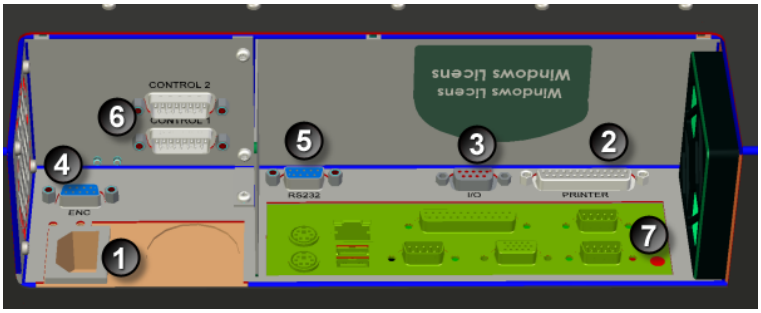
- Remove the supplied mount plate from back using 4 screws (TX10)
- Drill holes if necessary according to drawing, or use a standard bracket system (90x50 / 60x30 / 53x53)
- Mount screws from back of mount plate. The holes are drilled to match DIN 965 M6 flat head screws. See example in drawing section
- Secure mount plate onto installation site. Make sure you have access to mount controller again
- Fix controller to mount plate using 4 screws (TX10) from before

Electrical Installation

The TIPC15 is a standard PC with all the standard connections. In addition to these standard connections, the controller has connectors that are used for printer connections and I/O related to that.

Below is a schematic overview of where you should connect cables to the Touch IPC.

For pinouts please refer to wiring diagram, available separately.



Item	Description	Cable type used
1	Power connection 100-240 VAC	Standard C13 power cord
2	Print head connector	Male/female SUBD 25 1:1
3	I/O connector for start sensor and input/output	Male SUBD 9
4	Encoder	Male SUBD 9
5	RS232 (serial connection to controller board)	Female SUBD 9
6	Control connectors	Female SUBD 15
7	PC connections, various connectors for external screen, keyboard, mouse, USB etc.	

Capability of TIPC15

On the TIPC15 you can connect the following printing equipment:

Equipment Type	Capability
HP	up to 4 pens. This can be as one of the following configurations: Without distributor box Single head 1x1 pen to 1 x 4 pen With distributor box Any combination of heads for a maximum of 4 pens
Xaar 128	Up to 4 XJ128 print engines. This can be single engine printers that are daisy-chained.
Xaar 500	Up to 4 XJ500 printers daisy-chained.

Notice

You must specify the model of Touch IPC you wish to use.
It is not possible to use the same machine for all types of printers.

System Installation

> After mechanical installation, this chapter details the configuration of Windows and INKdraw software

First start of TIPC15 controller

The TIPC15 controller is supplied with Windows XP operating system installed with Service Pack 3 and all available user interface languages.

As this is an OEM version you will not get an installation CD or written documentation on Windows with the machine.

Notice

The controller will start up in US English language mode. This can be changed during first start-up, or any time during use.

The US English mode is necessary to support Multi User Languages environment.

What you will need

First time you start the controller, it will be "factory sealed" and Windows XP will behave as directly after a fresh installation. You will need to prepare the following to complete the installation.

- Have a physical keyboard connected to the machine. You can not complete first start without
- Write down the Windows XP serial number on a piece of paper or refer to the TIPC15 check sheet. It will appear like 5 x 5 characters, like AH7YG-KM24G-...

First start process

When you start the first time, you will have to go through the following:

Accept license agreement

Read and accept the license agreement for using Windows. Select "Agree" and click Next

Select regional options

Here you can select the language options for input, menus and more. You can also select location and time zone.

Please see below for details

Personalize Windows

Input owner and optionally organization for this machine. To complete this step, you need an external keyboard. It is not possible to skip using a touch screen only.

Computer name

Set the name of the computer, og accept the default name

Set date / time and time zone

This may have been completed already in the menu for regional options. Allows you to set the correct date and time, plus time zone for the machine.

After completing these steps, the machine will restart.

Notice

After restart Windows will not be activated. It is necessary to activate Windows before 30 days, or your machine will no longer be usable.

Windows activation can be done over an internet connection or by phone. In both cases, the process is anonymous, and no information apart from the license number is required, even by phone activation.

Notice

For performance reasons, the firewall and automatic update has been disabled on the TIPC.
It is not recommended that you have direct internet access on a Touch IPC used in an production environment. The settings below are for PRINTING need in a factory, NOT for Internet access on a public terminal. Likewise, there are NOT set up any restrictions for the default user account.

If you need direct internet access, please consult a guide on how to secure Windows XP and download Windows update.

Configuring the TIPC15

There are a number of settings you may change according to how your customer will work. The typical settings are described below.

Rotate the screen

The monitor driver allows the screen to be rotated. By default, 0 degrees is “connectors DOWN” while 180 degrees is “connectors UP”.

Calibrate the touch interface

Should the touch interface become inaccurate, you can carry out a manual recalibration. Usually a “standard” calibration is enough.

Procedure:

Click on the icon ”PM” in the lower right corner and choose ”Control Panel”.

Select the single device displayed (PenMount 9000) and select CONFIGURE

Select tab for ”Calibrate” and click ”Standard Calibration”.

Click on the red dots as requested.

It is recommended to use a stylus during this process, for improved accuracy.

In the same menu, there are a number of settings / features related to the touch interface. They will not be described here, but are quite self-explanatory.

International support

By default, English (US) Windows XP is installed on your Touch IPC.

When you wish to customize the Touch IPC for use in a non-English speaking environment, there are 5 points you should consider changing. These are:

- The user interface of Windows itself (menus, dialog boxes etc)
- The default display for dates, month names etc
- The input language (what character set you mainly use)
- The keyboard layout(s).
- The menus in INKdraw (not covered here, please see INKdraw manual)

Change the Windows user interface language

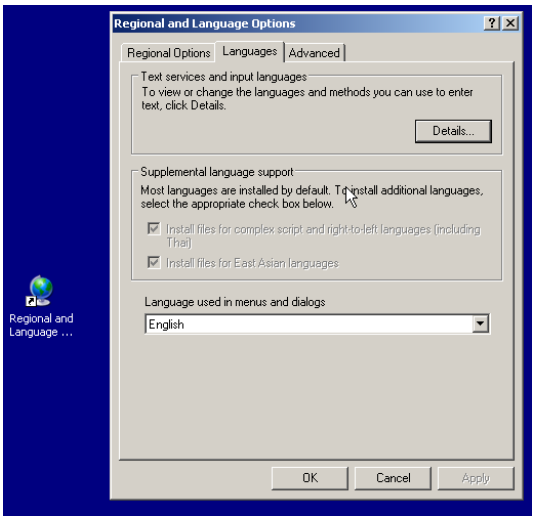
As part of the Windows XP installation, HS Automatic has installed a number of user interface languages. This allows every user on the PC to see Windows in their own, local language. Notice that the language settings of Windows can be done **per user**. So you can have users that have French while others have German – etc.

HS Automatic installs the following languages by default:

English
Danish
Czech
Russian
Greek
Hungarian
Polish
Portugese
Turkish
French
German
Japanese
Arab
Dutch
Italian
Spanish

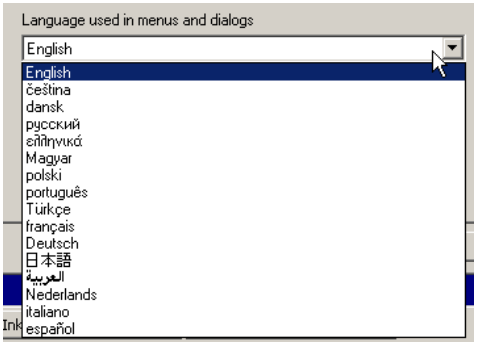
To change the language, select **"Regional and Languages"** icon located on the desktop or from the Control Panel.

The language setting for the desktop and Windows in General is in the second tab "Languages", at the bottom "Menus and Dialogs".



Choose any language from the list, this will be the default Windows language **for this user**.

Notice that you must log out and log in again to activate the new language.



Changing your local language defaults

Although Windows has now been configured to your language of choice you must still tell Windows what your *locale* is. A *locale* defines all the standards for your country, such as

- What month names and days names are
- How to display and format numbers
- How a “short” and “long” date is printed

Notice

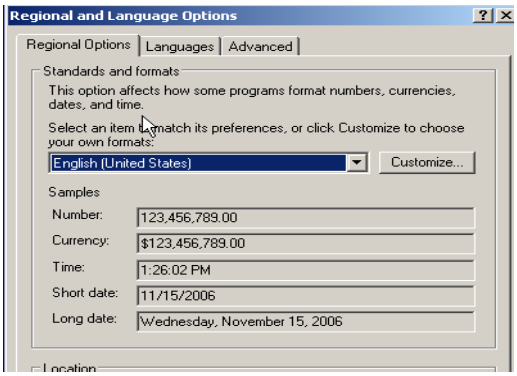
It is important to know that

A *locale* is independent of your setting in “menus and dialogs” above

INKdraw is using the settings from the *locale* to display date and time. You can always overrule this per object in INKdraw, but default is taken from Windows settings.

Locale (Standards and formats) is set in the first tab. You can choose a pre-defined region or customize the existing.

The ”Location” below in this window is only used in Microsoft services and has no relevance for the TIPC15.



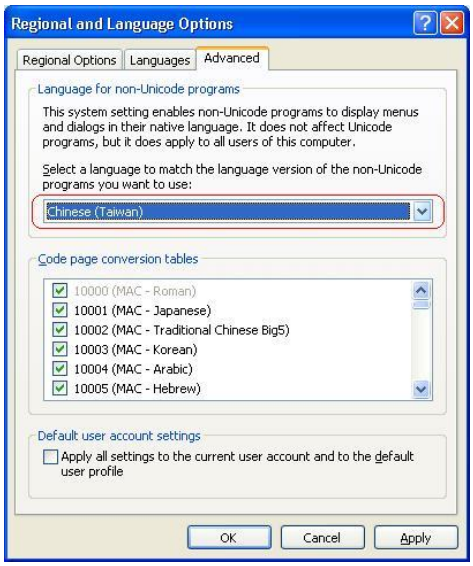
Changing input language for INKdraw

If you wish to work with INKdraw primarily in your local, non-western, language (such as Japanese, Hebrew, Thai, Arab,...) it is important that you change the *Input Language* to the one you use.
This is needed because INKdraw is not Unicode-Compatible, and is a requirement to edit and use databases in non-western languages.
Do so by – again – going into settings for **regional and language.**

On the final tab “Advanced” you can select “Language for non-Unicode programs”.

Choose your input format here.

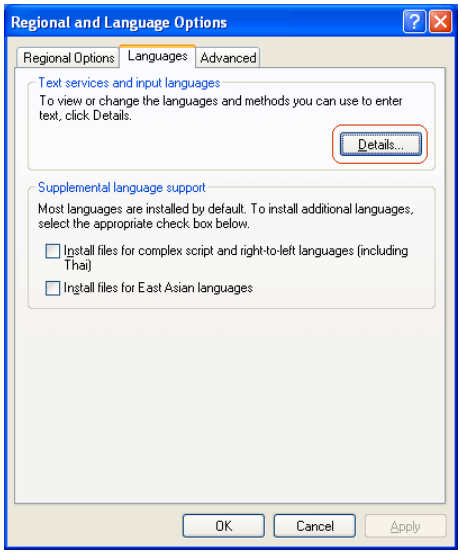
Windows may ask you if you wish to use the files already installed, just answer “Yes” to this.



Keyboard Layout / Input method

Finally, you can add one or more *keyboard layouts (input Method)*.
A keyboard layout decides which characters are input from your keyboard and how. Adding other than your default language here may allow you to input characters that are not otherwise available from your keyboard. HSA SYSTEMS has, as part of the Touch IPC installation, included support for non-western languages. If you select one of these, you will be able to use the Microsoft on-screen keyboard (Microsoft Input Method), by which you can type for example Japanese.

To change the keyboard click "**Details**" in the second tab "Languages".



Under Installed Services, click "Add..."

In the illustration here, there is already support for

US English (default)
French / France
Italian / Italy

In the Add Input Language dialog box, click the input language and keyboard layout or Input Method Editor (IME) you want to add.

Here, a German language with German keyboard is added.

You should now see a language indicator in the System Tray (located at bottom right hand corner of the desktop by default)

NOTE: You can switch between different input methods by pressing the left Alt + Shift keys or the right Alt + Shift keys. You can also have the language indicator appear as a small bar on your screen.

Service

If the hardware fails in your controller this chapter details the parts inside.

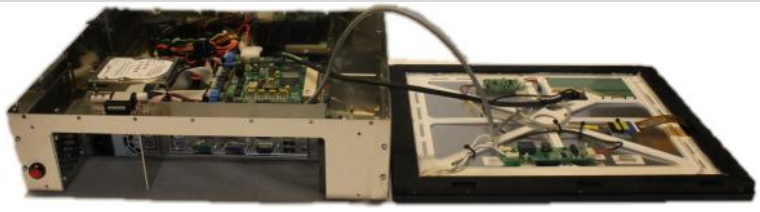
Please notice that any modification inside the controller may void your warranty. Please proceed only if you know what you are doing.

Opening the TIPC15 controller

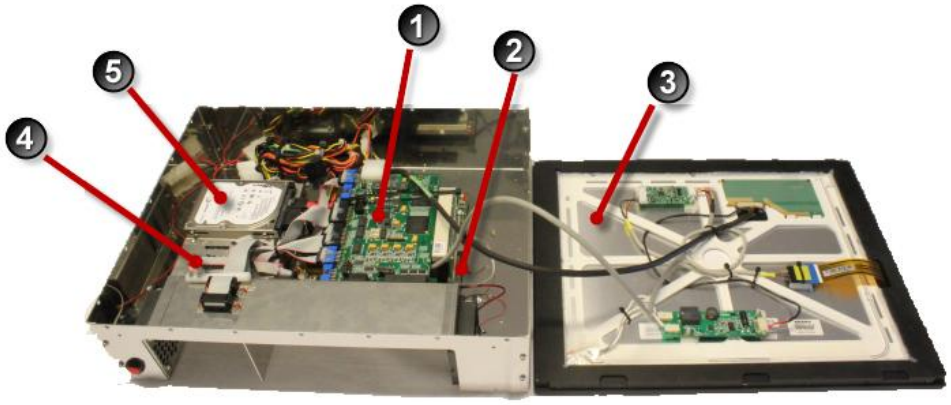
Typically it is not necessary to open your controller, as there are very few user-serviceable parts inside.

If you need to, please consult HSA SYSTEMS before you open your unit.

To open, follow this procedure:

Place the controller on a flat, clean surface and remove the 24 screws holding the screen in place. You need a Torx TX10 screwdriver	
Carefully lift screen in shown direction	
Carefully place touch screen like this on the side of controller. This way no cables are strained. Make sure you have a clean surface below the touch screen, like a cloth, to protect it.	

Once the controller is open, you can see the parts inside. For a complete list of part numbers for replacement, please see below.



Part No	Description
1	Controller board, type CB2 (Xaar) or CBF4 (HP)
2	Motherboard
3	Touch screen with touch surface
4	Power supply
5	Hard drive

Replacement parts

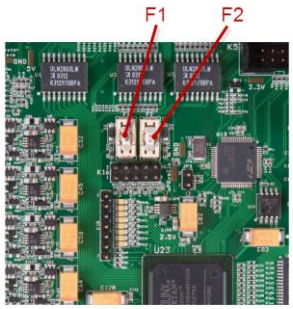
Below is a detailed list of replacement parts for the TIPC15. Notice that it is recommended to have the controller serviced by HSA SYSTEMS only to avoid any malfunction or damage to equipment.

Fuses

The controller board can supply external equipment with 5 and 12V DC from the internal PC power supply.

F1 is the 12V fuse and F2 is the 5V fuse both are 1A SMD Fast acting. The value of the fuses is related to the power available from the PCB. Use only 1A, if you need more power you must use an external power supply.

The fuses are located inside the PC on the top of the controller board.



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.

Supplier	Part Number
HSA SYSTEMS	ACEL-Fuse-1A-SMD
Farnell	9922164
Mouser	576-0451001.MRL

Other replacement parts

In case you need to replace other parts, kindly use these reference numbers.

Notice that there are two different versions of the TIPC15 - a standard and a Pharma version ("Plus")

Part	Part number	Std	Plus/Pharma
Hard drive	TIPC15 HDD SATA 2,5inch 7200RPM	X	X
Screen inverter	TIPC15 Inverter QF99v2.35 (for use between motherboard and LCD)	X	X
LVDS cable	TIPC15 LVDS Cable L24-0917-L060GTV1-**D**(Q) (Cable between motherboard and screen inverter)	X	
LVDS cable	TIPC15 LVDS Cable L24-0917-L060GTV1-**C**(Q) (Cable between motherboard and screen inverter)		X
Motherboard	TIPC15 Motherboard Endat 7105M w/1.5GHz VIA CPU	X	
Motherboard	TIPC15-P Motherboard Endat 4946i w/2GHz Intel Core 2 DuoT7200 CPU		X
PCI Riser	TIPC15 PCIRISER	X	X
Power supply	TIPC15 Power supply ENB-7020B	X	X
Memory	TIPC15 RAM DDR2 533MHZ 1GB	X	
Memory	TIPC15-P RAM DDR2 667MHz 2GB		X

Reference section

> In the references you can find exact specifications of the settings, installed hardware and dimensions of the controller

BIOS settings (Standard version)

Before you begin you have to connect a PS/2 keyboard. You cannot perform this operation without!

Enter the BIOS editor:

Turn on your IPC by pressing the red button on the back. Immediately press the **delete key** on your keyboard. Wait until the BIOS editor is loaded.

Resetting the BIOS:

Select the option: LOAD OPTIMIZED DEFAULTS
And press Y and enter to approve.

Choosing the correct settings:

In STANDARD CMOS FEATURES set the following:
DATE and TIME

HALT ON = NO ERRORS

Press ESC to exit menu

In **ADVANCED BIOS FEATURES** set the following:

FIRST BOOT DEVICE = USB-CDROM

SECOND BOOT DEVICE = HARD DISK

Press ESC to exit menu

In **ADVANCED CHIPSET FEATURES -> AGP & P2P BRIDGE CONTROL** set the following:

SELECT DISPLAY DEVICE = CRT+LCD

Press ESC to exit menu

In **POWER MANAGEMENT SETUP** set the following:

SOFT-OFF BY PWRBTN = DELAY 4 SEC.

Press ESC to exit menu

In **PnP/PCI CONFIGURATIONS** set the following:

PNP OS INSTALLED = YES

Press ESC to exit menu

Closing the editor:

Move the cursor to: **SAVE AND EXIT SETUP** and press enter
Press Y and ENTER to save the new settings.

BIOS settings (Pharma version)

Open BIOS settings

See above

Correct settings

In STANDARD CMOS FEATURES set the following:
DATE and TIME
HALT ON = NO ERRORS
Press ESC to exit menu

In ADVANCED BIOS FEATURES set the following:
FIRST BOOT DEVICE = USB-CDROM
SECOND BOOT DEVICE = HARD DISK
Press ESC to exit menu

In ADVANCED CHIPSET FEATURES -> AGP & P2P BRIDGE CONTROL set the following:
BOOT DISPLAY = CRT+LFP
Press ESC to exit menu

In POWER MANAGEMENT SETUP set the following:
SOFT-OFF BY PWRBTTN = DELAY 4 SEC.
Press ESC to exit menu

Exact model specifications

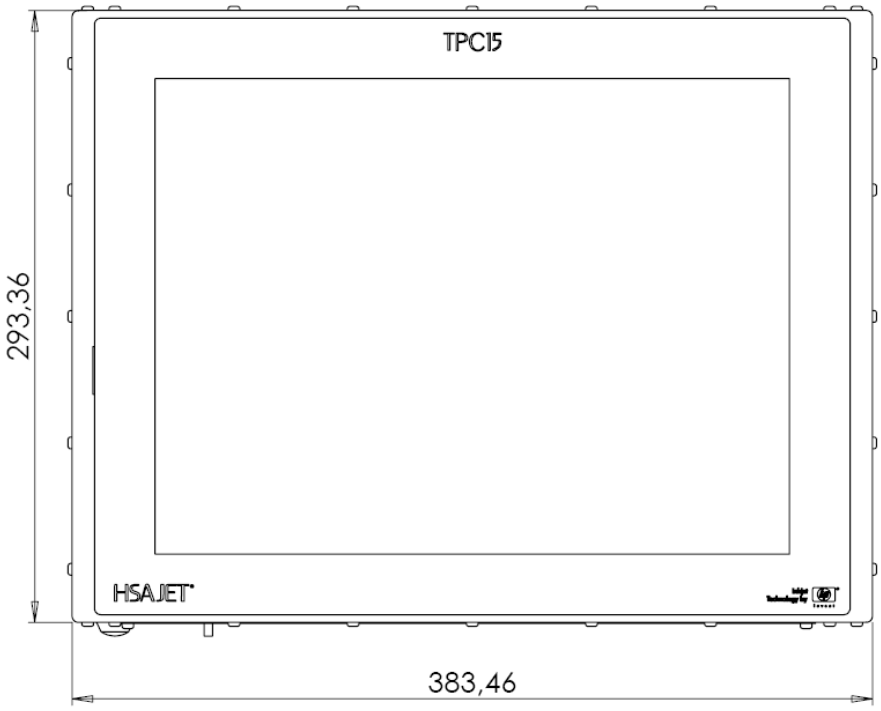
Model	Specification
Standard TIPC15	Motherboard Unicorn ENDAT 7105M VIA C7 1,5GhZ with FAN + LVDS RAM 1 GB DDR2/533 Hard disk 2,5" 7200RPM, connected by SATA
Pharma TIPC15-P	Motherboard Unicorn ENDAT 4946i Intel Core 2 Duo 2GHz T7200 RAM 2 GB DDR2/667 Hard disk 2,5" 7200RPM, connected by SATA

WARNING

If you replace motherboard on the TIPC, it is critical that you put ALL jumpers in the exact same position. Failure to do so may cause your controller to malfunction or fail to work.

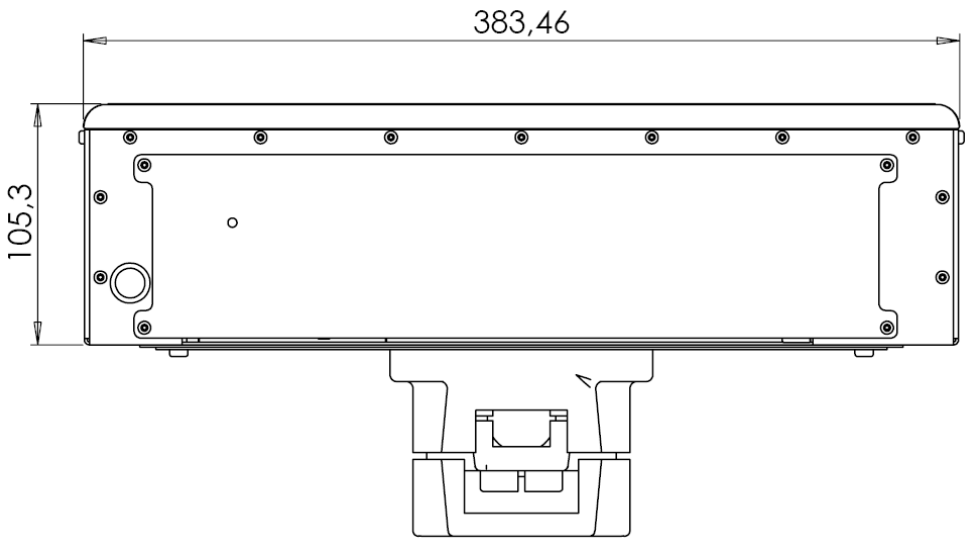
HSA SYSTEMS can supply an overview of jumper settings.

DRAWINGS

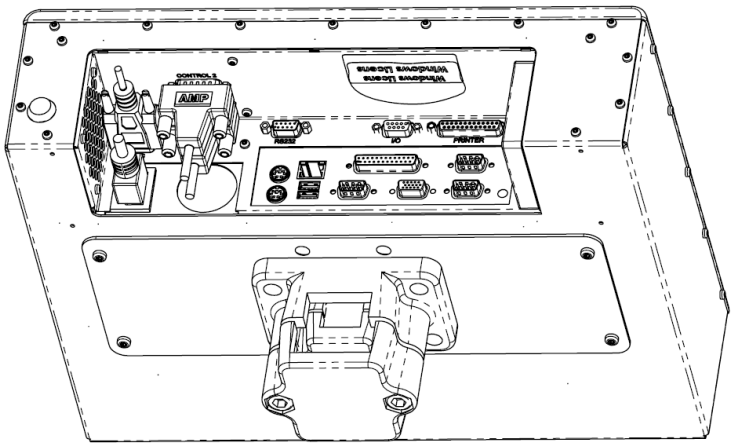


Front of controller (rotation: normal)

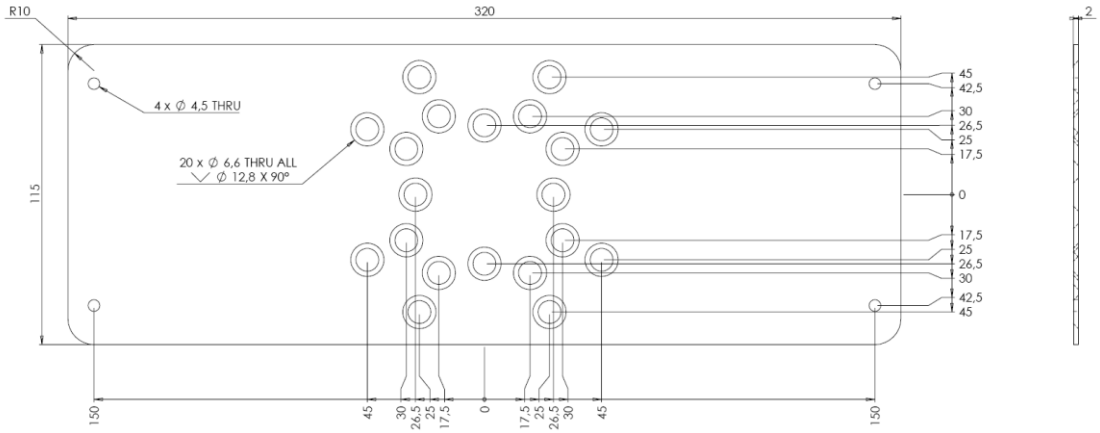
The controller can be mounted at 180 degrees rotation.



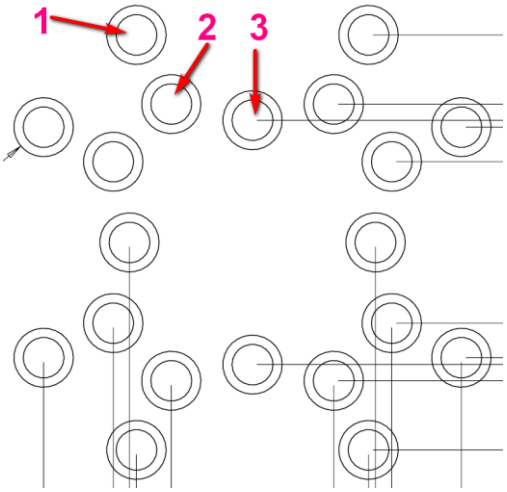
Back of controller, with optional bottom bracket and connector plate mounted.



View of controller with optional bracket (for square tubes) mounted to mount plate.



Bottom mount plate with dimentions



Bottom mount plate holes fits DIN 965 flathead screws

Holes are made for the following brackets:

1: 90 x 50 mm
2: 60 x 30 mm
3: 53 x 53 mm

Wiring Diagrams

Unless you purchase both start sensor and encoder from HSA Systems you will need to wire your own sensor and/or encoder to the supplied SUB-D connectors.

Please follow these wiring diagrams closely, and solder ONLY according to data sheets on the equipment you connect. Failure to connect correctly may damage your equipment.

All pins are numbered, please look closely on connectors for same numbering.

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.

- Output 1 = Active low - print signal / print message signal (open collector)
- Output 2 = Active low - low ink warning / print signal (open collector)
- Input 1 = Purge active low level trigger
- Input 2 = Not used

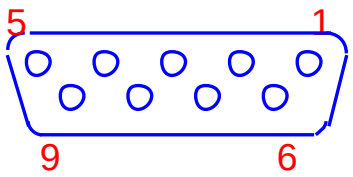
You can use either a simple mechanical switch or a photo cell for the start signal. The I/O connector can supply 5V and 12V DC for the sensor but you can use any sensor in the 3-33V range if you connect an external power source.

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:

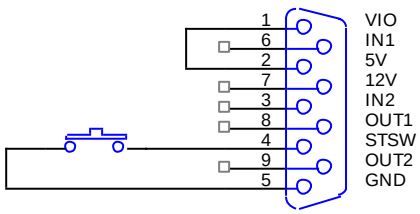
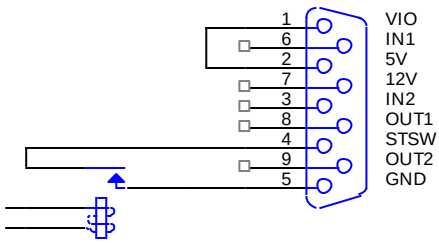
HSA	Product category
I/O-ENC test box set	Electric spare parts



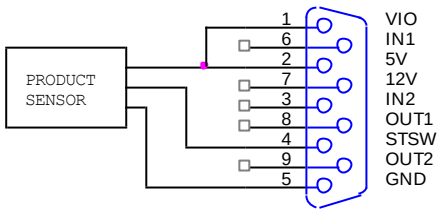
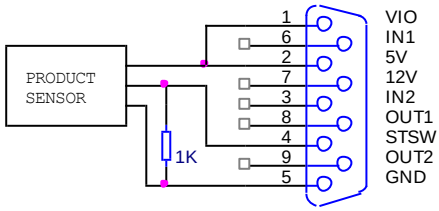
PIN	Description
1	VIO – voltage reference
2	5V
3	Input 2 – Not used
4	Start signal input
5	GND
6	Input 1 – Purge (active low)
7	12V
8	Output 1 - Active low - print/print message signal
9	Output 2 - Active low - ink low warning/print signal

Wiring of start sensor

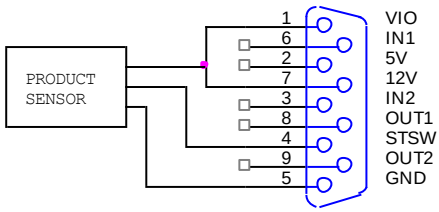
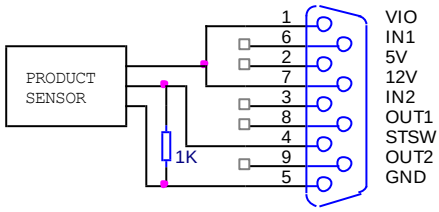
Mechanical start switch

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

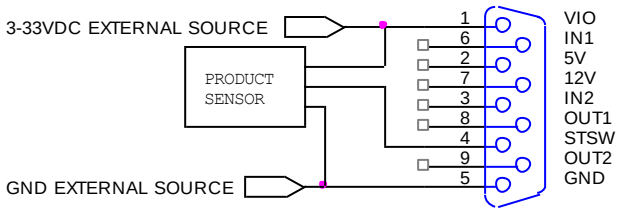
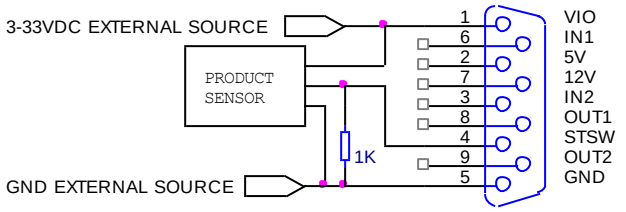
5V DC Sensor

	**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

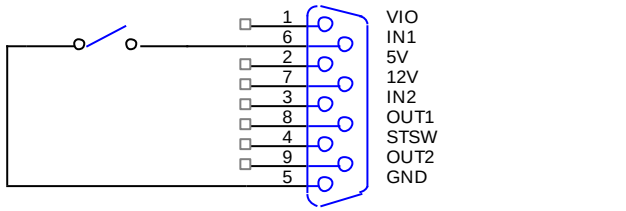
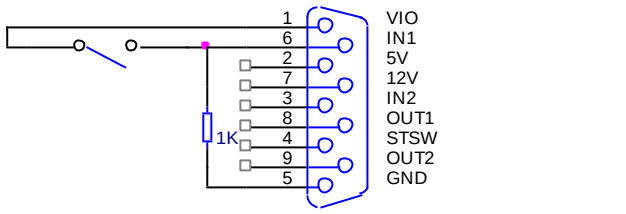
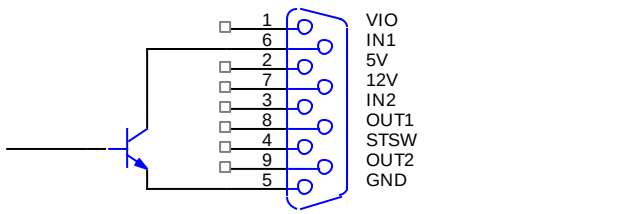
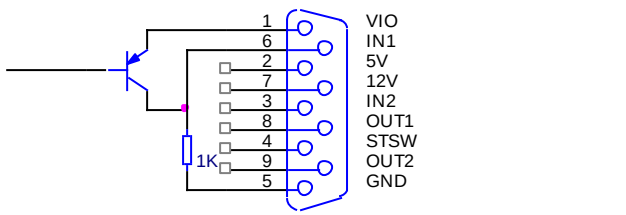
12V DC Sensor

	**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

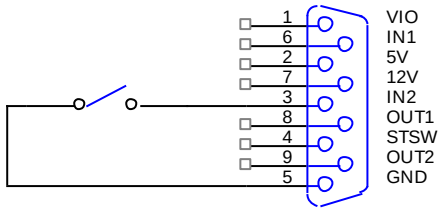
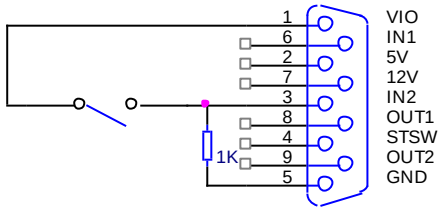
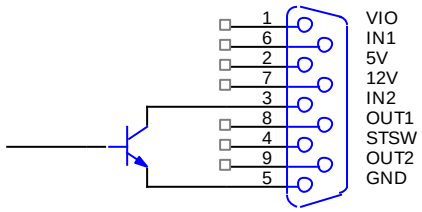
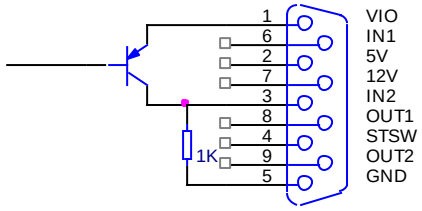
3-33V DC Sensor with external power source

	**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 – Purge active low level trigger

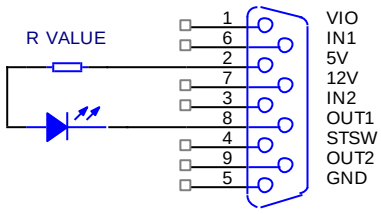
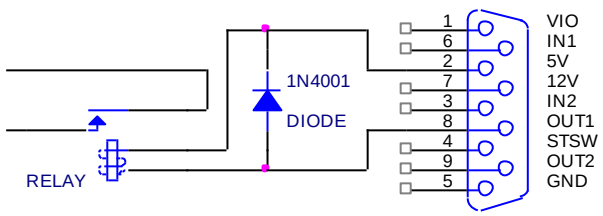
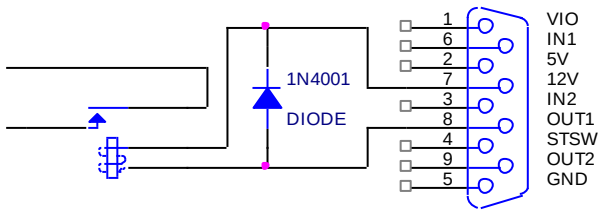
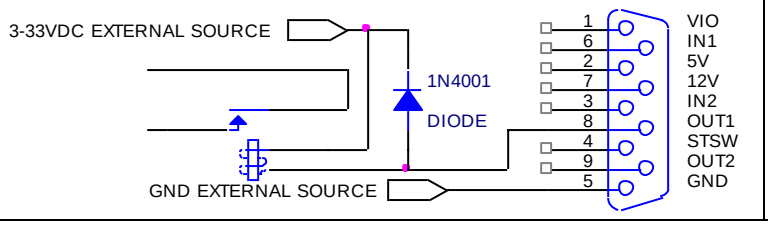
	**N/O normal open mechanical switch or relay** Connect the switch between pins 6 and 5
	**N/C normal closed mechanical switch or relay** Connect the switch between pins 1 and 6 1 K resistor between pin 6 and 5
	**NPN or PUSH/PULL output trigger** Signal to pin 6 GND to pin 5
	**PNP output trigger** VCC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

Input 2 – Not used

	**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

Output 1

Output 1 = Active low print / print message signal (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.

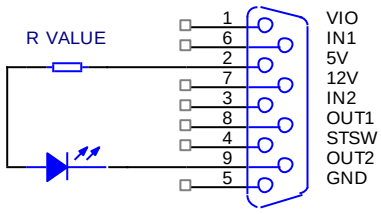
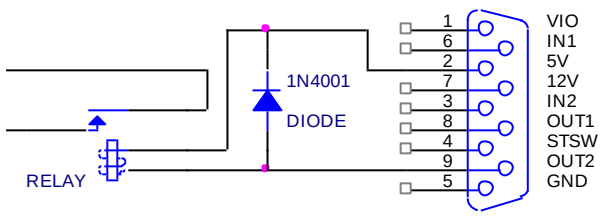
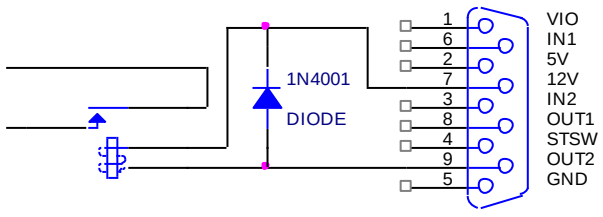
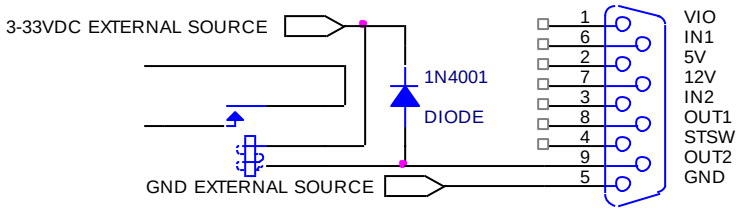
	**LED indicator** Connect the components between pins 2 and 8 The R value can be calculated using the equation below $R = \frac{5 - Ud}{Id}$ Where Ud is diode voltage and Id is diode current
	**5V DC relay** Connect the relay coil between pins 2 and 8 Some relays have a built in diode, if not please 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.

The signal type can be selected in Inkdraw preferences.

Output 2

Output 2 = Active low - low ink warning / print signal (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.

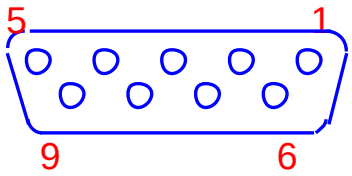
Warning: Do not connect a relay with a higher voltage than the voltage already connected to the VIO pin1 you will damage the unit.

The signal type can be selected in Inkdraw preferences.

Encoder connector

This connector is where the signals for the encoder are coming in. In the same connector is also an additional output signal for low ink level warning on Xaar versions.

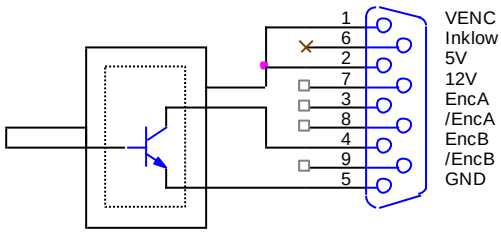
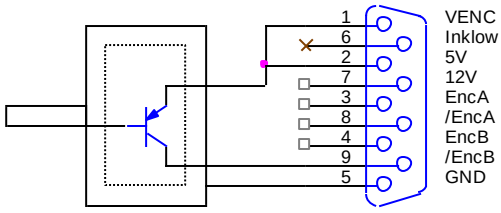
The encoder connector can supply 5V and 12V DC for the encoder but you can use any encoder in the 3-33V range if you connect an external power source.



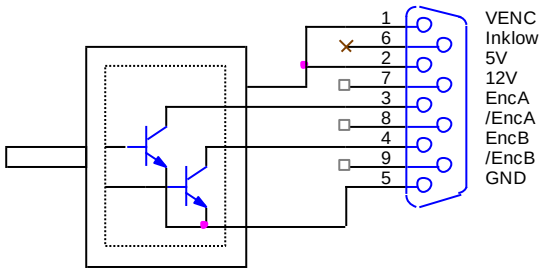
PIN	Description
1	VENC – voltage reference
2	5V
3	Encoder A
4	Encoder B
5	GND
6	Inklow - output
7	12V
8	/Encoder A (inverted)
9	/Encoder B (inverted)

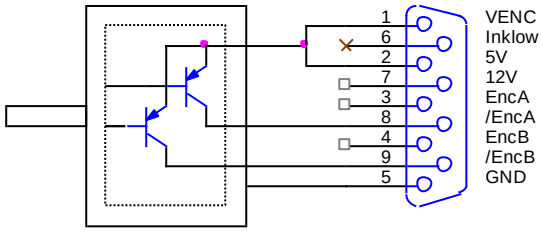
Wiring of Encoder

5V DC Encoder single channel

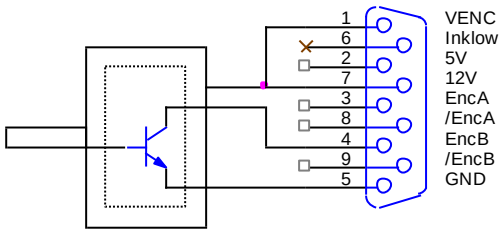
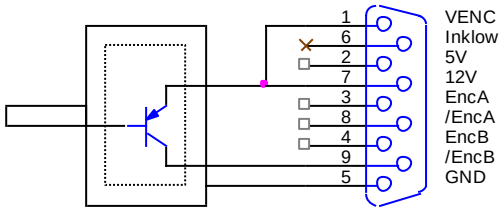
	**5V DC NPN or PUSH/PULL** VCC to pins 1, 2 Signal to pin 4 GND to pin 5
	**5V DC PNP** VCC to pins 1, 2 Signal to pin 9 GND to pin 5

5V DC Encoder dual channel

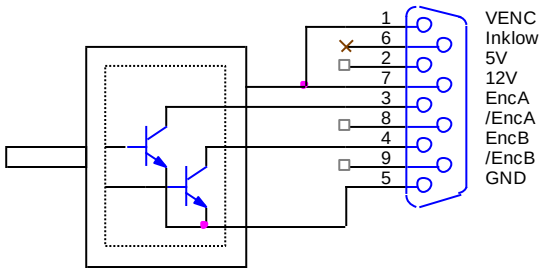
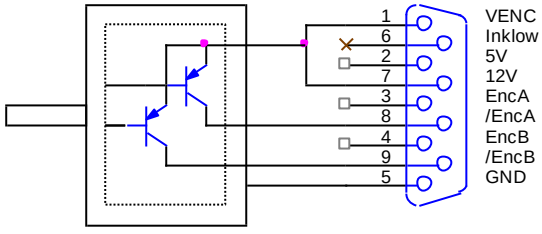
	**5V DC NPN or PUSH/PULL** VCC to pins 1, 2 Signals to pins 3, 4 GND to pin 5

	**5V DC PNP** VCC to pins 1, 2 Signals to pins 8, 9 GND to pin 5

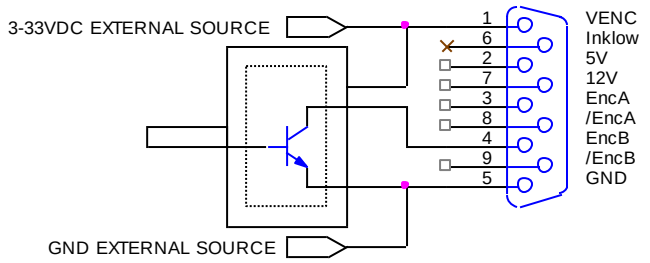
12V DC Encoder single channel

	**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

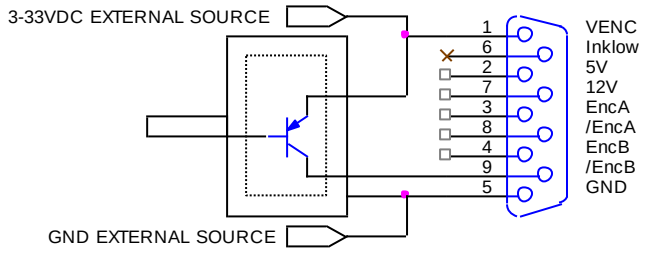
12V DC Encoder dual channel

	**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

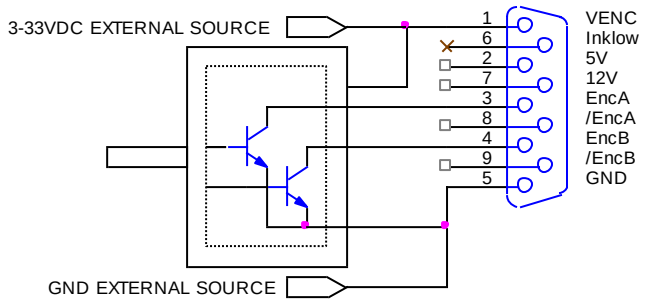


3-33V DC NPN or PUSH/PULL with external power source
VCC to pin 1
Signal to pin 4
GND to pin 5

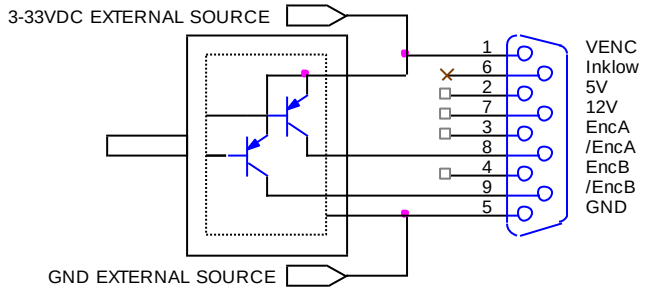


3-33V DC PNP with external power source
VCC to pin 1
Signal to pin 9
GND to pin 5

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

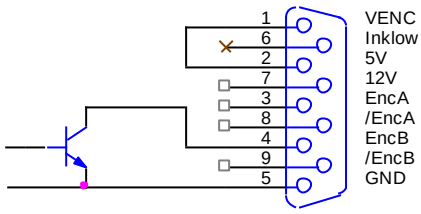
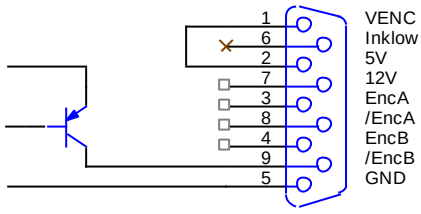


3-33V DC NPN or PUSH/PULL with external power source
VCC to pin 1
Signal to pin 3, 4
GND to pin 5

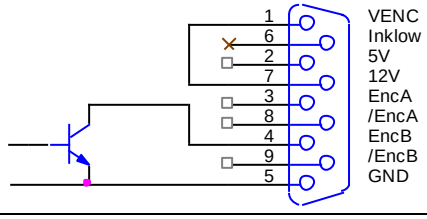
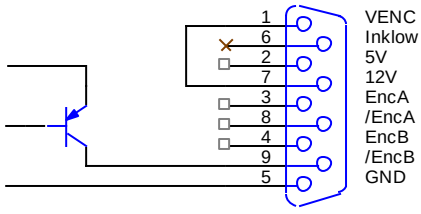


3-33V DC PNP with external power source
VCC to pin 1
Signal to pin 8, 9
GND to pin 5

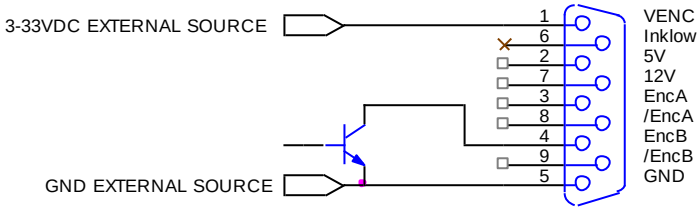
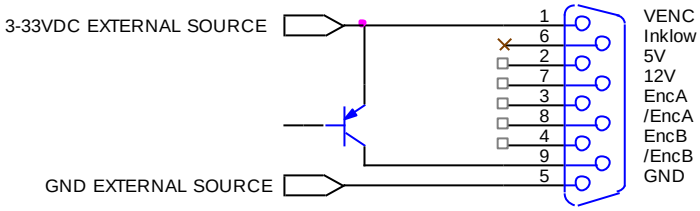
5V DC simulated encoder with external power source

	**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

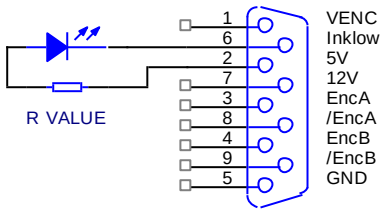
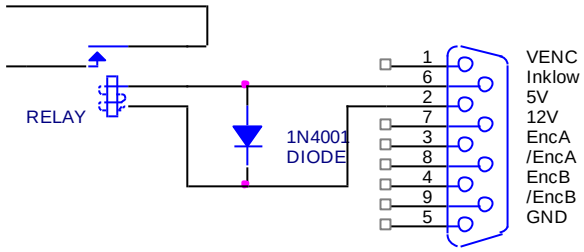
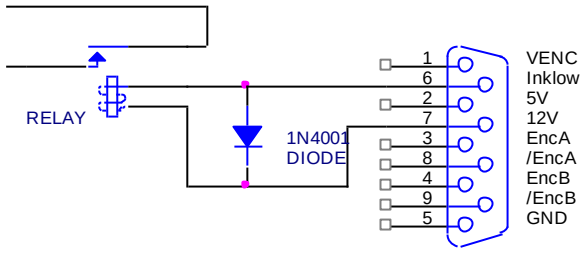
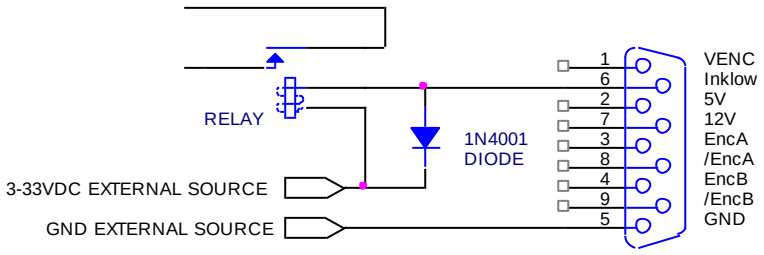
	**12V DC NPN or PUSH/PULL with external power source** Loop pins 1-7 Signal to pin 4 GND to pin 5
	**12V DC PNP with external power source** Loop pins 1-7 Signal to pin 9 GND to pin 5

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

Low ink output (XAAR VERSIONS ONLY)

Low ink level output active low (open collector) XJ128 and XJ500 versions only.
Warning: Do not connect a relay with a higher voltage than the voltage already connected to the VENC pin1 you will damage the unit.

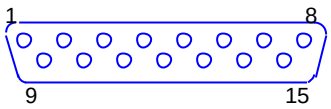
<table>
<tr>
<td> 
</td>
<td>LED indicator
Connect the components between pins 2 and 6
The R value can be calculated using the equation below
$R = \frac{5 - Ud}{Id}$
Where Ud is diode voltage and Id is diode current</td>
</tr>
<tr>
<td> 
</td>
<td>5V DC relay
Connect the relay coil between pins 2 and 6
Some relays have a built in diode, if not please also mount the protection diode on the coil connections.</td>
</tr>
<tr>
<td> 
</td>
<td>12V DC relay
Connect the relay coil between pins 6 and 7
Some relays have a built in diode, if not please also mount the protection diode on the coil connections.</td>
</tr>
<tr>
<td> 
</td>
<td>3-33V DC relay with external power source
Connect the relay coil between external VCC and pin 6
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.</td>
</tr>
</table>

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

Control1 connector

I/O extension for mailing - The CB2/CBF must be mail coded in order to use these functions.
This connector is an I/O extension for mailing systems and special projects. The controller board can support up to 8 outputs and 4 inputs on this connector but only with project specific or mailing FPGA's.

The stacker connector can supply 5V 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

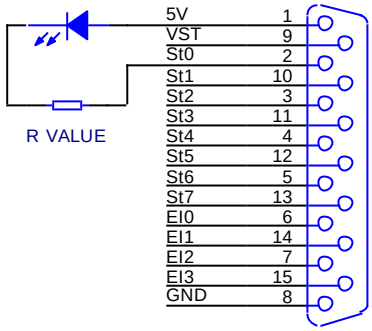
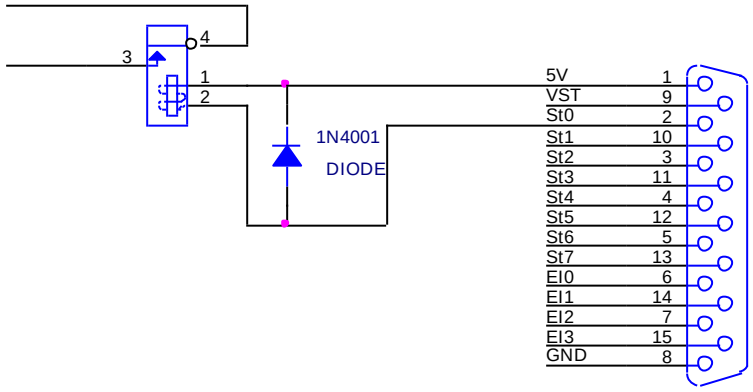
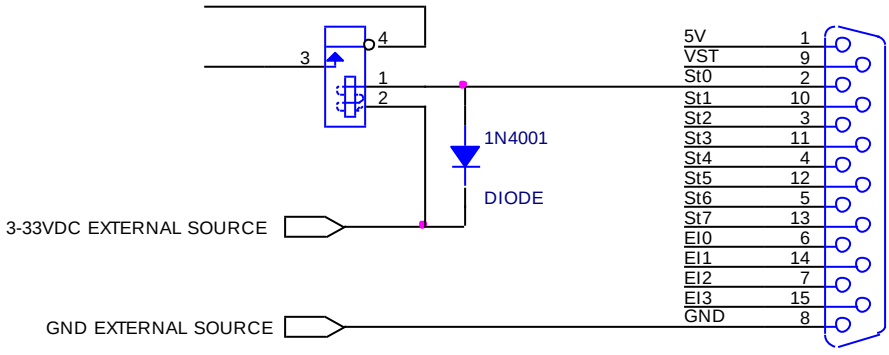


PIN	Description
1	5V
2	St0 output
3	St2 output
4	St4 output
5	St6 output
6	EI0 Input
7	EI2 Input
8	GND
9	VST – voltage reference
10	St1 output
11	St3 output
12	St5 output
13	St7 output
14	EI1 Input
15	EI3 Input

The schematics in this manual show how to connect the output called St0. The other outputs on the connector can be connected using St0 as a model, move the wire from St0 to St1-7 the other wires are the same for all outputs.

Control1 outputs

Warning: Do not connect a relay with a higher voltage than the voltage already connected to the VST pin 9 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.

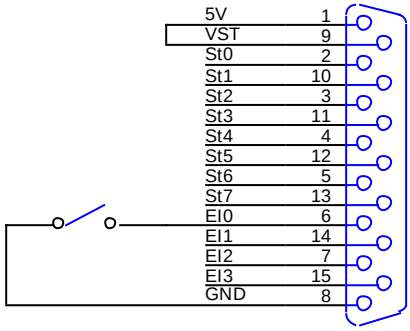
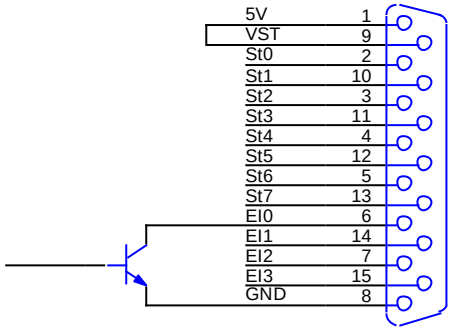
<table>
<tr>
<td> 
</td>
<td>LED indicator
Connect the components between pins 1 and 2
The R value can be calculated using the equation below
$R = \frac{5 - Ud}{Id}$
Where Ud is diode voltage and Id is diode current</td>
</tr>
<tr>
<td> 
</td>
<td>5V DC relay
Connect the relay coil between pins 1 and 2
Some relays have a built in diode, if not please also mount the protection diode on the coil connections.</td>
</tr>
<tr>
<td></td>
<td>12V DC relay
12V is not available on this connector</td>
</tr>
<tr>
<td> 
</td>
<td>3-33V DC relay with external power source
Connect the relay coil between external VCC and pin 2
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.</td>
</tr>
</table>

Warning: Do not connect a relay with a higher voltage than the voltage already connected to the VST pin 2 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.

The signal type can be selected in Inkdraw preferences.

Control1 inputs

The CB2/CBF must be mail coded in order to use these functions.
The schematics below show how to connect the input called Ei0 if you need other inputs on the connector you can just move the wire on Ei0 to Ei1-3 the other wires are the same for all inputs.

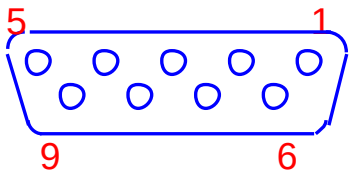
	**N/O normal open mechanical switch or relay** Connect the switch between pins 6 and 8 Connect a reference voltage to VST in this example 5V is chosen. (if you need to use the outputs with a higher voltage than 5 volts you must connect VST to the highest voltage that you use)
	N/C normal closed mechanical switch or relay You cannot use a relay of this type on this input
	**NPN output trigger** Connect a reference voltage to VST in this example 5V is chosen. Signal to pin 6 GND to pin 8
	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.

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.

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