
HSAJET CU2 / CUF USER MANUAL

**A guide to operating and
managing the HSAjet CU2
and CUF print controller**

Last update 20 December 2011



Introduction

Congratulations on the purchase of an HSAjet CU unit. You have a powerful stand-alone controller with features comparable to PC-solutions. With full remote control, on-line editing of content, security features and simple operation, this unit is suitable for many different applications.

For proper care of your unit, you should observe the following guidelines :



Do not unplug any cables while the unit is turned on



Do not take out the compact flash card while the unit is on



Do not take out cartridges (HP model) while the unit is in print mode



Preferably you should shut down unit properly before turning off power. This will correctly close any open files on the compact flash card



You should make sure the CU does not get in contact with water. It is not under IP protection.



Never remove the back panel with power on. Shock hazard!



IMPORTANT

NEVER try to insert the CF card by force. You may break the card connector, resulting in replacement of motherboard. If you can't easily fit the card, you may have it the wrong way around.

Remote communication with the CU is not detailed in this manual. Please see separate manual

"HSAJET CU REMOTE COMMUNICATION".

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Different CU models

The CU will be available in the following versions:

CU2

- CU2HP For HP heads non-fused with max 2 pens
- CU2XJ128 For Xaar128, up to 8 print engines
- CU2XJ500 For Xaar500, up to 2 print engines

CU release	4.20	Firmware version 037/034	(Xaar)
INKdraw version	1.12.xx	Firmware version 035	(HP)
Language Editor Version	1.5	Firmware version 055	(Controller)
Language File Information	1856 byte	MD5: 08d931a2a37183b8bd1e28f35a2aa85a CU2_firmware_v4_20.zip	

CUF

- CUFHP For F-type HP heads, up to 4 pens

CU release	4.20	Firmware version 035	(HP F-Type)
INKdraw version	1.12.xx		
Language Editor Version	1.5	Firmware version 055	(Controller)
Language File Information	1856 byte	MD5: 94686103c0e3ea8547dc09160eb3c478 CUF_firmware_v4_20.zip	

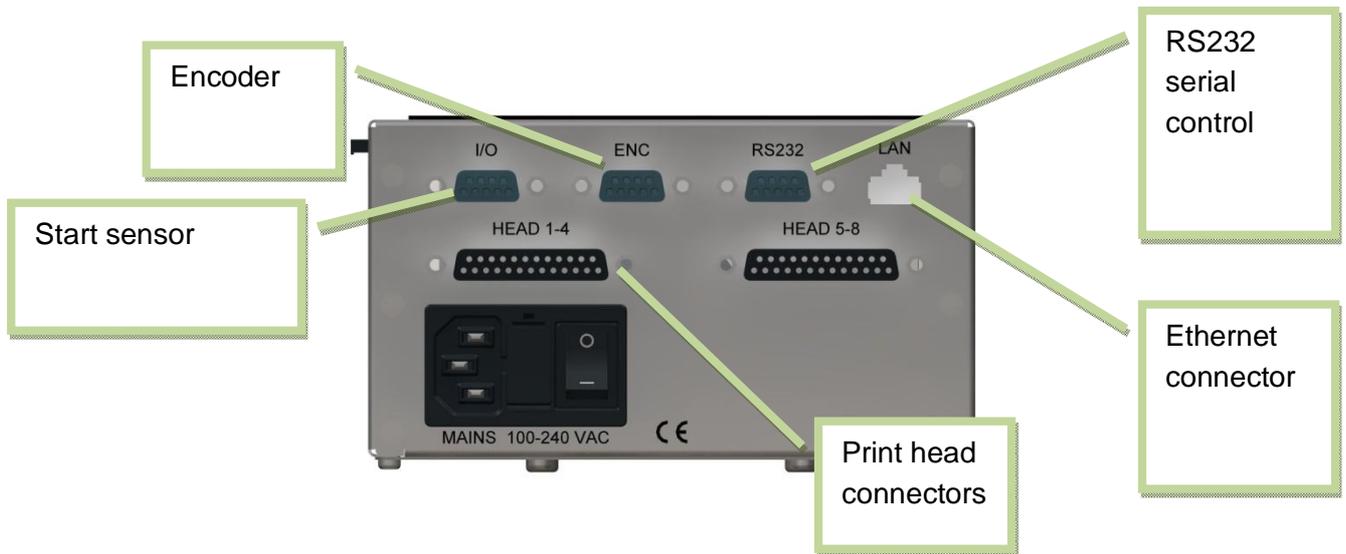
All models have internal 100-240 VAC switch mode power supply.

Features of the CU

- Print using normal printers, xaar- or HP based.
- Messages stored on standard Compact Flash cards.
- Variable text, date, clock, counter and barcode
- Prompt input of variables, 80 characters per line
- Print height 140 mm (Xaar) / 50,8 mm (HP)
- Separates message design and use
- 16 different fonts for variable objects, selectable among all windows fonts
- Input of all Latin-1 character set directly from unit
- Security features available to avoid unwanted editing of messages
- Ethernet connection / serial connection, allowing full remote control of unit. This feature is documented in separate manual.
- Bidirectional print supported
- HP cartridge parameters supported
- Variable objects in other codepages changeable via RS232

Connecting your CU

How you connect your CU depends on the type of CU you have. Please see this guide for instructions on how to connect your unit.



In general:

- I/O and encoder connects using 9-pin SUB-D. Please see reference section for pinouts. It is optional to use an encoder, but strongly recommended for best results.
- Print heads connect through 25-pin SUB-D cables. In some cases through a dongle.

CU2

HP version

1 pen	Use "Head 1-4" to connect first pen
1 + 1 pen	As above, and use "Head 5-8" for second pen
2 pen	Use "Head 1-4" for top pen, "Head 5-8" for bottom pen

Xaar 128 version

The first four engines (4 x 17,5mm or 2 x 35mm or 1 x 52,5mm or 1 x 70mm) connects to "Head 1-4". If you have more than one ink supply to control your 4 engines per output, you may chain them together.

You may connect "Head 5-8" similarly, for a total of max. 8 x 17,5mm print engines.

Max print height is 140 mm.

Xaar 500 version

Each connector "Head 1-4" and "Head 5-8" can connect 1 Xj500 printer.

Max print height is 140 mm.

CUF

HP version

1 pen	Use "Head 1-4" to connect first pen
1 + 1 pen	As above, and use "Head 5-8" for second pen. You need to connect through the CUF Dongle
2 pen	Use "Head 1-4"
2 + 1 pen	You need to connect through the CUF Dongle
2 + 2 pen	Part number: ACEL-HF-jumper-box Please see section on jumperbox for CUF
3 pen	Use "Head 1-4"
4 pen	Use "Head 1-4"

The CU keyboard



Used to start print activity



Enter the setup menu



Enter the previous menu or go to main menu.

Stop print activity



Shift key. Use for capital letters and with **SETUP** key to enter extended setup



Space key, and ALT key. Hold and press letter key for special characters.



Arrow keys, use with enter to select message navigate in menus.



Up/down to select menu screen, or to select values in edit mode.



Left / Right to navigate menu points within each screen.



Enter toggles edit mode or accepts a choice



Object keys that allow editing of the 6 different object types

In order as they appear:



Text, Barcode, Clock, Counter, Date, Logo



Designing CU pictures

The CU pictures are designed using the OBJ INKdraw software. Please see OBJ INKdraw manual for help on installing.

Concept of CU objects vs background

In a CU image, you have both *static* and *variable* content.

The static content has no limitation, which means that you can design using any font size and have all the barcodes available. You are also rotate text, and span text across all heads available. It is not changeable once the CU file is made.

The variable content (CU objects) are placed on top of the static content. The variable content can change during print, and can be changed by the user. There are some limitations on what you can do with this object type.

Notice that in all cases, both variable and fixed objects are optional – you can design an all-static or all-variable layout, or create a mix with both.

When you use variable objects, these will always be on top of static objects.

Please find a comparison below between variable and fixed content:

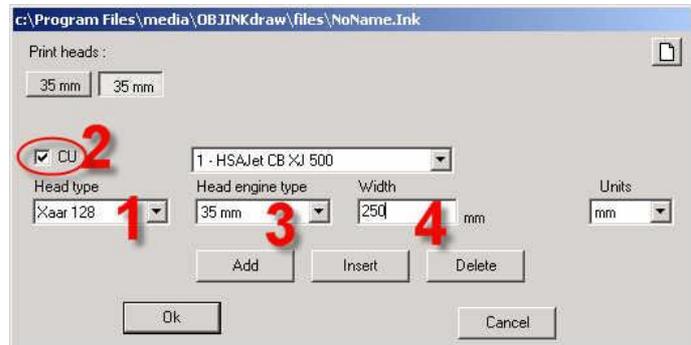
Feature	Static Objects	Variable Objects
Can change automatically during print	NO	YES
Scales freely	YES	16 different fonts available, these scale freely but each font type will be same size
Position in message	Free, any position	Vertically limited to fixed position relative to 32-pixel steps. Horizontally free position
Rotates	YES	NO
Spans heads	YES, fills entire message	NO, can ONLY print within head boundary. HP: max 12.7mm high.
Editable	NO	YES
Font type	All available	Selection. Latin-1 type editable on keyboard. Others only by remote control
Length	Unlimited	Depends on object type. Text 80 characters. Dates / clocks 32 characters in output format
Object types available	Only text, graphics and fixed barcodes. No objects that auto-update, like date, time...	Text and auto-update objects. Both can be displayed as normal objects or barcodes
Mandatory	No	No

As long as you are designing your picture in OBJ INKdraw, you can change both the background and variable content. Once you compile the CU file (save it to compact flash drive as a CU file), you can only edit the variable objects, on the CU unit itself.

Start a CU picture

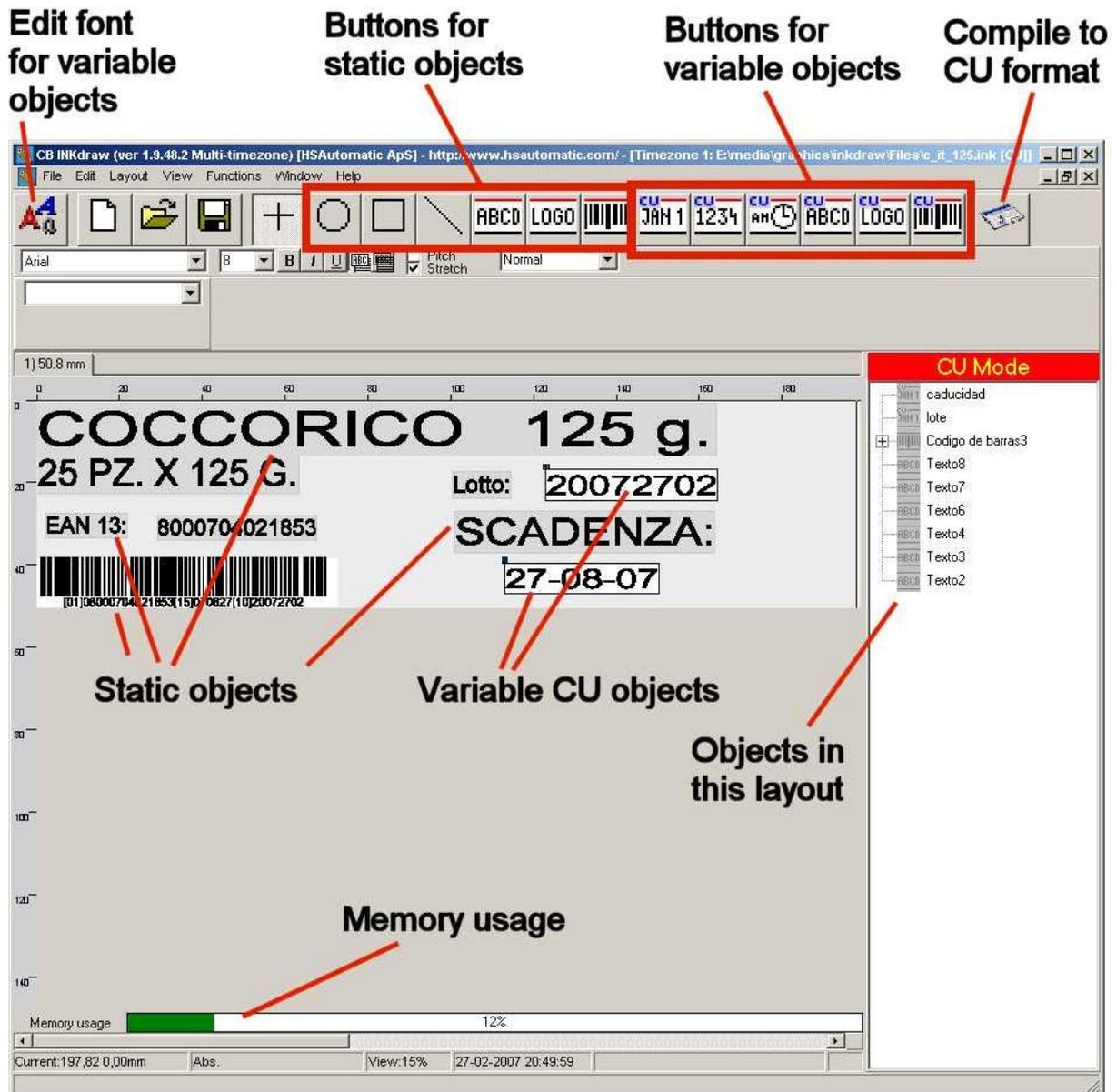
To start a CU picture, choose File->New on the menu, or click the "New File" icon. You will be presented with a menu where you select the file type.

- Select "Head type". You should select the same type of head as your CU unit is made for, you can't load other file types.
- Check the "CU" option.
- Add the heads as necessary with the buttons below. With XaarJet500 you will only have 1 size to choose from. You are only allowed to add as many heads as the CU can handle.
- Select the message length. You can change the unit between mm/inch/pixel/point.
- Click OK



Once you have clicked OK, you are presented with the edit screen for CU files. Most of the screen is identical to normal OBJ INKdraw pictures, but there are some differences.

Most importantly, a lot of the buttons are gone, and you see that there are 6 different CU objects available, and that these are placed on the canvas by *anchors* (please see below). You will also see the "CU Mode active" indicator right above the object panel.



- A) Edit font for variable objects
- B) Buttons for static objects
- C) Buttons for variable objects
- D) Compile to CU format
- E) Static objects
- F) Variable CU objects
- G) Objects in this layout
- H) Memory usage

Working with font types / anchors

The variable CU objects, except the logos and barcodes, display textual information. Because of it's resources, the CU is not able to place and scale fonts freely. That is why the *font anchors* were made.

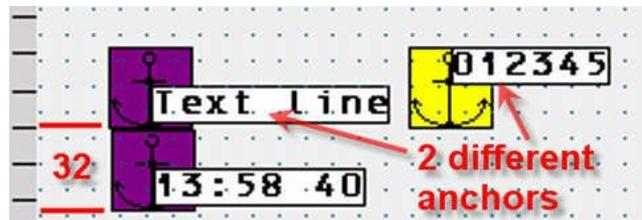
For every CU message you can choose up to 16 different fonts, each linked to an anchor with a different color. Within each of the 16 fonts, you can choose between font type (Arial, Courier, and every other installed true type font), a font size, bold - you can even stretch the font freely.

Within each anchor, you can change the font offset from top to bottom.

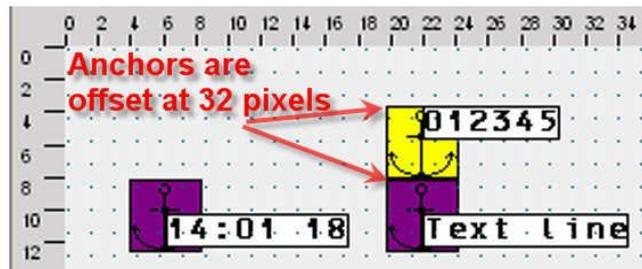
An *anchor* is defined as 1/4 of the XJ128 head, equal to **32 pixels**. You can place the anchor freely in the print direction (left/right), and in 32 pixels increments in the vertical direction.

Some illustrations will show the point of anchors:

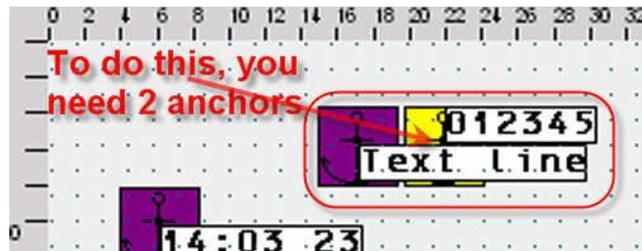
Here is a purple and yellow anchor, with the same font but different offsets from the anchor.



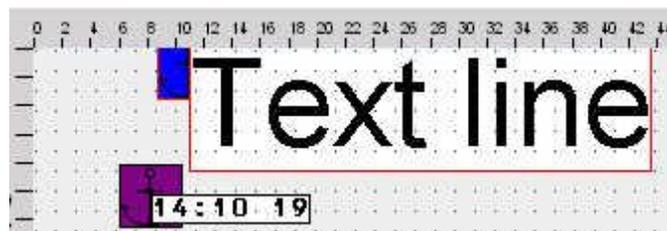
You can see that the same anchor always displays the same font. If you change an anchor font definition, it will affect all variables with that anchor color.



To have smaller text lines closer together, use two anchors. The anchor itself is only visible in design mode. They are not printed.



It is not a problem to define a font that is larger than the anchor itself.



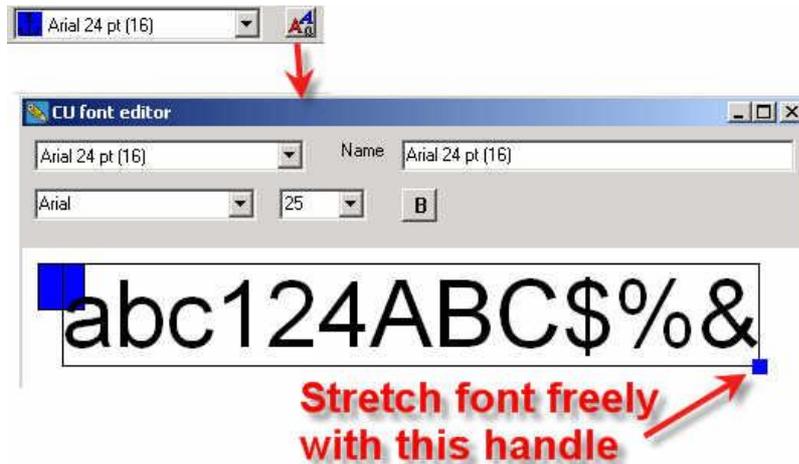
- A) 2 different anchors
- B) Anchors are offset at 32 pixels
- C) To do this, you need 2 anchors

To edit the anchor definitions, click the "A" button next to the anchor selector.

This will open the font editor. Select the anchor you wish to edit, and change the font as needed.

You can leave the default name (Name size (offset)) or make your own like "my big font"

Click "Close" when done.



CU file sizes and fonts

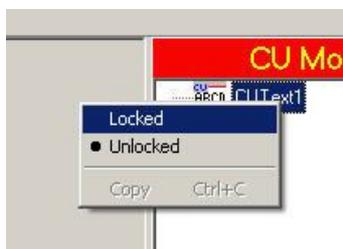
The most space-demanding part of the CU files are the font files.

If you do not change any font settings, the CU files will occupy about 1-2 Mb on the CF card, depending on the head type.

Notice that larger fonts increase the CU memory use. For example, a 70mm high font on Xaar500 will increase the font file to about 12 Mb. It is recommended to use smaller fonts.

Preventing object editing

Sometimes it is necessary to prevent objects in the CU from being edited. This is possible by locking the object in OBJ INKdraw before you compile the CU file.



To lock objects, **right-click** the object in the object list and select "Locked". Now you can no longer select the object in OBJ INKdraw canvas, and you can not edit in the CU.

If it is desired to *allow* editing, but *only* after entering a password, set a CU password in the preferences menu. Then you can use the same password to edit locked objects. Unlocked objects can always be edited.

Preventing file change

If you wish to allow changes while printing but not in the file, save the file with a prefix of "_", example "_file1.cu". This prefix will disable saving any changes to the file on the CF card.

CU Objects

The CU has 6 different variable objects. All of them are editable directly on the unit itself by pressing the corresponding object type key.



Dates

You can have a total of 10 different date objects, each with a user-defineable format and individual offset.

The format follows the standard codes such as "dd", "mm" and "yyyy", although the number of codes available are limited. You can choose from a pre-defined format, or type in your own string.

Month names are available, and changeable in the language file. Use mmm, Mmm and MMM for month names.

It is possible to use up to 32 characters in the date format string including quotes and literals.



Counters

A total of 10 counters is available, each with a user-defineable start- and step value



Time

Allows 10 different clocks, each with a different time offset.

The clock is in 24-hour format, 12-hour format is currently not available.



Text

Up to 10 different text lines.



Logo

10 different logos are possible. These can be placed anywhere, and are not limited to the position of an anchor.



Barcode

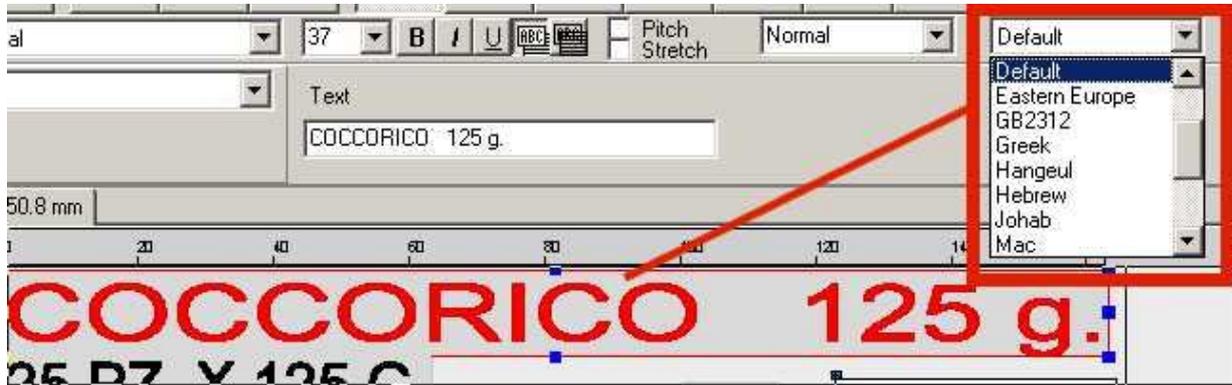
10 different barcodes are possible. Human-readable text is not supported but may be placed as a separate object.

The barcodes can contain variable information in the shape of either text, counter, date or time. It is not possible to have a barcode with multiple variable objects.

Notice that barcodes count against the 10 object limit in the respective object types. So, if you have 5 counter barcodes, you can only have 5 normal counters.

Other encodings

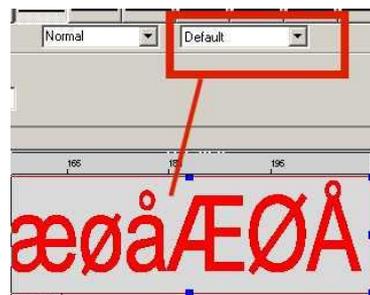
If you wish to use encodings that are different from English, you can select the encoding in the dropdown under the CU box.



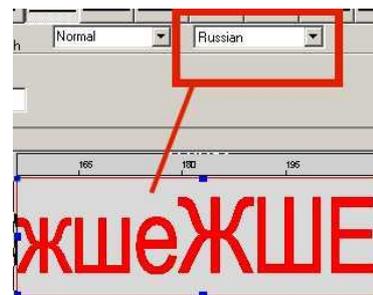
The CU (InkDraw) supports the following encodings and languages

Codepage	Language group
Win-1250	Central / Eastern Europe
Win-1251	Cyrillic
Win-1252	English / Western Europe
Win-1253	Greek (Modern)
Win-1254	Turkish
Win-1257	Baltic
Win-1258	Vietnamese
Win-932	Japanese (Shift-JIS), half-width KATAKANA only

The difference can be seen with a small demonstration. In this example, the actual text of the object was not changed. Only the character set.



Default (Western Europe)



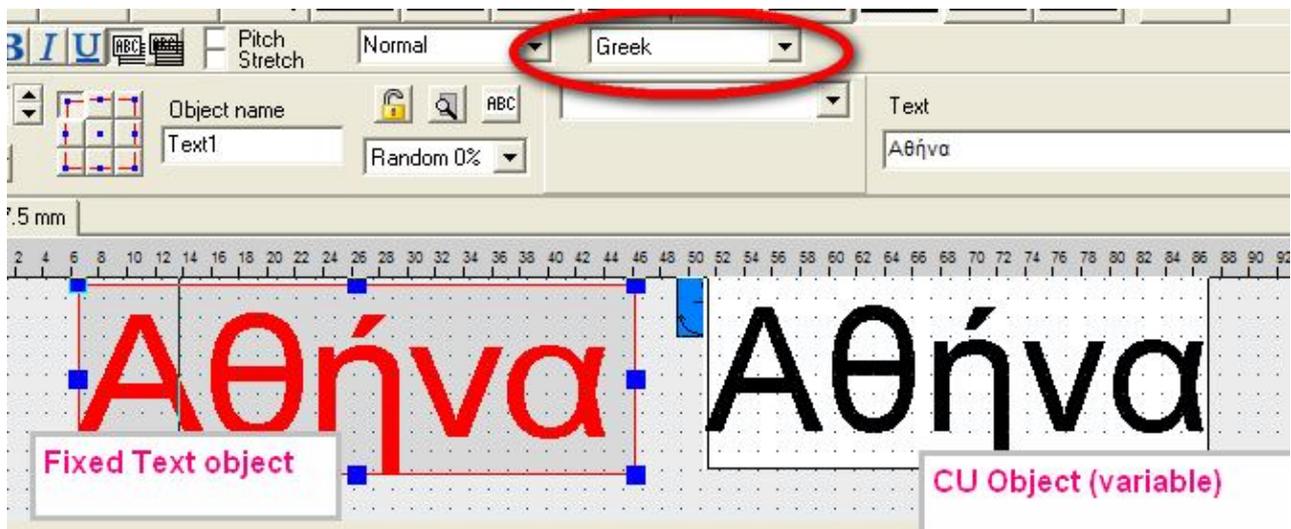
Russian

It is important to understand that whatever is entered into InkDraw must ALWAYS be entered in Win-1252 format.

To use strings in other encodings, f.ex Greek, you must do the following. Using the string " Αθήνα" (greek for "Athens")

- Get text of original in Win-1253 **Αθήνα**
- Convert to Win-1252. **Άεβιά**
- Insert this into InkDraw
- Select encoding to "Greek"

Conversion can be done using <http://www.string-functions.com/encodedecode.aspx>



HINT: If you update a string via RS232 or Ethernet, you must use the byte values from the Win-1253 codepage to get correct greek characters.

A reference with character tables are available from Microsoft

SBCS (Single Byte Character Set) codepages:

<http://msdn.microsoft.com/en-us/goglobal/bb964654>

Compiling / saving files (to CF)

When you are done editing your image, you need to compile the ink file to use it in the CU.

As this is a one-way process (i.e. you can not edit CU files later in OBJ INKdraw), the user is recommend to save the .ink file along with the CU files.

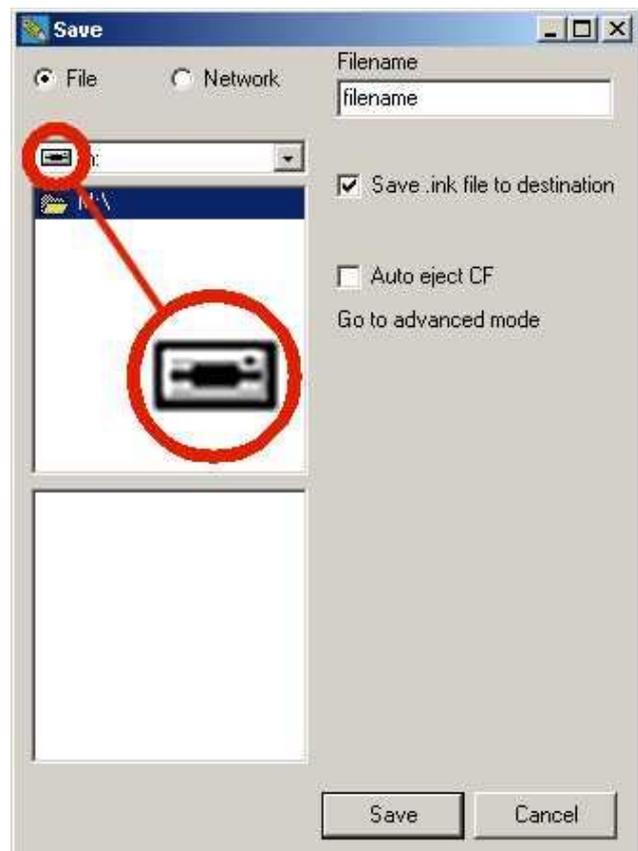
The CU files are made of 2 individual files that are both required: A CU file with object data, and a FNT file with the font data.

NOTICE : On the CU, you only need to change parameters for HP resolution while editing your message. All other parameters are set on the CU unit itself.

You can however store a file on the CF card called "CUPARMS" containing parameters from your current message - then upload to the CU. Do this in the "Advanced mode" below.

HINT : It is possible to save directly onto the CU using ethernet connection. Please see later chapter about this.

- Click the "Save to CF" icon. 
This will open the Save dialog box.
- Select the compact flash in the disc dropdown. You can also choose to save on the harddrive, and copy the files later. (not recommended)
- Enter a filename. It is a good idea to save the ink file along with the CU file, since you can't edit CU files from OBJ INKdraw.
- It is a good idea to check "Auto-eject CF" if you are not going to save more layouts on the card. Otherwise, the file system on the card may be destroyed.



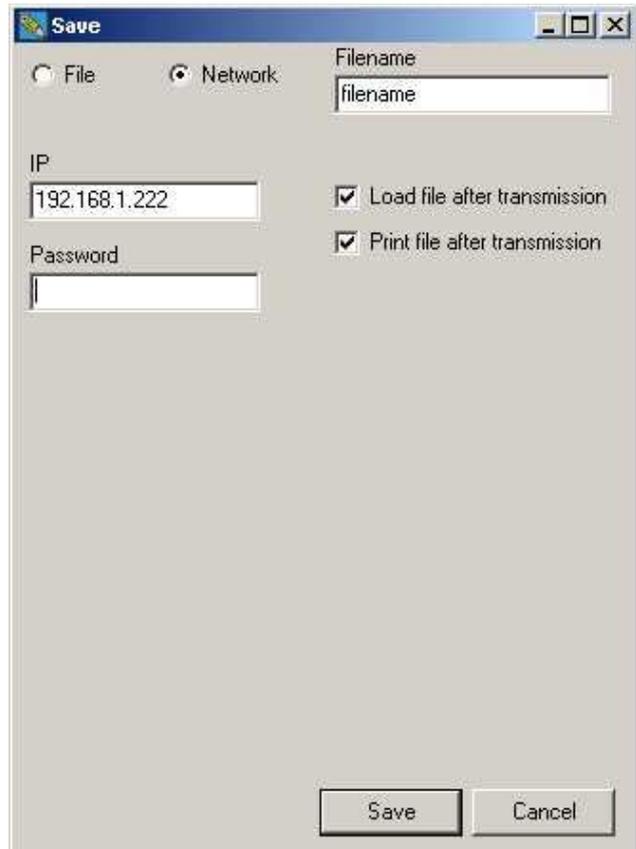
Saving files to PC network

If you have your CU connected in a PC network, you can save directly onto the CU unit. INKdraw will upload the file for you.

To use this function, you must know the IP number of your CU, see in the shift - setup menu how to check the IP number.

Then follow this procedure:

- Click the "Save to CF" icon.  This will open the Save dialog box.
- Select the "network" option
- Enter a filename. You can use the same name again if you only are interested in transferring new data, the old file will simply be overwritten.
- Enter the IP number, in the form
- Optionally you can load and / or print the file after upload to your CU.



Using the CU

After you have saved the file to the CF card, you must insert the card into the CU.

DO NOT TRY TO FORCE THE CF CARD IN WITH TOP UP, YOU WILL DESTROY YOUR CONTROLLER.

The idea of the CU is a unit that will allow the user to select messages and print them using the standard HS Systems printers – Xaar or HP.

The messages are stored on the compact flash, and can be recalled by simply selecting the filename from the main menu and pressing enter to load.

In each message, there can be both static and variable content. All variable fields can be edited by pressing the corresponding object type key.

Basics

You have two different "cursor modes" in the machine: editing and moving. When you enter a menu, the cursor is in move mode. From here, you use the arrow keys to move between menus, commands and fields.

If you press enter on a field, you will activate edit mode

Edit mode

- *Enter* activates your selection or starts edit mode.
- *Esc* cancels the editing
- *Insert* toggles between insert / overwrite
- *Delete* removes the character under the cursor
- *Arrow up / arrow down* chooses the values just above / below the current.
- *Alt/Space with some letters* will type european characters (Latin-1), such as á, ø, ú...

Navigation

At any point it is possible to jump directly to other sections by using the object keys. If you are in edit mode, this is considered as ESC. For example, you could have finished editing a text object, then it is possible to jump directly to date editing by pressing the "Date object" key.

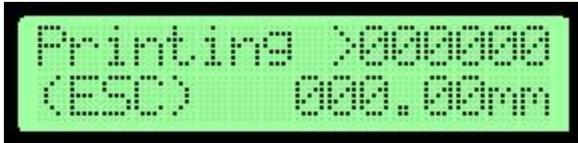
Password protection

It is possible to change setup values (print parameters) from the unit, but this menu can be protected by a password.

Print function

Activate the print function with the  key. The red LED in the key will turn on if the print mode is active. Use ESC to stop print mode.

During print you can adjust the start distance with the arrow keys



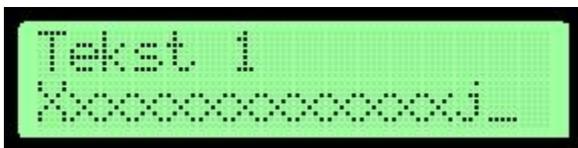
- 00000 Number of prints with this picture. Is reset when a new picture is loaded.
- 000.00 Start delay. You can adjust by using the arrow keys, ◀, ▶, ▲ or ▼. (decimals)
- mm Units for start delay (mm / inch)

Prompts

When the print mode is activated, there can be prompts set on one or more objects. Prompts is a way to ask the user to enter information that will be a part of the print, typically a best-before date or batch number.

Prompts are shown with the object name and room for editing. It is possible to activate prompts for the following objects:

- Text (string). Max 80 characters.
- Date (input format chosen in OBJ INKdraw preferences)
- Time
- Counter (start value)
- Barcode (variable object inside).



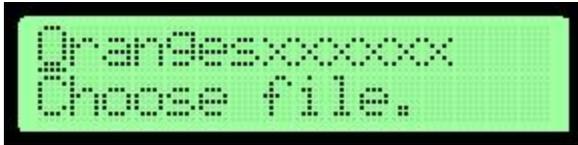
Editing is cancelled with ESC, which deletes what is written. ESC again will cancel print start.

Navigation in prompts is done with the arrow keys. Use up/ down to jump a full screen if the text is longer than 16 characters.

Main menu

You reach the main menu from any menu by pressing ESC.

The main menu is where you select the message to print.



or, if the current file is the active:



To load a file

It is simple to load a file. Use the arrow keys to browse the available files stored on the CF card, or start typing the file name. Predictive type-ahead will find the best match for you.

When you have reached the correct file name, press enter to load it. You will see the text below the file name change to "File selected."

If you try to load a file that is not made for your unit, you will see a warning that you can't use this file.



XJ500 files are invalid on XJ128
HP files are invalid on XJ128
HP files are invalid on XJ500
...

Shutting down the machine

When you wish to shut down the CU, you should exit properly to minimize the risk of file damage on the Compact Flash card.

Press ESC from the main menu, and you are asked



Press Y to shut down the CU unit or N to continue.

Shortly after you see



.. and you can turn the unit off on the power supply.

Editing object / message content

With the CU, there is a separation between content and design. While it is possible to change the size and position of objects in the design phase, this is not possible on the CU unit itself. Only the following can be changed.

- Content - except for logos.
- Visibility (on/off)

You edit the object by pressing the corresponding object button. This can be done at any time, even in print mode. (Notice though that there is a buffer of 2 prints, changes in print mode do not happen instantly).

When you press an object button, you are presented with a list of objects of that type. If none are found, you receive a notice about this:



If objects in the category exist, you will see a list of objects, arranged by their order of appearance in INKdraw. Choose object with **⬅** and **➡**.

When an object is selected, you see its value and on/off setting. Use cursor **⬇** to move down from object name to edit field, and press Enter to edit value.



Notice: If the object name has **(Bar)** written next to it, it is contained inside a barcode. You can then only see its content, and need to edit it through the barcode menu. Please see the “special case” section on next page.

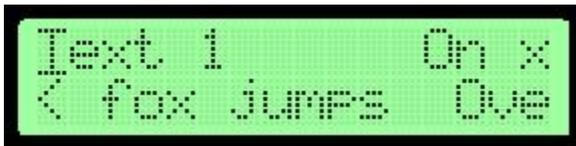
What you see will depend on the object type.





← and → will move 1 character

Shift ← / → will move 1 screen



As you can see from the example to the left, the text

The quick brown | fox jumps ove | r the lazy dog
is longer than one screen. You can scroll longer messages by using arrows up/down.

Selecting "X" deletes the entire line content.

After a change, you are informed about the change.



Enter returns you to the object list.

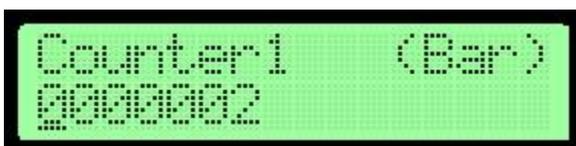
Special case: Barcodes

If you choose a barcode, the format of the content will depend on the content type (Text / Counter/ date / time).

When you select the barcode, you can choose between the available barcodes with arrows up/down. Then move the cursor with arrow right and press enter on "Edit content".



You will now see the edit screen for the content of the barcode



Once you are done editing the content, press ESC to exit to the barcode screen, or one of the other object type keys.

Input pictures for object types

Text	String, max 80 characters Scroll using up/down. Input of special characters possible.
Date	Numbers, from an input mask. The input mask is selected in OBJ INKdraw. You do not need to enter separation characters. Ex: 14-04-2005
Counter	Current value, entered as a decimal value. The number of digits can not be changed. Ex: 0000000
Barcode	Depending on the variable content.
Logo	Only visibility on/ off is possible

Input of special characters

To enter special characters like 'ä' and 'ü' you hold down the **space** key (Labelled "Alt") and press the key where the character is printed.

Similar characters are grouped on the same key, like on a cell phone, so that for example repeated pressing of



will toggle through the following

á Á ä Ä å Å à Æ â Â ã Ã

The CU is able to print almost all extended characters in the ISO Latin 1 character set. ISO Latin 2..15 is currently not supported in variable characters.

Please see reference section for a list of all characters and what key to use.

Configuring your CU

On the CU, most settings are made directly on the unit itself. This means that in the design phase, the designer can and should focus on *design* only. The operator / service responsible can and should focus on *hardware* only – setting the offsets and parameters correctly.

The configuration of the CU happens in two menus:

Setup	which is mostly related to the logical functions of the CU: offset length, encoder parameters, etc. This is also the menu where you can set the date/time of the unit, and get version information.
System setup	which focuses more on the <i>hardware</i> part of the setup: how the heads and engines are positioned in relation to each other and the start sensor. Ethernet parameters are also set here. And, this is where you set a password for the CU.

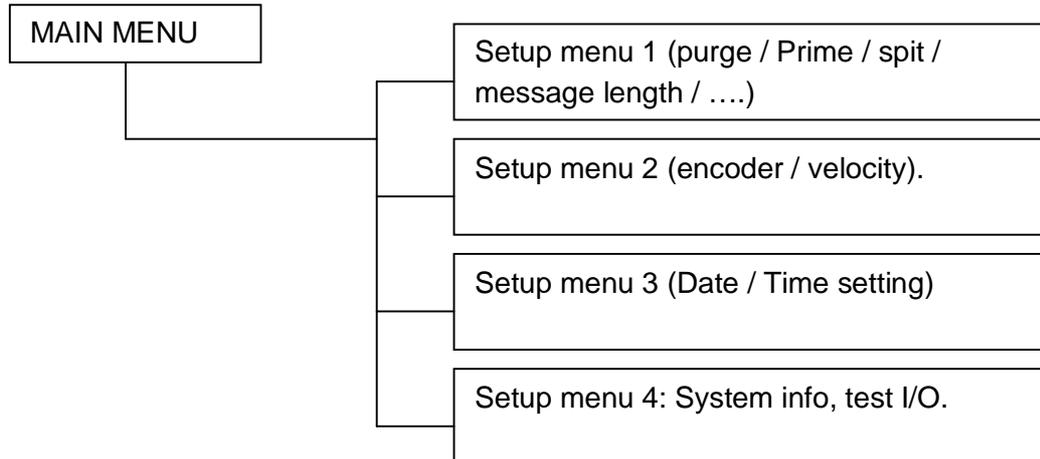
In both cases, the setup menus are working a several screens that are located below each other. The navigation between screens are with cursor up/down, within each screen with cursor left/right.

As always, press enter to start and end edit mode, and to toggle values.

SETUP MENU

Press the setup button  to change settings that affect mainly the current file.

In setup you have a series of menus that can be navigated with the arrow keys. At any point, press ESC to return to the main menu.



Setup Menu 1

On the CU, hardware settings like start, offset, direction and encoder settings are generally *not* taken from the design software, but used from the machine's own settings. You can load a Hardware setup, but until you do that, all settings are as set on the CU unit.



Purge

The purge function (shooting on all channels) is activated with ENTER. You purge as long as you hold down the key. Release to stop purging.

Spit settings

Spit function is made to prevent the ink from drying in the head. It can be set to print *n* dots (burst) every *x* seconds, on all channels.



Seconds	Time between each shot
Burst	The number of shots

Start distance / unit / sensor

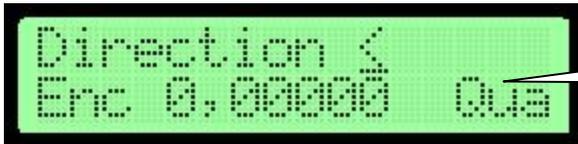
000.00 Start distance (1/100" or 1/100 mm).
Max distance is 655,35 mm/ Inc.

mm/ In Toggle between mm and Inches. The units will be converted

+ Start sensor pos/neg edge

Setup Menu 2

This section describes the printer settings. Setup menu 2 is the most basic settings for the printer, that will have affect on this message.



Qad = Quadrature
Lin = Linear



Display changes if you select Velocity.

Print settings

Top row is used to choose direction. Toggle with enter.

Please see section on birectional printing. You change parameter sets with the direction setting.

Encoder

Enc is a toggle that selects between encoder and velocity modes. The value when encoder is selected is written just like in OBJ INKdraw – mm/pulse.

Qua is a toggle for Quadrature (sensing on both channels, equal to 4 times the number of pulses. Qad = Quadrature, Lin = Linear.

Velocity

In velocity mode, the encoder parameters are not available, only the speed can be entered as m/minute.

Setup Menu 3



Endl. Y Toggle, endless. Y/N

Rep **00** Field, indicates repeat. 00 = no repeat.

Dist **000.00** Field for distance between repeats – also in Endless mode. Enter in units selected in first setup screen. (1/100" or 1/100 mm).
Minimum distance is equal to maximum engine + head offset. Page printing only possible where there are no offsets.

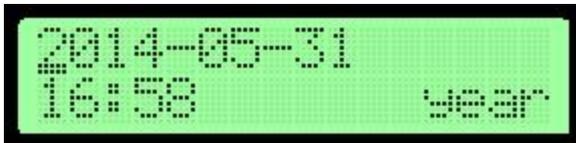
Time, date & year

The CU has a real-time clock built-in. The time and date of this determines the output for date objects.

You can set the current date / time in this menu, in the format YYYY-MM-DD HH:MM (24-hour clock).

You can see which part you are editing in the lower right corner, to avoid confusion between month/ day.

Press ENTER on the part you wish to edit, then enter again to accept.



Setup Menu 4

Test I/O

Second last screen is used to test the I/O function - encoder and start sensor.



The encoder rotates the bar next to the word (/ | - \). Start signal switches between 2 arrows. ↑ = high, ↓ = low

About-menu

Finally there is the about-menu. Mostly for internal use, for identification of the Firmware and Hardware versions.



If you press Enter on the word "Release" you will see further information about FPGA and uP version.

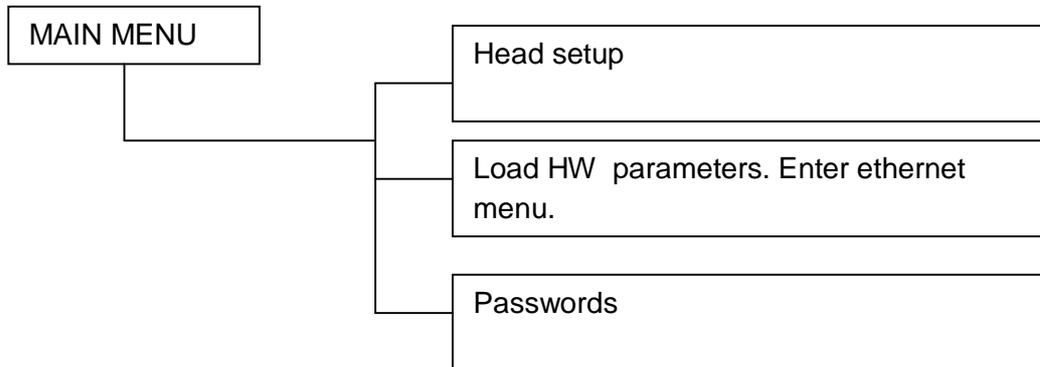
These numbers (Release, FPGA and uP version) are needed to HSA if you find a problem with your machine.



System setup

In system setup, you change the settings that are *not* related to the individual message, but are more hardware related.

Press and hold SHIFT , and press SETUP 

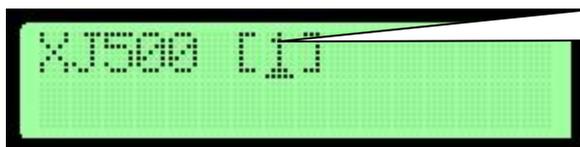


Head setup

The CU is not born with a setup of heads. You can take the unit and connect it to different configuration of printers.

The number and types of heads is stored inside the CU message and defined from INKdraw, but you can adjust the head offset and engine offset to suit your needs.

When you enter Head Setup menu you see a list of the heads configured in the message, listed with the number of engines per head in brackets. The total number of engines can not be more than 8.



On an XJ500 machine, one head has been set up



This is an XJ128 machine with 4 heads: 1, 2, 1 and 4 engines.

To change the settings for a head, press ENTER.



000.00 Offset for the head.

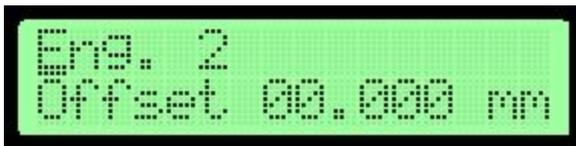
Adj Press Enter to adjust the engine offset(s). Only available if the head has more than one print engine. See below.

Ups N Is this head printing upside / down.

Oths N Is this head printing on other side (in reverse direction)

Engine adjustment

Engine adjust is available if the head has more than one print engine (XJ128 for 2,3,4 engine heads, and HP with 2,3,4 stall unit)



Select an engine (1..4) and choose settings

Offset Offset from the first engine in the head.

Managing Hardware parameters

Ink size/usage and Ethernet Setup

On the CU, all printing parameters (except HP resolution) are stored on the controller, not the message that you load. This ensures that you only have to focus on layout, once the parameters are correct.

It is possible to store the settings from OBJ INKdraw and save to the CF card. These settings can be loaded from the HW global setup screen.

From OBJ INKdraw select "Advanced Mode" in the save CU screen, and click "Save Hardware file". This file will be called **CUPARMS** and should simply be placed on the card.



Ethernet Setup

To use the machine in a PC network, you should configure it's settings in the network.



Notice that you can not edit IP address if DHCP is on, since it will be achieved automatically. 000.000.000.000 until address has been assigned by DHCP.

USE PORT 1500 to communicate with the CU

DHCP If this is set to ON, the machine will expect to find a DHCP server in the network, to automatically obtain an IP address.

IP If no DHCP server is used, the machine will use this IP address.

DeviceName The name this machine will have in a network. Only shown with command to get device name (REQ:device name#)

Ink menu

In this menu, you can set the size of your ink container and monitor how much ink has been used. This is also where you reset the value after replacing ink container.



Monitor Select this menu to see use of ink (HP)

Mode Choose between:

- Off (no low ink warning),
- cart 42ml,
- bulk 350ml and
- user set.

Monitoring the ink menu



You can see the approx. remaining ink for each defined cartridge. Press ENTER on the number to reset.

How to load Hardware settings

If you have saved a hardware setup file from INKdraw, you can load it by selecting "Load HW settings". If a file is found and loaded, the CU will display



If you do not have a hardware file, you will see



Press ESC to return to previous menu.

Output configuration

The CU has 2 outputs on the start switch, out1 and out2. Each of these can be selected to give a signal on the following: off (nothing), print mode, printing, fault, ink low(HP)

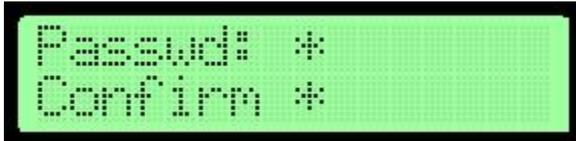
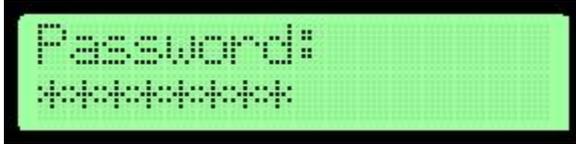


By default, the outputs are both set to "off".

Password

It is possible to protect the CU so that no-one without the password can access the parameters.

If there already is a password set, you need to enter it to change it. Otherwise, you just need to change it, and confirm it afterwards.



When you set the password, it will affect the following:

- Parameters / HW parameters are only available if you know the password
- Locked objects are editable, but only if you know the password
- If NO password is set (equal to blank input on password change) the following will be the case:
 - Parameters freely available
 - Locked objects can NOT be edited ("Object Locked" will be shown)

Bidirectional Print

Bidirectional print allows you to have a printhead that traverses, and prints in each direction, using the same message.

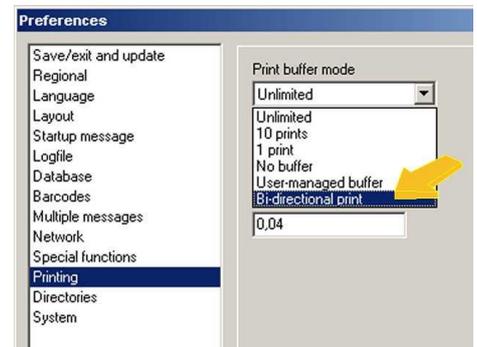
You should observe the following

- A start signal is needed in *both* directions, into the same input. The first print must be in the direction select for normal print. So printing are normal, reverse, normal,...
- There are two different start offsets, one for each direction. See below
- The time from the print is completed in one direction until the next start sensor is activated must not be shorter than 80 mSec.

To activate Bidirectional Print

The mode must be activated from INKdraw. In Preferences, select Printing, and under print buffer, "Bidirectional Print".

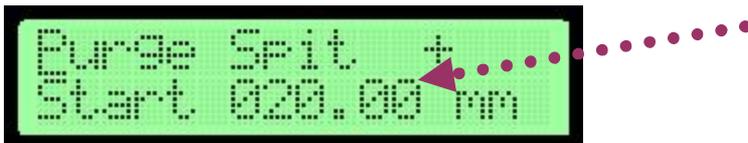
Proceed as normal setting up your message.



Setting start offsets on the CU

On the CU, you can adjust the two individual start offsets by changing the print direction. The CU will display a different start offset in the reverse direction if bidirectional is enabled.

Example: normal print direction is > (left to right)



If the other direction is selected



You will see and edit a different start distance



Cartridge Parameters

When using a PC solution it is possible to set and configure parameter values for HP. Doing so may optimize the output and quality on the HP cartridges, to adjust for each individual ink.

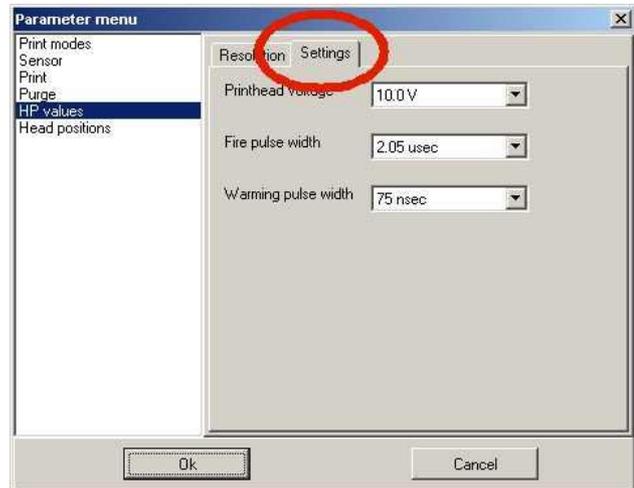
This option is now also possible on the CU, using latest beta version.

How to adjust HP parameters

From within INKdraw, select the parameter menu, at HP Values.

You will now have two tabs available: the first to set Resolution, the second with Cartridge Parameters.

When you generate your CU message, these parameters are automatically transferred and used. You cannot modify or view these values on the CU.



Upgrading your CU

If you receive a firmware upgrade for your CU, typically to add new features or improve existing, simply place the new firmware files on the compact flash card and start up your unit.

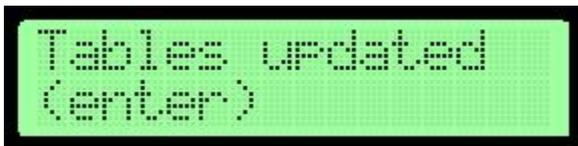
The files needed are the following:

CUENET.XXX	ethernet firmware update
CUFIRMW.XXX	CU firmware update
CUHPFPG.XXX	CU FPGA firmware update. HP could also be 128 or 500. The unit will pick the correct file automatically.
CULANG	Language file. The length of the file must be respected (so you can't upload an old version)
KEYBCHAR.TAB	Character set for the CU keyboard
SPECCHAR.TAB	Another file for keyboard

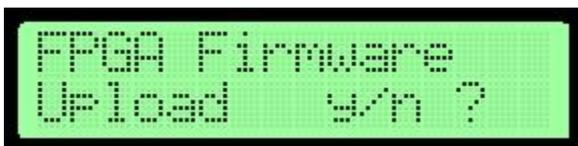
Notice that in addition to the files above, you also need at least ONE print layout in the correct format (HP/128/500) for your unit. The content is not important.

This existence of a layout is the first thing the CU checks for.

Insert the card into your unit and start. You will see in the display



After that, upload the following files (answer "Y" to upload)





When you are done, remove all firmware files from the CF card.



If something should happen during upgrade, such as a power-out, the internal programs could become damaged. In that case, you can upgrade the unit through cable via a *JTAG*.

Please contact your distributor for instructions.

Reference section

Language update

It is possible to change the language of the CU display, with the limitation that you are have fixed length of the texts.

The editing of the language file happens with the free tool "Language File Editor" available from HS Automatic.

Please see separate manual for this tool.

To use the language you have created, place the language file on the CF card with the name "CULANG". You will be asked to upload the language.

Keyboard layout, extended characters

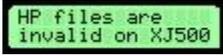
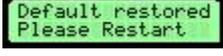
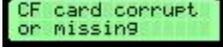
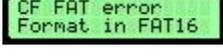
1	! ¿ ¡	2	"	3	#
4	,	5	.	6	&
7	/	8	<	9	>
0	= ½ ¼ ¾				
A	á Á ä Ä æ Æ å Å à À â Â ã Ã				
B	\ { } []				
C	ç Ç				
D	ð Ð				
E	é É è È ë Ë				
F	* ÷ ×				
G	:				
H	;				
I	í Í î Ì ï Ï				
N	ñ Ñ				
O	ó Ó ö Ö ø Ø ò Ò ô Ô õ Õ				
S	ß				
T	þ þ				
U	ú Ú ü Ü ù Û û Û				
Y	ý Ý ÿ				

Notice that due to display restrictions, your character may be displayed as a different character, but will print as expected.

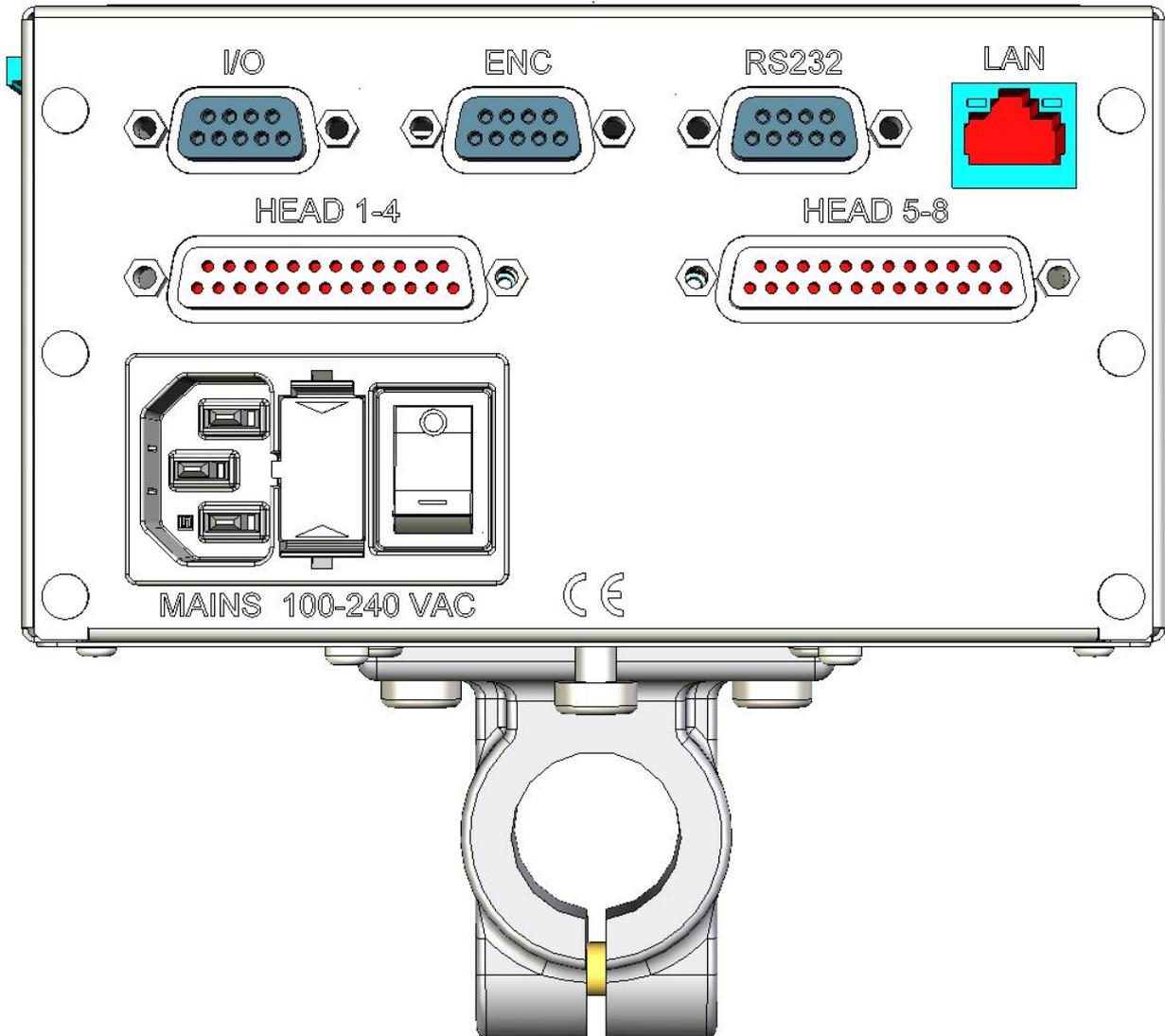
If you have selected a different character set in the CU object, the character will appear as above on the display but will print a different character. Refer to section on encoding and tables from MSDN. [<http://msdn.microsoft.com/en-us/globalization/bb964654>]

Error Messages

<pre>File Error: CU file missing</pre>	<p>There are no CU files on the card.</p>
<pre>File Error: CF card full</pre>	<p>No more room to write on the card.</p>
<pre>File Error: FNT file missing</pre>	<p>You forgot to transfer the FNT file. The CU layouts consist of 2 files: CU and FNT</p>
<pre>File Error: CU file corrupt</pre>	<p>Something is wrong with the CU file</p>
<pre>Flash Error: FPGA corrupt</pre>	<p>Something is wrong with the FPGA file</p>
<pre>Flash Error: Language corrupt</pre>	<p>Something is wrong with the language file</p>
<pre>XJ128 files are invalid on XJ500</pre>	<p>You are using XJ500 model, and try to load XJ128 pictures.</p>
<pre>XJ128 files are invalid on HP</pre>	<p>You are using HP model, and try to load XJ128 pictures.</p>
<pre>XJ500 files are invalid on XJ128</pre>	<p>You are using XJ128 model, and try to load XJ500 pictures.</p>
<pre>XJ500 files are invalid on HP</pre>	<p>You are using HP model, and try to load XJ500 pictures.</p>
<pre>HP files are invalid on XJ128</pre>	<p>You are using XJ128 model, and try to load HP pictures.</p>

	<p>You are using XJ500 model, and try to load HP pictures.</p>
	<p>Can not load hardware settings without HW file.</p>
	
	<p>Please make sure you insert the CF card during use</p>
	<p>The CU can only read cards formatted in FAT 16. Fat32 and NTFS will not work.</p>

Connectors



FUSES

The CU2/CUF units have 4 fuses, 2 on the outside and 2 on the inside.

The outer fuses are on the supply voltage, they are located right next to the power socket. The type is 2A Glass Fuse 5x20mm. If there is no reaction at all when you turn on the unit please check these fuses.

The inner fuses are for the internal 5V and 12V DC supply for the I/O and encoder connectors.

The CUs 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 CU power supply. Use only 0,5A if you need more power you must use an external power supply.

F1 and F2 are located inside the CU right next to the I/O 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 2 output signals. It is located on the front of the CU, as a 9-pin female D-SUB connector.

Output 1 = Active low (open collector)

Output 2 = Active low (open collector)

Input 1 = Not used

Input 2 = Not used

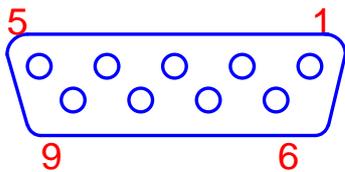
You can use either a simple mechanical switch or a photo cell for the start signal. The I/O connector can supply 5V and 12V DC for the sensor but you can use any sensor in the 3-33V range if you connect an external power source.

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.

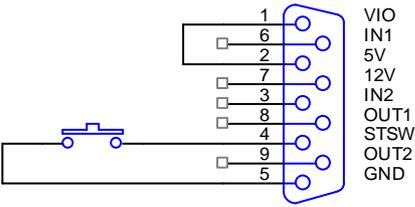
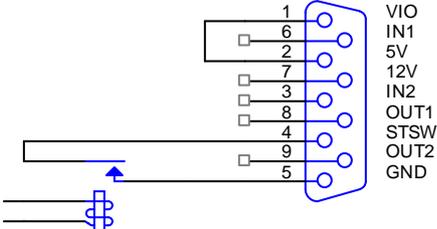
Part number:

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

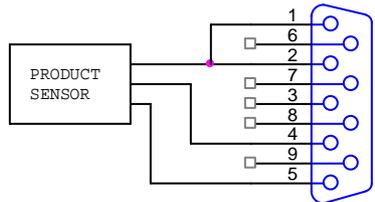
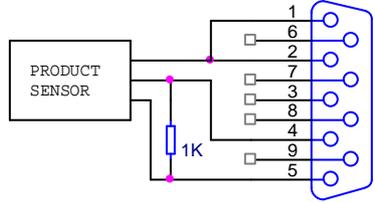


PIN	Description
1	VIO – voltage reference
2	5V
3	Input 2 – Not used
4	Start signal input
5	GND
6	Input 1 – Not used
7	12V
8	Output 1
9	Output 2

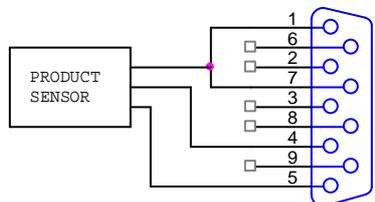
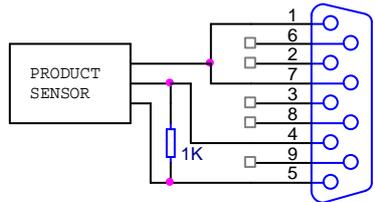
Mechanical start switch

	<p>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</p>
	<p>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</p>

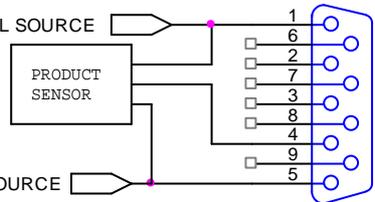
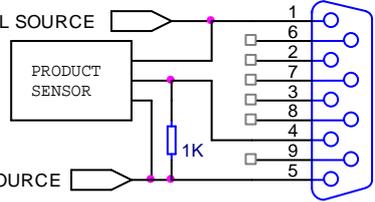
5V DC Sensor

	<p>VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND</p>	<p>5 Volt NPN or PUSH/PULL sensor VCC to pins 1,2 Signal to pin 4 GND to pin 5</p>
	<p>VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND</p>	<p>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</p>

12V DC Sensor

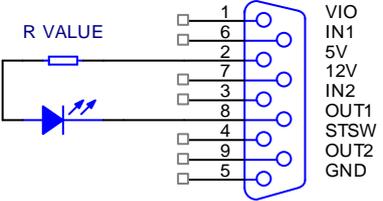
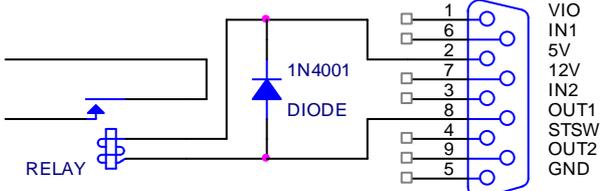
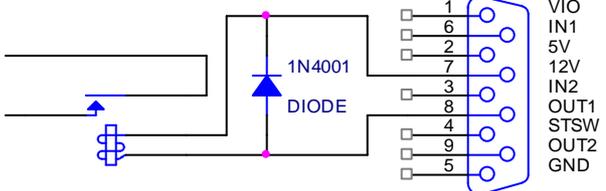
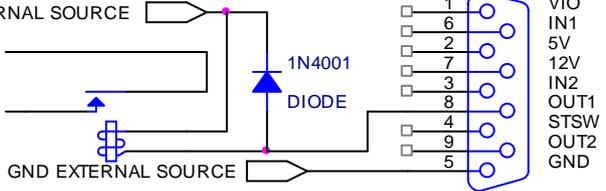
	<p>VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND</p>	<p>12 Volt NPN or PUSH/PULL sensor VCC to pins 1,7 Signal to pin 4 GND to pin 5</p>
	<p>VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND</p>	<p>12 Volt PNP sensor VCC to pins 1,7 Signal to pin 4 GND to pin 5 1 K resistor between pin 4 and 5</p>

3-33V DC Sensor with external power source

	<p>VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND</p>	<p>NPN or PUSH/PULL sensor VCC to pin 1 Signal to pin 4 GND to pin 5</p>
	<p>VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND</p>	<p>PNP sensor VCC to pin 1 Signal to pin 4 GND to pin 5 1 K resistor between pin 4 and 5</p>

Output 1 Active low (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.

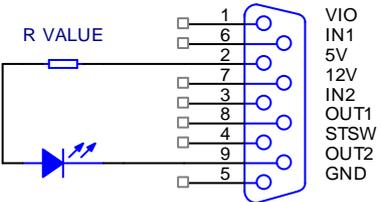
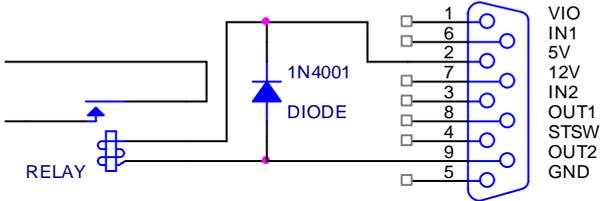
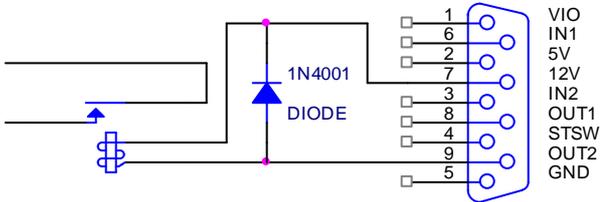
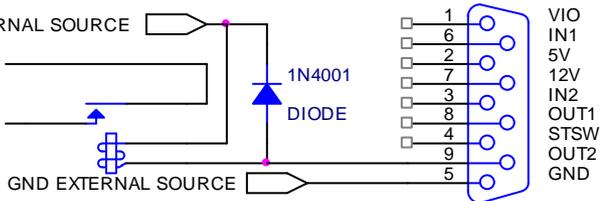
	<p>LED indicator Connect the components between pins 2 and 8 The R value can be calculated using the equation below $R = \frac{5 - U_d}{I_d}$ Where U_d is diode voltage and I_d is diode current</p>
	<p>5V DC relay Connect the relay coil between pins 2 and 8 Some relays have a built in diode, if not please also mount the protection diode on the coil connections.</p>
	<p>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.</p>
	<p>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.</p>

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 setup menu on the CU.

Output 2 Active low (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.

	<p>LED indicator Connect the components between pins 2 and 9 The R value can be calculated using the equation below $R = \frac{5 - U_d}{I_d}$ Where U_d is diode voltage and I_d is diode current</p>
	<p>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.</p>
	<p>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.</p>
	<p>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.</p>

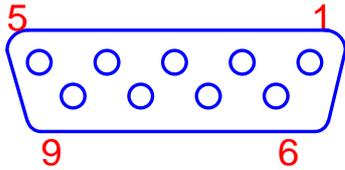
Warning: Do not connect a relay with a higher voltage than the voltage already connected to the VIO pin1 you will damage the unit.

The signal type can be selected in setup menu on the CU.

ENCODER CONNECTOR

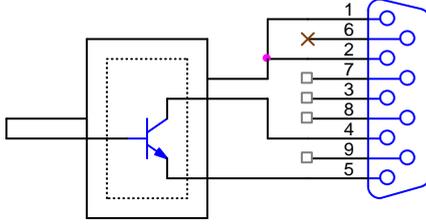
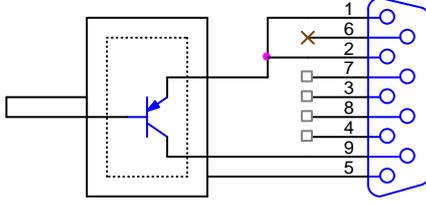
This connector is where the signals for the encoder are coming in. The connector is located on the front of the CU as a 9-pin female D-SUB connector.

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.

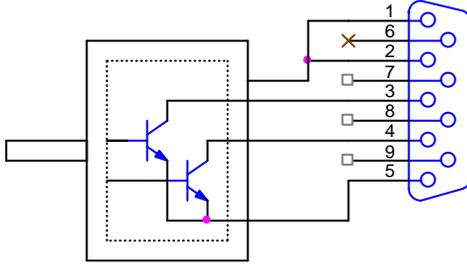
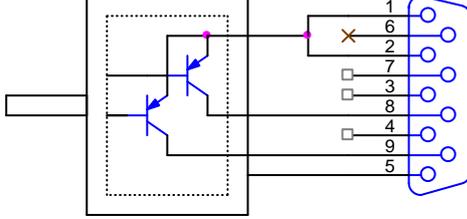


PIN	Description
1	VENC – voltage reference
2	5V
3	Encoder A
4	Encoder B
5	GND
6	Not used
7	12V
8	/Encoder A (inverted)
9	/Encoder B (inverted)

5V DC Encoder single channel

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

5V DC Encoder dual channel

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

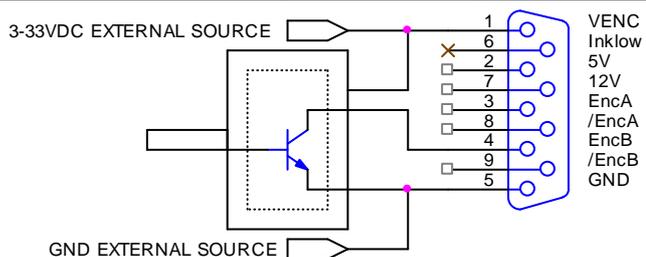
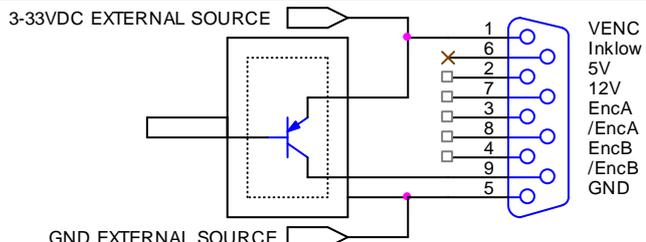
12V DC Encoder single channel

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

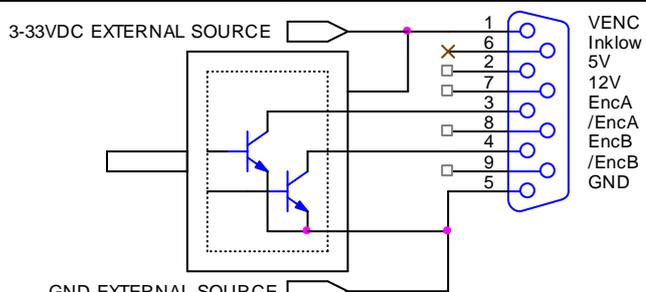
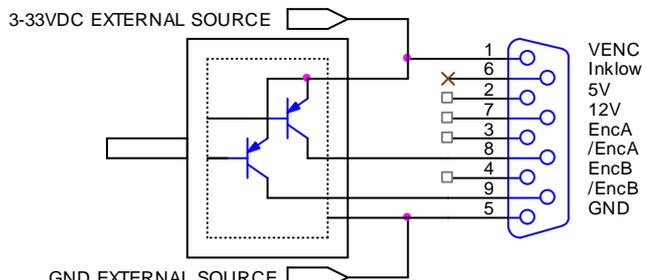
12V DC Encoder dual channel

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

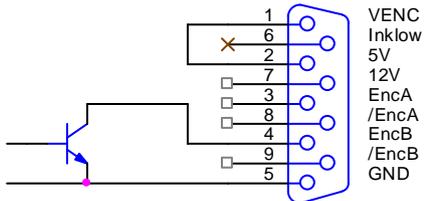
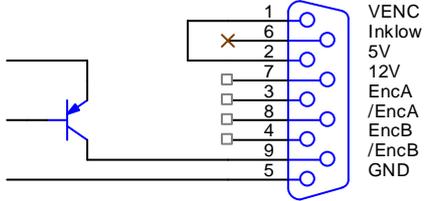
3-33V DC Encoder with external power source single channel

 <p>3-33VDC EXTERNAL SOURCE</p> <p>GND EXTERNAL SOURCE</p> <p>1 VENC 2 Inklow 3 5V 4 12V 5 EncA 6 /EncA 7 EncB 8 /EncB 9 GND</p>	<p>3-33V DC NPN or PUSH/PULL with external power source VCC to pin 1 Signal to pin 4 GND to pin 5</p>
 <p>3-33VDC EXTERNAL SOURCE</p> <p>GND EXTERNAL SOURCE</p> <p>1 VENC 2 Inklow 3 5V 4 12V 5 EncA 6 /EncA 7 EncB 8 /EncB 9 GND</p>	<p>3-33V DC PNP with external power source VCC to pin 1 Signal to pin 9 GND to pin 5</p>

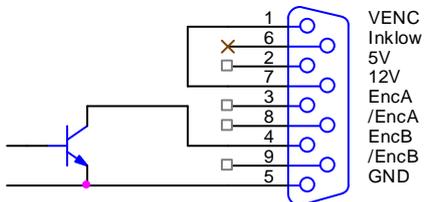
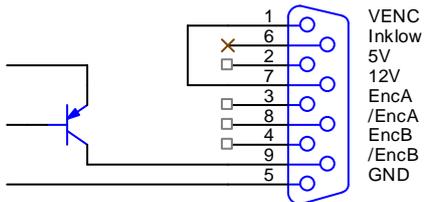
3-33V DC Encoder with external power source dual channel

 <p>3-33VDC EXTERNAL SOURCE</p> <p>GND EXTERNAL SOURCE</p> <p>1 VENC 2 Inklow 3 5V 4 12V 5 EncA 6 /EncA 7 EncB 8 /EncB 9 GND</p>	<p>3-33V DC NPN or PUSH/PULL with external power source VCC to pin 1 Signal to pin 3, 4 GND to pin 5</p>
 <p>3-33VDC EXTERNAL SOURCE</p> <p>GND EXTERNAL SOURCE</p> <p>1 VENC 2 Inklow 3 5V 4 12V 5 EncA 6 /EncA 7 EncB 8 /EncB 9 GND</p>	<p>3-33V DC PNP with external power source VCC to pin 1 Signal to pin 8, 9 GND to pin 5</p>

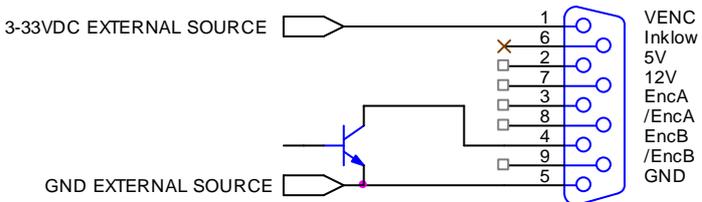
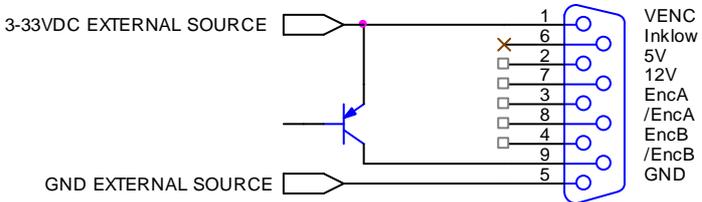
5V DC simulated encoder with external power source

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

12V DC simulated encoder with external power source

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

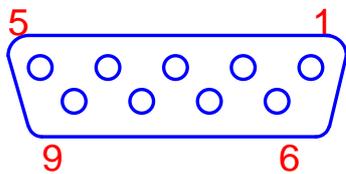
3-33V DC simulated encoder with external power source

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

RS-232 connector

This connector is used for remote communication with the CU2 / CUF, 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

HF JUMPERBOX for CUF

HF Jumperbox for CUF is an accessory for CUF controllers which allows you to use **two physical heads** with your controller.

The CUF is equipped with two ports, labelled "Head 1-4" and "Head 5-8". Without HF Jumperbox the two ports will print the same data.

Part number: **ACEL-HF-jumper-box**

Instruction

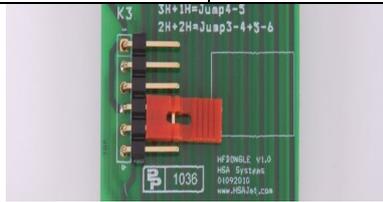
The HF jumper box is supplied in a bag disassembled with two jumpers mounted in neutral position, as illustrated.

To use:

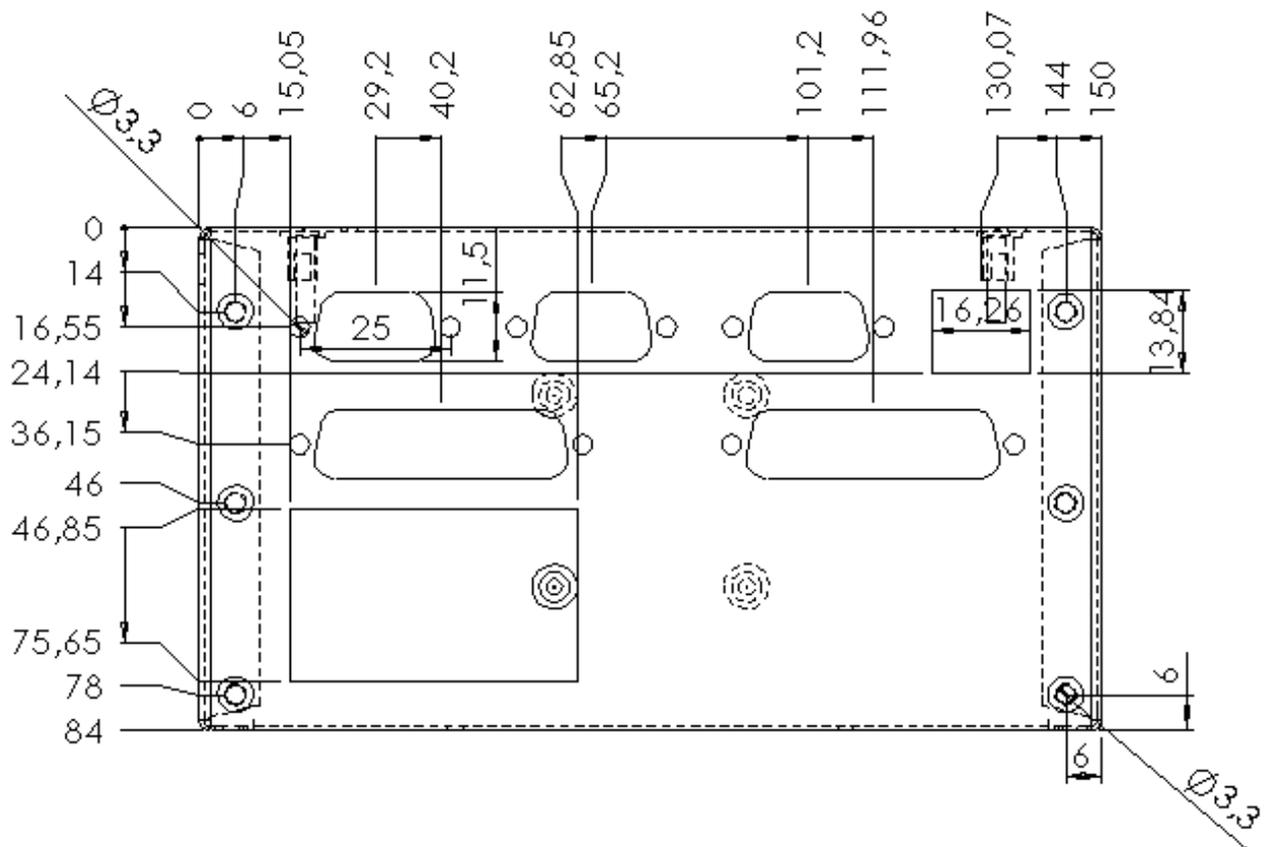
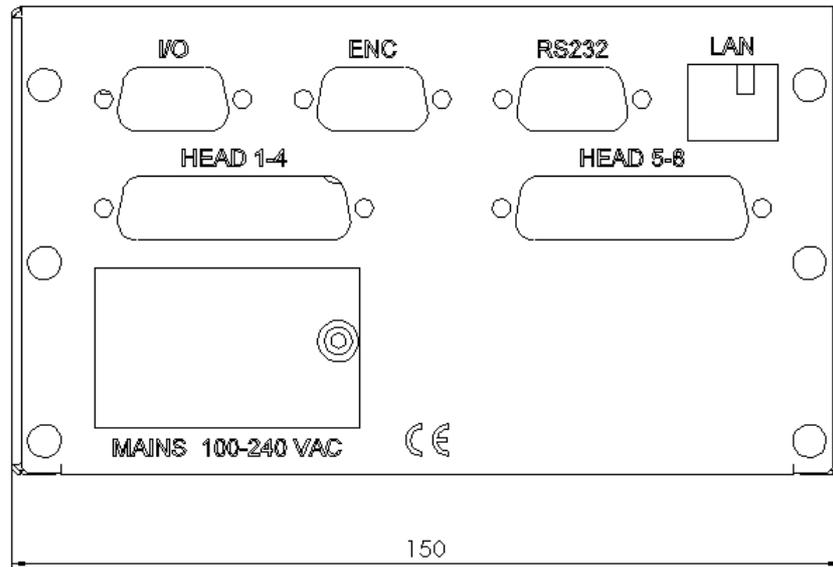
1. Set jumpers to desired configuration - see below
2. Apply plastic cover and mount screws
3. Lock - only after mounting screws
4. Mount risers on female connector
5. Mount HF Jumper box on connector "Head 5-8"
6. Mount print head on other side of jumper box

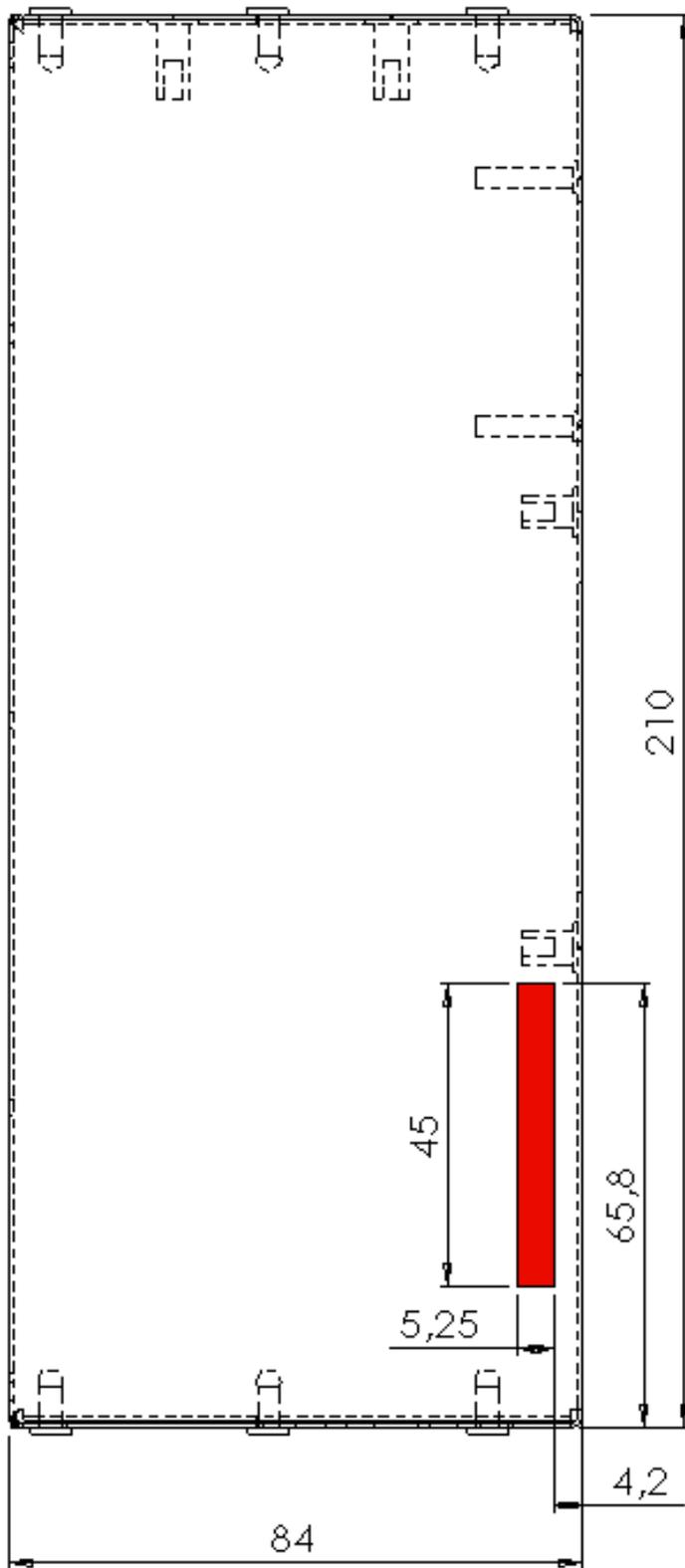


Jumper settings

Head 1-4	Head 5-8	Head 1-4	Head 5-8	Head 1-4	Head 5-8
1 pen	1 pen	2 pen	1 pen OR 2 pen	3 pen	1 pen
					
Jumper set on 1-2		Jumper set on 3-4 and 5-6		Jumper set on 4-5	

Drawings of the CU





SUPPORT

For support on the CU2 / CUF please contact your local distributor or HSA Systems customer service

Phone: +45 66 10 34 01

hsasupport@hsasystems.com

