

CB6e Connector Wiring Diagrams

Version:

31-10-2013

This manual supports: CB6e V2.0

Index

How to use this guide	1
CB6e drawing	2
Fuses	3
Test equipment	3
I/O connector	4
Encoder connector	12
Stacker#0 board connector	16
Support	19

How to use this guide

This guide is intended as a support document for technicians who have a general knowledge of HSA equipment and has received training for this product. It is not meant as a document that can be redistributed to end users nor is the contact information in the last section.

The guide shows the layout of the I/O connectors on the CB6e board, it also shows detailed examples for connecting photocell, encoder, and some of the most common inputs and outputs. The guide does not contain detailed information for mailing and pharmaceutical systems, for more information about these please contact HSA support.



CB6e drawing

F1, F2	Fuses
K6	I/O connector
K7	Encoder connector
K8	RS232 connector
K9	Stack#0 connector
K10	Stack#1 connector
K11	Daisy chain connector
K12-1	Head 1 connector
K12-2	Head 2 connector
K12-3	LVDS-I/O connector
K12-4	Camera 1 connector
K12-5	Camera 2 connector
K12-6	Camera 3 connector
K13	CB6ePlug connector
K15	PC AT power connector





Fuses

The controller boards can supply external equipment with 5 and 12V DC from the internal PC power supply. F1 is the 5V fuse and F2 is the 12V fuse both are 0,5A SMD Fast acting. The value of the fuses is related to the power available from the PCB. Use only 0,5A if you need more power you must use an external power supply.

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	576-0451.500NRL

Test equipment

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



I/O connector

Main function for this connector is to provide the print start signal, to begin print. In the same connector are also additional inputs as well as 2 output signals. It is located on the front of the controller board, as a 2x5-pin framed PCB connector for flatcables. The HP Premium print heads are designed with a print signal connector directly on the printer, you cannot connect your own sensor to the head, but you can buy a sensor from HSA that can be connected.

- Output 1 = configurable in software (open collector)
- Output 2 = configurable in software (open collector)
- Input 1 = configurable in software (active low with internal pull up)
- Input 2 = configurable in software (active low with internal pull up)

The examples in this document show how to connect a simple mechanical switch for testing, a photoelectric sensor and an electronic input like a solid state relay or a PLC. The I/O connector can supply 5V and 12V DC for the sensor but you can use any input signal in the 3-33V range if you connect an external power source.

Connector layout:

	1	VIO	1	$\overline{\Box}$
1 2	2	INPUT1	6	Γ_{0}
	3	5V	2	
3 4	4	12V	7	Γ_{\cap}
비그 그	5	INPUT 2	3	\square
5 6	6	OUTPUT1	8	Γ_{\circ}
	7	INPUT2	4	
7 8	8	OUTPUT2	9	Γ_{\cap}
	9	STSW	5	\Box
9 10	10 🗸			$\overline{}$
	~			

In this section of the manual it is expected that you use an extension wire with a 9 pin female connector.

Part number:

HSA	Product category
OPT-mntkit-IO/ENC	Accessories



5V Print signal

1 0 VIO 1 5V 12V 12V 12V 12V 12V 12V 12V 12	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
1 0 VIO 1 5 2 0 12V 12V 12V 12V 12V 12V 12V 12V	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
1 0 VIO 2 0 IN1 5V 12V 12V 3 0 0UT1 STSW 0UT2 0UT2 GND 5 0	5 Volt NPN or PUSH/PULL photoelectric sensor, solid state relay or control logic VCC to pins 1,2 Signal to pin 4 GND to pin 5
1 0 VIO 2 0 IN1 5V 12V 12V 1 0 100 100 1 0 3 0 000 1 1 0 000 000 1 1 1 000 000 1 1 1 000 000 000 000 000 000 000 1 1 9 0 000 000 000 000 000 000 000 000 000 1 1 9 0 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000	5 Volt PNP photoelectric sensor, solid state relay or control logic VCC to pins 1,2 Signal to pin 4 GND to pin 5 1 K resistor between pin 4 and 5



12V Print signal

1 0 VIO 1 5V 12V 12V 12V 12V 12V 12V 12V 12	Pushbutton Loop pins 1-7 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
1 0 0 0 0 0 0 0 0 0 0 0 0 0	Relay Loop pins 1-7 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
1 0 VIO 2 0 IN1 7 0 12V 12V IN2 0UT1 STSW 0UT2 GND	12 Volt NPN or PUSH/PULL photoelectric sensor, solid state relay or control logic VCC to pins 1,7 Signal to pin 4 GND to pin 5
1 VIO 2 0 7 0 3 0 1K 9 0UT1 STSW 0UT2 GND	12 Volt PNP photoelectric sensor, solid state relay or control logic VCC to pins 1,7 Signal to pin 4 GND to pin 5 1 K resistor between pin 4 and 5



3-33V Print signal with external power source





Input 1

0 1 0 VIO 1 0 IN1 5V 2 0 12V 12V 3 0 0UT1 STSW 0 4 0 0UT2 9 0 5 0	N/O normal open mechanical switch or relay Connect the switch between pins 6 and 5
1 0 VIO IN1 5V 12V 12V 12V 12V 12V 12V 12V 12	N/C normal closed mechanical switch or relay Connect the switch between pins 1 and 6 1 K resistor between pin 6 and 5
1 0 VIO 6 0 IN1 5V 12V 7 0 8 0 4 0 9 0 0UT1 STSW 0UT2 GND	NPN or PUSH/PULL trigger Signal to pin 6 GND to pin 5
1 0 VIO IN1 5V 12V IN2 0UT1 STSW 0UT2 GND	PNP trigger VCC to pin 1 Signal to pin 6 1 K resistor between pin 6 and 5



Input 2

0 0 0 0 0 0 0 0 0 0 0 0 0 0	N/O normal open mechanical switch or relay Connect the switch between pins 3 and 5
1 0 VIO IN1 5V 12V IN2 0 0 3 0 0UT1 STSW 0UT1 STSW 0UT2 GND	N/C normal closed mechanical switch or relay Connect the switch between pins 1 and 3 1 K resistor between pin 3 and 5
1 0 VIO 2 0 IN1 5V 12V 12V 1 0 VIO 7 0 12V 3 0 0 4 0 OUT1 STSW OUT2 GND	NPN or PUSH/PULL trigger Signal to pin 3 GND to pin 5
1 0 VIO IN1 5V 12V IN2 0UT1 STSW 0UT2 GND	PNP trigger VCC to pin 1 Signal to pin 3 1 K resistor between pin 3 and 5



Output 1 (open collector)

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

R VALUE		VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND	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
TIN4001 DIODE	1 0 2 0 7 3 0 8 0 9 5 0	VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND	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.
	1 6 0 2 0 7 0 3 0 8 0 9 0 5 0	VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND	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.
3-33VDC EXTERNAL SOURCE	1 6 0 2 0 7 0 8 0 8 0 5 0 5 0	VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND	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 cotroller.



Output 2 (open collector)

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

R VALUE	1 6 2 0 7 0 3 0 4 9 5 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND	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
RELAY	1 0 2 0 7 0 3 0 4 0 9 0 5 0	VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND	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.
	1 6 2 0 7 0 3 0 8 0 9 0 5 0	VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND	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.
3-33VDC EXTERNAL SOURCE	1 6 0 2 0 7 0 8 0 9 5 0 5 0	VIO IN1 5V 12V IN2 OUT1 STSW OUT2 GND	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 controller.



Encoder connector

This connector is where the signals for the encoder are connected. The connector is located inside the PC on the edge of the controller board. The connector on the CB6e controller board is a 2,54mm pitched 2x5 pin male 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.

Connector layout:

	1 VENC	1
1 2	2	6
	3 5V	2 0
3 4	4 12V	7
비그 그	5 ENC A	3 0
5 6	6 /ENC A	8
비브 브	7 ENC B	4 0
7 8	8 /ENC B	9 0
	9 GND	5
9 10	<u>10</u> ×	

In this section of the manual it is expected that you use an extension wire with a 9 pin female connector.

Part number:	
HSA	Product category
OPT-mntkit-IO/ENC	Accessories

5V DC Encoder single channel

1 VENC 2 0 7 0 3 0 4 0 9 5 5 0	5V DC NPN or PUSH/PULL VCC to pins 1, 2 Signal to pin 4 GND to pin 5
1 VENC 1 0 2 0 7 0 8 0 4 0 5 0	5V DC PNP VCC to pins 1, 2 Signal to pin 9 GND to pin 5

5V DC Encoder dual channel



Page 13 of 19



12V DC Encoder single channel

VENC Inklow 5V 12V EncA /EncA /EncB GND	12V DC NPN or PUSH/PULL VCC to pins 1, 7 Signal to pin 4 GND to pin 5
1 0 VENC Inklow 5V 12V EncA /EncA 9 9 5 0 KIC 12V EncA /EncB (ND	12V DC PNP VCC to pins 1, 7 Signal to pin 9 GND to pin 5

12V DC Encoder dual channel

1 0 VENC Inklow 5V 12V EncA 4 0 5 0 6 0 12V EncA /EncB GND	12V DC NPN or PUSH/PULL VCC to pins 1, 7 Signals to pins 3, 4 GND to pin 5
1 VENC 2 0 7 0 8 0 4 0 9 0 50 GND	12V DC PNP VCC to pins 1, 7 Signals to pins 8, 9 GND to pin 5

Page 14 of 19



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

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





5V DC simulated encoder with external power source



12V DC simulated encoder with external power source

1 VENC × 6 1 VENC 1 Nation 2 Venc 7 Venc 1 Venc 1 <td< th=""><th>12V DC NPN or PUSH/PULL with external power source Loop pins 1-7 Signal to pin 4 GND to pin 5</th></td<>	12V DC NPN or PUSH/PULL with external power source Loop pins 1-7 Signal to pin 4 GND to pin 5
1 VENC 2 1 7 1 7 1 8 1 4 1 9 1 5 0	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

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

Dort number



Stacker#0 board connector

I/O extension for mailing - The CB6e must be mail or pharma 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, mailing or pharma FPGA's. The connector is located inside the PC on the edge of the controller board.

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

The connector on the CB6e controller board is a 2,54mm pitch 2x8 pin male connector.



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. In this section of the manual it is expected that you use an extension wire with a 15 pin male connector. If you use another connector you can use this page to calculate to correct pin number.

О

O

O

С

24 12

25

13

Fait number.		
HSA product code	Short description	Product category
CabDB15M2x8F20CM	CABLE DB15M 2x8F 20CM	Accessories



Stacker#0 D-Sub 15 outputs

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.

Notice: VST is a reference for inputs, but it is also connected to the output protection circuit, it must be connected to the highest voltage that you use on the connector 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.



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.



Stacker#0 D-Sub 15 inputs

The CB6e 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.

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	 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
5V 1 VST 9 St0 2 St1 10 St2 3 St3 11 St5 12 St6 5 St7 13 E10 6 E11 14 E12 7 GND 8	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
	The CB6e does not support PNP on the Stacker inputs.
	inputs, but your board and software must be Pharma
	coded. 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.



Support

End users must contact their local distributor for support. Contact information is available at www.hsasystems.com

Registered distributors can contact HSA customer service departments:

Software related:

E-mail: hsasupport@hsasystems.com

Phone: +45 66 10 34 01

Hardware related:

E-mail: techsupport@hsasystems.com

Phone: +45 44 94 02 22

