USC-1 Manual

Rev. 1.10.2, 13.10.2011

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1 Introduction

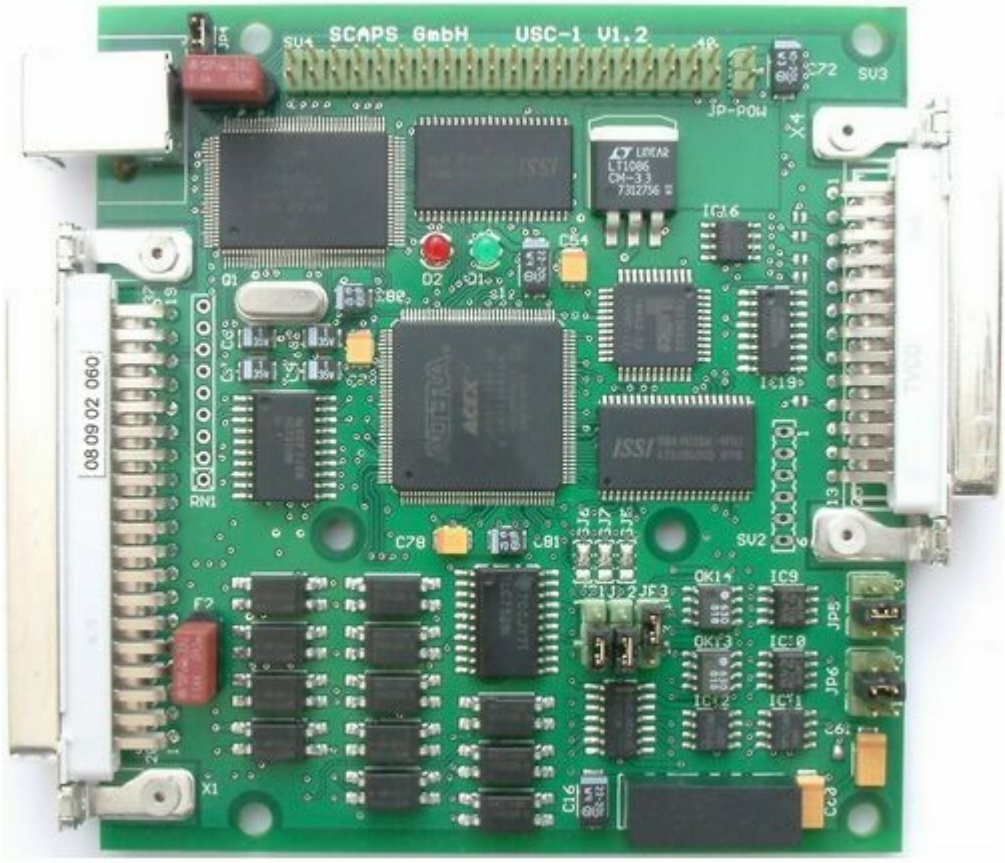

Figure 1.1: USC-1 USB Scanner Controller V1.2

1.1 Version History

Date	Changes
10.01.2008	Chapter Marking On The Fly and chapter Appendix added
26.02.2008	Note concerning the AEB-1 signals added
27.03.2008	Maximum XY2-100 cable length updated
08.09.2008	Index updated
04.11.2008	Chapter Analog Extension updated
09.04.2009	Figures and section USB updated
14.04.2009	Layout changed
02.11.2009	- Output current for Laser Signals and LaserPort added - Threshold level for MOTF signals added
26.03.2010	Explanation of Analog Output jumper updated
10.12.2010	Chapter "First Steps / Getting Started" added; Layout changed

Table 1.1: Version history

1.2 Safety

The goods delivered by SCAPS are designed to control a laser scanner system. Laser radiation may effect a person's health or may otherwise cause damage. Prior to installation and operation compliance with all relevant laser safety regulations has to be secured. The client shall solely be responsible to strictly comply with all applicable and relevant safety regulations regarding

installation and operation of the system at any time.

The goods will be delivered without housing. The client shall be solely responsible to strictly comply with all relevant safety regulations for integration and operation of the goods delivered.

1.3 Overview

The USC-1 interface module is designed for controlling a 2-axis galvanometric scanner system. It supplies also all necessary signals for laser and external control. As an option, the control of a 3-axis system is also possible.

The controller commands are downloaded via the USB (Version 1.1 or 2.0) interface from the connected host system. The received commands are stored in a data buffer. When a block of valid data is available the system enables it for execution while filling additional buffer blocks with new data transmitted from the host system.
The command size varies from 1 to 6 bytes per command. Depending on the command the USC-1 can execute 10-30 commands in a 10 us (default) output interval. The maximum download rate is 1 Mbytes/sec for USB 1.1 and 40 Mbytes/sec for USB 2.0.

1.4 Position Within The System

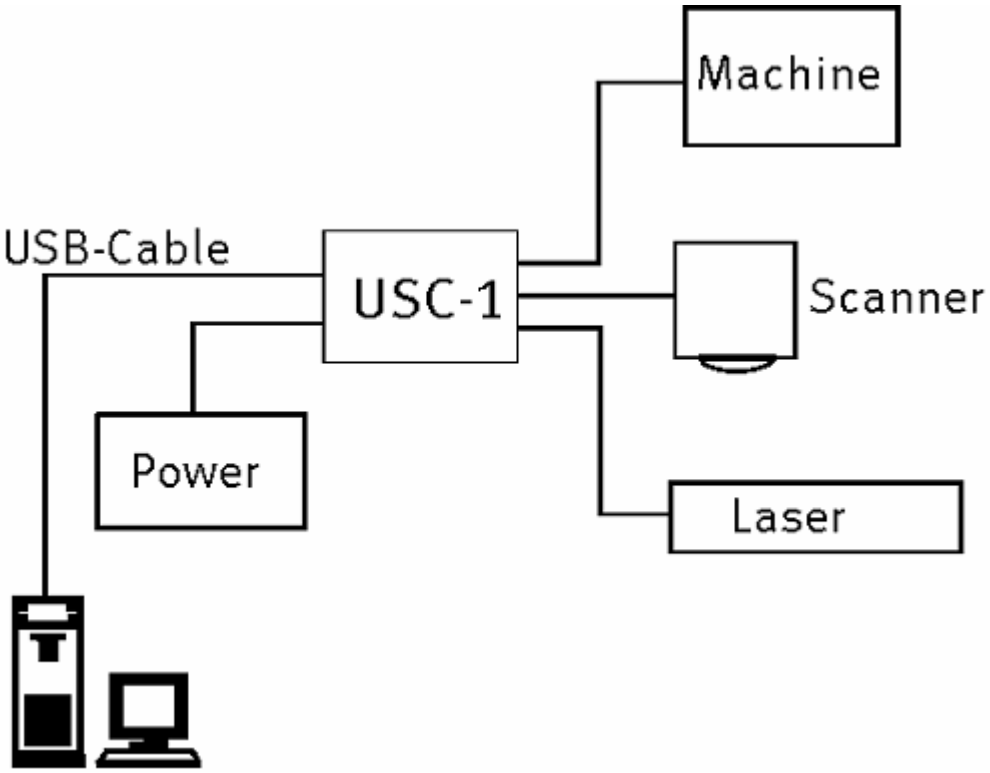

Figure 1.2: USC-1 integration

1.5 Features

The USC-1 has the following key features:

USB 1.1 - 2.0 micro controller on board :
- 256 Kbytes SRAM for USB data buffering
- 10 us cycle time

Laser control:
- Laser Gate Output:

Laser On and Off delay with 500 ns resolution
Optocoupler TTL level/5 mA output current

Q-Switch output:
Frequency resolution: 41.7 ns (24 MHz clock)
Pulse length resolution: 41.7 ns
Optocoupler TLL level /5 mA output current

First pulse killer output:
Resolution 41.7 ns
Optocoupler TTL level/5 mA output current

Scanner control:
XY2-100 digital interface
special digital interface to SCAPS analog board

2 x 8 bit analog channels with 2.5, 5, 10 V output range
1 x 8 bit TTL output port.

External control:
6 opto-insulated outputs
6 opto-insulated inputs (2 - 24 V level)
RS 232 interface

Optional:
digital-analog converter board
control of 3-axis system
MarkingOnTheFly

Power:
Digital and Laser Analog:
+5 V /1.6 A

2 Board And Connectors

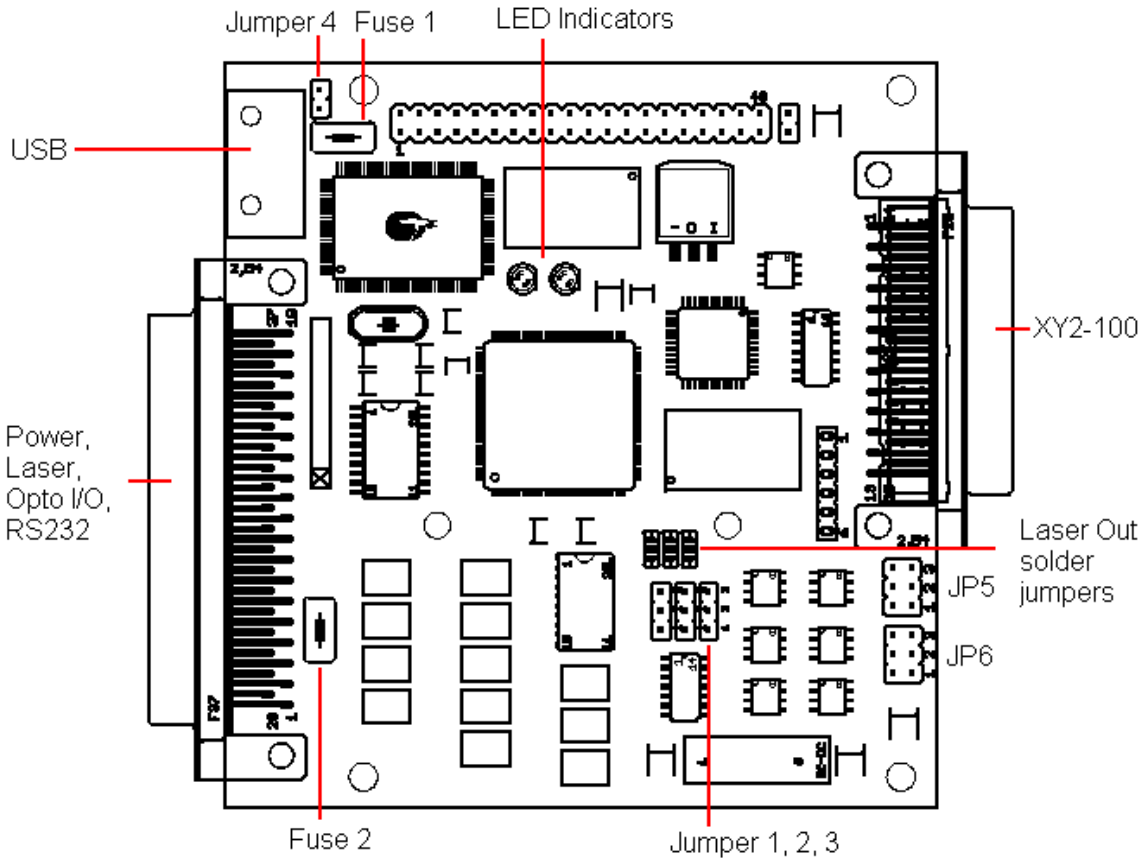

Figure 2.1: USC-1 jumper

2.1 USB

Standard USB Series B Connector, self powered configuration. The maximal cable length with standard cables is 5 meters, with repeaters up to 25 meters.

Note:
Connection problems can also result from ground loops. To avoid these loops there is a solder jumper on the bottom side of the USC-1. If the jumper is closed (by default), the cable shield is connected to the USC-1 ground. Open the jumper to disconnect USC-1 ground and cable shield.

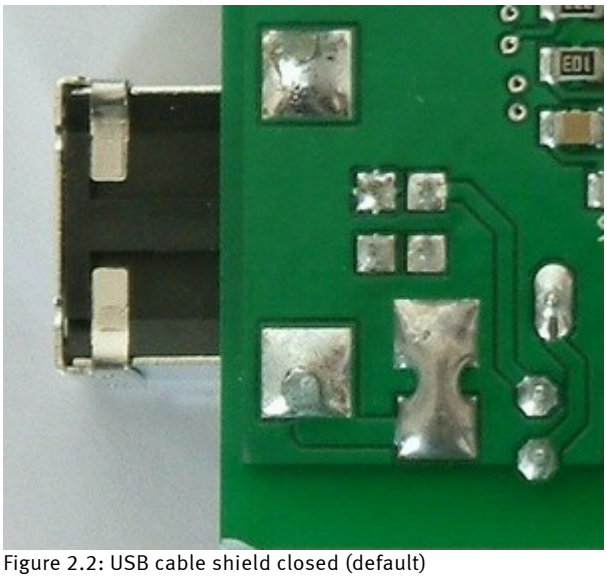

Figure 2.2: USB cable shield closed (default)

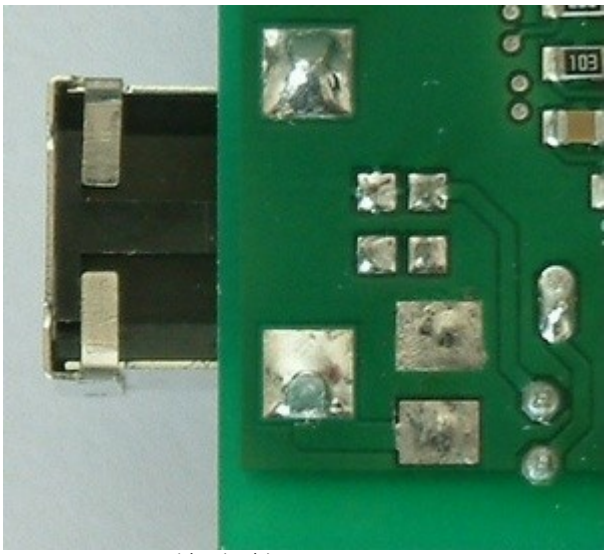

Figure 2.3: USB cable shield open

2.2 Power, Laser, OptoI/O, RS232

This connector provides all signals commonly used to control laser interfaces and allows to connect external control units like SPS, PC etc. over opto-insulated IO lines. It also provides the power lines when driving the unit in self powered mode.

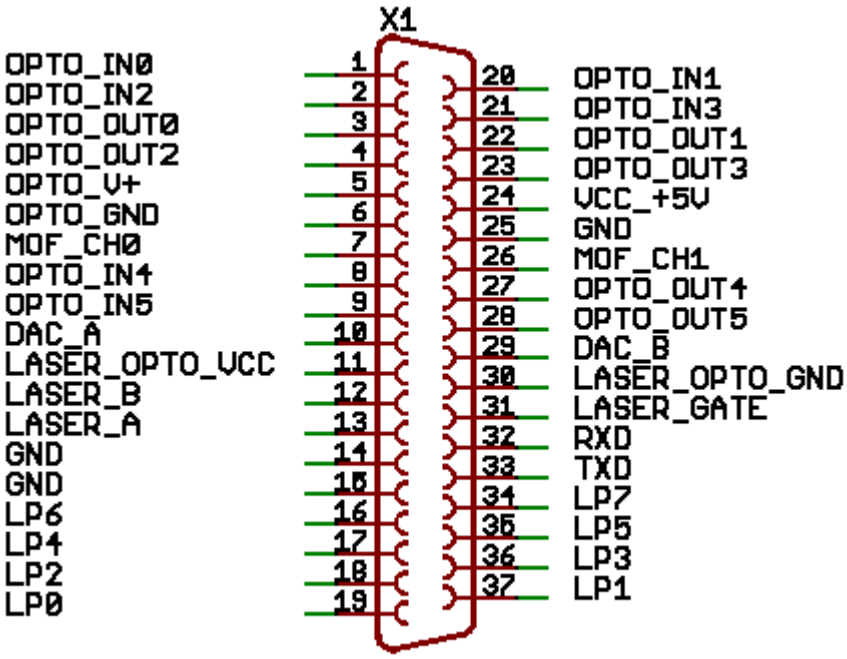

Figure 2.4: 37-pin connector assignment

2.2.1 Power

The USC-1 can operate in USB bus powered or self powered mode.

2.2.1.1 Bus Powered

The USB specification allows to draw 500 mA from the USB power line. The power consumption of the USC-1 depends on several conditions and can exceed significantly this upper limit. Although the most USB host systems allow to draw much more power over the USB line, this mode should be only used for test and evaluation purpose. Next to the allowed power rate only shorter USB cables should be taken in account since due to the cable resistance the available voltage on the board itself could go below internal allowed values.

2.2.1.2 Self Powered

Self powered mode can be achieved by applying +5 V on VCC pin (pin 24) with respect to the GND pins (pin 25, 14, 15).

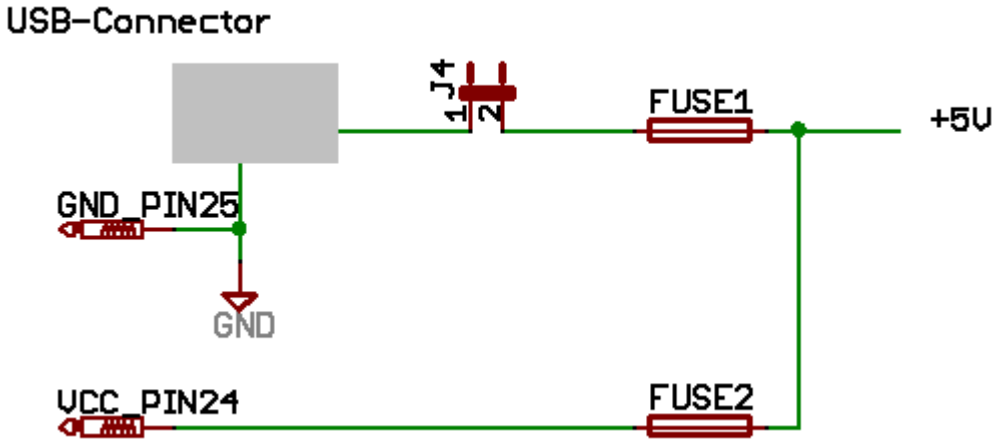

Figure 2.5: USC-1 power connection

Warning:
To avoid conflicts with the USB power line, Jumper 4 must be removed.

2.2.2 Laser

2.2.2.1 Gate, LaserA, LaserB

All 3 outputs can operate in opto-insulated mode. For this the LASER_OPTO_VCC (pin 11) and LASER_OPTO_GND (pin 30) must provide the supply. LASER_OPTO_VCC may not exceed +5 V with respect to LASER_OPTO_GND.

The maximum output current is 17 mA.

As default the optocouplers take their supply from internal VCC, which causes to eliminate the opto insulation. In this case the voltage of all 3 outputs are TTL compatible in respect to GND. The mode can be selected by jumpers JP1 (GND), JP2 (VCC) as shown in figures 2.6a and 2.6b.

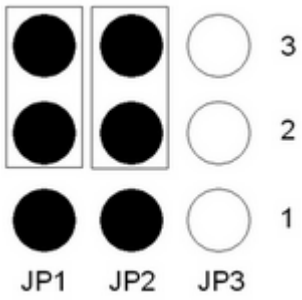

Figure 2.6a: Laser signal optocoupler external supply

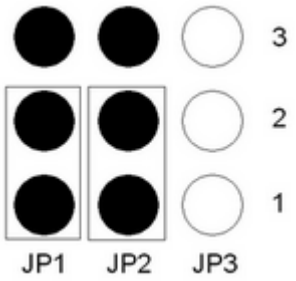

Figure 2.6b: Laser signal optocoupler internal supply (default)

The polarity of the Gate, LaserA and LaserB outputs is selected with jumper JP3 as shown in figures 2.7a and 2.7b.

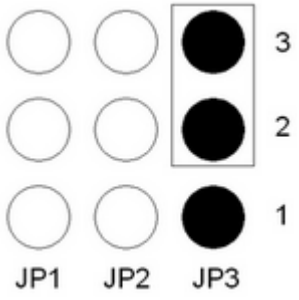

Figure 2.7a: Laser signal polarity active low (default)

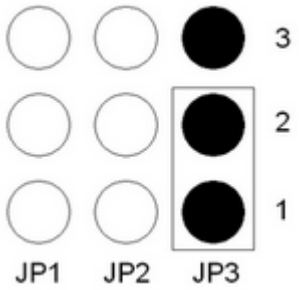

Figure 2.7b: Laser signal polarity active high

Note:
During startup and when the laser signals are disabled by software, the Gate, LaserA and LaserB outputs will go into tri-state. It must be sure that the Laser defaults to a safe operation in this case.

For YAG style laser mode the output timing (active low mode) is as follows:

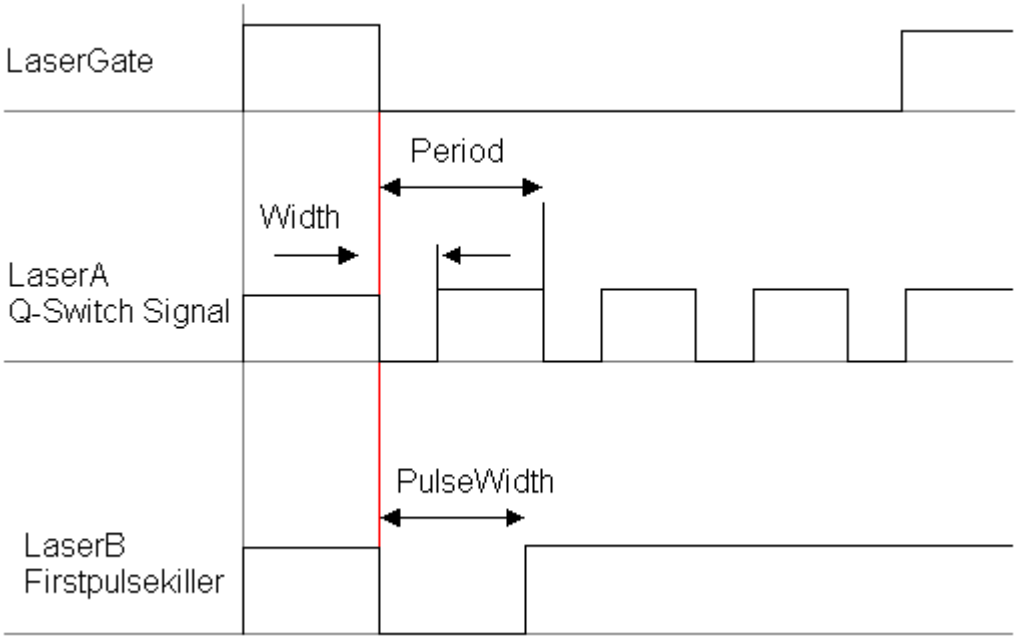

Figure 2.8: YAG laser control signals

2.2.2.2 Analog A And Analog B

Analog A and Analog B are the outputs of the internal 8 bit D/A converters and provide signals in the range from 0..2.5 V (position 1), 0..5 V (position 2) or 0..10 V (position 3) with respect to GND with a current of max. 10 mA. The supply for this circuit is generated on board from the +5 V main supply.

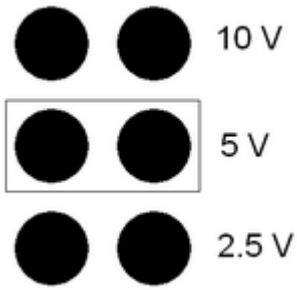

Figure 2.9: Analog output range selction

The output range can be selected by jumpers J5 (Analog A) and J6 (Analog B). The above example shows the settings for the +5 V range for both outputs (default).

2.2.2.3 Parallel Port LP0 - LP7

The 8 bit parallel port LP 0..LP 7 provides TTL output signals. All levels are defined in respect to GND.

The maximum output current is 30 mA.

2.2.3 Opto I/O

The I/O section provides opto-insulated In/Outputs and can be used to work with attached machinery/footswitches for triggering and so on.

By default following I/Os are used:

- opto input 0 for external start triggering (mark start, rising edge starts marking if software enabled this behavior)
- opto input 1 for external stop triggering (mark stop, rising edge stops a currently running marking process)
- opto output 0 as marking signal (mark in progress, signal goes to high as long as marking is in progress)

The optocouplers need an external supply OPTO_V+ (pin 5) , OPTO_GND (pin 6).
OPTO_V+ must be in the range of +5 V to +24 V in respect to OPTO_GND.

By connecting the pins VCC (pin 24) with OPTO_V+ and GND (pin 25) with OPTO_GND the circuit is supplied with the internal +5 V. OPTO_OUT0 is used as Mark in Progress flag and is parallelly driven with the Mark In Progress indicator LED.

The input activate threshold point is at +2 V. To increase it an approriate external resistor R_{Ext} must be added. The voltage on OPTO_IN(0..5) may not exceed +24 V in respect to OPTO_GND.

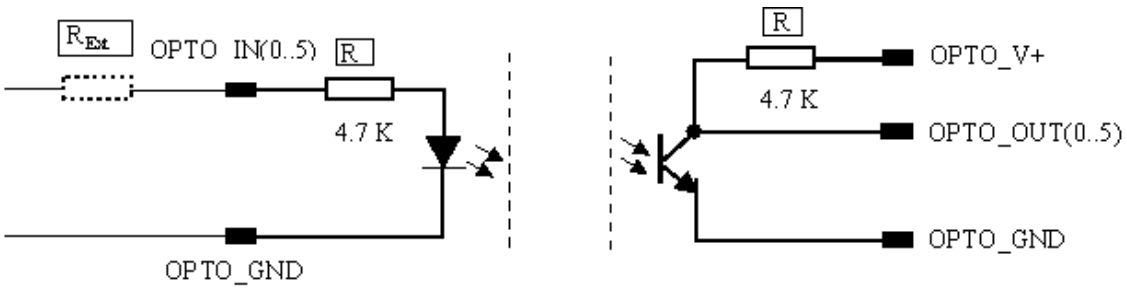

Figure 2.10: schematic optocoupler input and output circuit

Note:

SAMLight uses OPTO_IN0 for external trigger start and OPTO_IN1 for stop. OPTO_OUT0 is reserved for mark in progress.

The current consumption of the optocouplers is about 10 mA.

2.2.4 RS232

The RxD and TxD lines are defined in respect to the connected device. So the USC-1 RxD pin should be connected to the device RxD pin and the same for the TxD pins. The baud rate can be defined between 2400 and 57600.

2.3 XY2-100 Interface

The connector X4 provides the standard XY2-100 Interface.

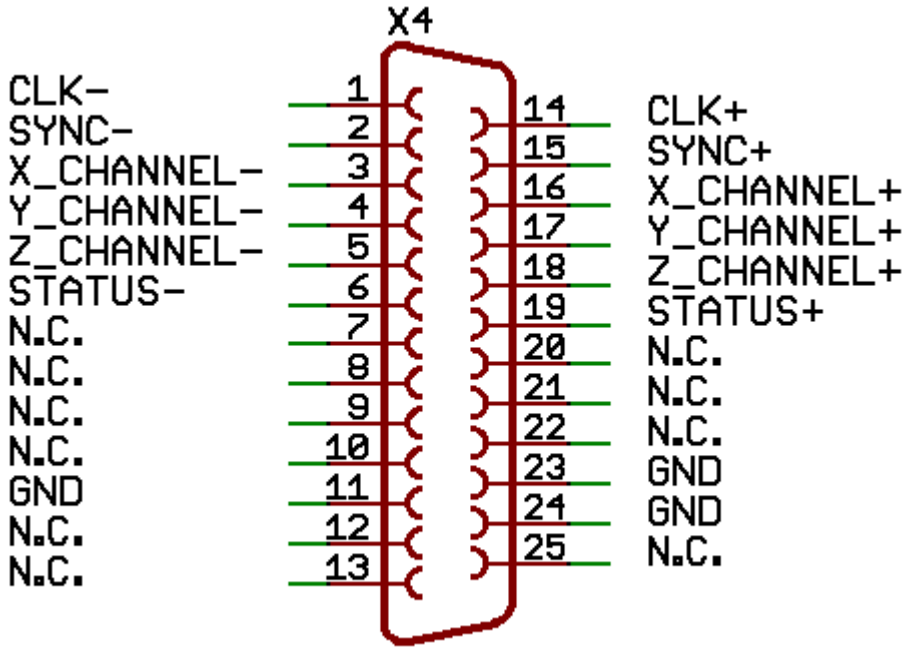

Figure 2.11: XY2-100 interface connector assignment

N.C. : Do not connect

2.4 LED Indicators

The two LED Indicators have the following function:

Figure 2.12: LED indicators

Device State (green color):

In general when blinking or Off the device is not operational.

Specific:

Blinking with 1 sec period: After device has booted from the on board EEPROM.
Blinking with 0.2 sec period: The FPGA program is downloaded via USB.
Staying ON: Device is operational.

Mark In Progress (red color):

This LED is parallel with the opto-insulated OPTO_OUT 0 (pin 3) output of the 37-pin connector. It is ON during mark.

3 Analog Extension

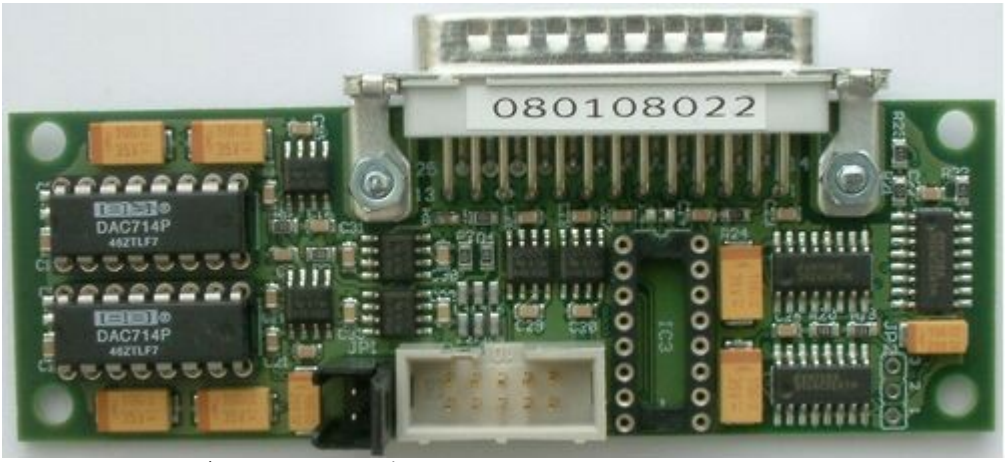

Figure 3.1: AEB-1 Analog Extension Board

3.1 Features

The AEB-1 (Analog Extension Board) is designed to drive various kinds of scanner controllers with an analog position signal. It can be directly mounted to the USC-1 or it can be connected via a cable with up to 50 meter length. Due to its small size it fits in almost every scan head.

Analog Outputs
- 3 x 16 bit channels
- ± 5 or ± 10 V output range
- 5 mA output current

Digital I/O
- 3 outputs
- 3 inputs

Power
- ± 15 V / 200 mA
- + 5V / 200 mA

3.2 Board And Connectors

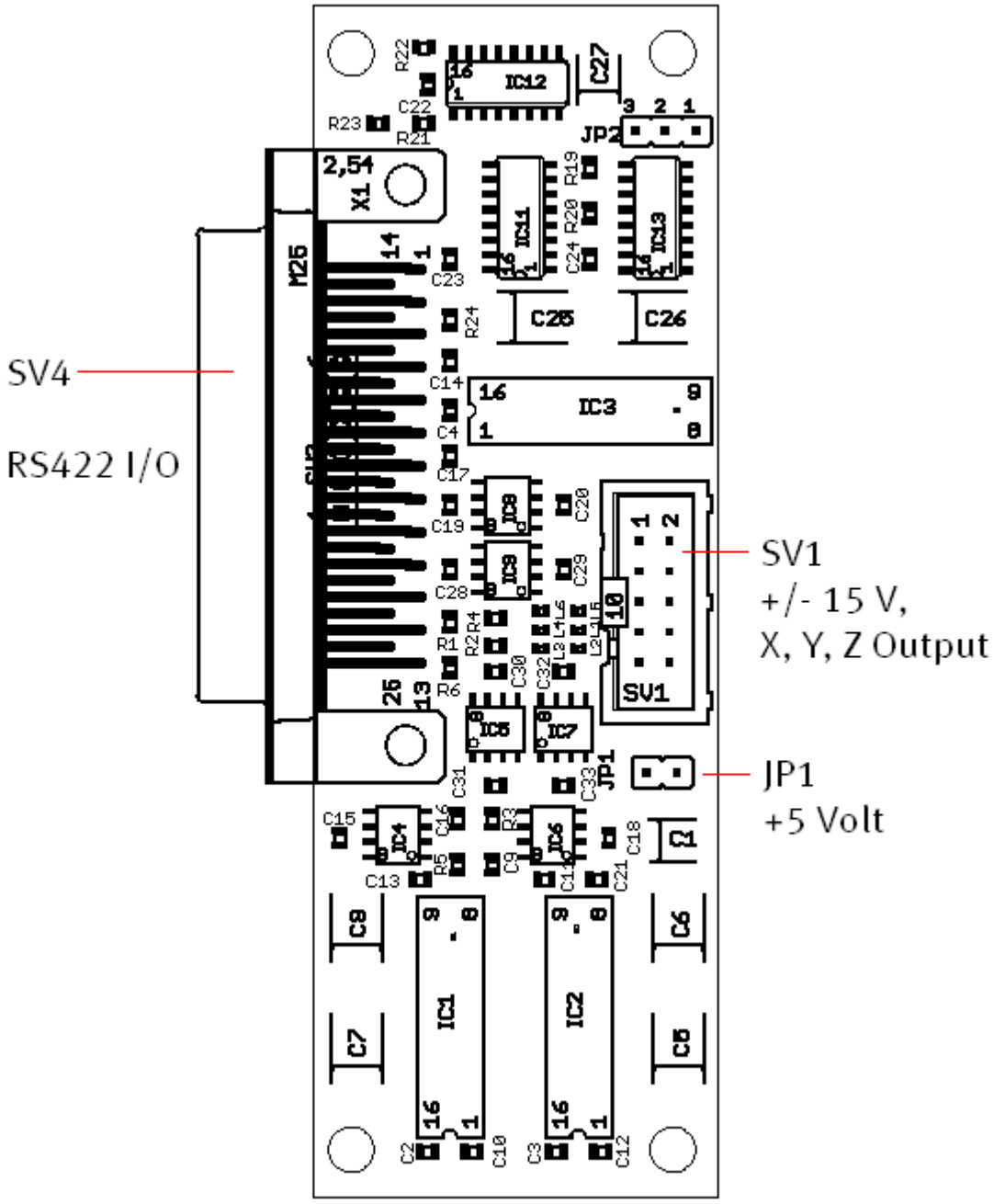

Figure 3.2: AEB-1 connectors

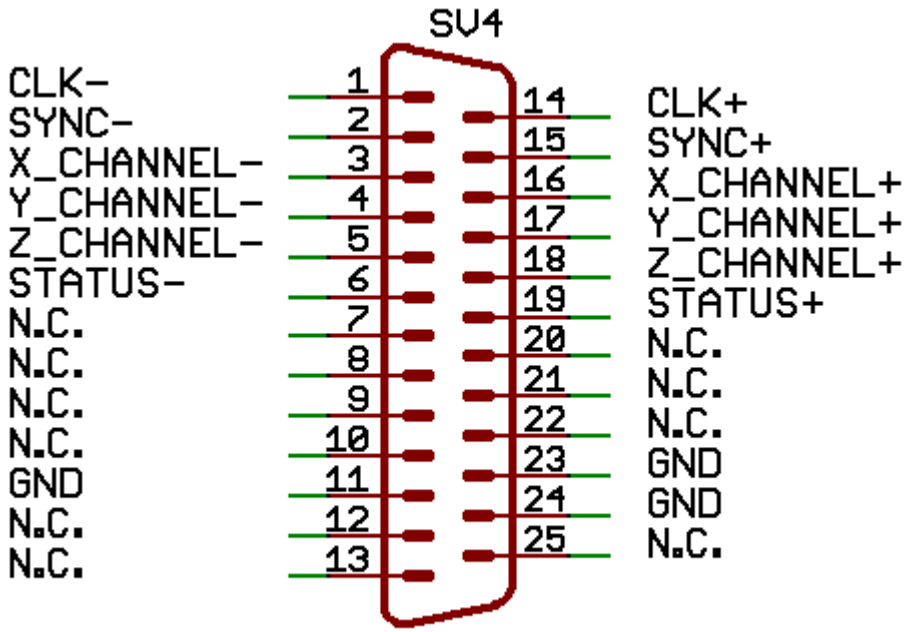

Figure 3.3: SV4 - 25-pin connector pin assignment

N.C.: Do not connect.

The 16 bit analog outputs are provided as a differential signal for the X, Y and Z channels via the 10 pin connector SV1. For operation an external +/- 15 V supply must be connected. Each channel can be configured to either +/-5 V or +/- 10 V output range and can deliver 5 mA .

Note:
The negative signals are used for scan heads with differential inputs. When using a scan head without differential inputs the positive signals are used in respect to ground (pin 6 or 10 AGND).

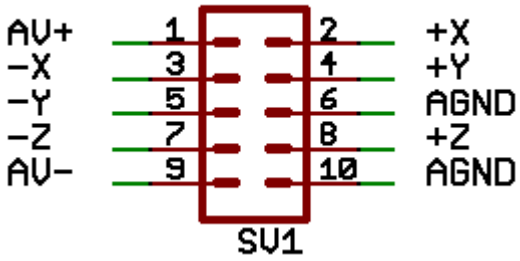

Figure 3.4: SV1 - 10-pin analog connector pin assignment

Pin	Name	Comments
1	AV+ (+15 V)	+15 V positive supply in respect to AGND, 200 mA max current. Appropriate fuse for circuit protection must be provided by the external circuit.
2	+X	Positive X channel, max. 5 mA current
3	-X	Negative X channel, max. 5 mA current
4	+Y	Positive Y channel, max. 5 mA current
5	-Y	Negative Y channel, max. 5 mA current
6	AGND	Analog Ground, Connected also to pin 10 of SV1
7	-Z	Negative Z channel, max. 5 mA current
8	+Z	Positive Z channel, max. 5 mA current

9	AV- (-15 V)	-15 V negative supply in respect to AGND, 200 mA max current. Appropriate fuse for circuit protection must be provided by the external circuit.
10	AGND	Analog Ground, Connected also to pin 6 of SV1

Table 3.1: AEB-1 10-pin connector assignment

3.2.1 +5 Volt Connector

+5 V in respect to AGND must be supplied via the connector JP1, 200 mA max. current.

Note:
An appropriate fuse for circuit protection must be provided by the external circuit.

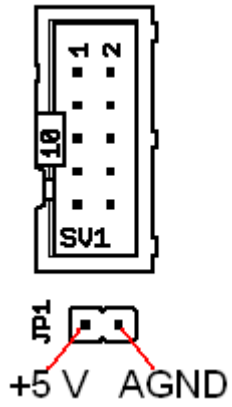

Figure 3.5: 5 V connector

3.2.2 Connection Kit

In order to connect the AEB-1 with SV1 and JP1 there is a connection kit delivered with the board.

The connection kit consists of the parts listed in table 3.2.

Quantity	Description
1 EA	Ribbon Cable Connector (AMP-LATCH)
1 EA	Strain relief (AMP-LATCH)
1 EA	Minimodul connector, pitch 2.50 mm
3 EA	Crimp contact

Table 3.2: AEB-1 connection kit

3.3 Output Range

The AEB-1 provides a differential output signal as shown in figure 3.6.

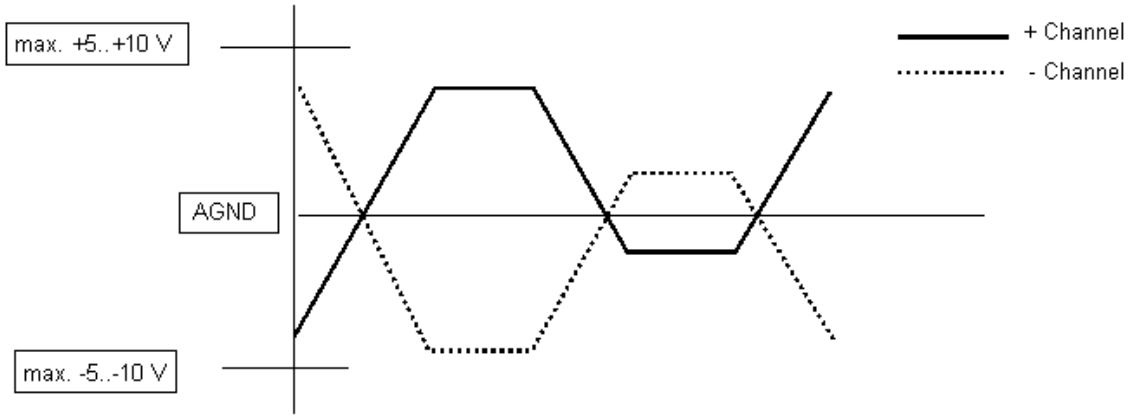

Figure 3.6: AEB-1 analog output

The output range can be selected for each channel separately with solder jumpers on the bottom side of the AEB-1 as shown figure 3.7 and described in table 3.3.

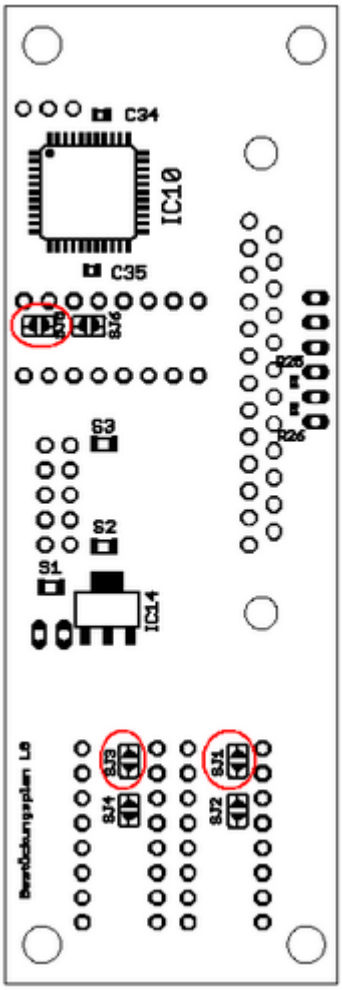

Figure 3.7: Solder jumpers for output range selection

Channel	Jumper	State	Output range
X	SJ1	Open	-10 V..+10 V
		Closed	-5 V..+5 V
Y	SJ3	Open	-10 V..+10 V
		Closed	-5 V..+5 V
Z	SJ5	Open	-10 V..+10 V
		Closed	-5 V..+5 V

Table 3.3: AEB-1 output range selection

Note:
By default, the 3 jumpers SJ1, SJ3 and SJ5 are closed.

Warning:
SJ2, JS4 and SJ6 must always remain closed.

3.4 Connecting AEB-1 To USC-1

3.4.1 Direct Connection

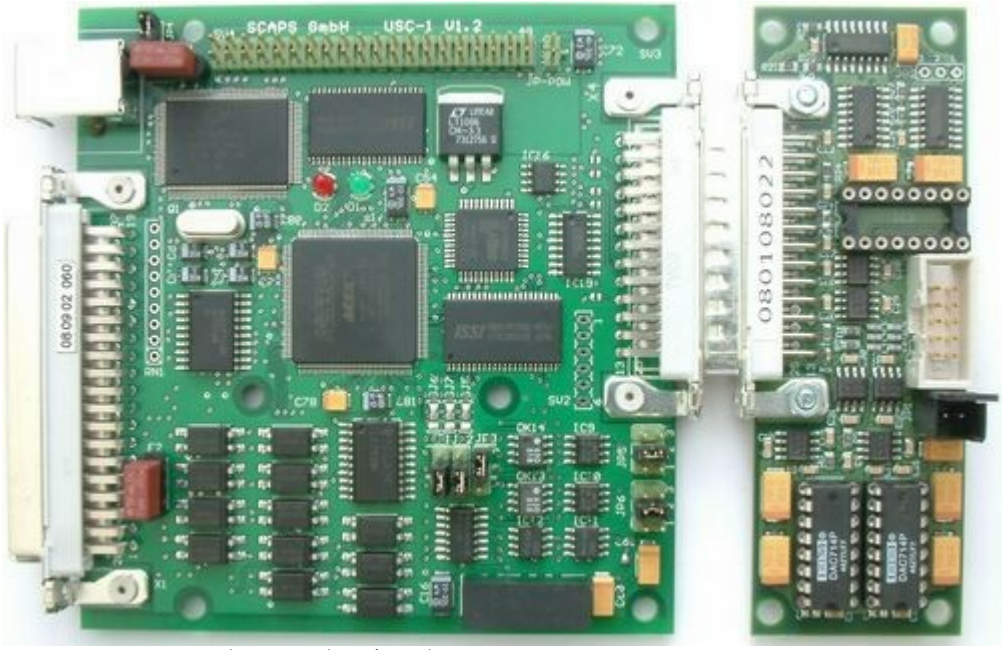

Figure 3.8: Connecting the AEB-1 directly to the USC-1

3.4.2 Cable Connection

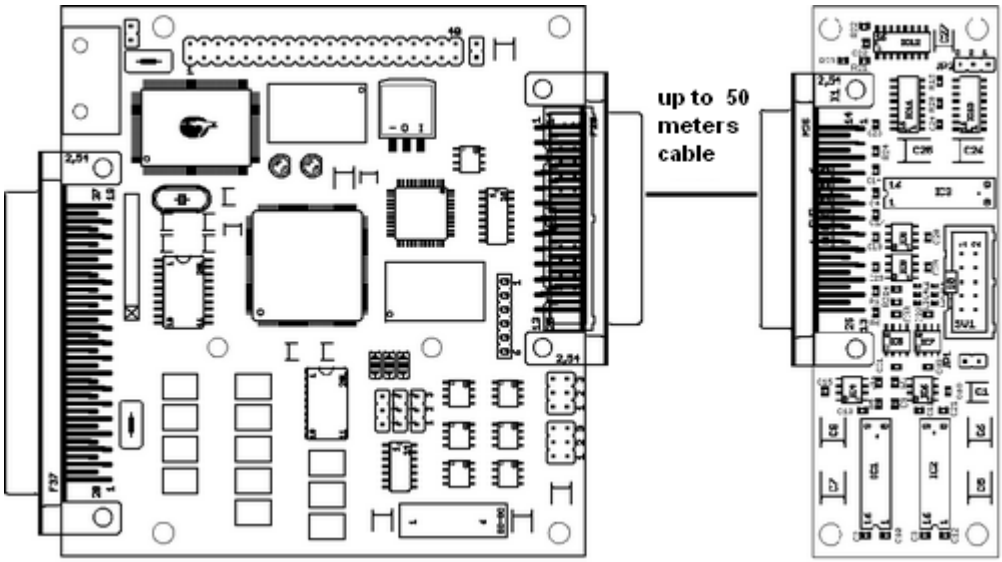

Figure 3.9: Connecting the AEB-1 to the USC-1 via cable

4 Installation

For detailed information on installation and setup see chapter First Steps / Getting Started 22.

5 Marking On The Fly

5.1 Overview

The typical marking on the fly setup is shown below:

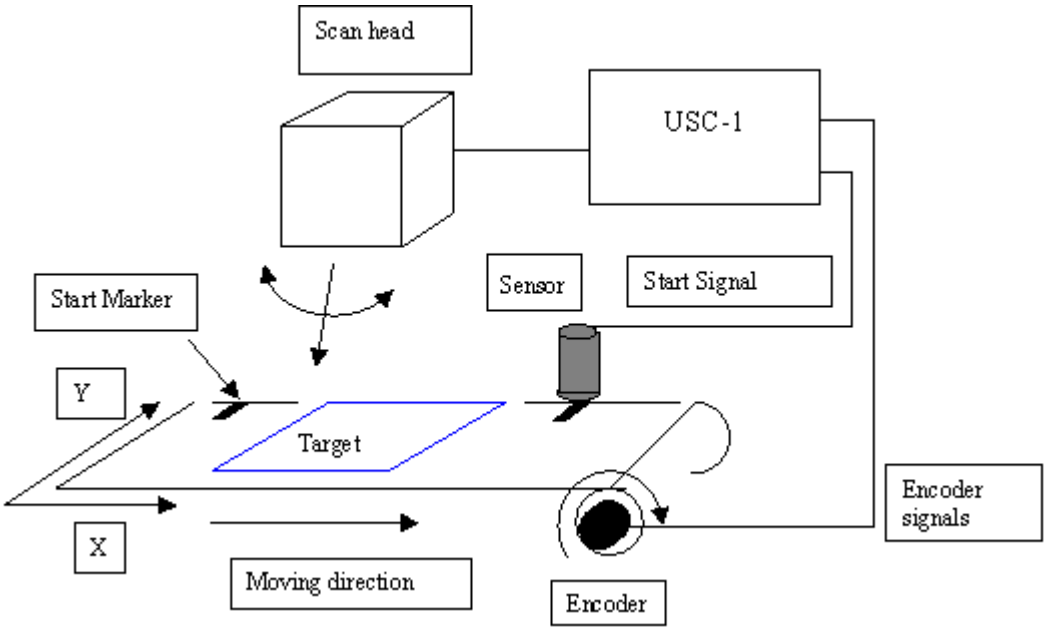

Figure 5.1: Marking on the fly setup

The target piece is placed on a moving belt. The movement of the belt is measured by a rotary encoder. The encoder signals are decoded by the USC-1 logic into a distance information which in turn is transferred to the Scan head to compensate the target movement. A photo sensor acts as a

synchronisation element by delivering a start impulse to the USC-1. This start impulse typically resets the USC-1 distance counter and initialises marking.

5.2 Encoder Signals

The USC-1 is designed to handle two 90° shifted encoder signals delivered by standard commercial encoders. The USC-1 decoder interprets each transition, whether it is on MOF_CH0 or Channel MOF_CH1, as a count impulse. The up/down information (which reflects the moving direction of the belt) is taken from the order of transitions and the state for both channels. If for example MOF_CH0 is high while MOF_CH1 goes from low to high (Point A) the direction is up. If MOF_CH0 is low while MOF_CH1 goes from low to high (Point B) the direction is down. Similar rules are valid for other combinations of channel state and transitions.

Therefore exchanging the MOF_CH0/MOF_CH1 wiring from the encoder to the USC-1 or inserting inverting elements will not effect the count pulses but will effect the up/down information encoding.

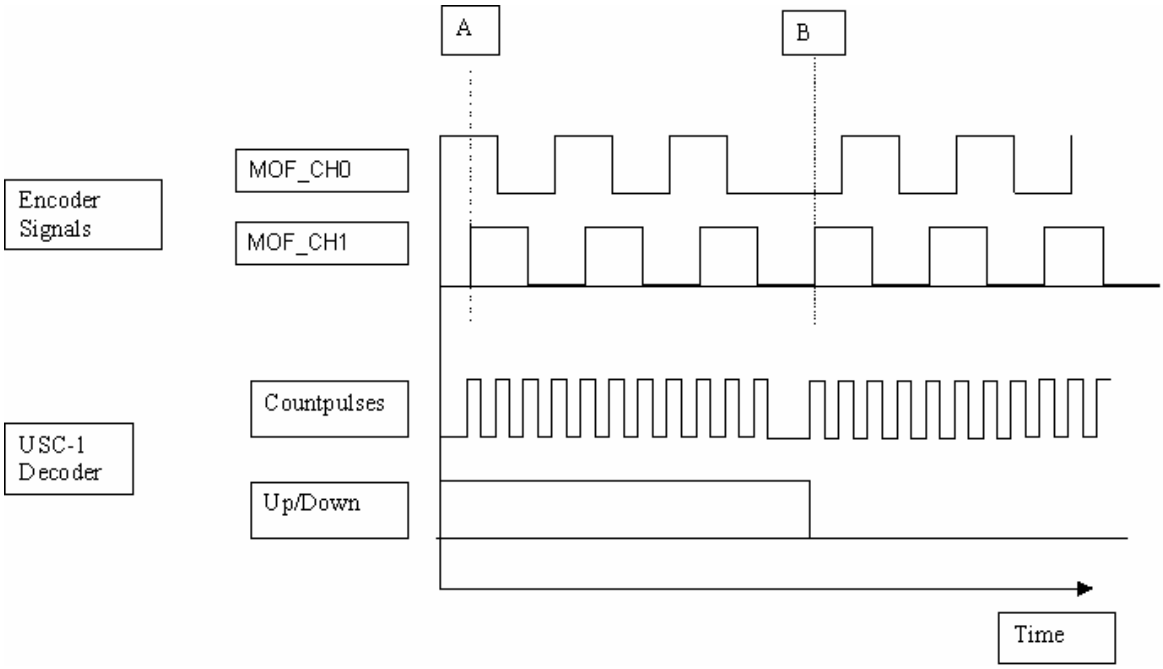

Figure 5.2: Encoder signals

5.3 Principle Of Working

The USC-1 internal logic for decoding the encoder signals MOF_CH0 and MOF_CH1 is shown below.

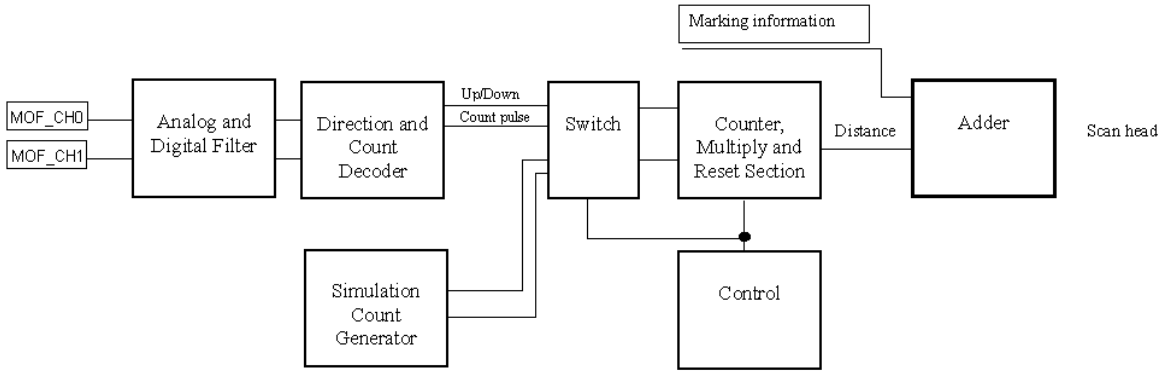

Figure 5.3: Principle of working

The MOF_CH0 and MOF_CH1 signals are filtered by an analog and digital filter unit. The cut off frequency is 300 kHz leading to 4 times more maximal count frequency of 1.2 MHz. After the decoding a counter counts the incoming count pulses and is incremented or decremented according to the up and down information. In some application the belt movement direction and speed remains constant. In this case the count and up/down information can be generated by an internal Simulation Generator eliminating the need for an encoder. The count frequency is fixed to 100 kHz.

In order to calibrate the counter to the scanner field units [typically in bits, mm or inch] the counter value is multiplied by a user definable signed constant. The resulting distance information is added to the marking information to form the final scan head control signals.

5.4 Connecting The Encoder Signals

5.4.1 Configuring USC-1

In order to use the marking on the fly inputs MOF_CH0 and MOF_CH1, USC-1 jumpers on the bottom side have to be set as shown in the figures 5.4 and 5.5.

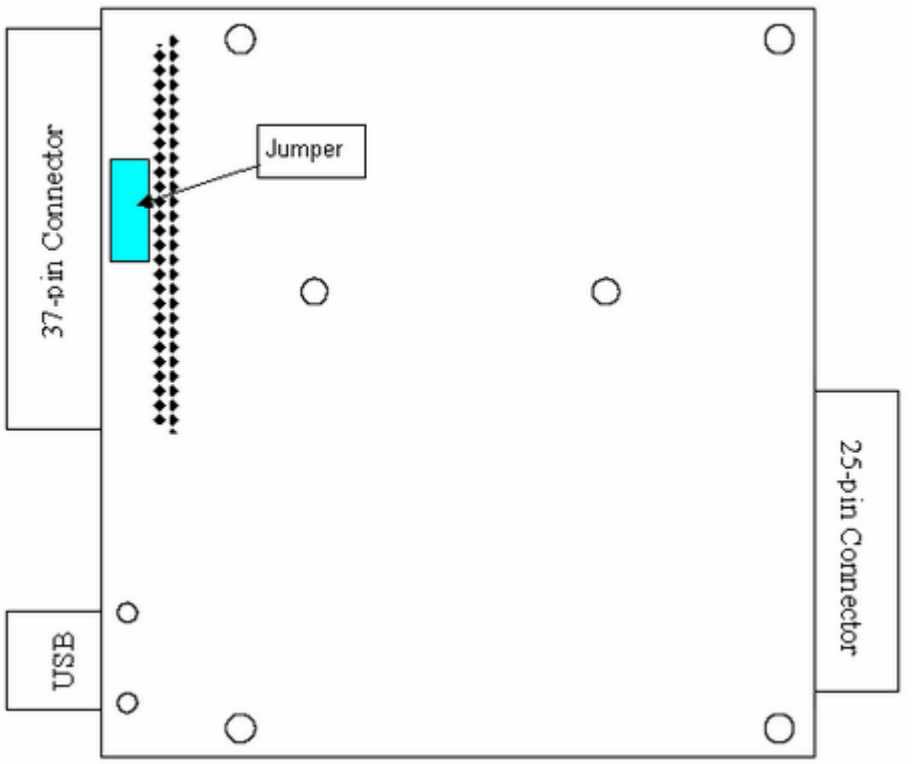

Figure 5.4: USC-1 board – bottom view

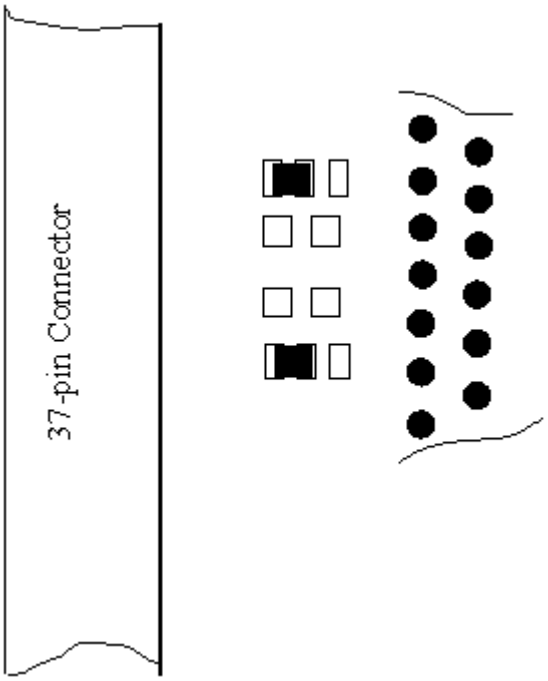

Figure 5.5: Marking on the fly setup

5.4.2 Pin Connection

The encoder signals MOF_CH0 and MOF_CH1 must be connected to the USC-1 37-pin connector. The signal level may not be below –0.5 V or above +7 V with respect to ground (GND).

The threshold level for the signal inputs is 3.4 V.

5.4.3 Software Settings

The marking on the fly settings can be edited within the USC-1 global settings dialog.

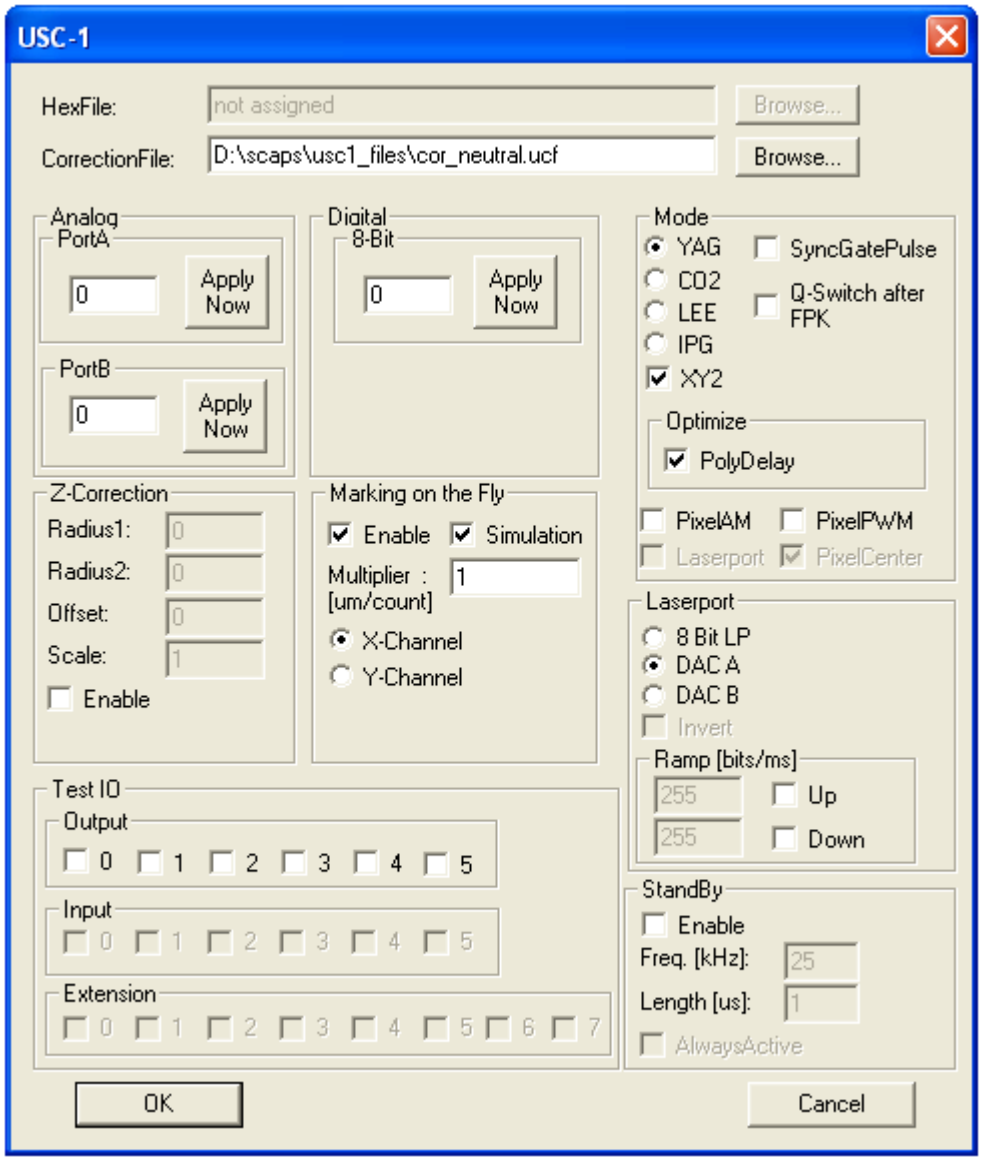

Figure 5.6: Software settings

Enable: Generally enables the marking on the fly mode.
Simulation: Takes the internal 100 kHz clock generator as clock source.
Multiplier: Defines the multiply constant for converting Count pulse to field units.
In the above example 1 count equals 1 µm.
For a 100 mm field and the internal 100 kHz clock the making of the fly speed is 100 mm / sec.
The multiplier may also have negative sign. This can be used to invert the compensation direction.
X/Y Channel: Compensate along the Scanner X or Y axis.

6 First Steps / Getting Started

Install the latest version of SAMLight, which can be downloaded here:

SCAPS Download

In the following text, ‹SCAPS› is a placeholder of the software installation path. As default, the SCAPS software will be installed to: C:\scaps\sam2d\.

6.1 Installation

Installing SAM Software

Run sc_sam_setup_v_3_0_X_YYYYMMDD.exe and follow the instructions.

Note:
Administrator rights on the PC are necessary for the software installation.

Installing the dongle

1. Plug in the dongle at the USB connector of the PC (not necessary if there is an USC-1 or USC-2 scanner card installed).
2. Start SAMLight and type in your password:

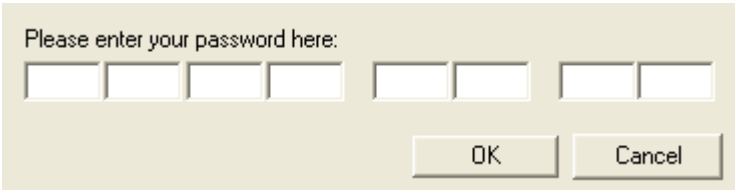

Figure 6.1: Password Dialog

Note:
When using an old password, which consists of four or six blocks, leave the other fields empty!

Register scanner driver card
Before using the scanner driver card with the SAM software, the type of card, the laser type and the location of some files must be defined. Other settings can also be modified directly in SAMLight and the Standard2D software.
See sc_setup 27 for further information.

Card settings
Define the location of the files for the scanner driver card within SAMLight->Settings->System->Card or Standard2D->Settings->Scanner->Global->Driver Settings.

Optic settings
Within the optic settings (SAMLight->Settings->System->Optic , Standard2D->Settings->Scanner->Global), the field size, working area and the home position can be defined. These settings are very important to get the correct size of the marking result.

Note:

Please refer to the manual sc_manual_sl_English.pdf

6.2 sc_usc_server.exe

The sc_usc_server.exe is located in the folder ‹SCAPS›\system.

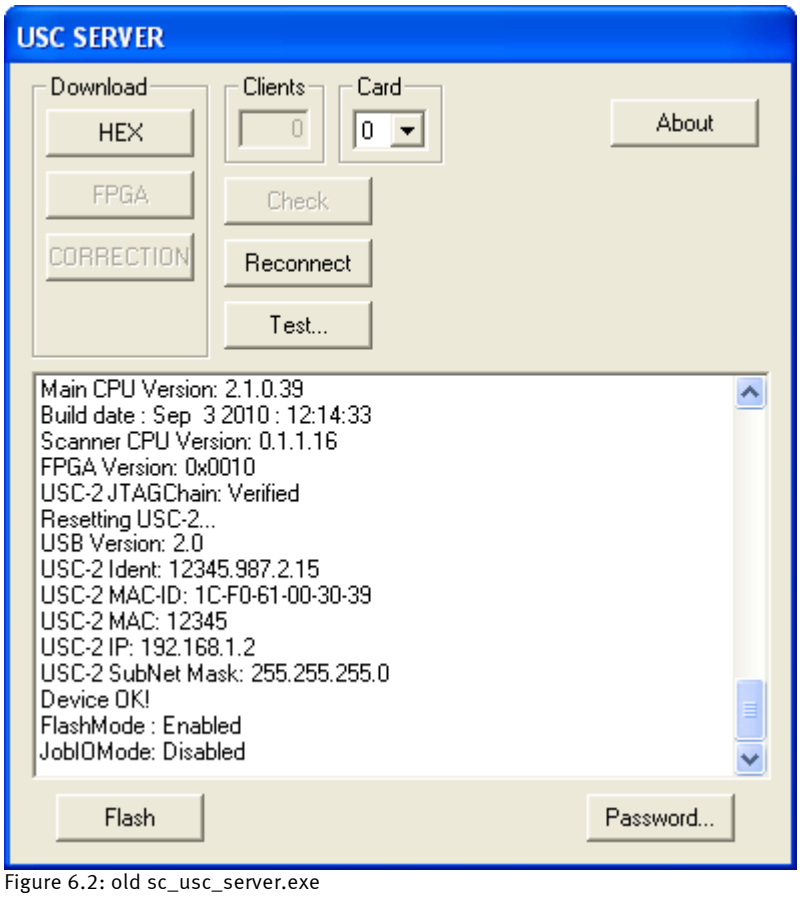

Figure 6.2: old sc_usc_server.exe

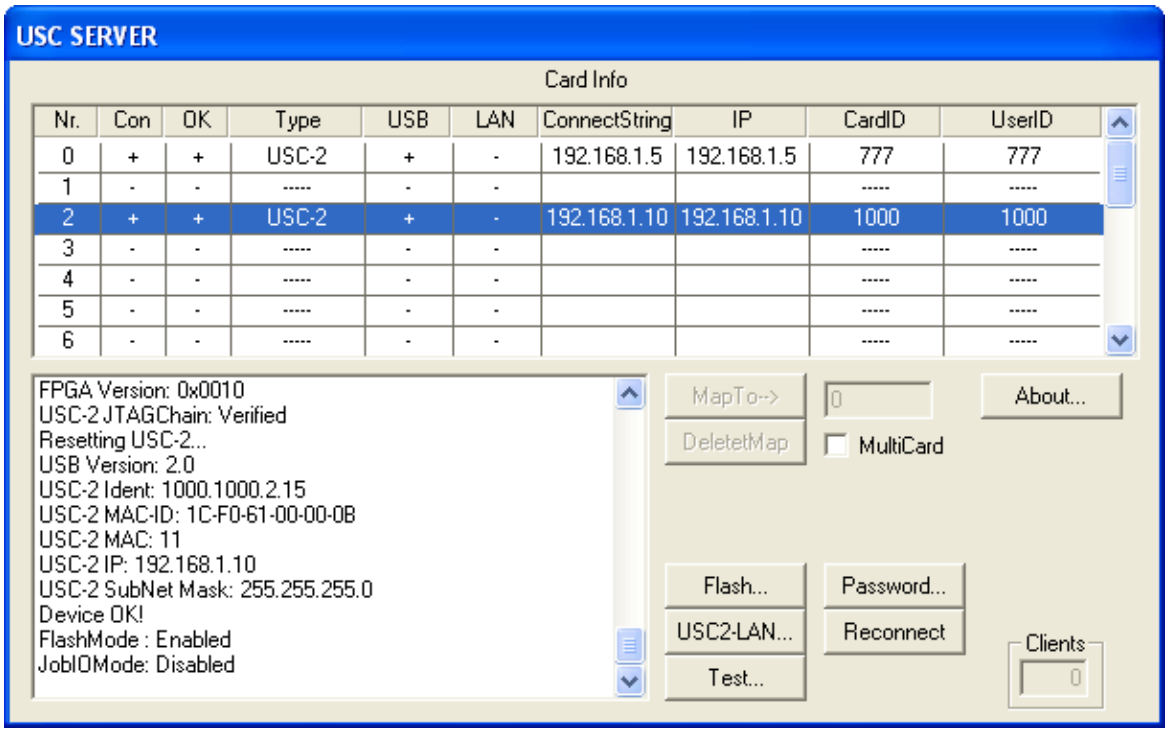

Figure 6.3: new sc_usc_server.exe

6.2.1 Visible Mode

- Close SAMLight or any other running SAM program
- Cancel a running sc_usc_server with the task manager
- Choose sc_usc_server.exe from the list and click "End Process"

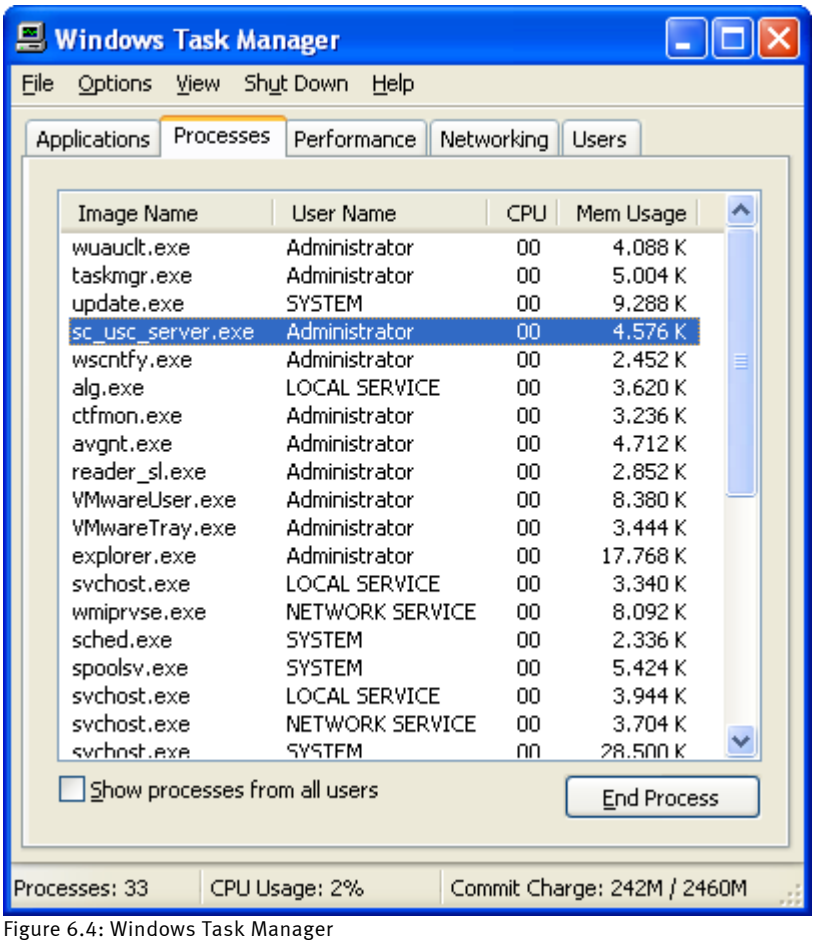

Figure 6.4: Windows Task Manager

There are three ways to start sc_usc_server.exe in visible mode.

1. Press "Start", choose "Run...", type in "C:\scaps\sam2d\system\sc_usc_server.exe /v", hit the enter key.
2. Create a shortcut of ‹SCAPS›\system\sc_usc_server.exe and expand the target with /v.
3. Set the line "VisibleMode=0" in the file ‹SCAPS›\system\sc_usc.cfg 26 to "VisibleMode=1".

6.2.2 Test...

The TestDialog can be used to set or display the OptoIOs as well as the analog outputs.

6.2.3 Reconnect

Reconnect the selected device.

Note:
Reconnect is only possible when using USB!

6.2.4 sc_usc.cfg

The file sc_usc.cfg (formerly sc_usc1.cfg) consists of the following entries:
(Default values are **bold**.)

Entry	Value	Description
InvertOptoOut	**0** | 1	invert the OptoOuts (only for USC-1)
VisibleMode	**0** | 1	start sc_usc_server.exe in visible mode
ServerRestart	**0** | 1	unused, will be deleted when using the latest sc_usc_server.exe
ForceUSB11	**0** | 1	use USB 1.1, even if the card is connected to a USB 2.0 port
Connect0	IP-Address	IP-Address of the USC-2 (only for USC-2)
Connect1	IP-Address	- ditto -
Connect2	IP-Address	- ditto -
Connect3	IP-Address	- ditto -
Connect4	IP-Address	- ditto -
Connect5	IP-Address	- ditto -
Connect6	IP-Address	- ditto -
Connect7	IP-Address	- ditto -
Connect8	IP-Address	- ditto -
Connect9	IP-Address	- ditto -
Connect10	IP-Address	- ditto -
Connect11	IP-Address	- ditto -
Connect12	IP-Address	- ditto -
Connect13	IP-Address	- ditto -
Connect14	IP-Address	- ditto -
Connect15	IP-Address	- ditto -
MultiCard	**0** | 1	set the value to one when using more than one USC-2

Table 6.1: sc_usc.cfg

6.2.5 sc_usc_card_ids.txt

The file sc_usc_card_ids.txt (formerly sc_usc1_card_ids.txt) consists of 16 entries, which define the order to enumerate the cards. The first entry defines Head0 and so on.


Note:
This file will be created dynamically the first time more than one card is connected.
Head0 must exist!
Each ID must exist only once!
Unused entries are set to zero.

6.2.6 MultiCard

The MultiCard flag enables the option to mark with a certain head when more than one card is connected. It also activates the "MapTo-->" and "DeleteMap" buttons. With these buttons the list "Card Info" can be edited. The list will be stored in the file sc_usc_card_ids.txt 26.

	SingleHead (normal)	MultiHead	MultiCard
Number of cards	1	multiple	multiple
Number of working areas	1	multiple, overlapping	one for all heads
Splitting	no	depends on the size of the working areas	no
Marking	whole job	each head marks a certain part of the job	the active head can be selected manually; default is head 0
License	standard	MultiHead	standard

Table 6.2: MultiCard vs. MultiHead

Note:
MultiCard is not MultiHead!
The MultiCard flag will be ignored, if a MultiHead license is installed.

6.3 sc_setup.exe

The sc_setup provides all functionalities to setup the hardware and software. It is located in the folder ‹SCAPS›\tools.

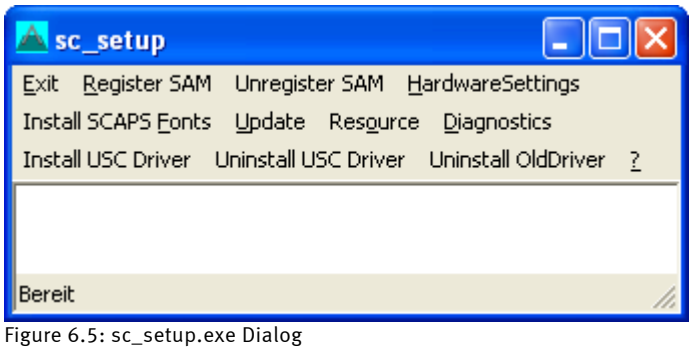

Figure 6.5: sc_setup.exe Dialog

Menu Item	Description
Exit	exit the software
Register SAM	register the SCAPS dlls
Unregister SAM	unregister the SCAPS dlls
HardwareSettings	open the "GeneralSettings" dialog
Install SCAPS Fonts	install the SCAPS laser fonts
Update	update from previous versions
Resource	edit the language resources
Diagnostics	display information about the plugged in dongle, software version and dll versions
Install USC Driver	install the USC driver software
Uninstall USC Driver	uninstall the USC driver software
Uninstall OldDriver	uninstall the old USC-1 driver software
?	open the "About" dialog

Table 6.3: sc_setup.exe Menu

6.3.1 HardwareSettings

sc_light_settings.sam is the default settings file for SAMLight. sc_settings.sam is the default SAM2D settings file. These files are stored to ‹SCAPS›\system. All settings which are described in the following chapters, will be stored to the settings file.

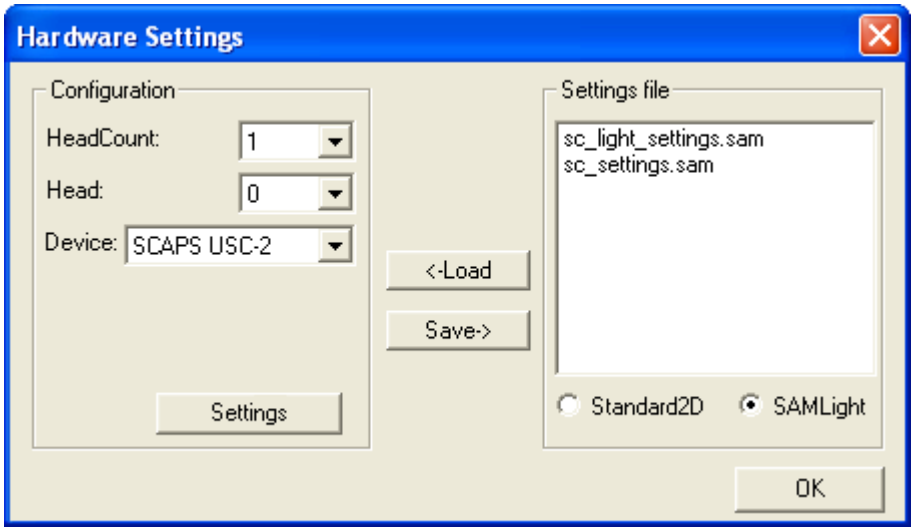

Figure 6.6: Hardware Settings Dialog

- Choose the settings file from the list on the right side and click "‹-Load". When using the radio buttons, "Standard2D" loads sc_settings.sam and "SamLight" loads sc_light_settings.sam.
- HeadCount: choose the number of cards

  Note:
  When using USC-2 with Head2 license, it's still one card!
- Head: select the head which has to be setup
- Device: select the hardware device (USC-1/2, RTC-3/4/5, etc.) for the previous selected head
- press "Settings" to get to the next dialog

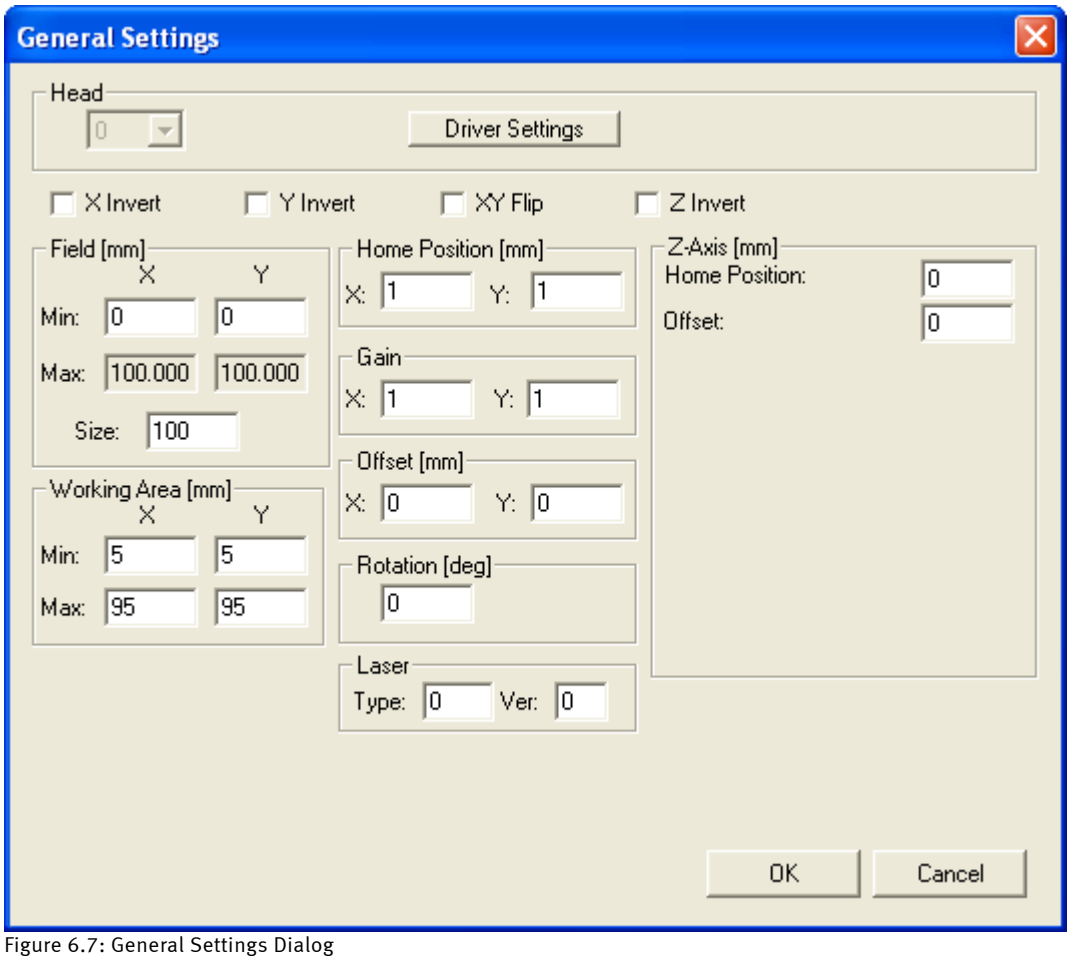

Figure 6.7: General Settings Dialog

Head:	choose the Head for which the "Driver Settings" should be edited the drop down menu will be enabled only if the 'HeadCount' in the previous dialog is bigger than 1
Driver Settings:	opens the Driver Settings 30 dialog where hardware specific settings can be edited
Invert / Flip:	- Invert: each scanner axis can be inverted separately - Flip: the X and the Y axis can be flipped, so that the X axis gets the Y coordinates and the other way round
Field [mm]:	- the field size has to be typed in in mm - the field is always a square, the edge length is 'Size:' - the 'Max:' value is computed as 'Min:' + 'Size:' - the 'Min:' value can be negative, so that the field can be set up symmetrically to the origin
Working Area [mm]:	- the Working Area has a rectangular shape - the area is defined by 'Min:' and 'Max:' - the Working Area has to be within the Field, also consider the Rotation
Home Position [mm]:	- defines the position, from where the scanner starts its movement - if HomeJump is enabled, the scanner goes back to this position after marking
Gain:	The gain values are thought to compensate slightly X/Y gain errors to achieve a quadratic field.
Offset [mm]:	The offset values are thought to compensate slightly X/Y offset errors to achieve the theoretical midpoint of the scanner field. Global offset errors which have the same deviation in X and Y direction should be corrected by changing the field X/Y min values in the Field edit group.
Rotation [deg]:	the scanner output will be rotated counterclockwise by this angle

Laser:	type in 'Type:' and 'Ver:' as advised by SCAPS
Z-Axis [mm]:	- this option is only for Optic3D - 'Home Position': defines the position, from where the scanner starts its movement - if HomeJump is enabled, the scanner goes back to this position after marking

6.3.1.1 Driver Settings

The Driver Settings dialog can be used to setup the SAMLight startup defaults for the specified hardware.

6.3.1.1.1 USC-1

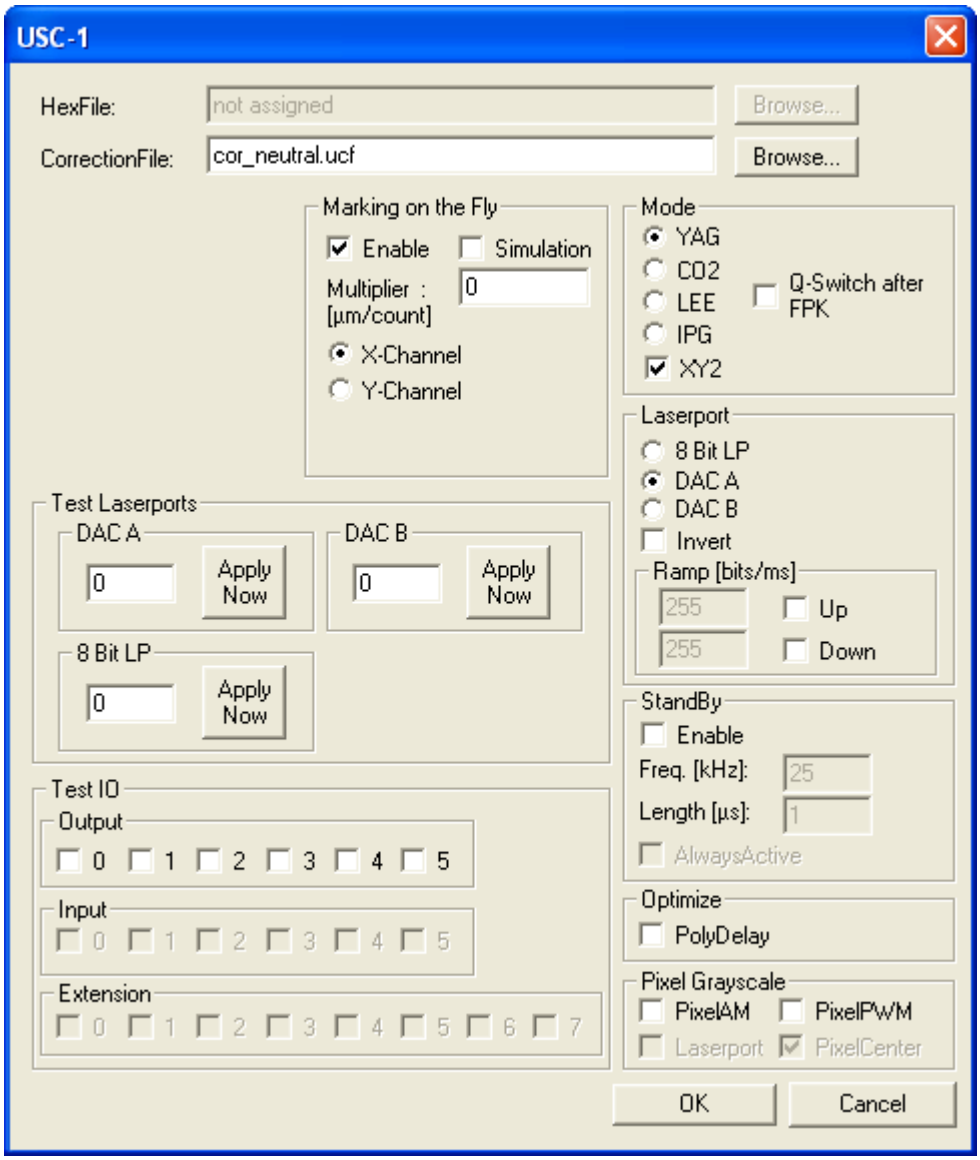

Figure 6.8: USC-1 Driver Settings Dialog

CorrectionFile:	the "Browse" button can be used to select the dedicated correction file
Marking on the Fly:	- the "Enable" check box will be activated by password - the 'Multiplier' has to be set as specified by the encoder - the radio buttons are used to set the MOTF direction
Mode:	- the radio buttons define the used Laser mode

	- 'Q-Switch after FPK' defines that the Q-Switch (LaserA) starts to pulse after a single pulse at the LaserB port - 'XY2' defines that the scanner driver signals are standard XY2-100 *Warning:* *Make sure that the 'XY2' check box is checked, if not mentioned differently.*
Laserport:	- the radio buttons define which port to use for Laser power control - the 'Invert' flag can be used to invert the laser port, this means 0 = 100% and 255 = 0% power - the power ramp can be activated by the 'Up' and 'Down' flag, the gradient of the ramp has to be between 0 and 255
Test Laserports:	a value between 0 and 255 will be set on the output by clicking "Apply Now"
StandBy:	if enabled, a standby frequency and a pulse length can be defined
Test IO:	- the 'Output' check boxes can be used to set OptoOut[0..5] - the 'Input' check boxes can be used to display OptoIn[0..5] - the 'Extension' check boxes can be used to display Input[0..7] of the I/O Extension Board
Optimize:	If selected the length of the polygon delay gets varied depending on the angle between two successive vectors.
Pixel Grayscale:	- 'PixelAM': enables Amplitude Modulation - 'PixelPWM': enables Pulse Width Modulation - 'Laserport': if checked the selected Laserport gets used for the output of PixelAM, else port DA2 is taken
OK:	save the settings to the settings file and close the dialog
Cancel:	discard changes and close the dialog

6.3.2 Diagnostics

The menu item "Diagnostics" -› "Dongle" displays the following dialog.

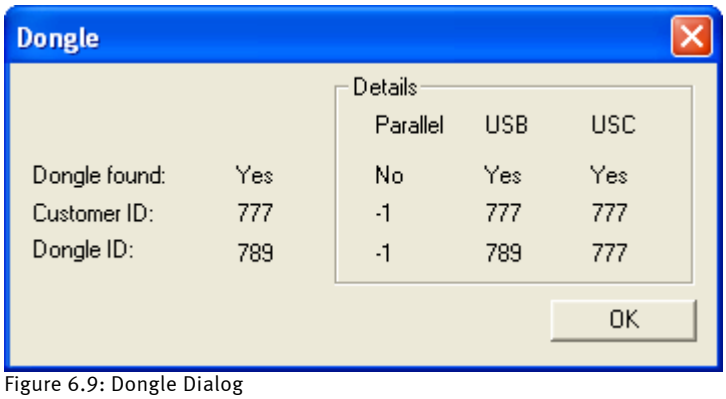

Figure 6.9: Dongle Dialog

Note:
Use the sc_usc_server.exe to display the dongle information of multiple USC cards!

7 Appendix

7.1 USC-1 Dimensions

Note:
All measures are denoted in mm.

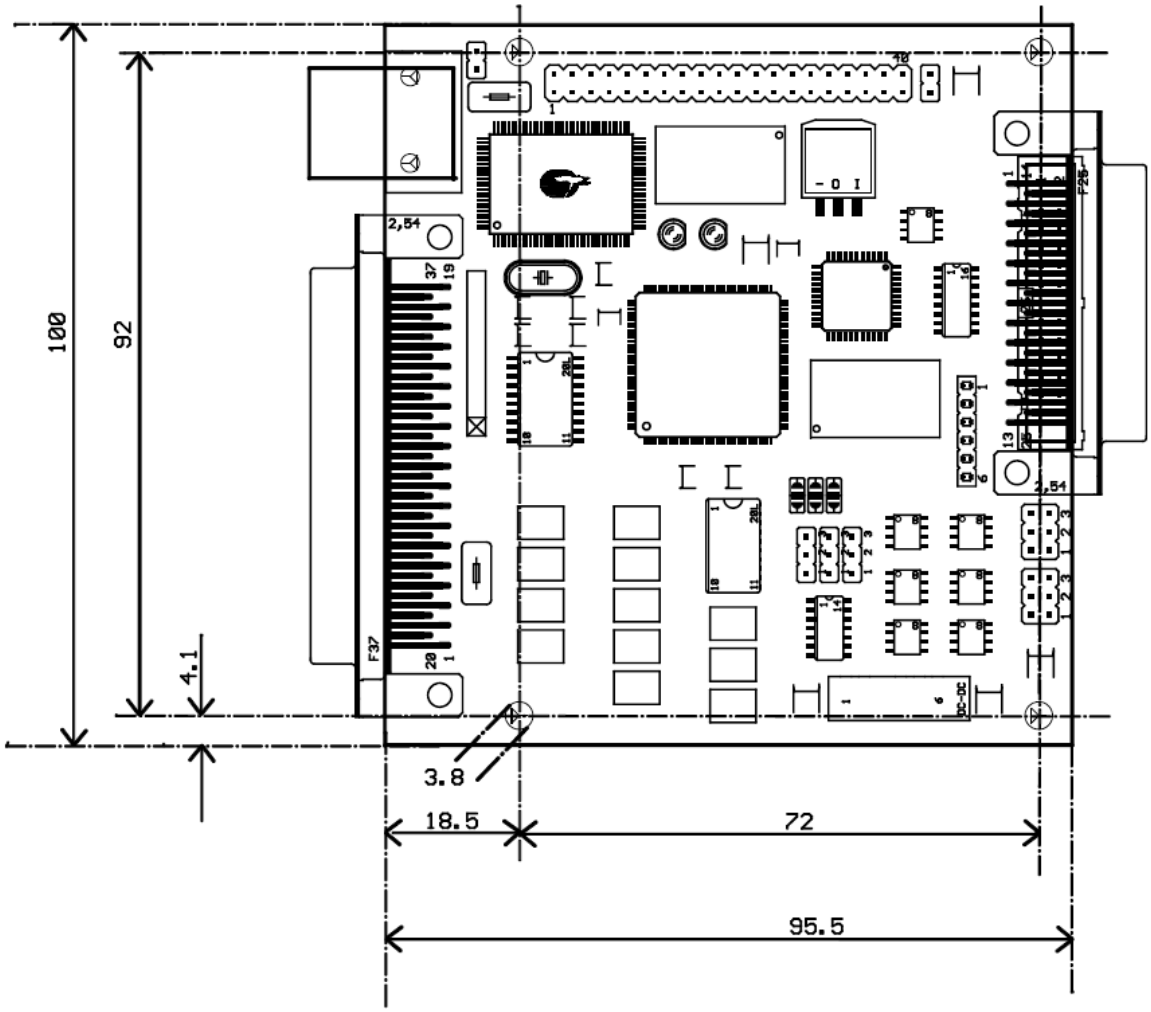

Figure 7.1: USC-1 dimensions

7.2 AEB-1 Dimensions

Note:
All measures are denoted in mm.

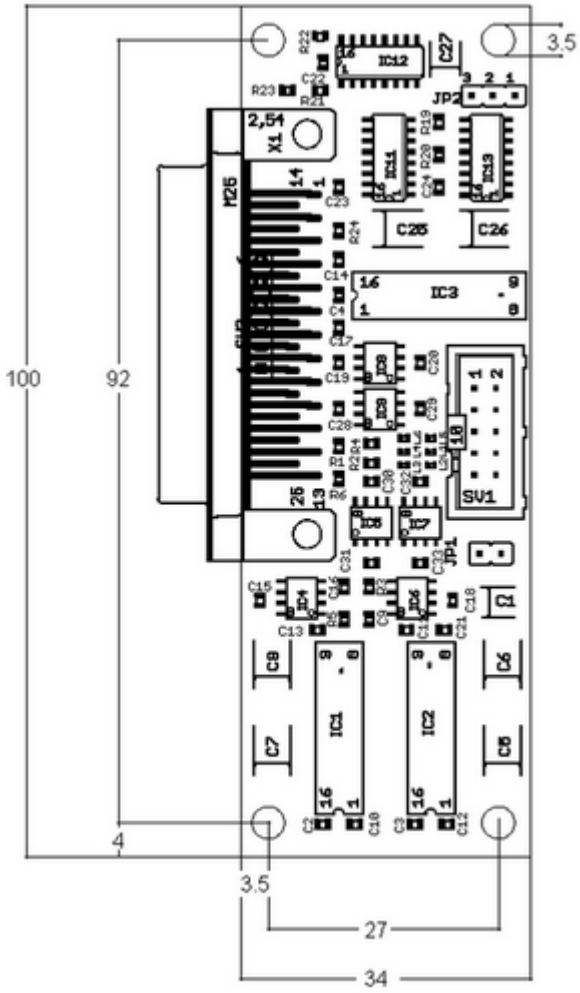

Figure 7.2: AEB-1 dimensions

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- T -

- U -

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- X -