



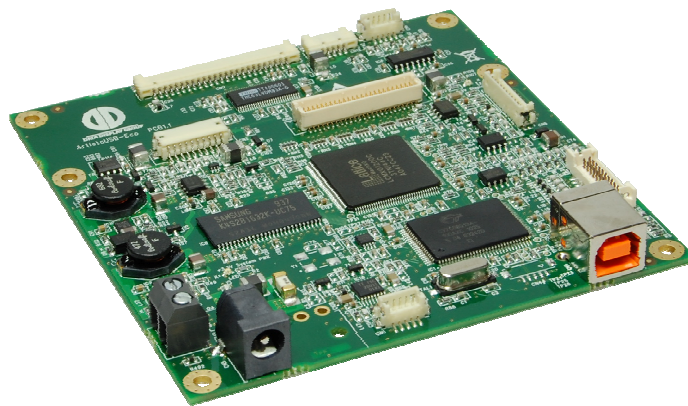
DATA DISPLAY GROUP

Datasheet

ArtistaUSB-eco

TFT Display Controller with USB 2.0 High Speed Interface

AR-02-100_A1



Version 1.6

21.08.2013

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1 Revision History

Date	Rev.No.	Description	Page
03.03.2010	1.0	Initial version	All
02.06.2010	1.1	Added details about supply current, GPIO connector, dimensions	5,10,11,14
06.08.2010	1.2	Corrected pins of CN11; Added pin 1 markings to drawing on page 14	12,14
01.12.2010	1.3	Added 24V supply voltage option	5,12
24.01.2011	1.4	HW rev. 1.1: Added CN12, added GND connections to CN7	7,8,9,15,16
10.07.2012	1.5	Updated part number of Molex connector CN10	13
21.08.2013	1.6	Updated part number connector CN10 and CN11	7



2 Overview

The ArtistaUSB technology provides an easy to use USB interface for TFT displays. ArtistaUSB-eco is intended for small and medium sized displays from QVGA to WSVGA. ArtistaUSB-eco will be equipped with an LVTTTL and LVDS interface. The LVDS interface is able to provide 24Bit conventional and non-conventional data mapping. The color depth is internally 16Bit BGR (565) and is mapped to 18 or 24Bit LVTTTL or LVDS. The data mapping will be configured by firmware.

Please contact our sales department for information about applicable displays.

ArtistaUSB-eco supports USB2.0 High-Speed and USB1.1 Full-Speed standards.

ArtistaUSB-eco also provides an integrated four wire resistive touch controller. An optional GPIO and/or RS232 Interface can be provided upon request.

Windows extended Desktop Drivers and a Windows and Linux Software Development Kit (SDK) are available.



3 Electrical Specifications

3.1 Self Powered Configuration (standard)

Operating conditions

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	V_{IL}	10.8	12.0	13.2	V	Depending on inverter specification, see note (3)
Optional Supply Voltage			24.0		V	Please ask your local sales representative for this option
Supply Current without Display	I_{IL}	-	100	120	mA	
Supply Current with SVGA Display	I_{IL-max}	-	1.0	-	A	SVGA sample configuration: Display: 270mA @ 3.3V Inverter: 0.8A @ 12V

Maximal allowed power consumption for TFT Panels operating with +3.3V

Item	Symbol	Max.	Unit	Note
+3.3V display power on CN7 or CN8	I_{disp}	1000	mA	without backlight

Maximal allowed power consumption backlight inverter

Item	Symbol	Max.	Unit	Note
+5V backlight power on CN2	I_{BKL}	2.0	A	5V backlight power is a mounting option
+12V backlight power on CN2	I_{BKL}	2.5	A	

Electrical maximum ratings

Item	Symbol	Min.	Max.	Unit	Note
Supply Voltage	V_{IL}	-0.2	16	V	(1),(2),(3)

Environmental Conditions

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	T_{op}	0	50	°C	
Storage Temperature	T_{store}	-35	85	°C	

Note (1) With-in operating temperature

Note (2) Permanent damage to the device may occur if maximum values are exceeded.

Functional operation should be restricted to the conditions described under normal operating conditions.

Note (3) Inverter power is not regulated. Inverter power is the same as power in. Absolute maximum ratings are depending on inverter specification.

3.2 Bus Powered Configuration (option)

Please ask your local sales representative for a bus powered version of ArtistaUSB-eco.



3.3 Supported Displays

- Only displays with supply voltage of **3.3V** are supported
- For current rating of supported displays see sections 3.1 and 3.2
- 16Bit BGR (565) mapped to 18 or 24Bit (configured by FW)
- Resolution from QVGA (320x240) up to WSVGA (1024x600)
- Panel size up to 15"
- Single channel LVDS
- Conventional and non-conventional LVDS data mapping (configured by FW)
- LVTTTL

3.4 Supported Inverters

- Supply voltage: **12V** (standard)
- Upon request backlight inverters with 5V supply voltage can be supported by mounting option
- On/off-switching of inverter supply is controlled by FW, thus allowing power sequencing for LED driver
- For current rating of supported inverters see sections 3.1 and 3.2
- Brightness control:
 - PWM level 3.3V
 - PWM frequency 100Hz-20kHz
 - Analog backlight control voltage 0-5V

3.5 Interfaces

Input:

- USB 2.0 high speed and full speed

Output:

- LVDS single channel
- LVTTTL
- four wire resistive touch screen interface
- RS232 (option)
- GPIO (option)
- SPI (option)
- JTAG programming interface (for internal use only)



3.6 Connectors

3.6.1 Overview

CN#	Description	Type	Manufacturer
CN6	Programming/JTAG	Do not use (for maintaining purposes only)	Hirose (DF13 Series)
CN7	LVDS Interface	1.25 mm Pitch board to wire, horizontal, 25 Pins	Hirose (DF14 Series)
CN8	LVTTTL Interface	1.25 mm Pitch board to wire, vertical, 2x25 Pins	Hirose (DF20 Series)
CN12	LVDS Extra Power	1.25 mm Pitch board to wire, horizontal, 5 Pins	Hirose (DF14 Series)
CN2	Inverter Supply and Backlight Control	1.25mm pitch board to wire, horizontal, 10 Pins	Hirose (DF13 Series)
CN1	Touch Screen	1.25mm pitch board to wire, vertical, 5 Pins	Hirose (DF13 Series)
CN3	GPIO	Optional GPIO extension interface, 1.25mm pitch board to wire, vertical, 2x10 Pins	Hirose (DF13 Series)
CN9	RS232	Optional serial data interface, 1.25mm pitch board to wire, vertical, 5 Pins	Hirose (DF13 Series)
CN4	USB	USB B-Type	Samtec (USB-R-B-S-F-O-TH)
CN4#	USB	Optional USB connector, 1.25mm pitch board to wire, vertical, 5 Pins	Hirose (DF13 Series)
CN5	Power Supply Connector	DC Power	Kycon (KLDX-SMT-0202-AP)
CN10	Power Supply Connector	Optional DC Power connector, horizontal, 4 Pins	Molex (39-30-3045)
CN11	Power Supply Connector	Optional DC Power connector, 2 pin screw terminal block	PTR (AK500/2DS-5.0-V-BL)

3.6.2 Programming/JTAG (for internal use only)

- Vertical orientation
- Standard 11 pin Hirose DF13 series

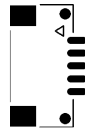


CN6 Programming/JTAG		
Pin	Signal	Description
1	+3.3V	Power Supply
2	TCK	Test clock
3	TMS	Test mode select
4	TDI	Test data in
5	TDO	Test data out
6	GND	Ground
7	+3.3V	Power Supply
8	EXT_SCL	I2C Clock
9	EXT_SDA	I2C Data
10	RST	Internal Reset
11	GND	Ground

3.6.3 LVDS Extra Panel Power (option)

- Horizontal orientation
- Standard 5 pin Hirose DF14 series
- LVDS_OPT signal is configured by firmware

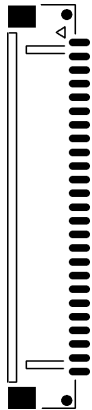
CN12 LVDS Extra Panel Power		
Pin	Signal	Description
1	LVDS_OPT	LVDS Option for certain panels
2	SVCC	Display Power
3	SVCC	Display Power
4	GND	Ground
5	GND	Ground



3.6.4 LVDS Display Interface

- Horizontal orientation
- Standard 25 pin Hirose DF14 series
- Conventional/non-conventional data mapping is configured by firmware

CN7	LVDS Interface	
Pin	Signal	Description
1	SVCC	Display Power
2	SVCC	Display Power
3	GND	Ground
4	GND	Ground
5	TXA3+	LVDS 3+
6	TXA3-	LVDS 3-
7	TXACLK+	LVDS Clock+
8	TXACLK-	LVDS Clock-
9	TXA2+	LVDS 2+
10	TXA2-	LVDS 2-
11	TXA1+	LVDS 1+
12	TXA1-	LVDS 1-
13	TXA0+	LVDS 0+
14	TXA0-	LVDS 0-
15	GND	Ground
16	GND	Ground
17	GND	Ground
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	BKLT_EN	Enable Backlight



3.6.5 LVTTTL Display Interface

- Vertical orientation
- Standard 2x25 pin Hirose DF20 series
- Optional adapter board for conversion from TTL cable to FFC cable
- Colour data mapping is configured by firmware

CN8	LVTTTL Interface	
Pin	Signal	Description
1	GND	Ground
2	GND	Ground
3	LCD_CLK	LCD Pixel Clock
4	GND	Ground
5	LCD_HSYNC	Horizontal Sync
6	LCD_VSYNC	Vertical Sync
7	GND	Ground
8	GND	Ground
9	RED_0	RGB Data RED_0
10	RED_1	RGB Data RED_1



11	RED_2	RGB Data RED_2
12	RED_3	RGB Data RED_3
13	GND	Ground
14	GND	Ground
15	RED_4	RGB Data RED_4
16	RED_5	RGB Data RED_5
17	RED_6	RGB Data RED_6
18	RED_7	RGB Data RED_7
19	GND	Ground
20	GND	Ground
21	GREEN_0	RGB Data GREEN_0
22	GREEN_1	RGB Data GREEN_1
23	GREEN_2	RGB Data GREEN_2
24	GREEN_3	RGB Data GREEN_3
25	GND	Ground
26	GND	Ground
27	GREEN_4	RGB Data GREEN_4
28	GREEN_5	RGB Data GREEN_5
29	GREEN_6	RGB Data GREEN_6
30	GREEN_7	RGB Data GREEN_7
31	GND	Ground
32	GND	Ground
33	BLUE_0	RGB Data BLUE_0
34	BLUE_1	RGB Data BLUE_1
35	BLUE_2	RGB Data BLUE_2
36	BLUE_3	RGB Data BLUE_3
37	GND	Ground
38	GND	Ground
39	BLUE_4	RGB Data BLUE_4
40	BLUE_5	RGB Data BLUE_5
41	BLUE_6	RGB Data BLUE_6
42	BLUE_7	RGB Data BLUE_7
43	GND	Ground
44	GND	Ground
45	LCD_DATA_EN	Data Enable
46	REV_SCAN_CTRL_H	Reverse Scan Control Horizontal
47	LCD_PWR	+3.3V
48	LCD_PWR	+3.3V
49	REV_SCAN_CTRL_V	Reverse Scan Control Vertical
50	GND	Ground

3.6.6 Backlight Inverter

- Horizontal orientation
- Standard 10 pin Hirose DF13 series
- 5V inverter supply as mounting option (Pin 5 and 6)
- BKL_EN voltage level is configured by FW

CN2 Inverter Supply and Control		
Pin	Signal	Description
1	+12V	+12V Backlight Power
2	GND	Ground
3	BKL_EN	0V ..+3.3V or 0V ..+5V, backlight enable
4	BR_CTRL	Brightness control; Analog or PWM selected by FW; Analog range: 0V..+5V; PWM: +3.3V signal level;
5	+5V	5V Backlight Power (option)
6	+5V	5V Backlight Power (option)
7	+12V	12V Backlight Power
8	+12V	12V Backlight Power
9	GND	Ground
10	GND	Ground

3.6.7 Touch Screen

- Vertical orientation
- Standard 5 pin Hirose DF13 series

CN1 Touch Screen Interface		
Pin	Signal	Description
1	X+	X+ position input
2	Y+	Y+ position input
3	X-	X- position input
4	Y-	Y- position input
5	GND	Ground

3.6.8 GPIO (option)

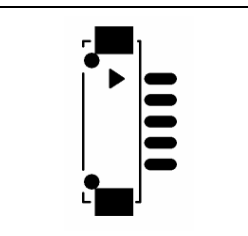
- Vertical orientation
- Standard 2x10 pin Hirose DF 13 series
- SPI interface
- GPIO interface
- Reset pin
- Wakeup pin
- Interrupt pin
- Extended touch controller interface

CN3	GPIO connector	
Pin	Signal	Description
1	+3.3V	+3.3V Power Supply
2	+3.3V	+3.3V Power Supply
3	VBAT1	Touch Interface
4	VBAT2	Touch Interface
5	IN1	Touch Interface
6	IN2	Touch Interface
7	GND	Ground
8	RESET	Reset
9	WAKEUP	Wakeup
10	INT5	Interrupt
11	PA0/INT0	GPIO
12	PA2/SLOE	GPIO
13	PA4/FIFOADR0	GPIO
14	PA5/FIFOADR1	GPIO
15	SPI_OUT/PE3	SPI Interface
16	SPI_CS/PC2	SPI Interface
17	SPI_IN/RXD0	SPI Interface
18	SPI_CLK/TXD0	SPI Interface
19	GND	Ground
20	GND	Ground

3.6.9 RS232 serial data interface (option)

- Vertical orientation
- Standard 5 pin Hirose DF 13 series


CN9	RS232 Interface	
Pin	Signal	Description
1	TXD0	Serial port 0 transmit data
2	RXD0	Serial port 0 receive data
3	TXD1	Serial port 1 transmit data
4	RXD1	Serial port 1 receive data
5	GND	Ground



3.6.10 USB

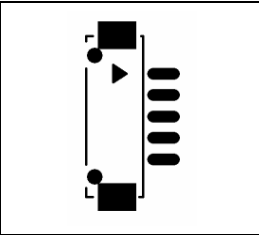
- Standard Type B

CN4	USB connector	
Pin	Signal	Description
1	VBUS	USB Bus Voltage
2	D-	USB D-
3	D+	USB D+
4	GND	Ground



- Optional 5 pin Hirose DF13 series, vertical orientation, NA

CN4#	USB connector (option)	
Pin	Signal	Description
1	VBUS	USB Bus Voltage
2	GND	Ground
3	D-	USB D-
4	D+	USB D+
5	GND	Ground

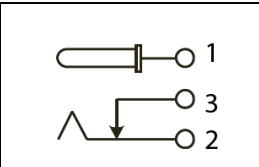


3.6.11 Power

Note that upon request a version that works with +24V power supply can be provided.

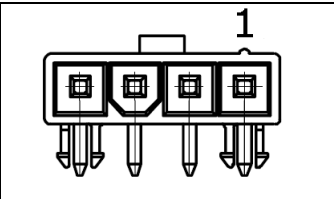
- Kycon KLDX

CN5	Power supply connector	
Pin	Signal	Description
1	+12V	+12V power supply
2	GND	Ground
3	-	Not connected




- Optional 4 pin Molex 39-30-3045, horizontal orientation, NA

CN10	Power supply connector (option)	
Pin	Signal	Description
1	GND	Ground
2	GND	Ground
3	+12V	+12V power supply
4	reserved	Not connected



- Optional 2 pin screw terminal block, NA

CN11	Power supply connector (option)	
Pin	Signal	Description
1	GND	Ground
2	+12V	+12V power supply



3.7 Status LEDs

- LED1 (yellow): Board Power OK (3.3V)
- LED2 (green): Display Power On (3.3V)



4 Usage Notes

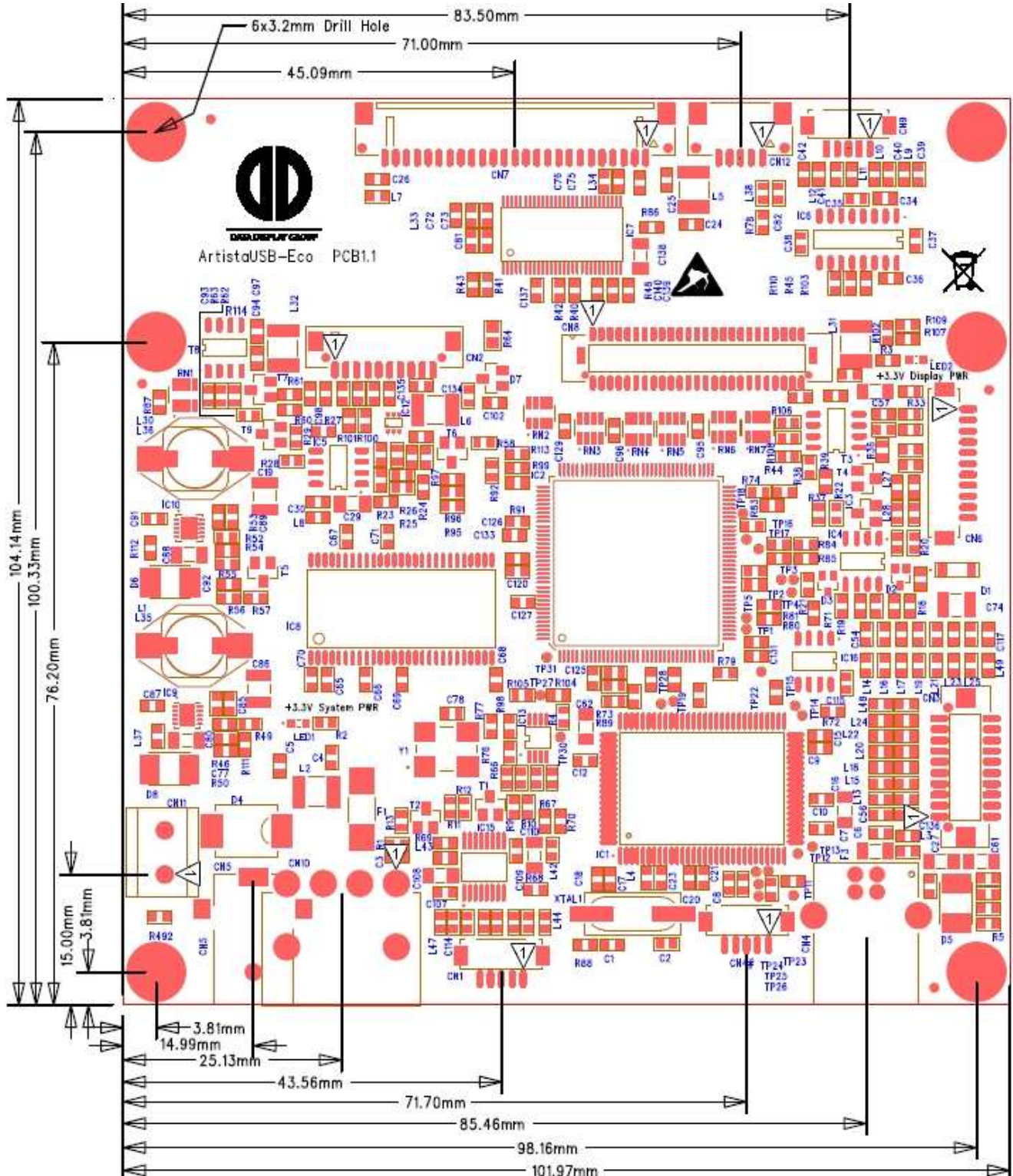
After removing ArtistaUSB's power supply a minimum time period of 5ms must elapse before the board is powered up again.



5 Physical Specifications

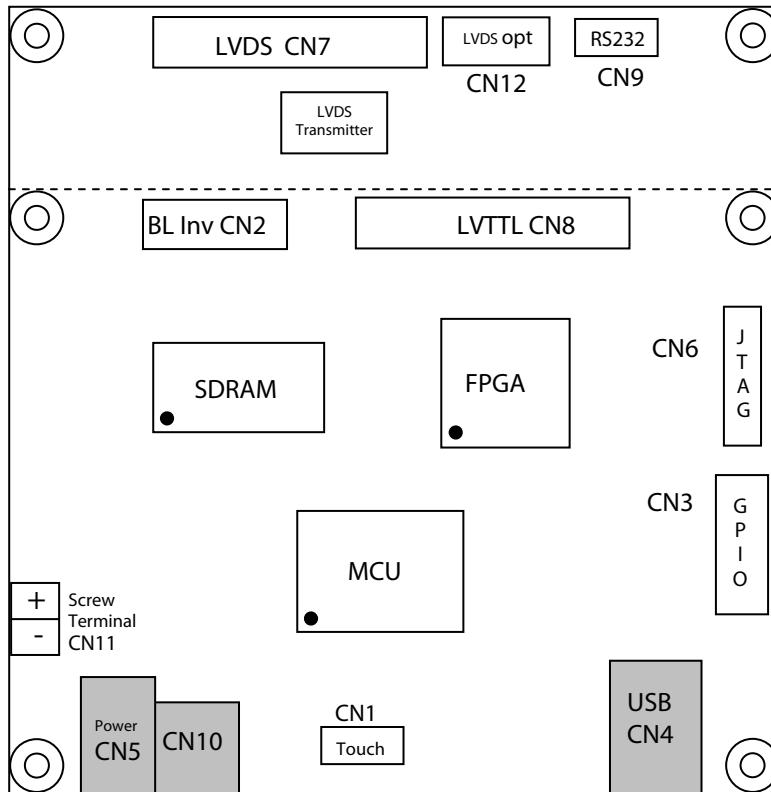
5.1 Dimensions

- 101.97 x 104.14 x 15.0mm
- Same outline and drilling positions/dimensions as ArtistaUSB-II
- USB and power connector on the same position as on ArtistaUSB-I and II





5.2 Connector positions





6 Software Support

Windows extended Desktop Drivers

Windows SDK

Linux SDK

Operating systems:

Windows XP, Vista, Windows 7, Linux



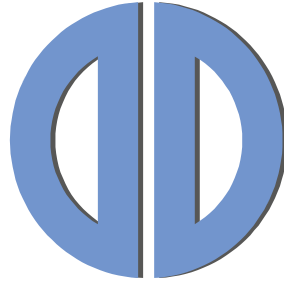
7 News and Updates

The latest version of documents, drivers and software packages can be found at:

German Site <http://www.distec.de/de/Downloads/Artista.html> or

English Site <http://www.distec.de/en/Downloads/Artista.html>.

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