

# TFT/HBxxxPU8yyy-zzzz

# TFT/HVxxxPU8yyy-zzzz

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# 1 Introduction

## 1.1 General Remarks

The content and presentation of this document has been carefully checked. No responsibility is accepted for any errors or omissions in the documentation.

Note that the documentation for the products is constantly revised and improved. The right to change this documentation at any time without notice is therefore reserved.

Syslogic is grateful for any help referring to errors or for suggestions for improvements.

The following registered trademarks are used:

IBM-PC, PC/AT, PS/2	trademarks of IBM Corporation
SPI	trademark of Motorola
PC	trademark of Philips Corporation
WINbloc	trademark of Weidmüller Interface GmbH
CompactFlash	trademark of SanDisk Corporation
Intel Atom	trademark of Intel Corporation
Windows Embedded Compact	trademark of Microsoft Corporation
Windows Embedded Standard	trademark of Microsoft Corporation

All other trademarks appearing in this document are the property of their respective company.

## 1.2 Explanation of Symbols

### 1.2.1 Danger warnings

The following information is for your personal safety and the prevention of damage to the product described or connected devices.

Safety instructions and warnings for the prevention of danger to the life and health of users or service personnel and for the prevention of damage are highlighted in this document by the pictograms specified below. *Warning* and *Information* pictograms are shown in this document.

### 1.2.2 Warnings indicate the following:

Death, serious injury or substantial material damage may occur if the related safety measures are not implemented.

The individual "Warning" pictograms have the following meaning:



#### Attention! General!

Is an instruction that must be observed in order to ensure protection before, while and after using the device. The correct procedure must be observed.



#### Attention! Electric shock!

Persons may be exposed to dangerous voltages in electrical installations. There is a danger of electric shock if a live part is touched.



#### Attention! Observe ESD measures!

Electrostatic discharge may destroy electronic components.



#### Attention! Hot surfaces

Keep clear of surfaces. They may be hot.

### **1.2.3 Information pictograms indicate the following:**

Important information about the product or the relevant section of the document requiring the particular attention of the reader is marked as followed:



Indicates important and instructional information.

## **1.3 Copyright note**

This documentation is the intellectual property of Syslogic Datentechnik AG, which also has the exclusive copyright. Any modification of the content, duplication or reprinting of this documentation, as well as any distribution to third parties can only be made with the express permission of Syslogic Datentechnik AG.

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## **1.4 Contents of this Documentation**

This document addresses to system integrators, programmers and instructed installation and maintenance personal working with the PROTOUCH-WIDE system. It provides all information needed to configure setup and program the product. For further information consult the documentation of the mounted Mainboard e.g. DOC/IPC\_SL8-E.

## **1.5 Additional Products and Documents**

### **1.5.1 Hardware Products**

The following hardware products are useful together with this documentation:

- IPC/SL8 Documentation

### **1.5.2 Software Products**

Depending on your operating system you might need additional driver software for the touch controller. Please contact technical support (details see 7.1) for assistance.

### **1.5.3 Documents**

For details regarding the integrated IPC see separate product documentation e.g. DOC/IPC\_SL8-E.

## 1.6 Items delivered

### 1.6.1 Built-in version

- 1x TFT/HBxxxPU8yyy-zzzz
- 1x Fixing Frame with M4x10 securing screws
- 1x Power supply connector Weidmüller BCZ 3.81/04/180F SN SW (1792970000)

### 1.6.2 VESA mount version

- 1x TFT/HVxxxPU8yyy-zzzz
- 1x Power supply connector Weidmüller BCZ 3.81/04/180F SN SW (1792970000)
- 4x M4x8 securing screws for VESA100 mounting

## 1.7 Installation

The installation of the system is described in chapter 2.7.5 this documentation.

For details regarding the integrated IPC see separate product documentation e.g. DOC/IPC\_SL8-E.

## 1.8 Safety Recommendations and Warnings

The products are intended for measurement, control and communications applications in industrial environments. The products must be assembled and installed by specially trained people. The strict observation of the assembly and installation guidelines is mandatory.

The use of the products in systems in which the life or health of persons is directly dependent (e.g. life support systems, patient monitoring systems, etc.) is not allowed.

The use of the products in potentially explosive atmospheres requires additional external protection circuitry which is not provided with the products.

In case of uncertainty or of believed errors in the documentation please immediately contact the manufacturer (address see chapter 7.1). Do not use or install the products if you are in doubt. In any case of misuse of the products, the user is solely liable for the consequences.

### 1.8.1 General warnings



#### Important note

Ensure that the power supply is disconnected from the device before working on the device (connecting interfaces, replacing flash cards, batteries, opening the enclosure, etc.).



#### Important note

The output voltage of the external power supply shall be SELV and shall be limited power source according to clause 2.5 EN 60950-1. Please read the safety instructions of the power supply before installing/connecting the device.

### 1.8.2 EMC



#### Important note

This is a Class A product and not intended to be used in domestic environment. The product may cause electromagnetic interference. Appropriate measures must be taken.

### 1.8.3 Electro Static Discharge



Electronic boards are sensitive to Electro-Static Discharge (ESD). Please ensure that the product is handled with care and only in an ESD protected environment. Otherwise a proper operation is not guaranteed.

### 1.8.4 Battery



#### Maintenance of battery

Empty batteries may leak.

Check battery status flag and replace the battery to avoid loss of date (RTC) and damage to the product.



#### Changing batteries

Danger of explosion if the battery is not correctly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.

Never short the battery.

### 1.8.5 Hot surface



#### Attention! Hot surfaces

Make sure the device is not hot before mounting or changing the installation. The device may be hot and may cause burns.

## 1.9 Life Cycle Information

### 1.9.1 Transportation and Storage

During transportation and storage, the products must be in their original packing. The original packing contains an antistatic bag and shock-absorbing material. It is recommended, to keep the original packing in case of return of the product to the factory for repair. Note that the packing is recyclable.

### 1.9.2 Assembly and Installation

Observe the EMI-precautions against static discharge. Carefully read the installation documentation before unpacking the product.

The installation procedures must be strictly observed. Note that deviations from the installation guidelines may result in degraded operational reliability or in unfavourable EM-radiation or EM-susceptibility.

### 1.9.3 Operation

The operating environment must guarantee the environmental parameters (temperature, power supply, etc.) specified in the technical specification section of this document.

The main functionality of the product is defined by the application program. The application program is not part of the delivery by Syslogic but are defined, developed and tested by the customer or a system-integrator for each specific application. Refer to the respective documentation for more information.

### 1.9.4 Maintenance and Repair

In the rare case of a product hardware-failure or malfunction, the complete product should be exchanged. The faulty product must be returned to the factory for repair. Please use whenever possible the original packing for return of the product (EMI and mechanical protection).



### **1.9.5 Disposal**

At the end of the lifespan the PROTOUCH products must be properly disposed. PROTOUCH products contain a multitude of elements and must be disposed like computer parts. Some of the PROTOUCH products contain batteries which should be properly disposed.

### **1.9.6 RoHS**

The products of the PROTOUCH family are designed and produced according to the Restriction of Hazardous Substances (RoHS) Directive (2011/65/EU).

### **1.9.7 WEEE**

The products of the PROTOUCH family are not designed ready for operation for the end-user and are not intended for consumer applications. According to Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC) Syslogic takes back defective devices for proper disposal at the point of sale.

## 2 Product Description

### 2.1 Introduction

#### 2.1.1 Benefits of Syslogic's Projected capacitive touch panels

The product meets all the requirements of state-of-the-art advanced Panel Computer.

The TFT technology makes a wide range of applications possible with a perfect and clear picture on an absolutely flat surface.

The product is available in different screen sizes.

A metal housing with a solid front frame and scratch resistant glass protects the device

A Robust touch screen technology is used.

The product is a rugged information, display and input device that are specially developed for operation in harsh environments providing a front protection of IP65.

The absolutely flat PCT (Projected capacitive Touch) touch panel offers the latest Multi-Touch technology. PCT Touch Screen can be used with fingers or with special capacitive touch or thin latex gloves or pens/stylus. The touchscreen is self-calibrating.

Reliably during long and rugged periods of use and requires little care and maintenance.

The Product is available for long term.

#### 2.1.2 Intended use of Projected Capacitive Touch Panels

The Projected Capacitive Touch Panel is designed for:

- Visualization and process control
- PLC visualization
- General control and automation tasks
- Industrial use
- For medical technology
- For multi-media systems
- Operation in the ambient conditions specified in the technical data

This device description is designed as a reference guide for the installation, connection, operation and maintenance of all versions of the Projected Capacitive Panel, and also provides all the relevant technical data.

### 2.2 Device Variants

The Projected capacitive touch panels are available in the following versions:

TFT/H	x	yyy	PU8	ccc	zzz	E
Syslogic Touchpanel PC	<i>B</i> : flush mounting <i>L</i> : VESA mounting	<i>104</i> : 10.4" XGA <i>121</i> : 12.1" XGA <i>150</i> : 15.0" XGA	Protouch 8 family with standard connectors	<i>G13</i> : Intel E3825 dual core 1.3GHz, 2GB RAM <i>H19</i> : Intel E3825 quad core 1.9GHz, 4GB RAM	<i>102</i> : 2x RS232 <i>122</i> : 1x RS232, 1x CAN	extended temperature range

Tab. 1 Projected capacitive touch panel versions

## 2.3 Accessories

The following accessories are not necessarily supplied with the device. These parts could be ordered additionally or downloaded under [www.syslogic.com](http://www.syslogic.com):

Accessories		
Order code	Type designation	Description
TouchDriver	Touch driver software	Built-in touch driver software for Windows 7 and newer Additional driver for Linux needed

Tab. 2 Projected capacitive touch panel accessories

## 2.4 Features

For detailed information regarding the built-in IPC see DOC/COMPACT8-SL-E

The following images are only for illustration. For mechanical details please see 4.3

### 2.4.1 HBxxxPU8yyy-zZZZ

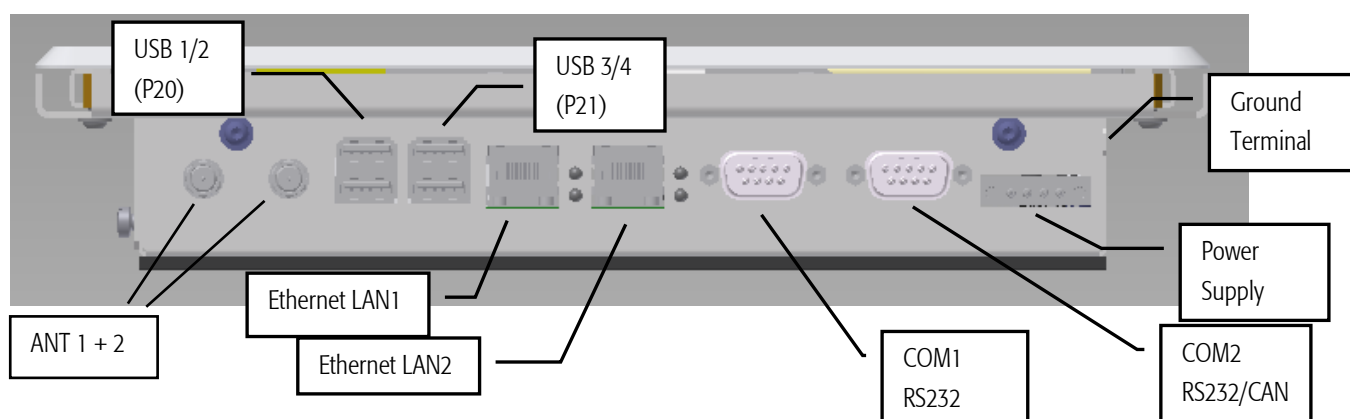


Fig. 1 HBxxxPU8yyy-zZZZ (Front)

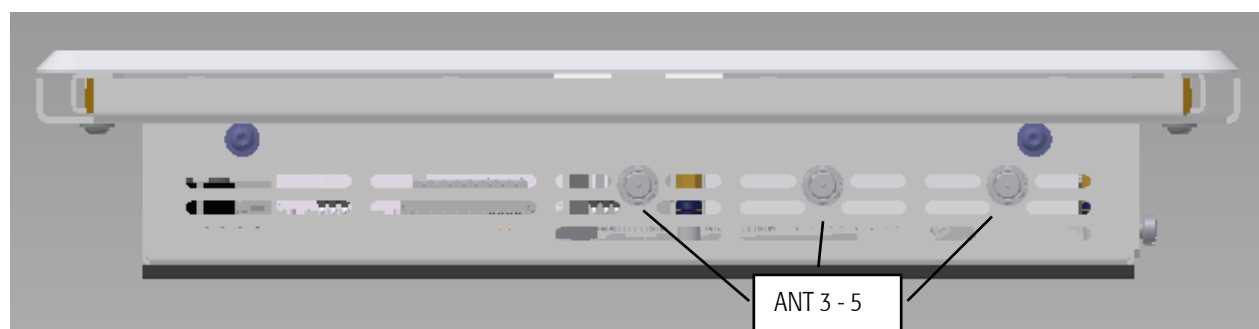


Fig. 2 HBxxxPU8yyy-zZZZ (Back)

### 2.4.2 HVxxxPU8yyy-zZZZ

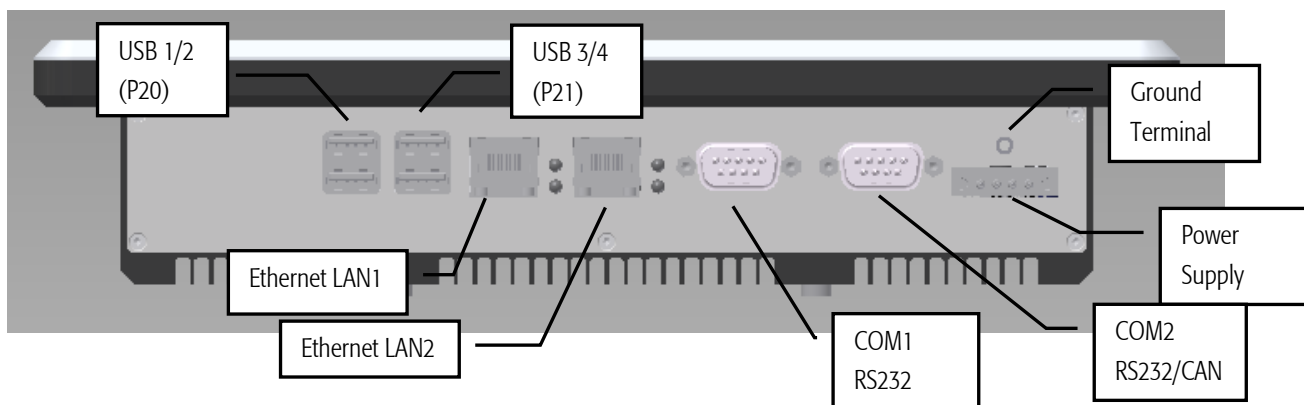


Fig. 3 HVxxxPU8yyy-zZZZ (Front)

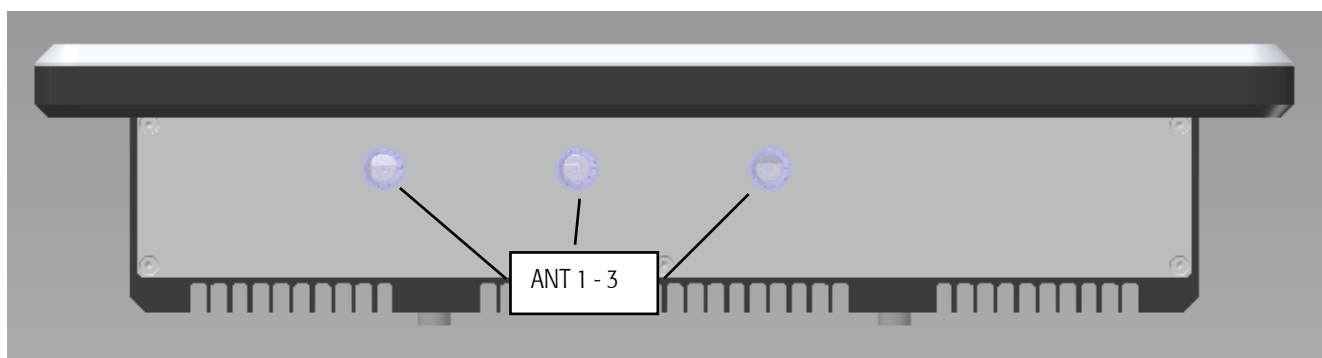


Fig. 4 HVxxxPU8yyy-zZZZ (Back)

### 2.4.3 Power supply

The processor and its peripherals are powered by a non-isolated, integrated power supply which generates all internal voltages.

#### Device Connection

Weidmueller BCZ 3.81/04/180F SN BK (Ordercode 1792970000)

Pin	Signal	Marking
1	VDC_AUX	VAUX
2	Power Fail/Remote on/off	PF
3	VCC	VDC
4	GND	GND

Tab. 3 Power supply connector P1 (1x4 pin)

For normal operation the external power supply has to be connected to the pins 3 (VCC) and 4 (GND) of the connector P1. Pin 1 (VDC\_AUX) is used to extend battery life time if the device main power is disabled. Pin 2 is used as an input for either a power fail on remote on/off signal.

For details regarding the power management see separate product documentation DOC/COMPACT8-SL-E

#### Important Note



Input current may vary significantly during operation. Make sure wire diameter is designed properly to remain within the specified operating voltage range.

### 2.4.4 COM 1

Serial port 1 has standard RS232 signals on a standard DSUB-9 connector on the front (COM1). The serial port has a fixed base address of 3F8H. COM1 uses hardware interrupt 4, interrupt configuration may be changed in CMOS setup SIO configuration.

#### Device Connection RS232

The Serial Port COM1 is available on DSUB-9

Pin Number	Signal	Pin Number	Signal
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

Tab. 4 Serial Port COM1

### 2.4.5 COM 2 (only on selected products; see 2.2)

Serial port 2 is available with standard RS232 signals on a standard DSUB-9 connector on the front (COM2). The serial port has a fixed base address of 2F8H.

COM2 uses hardware interrupt 3, interrupt configuration may be changed in CMOS setup SIO configuration.

#### Device Connection RS232

The Serial Port COM2 is available on DSUB-9

Pin Number	Signal	Pin Number	Signal
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

Tab. 5 Serial Port COM2

### 2.4.6 CAN Interface (only on selected products; see 2.2)

Serial port 2 is available as a CAN 2.0b interface using standalone SJA1000-similar PCIe CAN controllers. The controller is compatible with PEAK-System PCIe CAN controller and includes a license to use the PEAK-System drivers.

CAN i/o base address and interrupt enumerated by PCIe BIOS.

#### Device Connection CAN

The CAN interface is available on DSUB-9



#### Important Note

120 Ohm termination resistors must be connected externally

Pin Number	Signal	Pin Number	Signal
1	no connection	6	no connection
2	CAN Low	7	CAN High
3	CAN Ground	8	no connection
4	no connection	9	no connection
5	no connection		

Tab. 6 CAN port on DSUB-9 male (9 pin)

## 2.4.7 USB Interface

The PROTOUCH-8 features an OHCI/EHCI and a XHCI compatible USB host controller having assigned the base address and IRQ at boot time by the PCI-BIOS. All ports support USB 2.0 devices and port 1 supports USB 3.0 devices with Superspeed.

### Device Connection

The USB interface uses two standard A type double USB connector on the front for USB ports 1/2 and 3/4.

P20 bottom Pin Number	USB port 1 Signal	P20 top Pin Number	USB port 2 Signal
1	VBUS	1	VBUS
2	D-	2	D-
3	D+	3	D+
4	GND	4	GND
5	SSRX-	5	-
6	SSRX+	6	-
7	SSGND	7	-
8	SSTX-	8	-
9	SSTX+	9	-

Tab. 7 USB1/2 Interface Connector P20 (Dual Type A)

P21 bottom Pin Number	USB port 3 Signal	P21 top Pin Number	USB port 4 Signal
1	VBUS	1	VBUS
2	D-	2	D-
3	D+	3	D+
4	GND	4	GND

Tab. 8 USB3/4 Interface Connector P21 (Dual Type A)

### Important Note



Maximum cable length allowed for USB connection is 3 m. If longer cables are used, special overvoltage and filtering elements must be installed to comply with the requirements of EMI/RFI *CE*-certification. Only use high quality industrial USB devices with sufficient EMI compatibility. Use shielded cables for maximum EMI protection. Drawing excessively power might disturb operation.

### 2.4.8 Ethernet LAN Interface

The PROTOUCH-8 features up to two PCI Ethernet controller having assigned the base address and IRQ at boot time by the BIOS. The Ethernet interface drives two LED's (yellow and green) integrated into the RJ45 connector for status information. The meaning of the LED activity is programmable (normally set by the low-level driver).

LAN1 and LAN2 feature Intel I210 Ethernet controllers supporting 10/100/1000Mb/s. Both interfaces support Auto Negotiation and Auto MDIX functions. Check manufacturer's datasheets for detailed information.

No configuration options are available for the Ethernet device.

#### Device Connection

The Ethernet interfaces use the standard RJ45 Gigabit connector on the front for 100Ω shielded or unshielded Twisted Pair cabling.

Pin Number	Signal	Remarks
1	MD0+	
2	MD0-	
3	MD1+	
4	MD2+	
5	MD2-	
6	MD1-	
7	MD3+	
8	MD3-	

Tab. 9 Ethernet Twisted Pair Interface Connectors (RJ45)

### 2.4.9 Frontside Status LEDs

The four colored LEDs on the front side show the following states:

LED	Signal	Remarks
Red up	STOP signal	For programming see DOC/COMPACT8-SL-E
Green down	Board ready	For programming see DOC/COMPACT8-SL-E
Green up	Aux LED	For programming see DOC/COMPACT8-SL-E
Yellow down	Disk activity	SATA/CFast only

Tab. 10 Frontside Status LEDs

### 2.4.10 Antennas (only on selected products)

If the device is equipped with a radiotelecommunication device the respective signals are available on standard SMA or SMA-RP connectors, depending on the radiotelecommunication technology.

#### Important Note



Maximum cable length allowed for antenna connections is 2.8 m. If longer cables are used, special overvoltage and filtering elements must be installed to comply with the requirements of EMI/RFI "CE"-certification. Only use high quality industrial devices with sufficient EMI compatibility.



## **2.4.11 Internal connectors**

### **CMOS Battery**

The CMOS battery supplies the necessary power required to maintain the CMOS settings and configuration data in the UEFI flash chip. The specified battery type is CR2450N(3V, 540mAh) or CR2477(3V, 950mAh). Because the self-discharge of all lithium batteries increases rapidly at high temperatures the battery life time decreases by a great amount. To prevent battery leakage scheduled service/replacement is recommended. Please contact the battery manufacturer for further details and calculation assistance for battery life time calculation.

### **Fuse**

The main fuse protects the system against destruction in case of high energy distortions on the power line. For replacement, the system must be opened in an ESD protected environment. Only an entitled instructed person is allowed for this operation. Replacement fuse type is Littelfuse 452004.MRL (4A slow-blow).

### **USB 2.0**

Depending on the installed PC board the PROTOUCH-8 offers several internal USB connectors whereof one is used to connect the touchpanel. Please contact technical support for further details and assistance.

### mPCIe slot

The PC board offers a mPCIe slot for inserting different removable mPCIe cards

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	UIM_PWR <sup>1</sup>
9	GND	10	UIM_DATA <sup>1</sup>
11	REFCLK-	12	UIM_CLK <sup>1</sup>
13	REFCLK+	14	UIM_RESET <sup>1</sup>
15	GND	16	NC
17	NC	18	GND
19	NC	20	W_DISABLE#
21	GND	22	PERST#
23	PERn0	24	+3.3V
25	PERp0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETn0	32	SMB_DATA
33	PETp0	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3V	40	GND
41	+3.3V	42	LED_WWAN#
43	GND	44	LED_WLAN#
45	NC	46	LED_WPAN#
47	NC	48	+1.5V
49	NC	50	GND
51	NC	52	+3.3V
53	GND	54	GND

Tab. 11 Pinout mPCIe slot

<sup>1</sup> Availability of SIM interface depends on installed PC board

## 2.5 Touch Screen

All devices use a DMC touch sensor with an EETI touch controller with customized firmware.

### 2.5.1 Basic functions of the touch screen

The touch screen operates using the PCT (Projected Capacitive Touch) technology.

Therefore, the touch must be manipulated using fingers, thin latex or special gloves or pens/styluses that are made for use with capacitive touch panels.

Depending on the driver version and Operating System the PCT touch supports Multi-touch up to 10 points. Which means you can operate the touch screen with more than one finger for drawing or selecting.

The firmware is equipped with a water detection algorithm. When water is detected on the surface the touch controller switches to single touch operation. When even more water is detected the controller is shut down until the water is removed.

## 2.6 Display brightness

Display brightness can be manipulated either in the BIOS setup or using the driver interfaces in the operating system.

Defining the default display brightness in BIOS has the advantage that the brightness is defined already at start-up and boot sequence. If change of the brightness is required after start-up it is required to use the boot driver interface. For further details on manipulating display brightness refer to the manual of the operating system.

If required display brightness may be manipulated by I/O Register access. If required contact manufacturer's sales.

### 2.6.1 Modifying display brightness using BIOS setup

To modify the brightness in BIOS Setup utility follow this procedure:

1. Start up the device while pressing [del]-key
2. As the BIOS Setup Utility shows up press left to select menu "Advanced" then down to select option "Graphics"
3. In the Advanced/Graphics menu select Backlight settings and enter desired value
4. Press [F10] key and confirm to save changes to quit

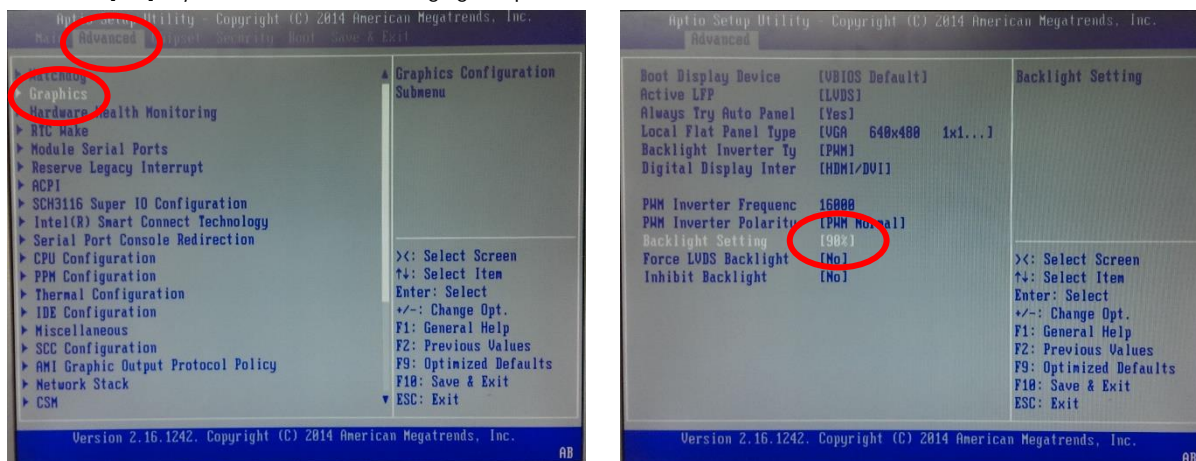


Fig. 5 Modify default value of backlight

## 2.7 Maintenance

The following images are only for illustration. For mechanical details please see 4.3 and the product description.

To replace the battery or the C-Fast Data storage it is required to remove the service cover.



Shutdown the system and disconnect from power supply and all other connections



Make sure the device has cooled down to room temperature



Only open the device in an ESD protected area

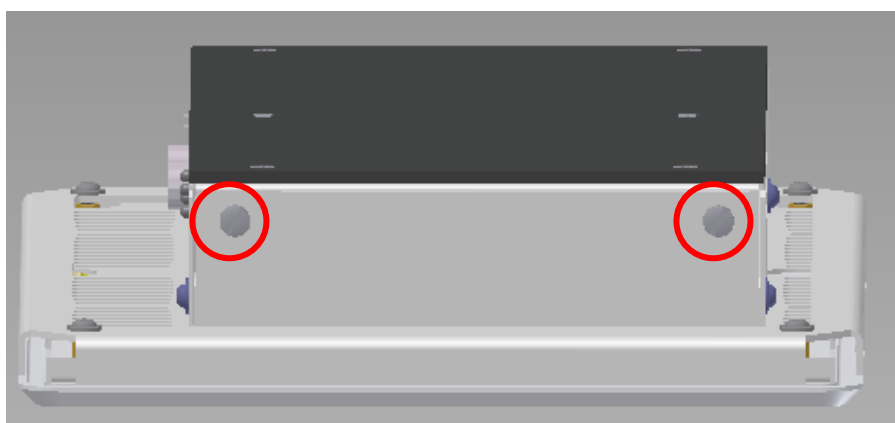


Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

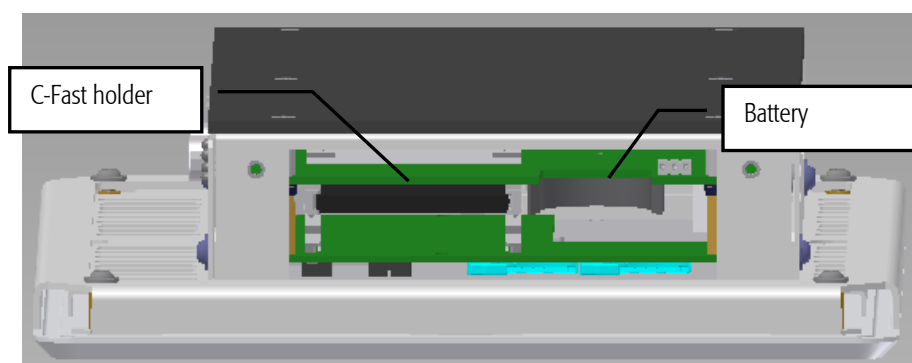
### 2.7.1 Removing Service Cover

#### TFT/HBxxxPU8yyy-zZZZ

1. Disconnect device from power.
2. Remove the two knurled screws highlighted and remove the cover.



3. After removing the cover, the C-Fast and the battery slot are accessible.

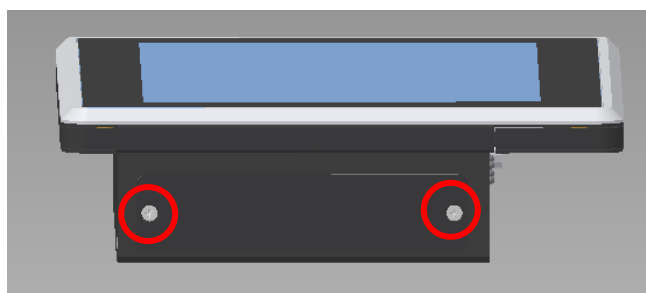


4. Please re-install the service cover before operating the Projected capacitive touch panel.

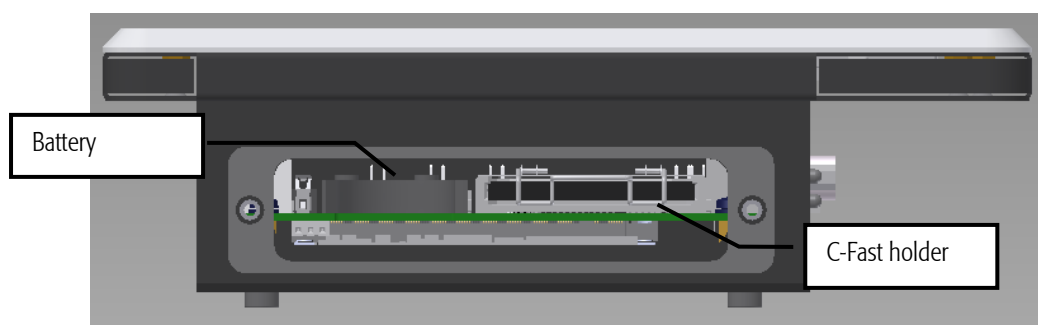
**TFT/HVxxxPU8yyy-zZZZ**

1. Loosen the screws on the service cover

Tool: Pozidriv screw driver number 1



2. Remove the service cover
3. After removing the cover, the battery and the C-Fast slot are accessible.



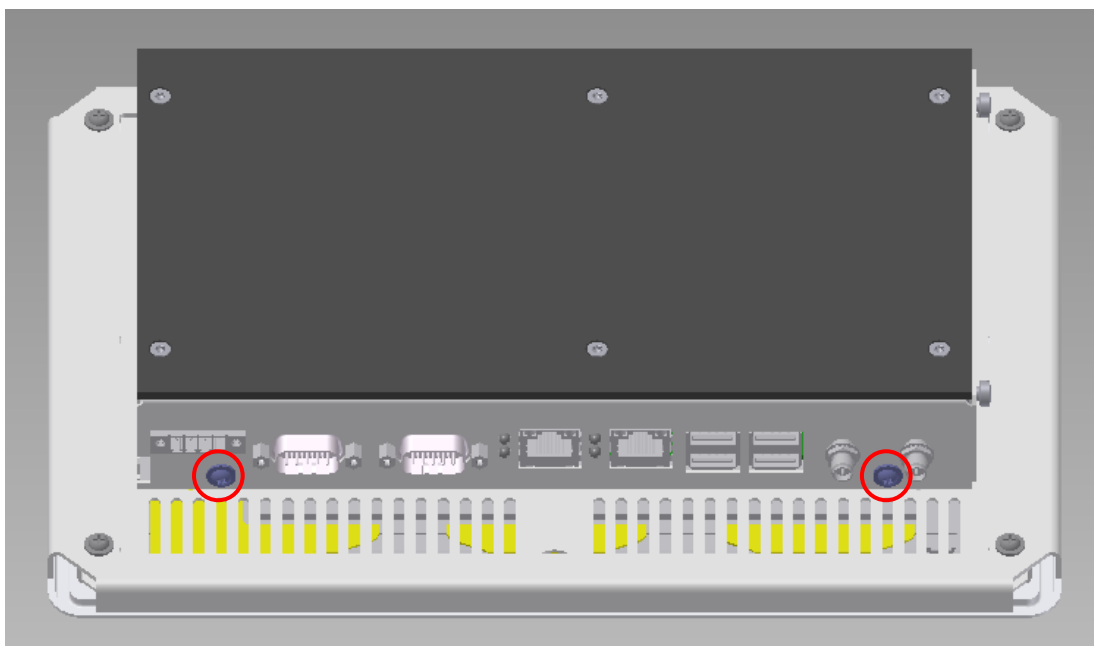
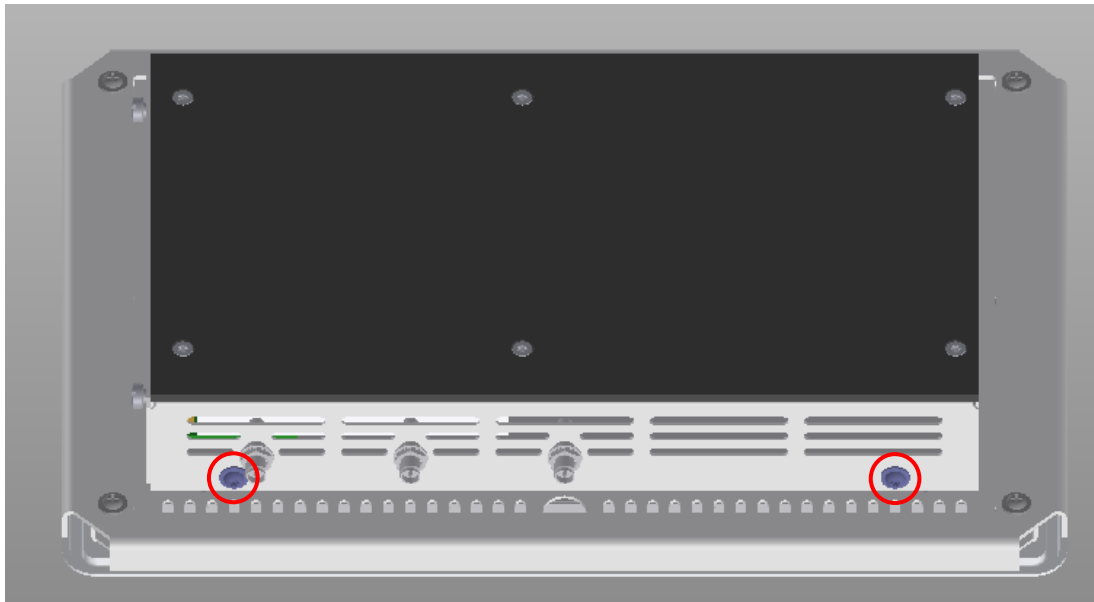
4. Please install the service cover before operating the Projected Capacitive Touch Panel.

## 2.7.2 Replace Main Fuse

### TFT/HBxxxPU8yyy-zZZZ

1. Loosen the four screws fixing the housing

Tool: Torx screwdriver T10



2. Carefully remove the PC box



### Important Note

Be careful not to tear the cables for display and touch

3. Detach the cables to the display and touch

4. Replace fuse and re-install the case

Tool: Torx screwdriver T10

Torque: 0.5Nm

### **TFT/HVxxxPU8yyy-zzzz**

1. Loosen the screws fixing the housing

Tool: Torx screwdriver T10

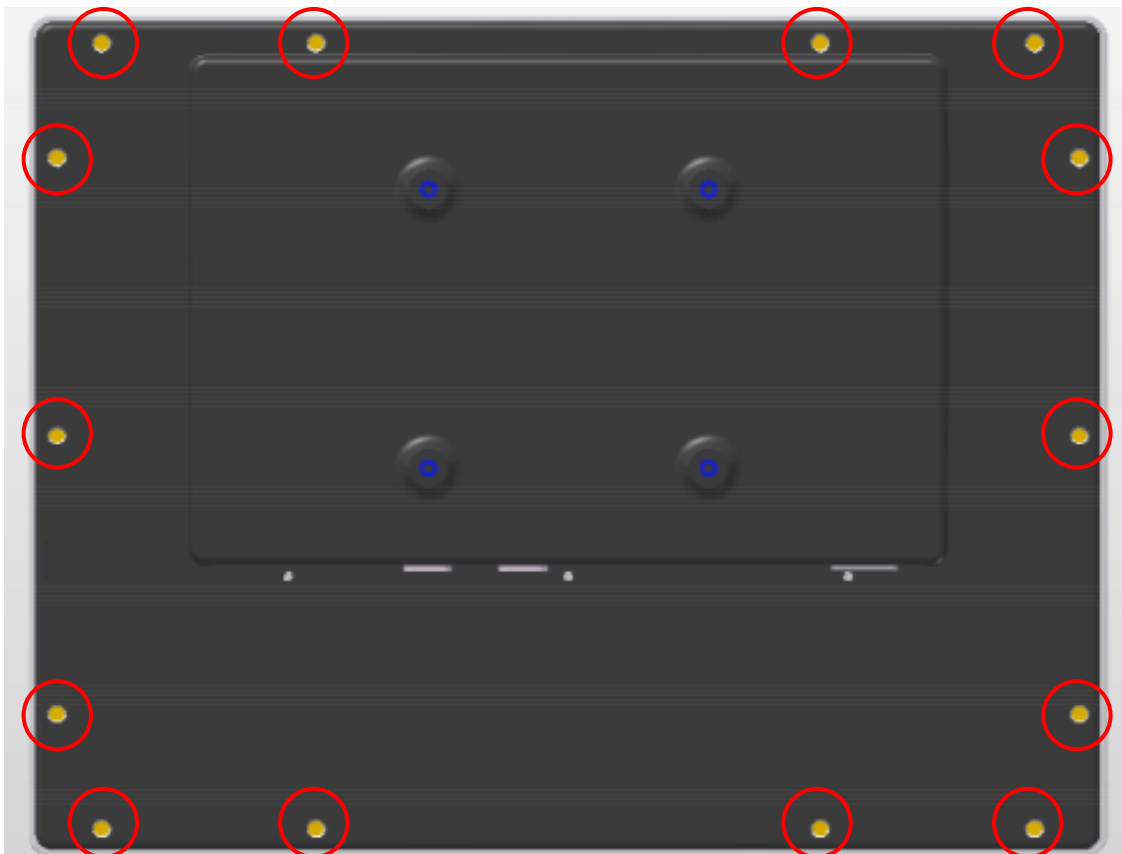


Fig. 6 Remove rear case of TFT/HVxxxPU8yyy-zzzz devices

5. Carefully remove the PC box



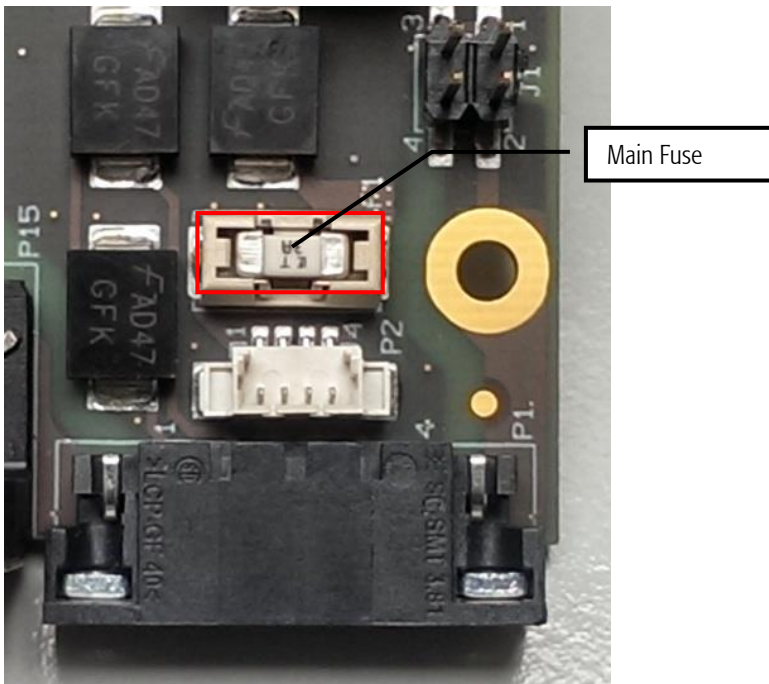
### **Important Note**

Be careful not to tear the cables for display and touch

6. Detach the cables to the display and touch

### Replace Fuse

1. Locate the fuse right behind the power connector
2. Extract with tweezers and replace with same type (Littelfuse 452004.MRL)



### 2.7.3 Cleaning the glass front

For cleaning the glass front please use a soft cloth and a standard glass cleaning detergent.



Even though the touch controller is optimized to detect cleaning it may happen that input signals are generated. Prevent unwanted and potentially dangerous actions while the front is being cleaned.

**Prevent the system from unwanted and dangerous actions while the front is being cleaned.**



Make sure the device has cooled down to room temperature

### 2.7.4 Cleaning the metal housing

For cleaning the metal housing please use a soft cloth and a metal polish.



Do not use a coarse scouring cloth, scouring powder or solvent.

**Cleaning should only be carried out when the device is switched off!**



Make sure the device has cooled down to room temperature



### 2.7.5 Spare parts

<b>Designation</b>	<b>Type</b>	<b>Order number</b>
Power supply	24V Desktop Power Supply 60W - 4 pole	PSU/DT24V60W-4
CMOS battery	CR2450N(3V, 540mAh)	CPN/CR2450N
CMOS battery	CR2477(3V, 950mAh)	CPN/CR2477N
Fuse	4A slow-blow	Littelfuse 452004.MRL

Tab. 12 Spare parts

### 3 Installation Description

#### 3.1 Mounting

##### 3.1.1 TFT/HBxxxPU8yyy-zzzz

Mounting the device requires the following steps:

1. The desired mounting place must have a cut out and wall thickness regarding the following overview.

Device #	Front cut out dimensions		Edge radius	Wall thickness
	W [mm]	H [mm]	R [mm]	D [mm]
TFT/HB104PR8yyy-zzzz	271 <sup>-0/+2</sup>	217 <sup>-0/+2</sup>	max. 3	1 to 5
TFT/HB121PR8yyy-zzzz	316 <sup>-0/+2</sup>	258 <sup>-0/+2</sup>		
TFT/HB150PR8yyy-zzzz	378 <sup>-0/+2</sup>	295 <sup>-0/+2</sup>		

Tab. 13 TFT/HBxxxPU8yyy-zzzz Mounting dimensions

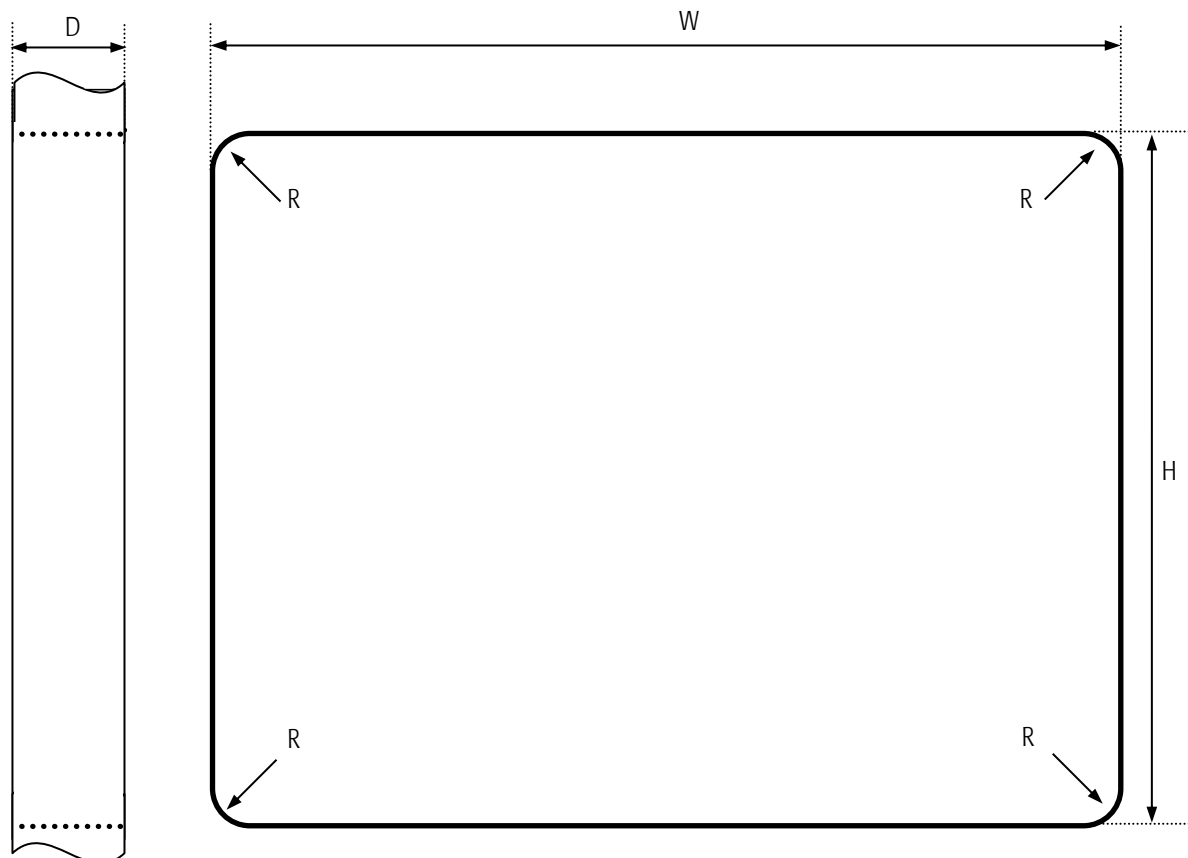


Fig. 7 Required Cut out HBxxxPU8yyy-zzzz



**Mounting Angle:**

Mounting Angle must be 90°

**Cooling Space:**

To ensure cooling leave enough of free space around product to allow free air flow.

2. Remove the screws highlighted in red and then remove the mounting frame.

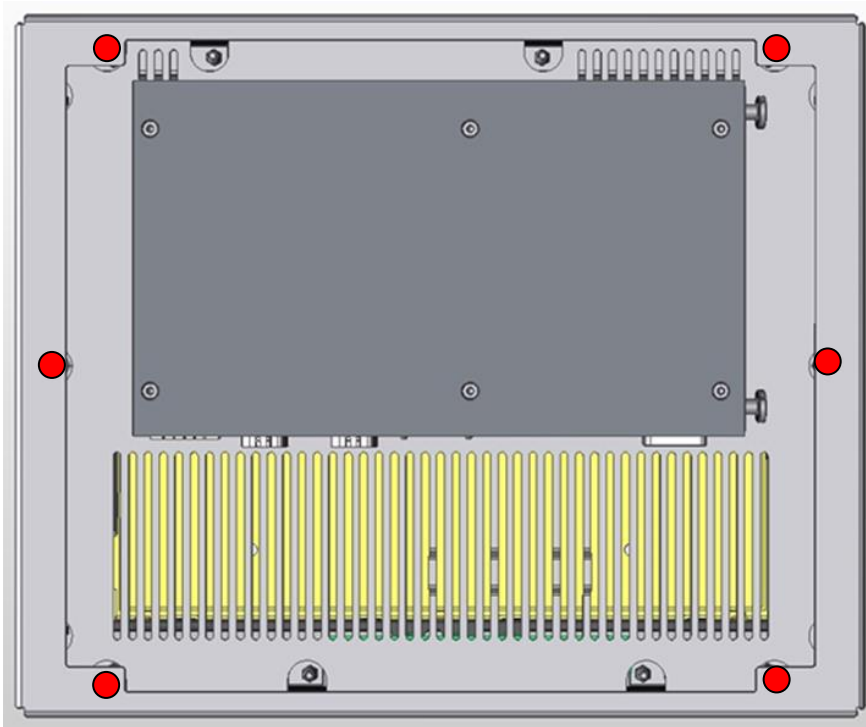


Fig. 8 Screws to hold the mounting frame

3. Insert the projected capacitive touch panel from the front into the cut out and make sure that the sealing fits properly.
4. Reattach the mounting frame and fix it into place by reattaching the screws highlighted in red. Required torque: 1.3Nm
5. The product is now installed properly.

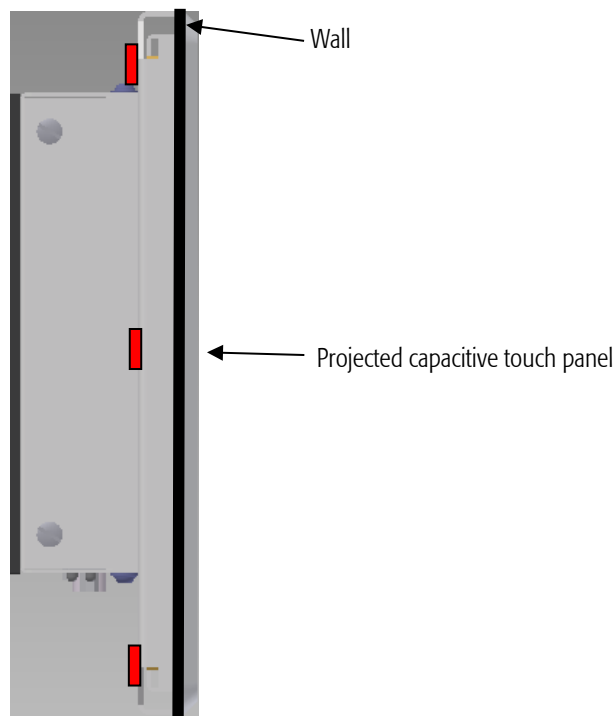
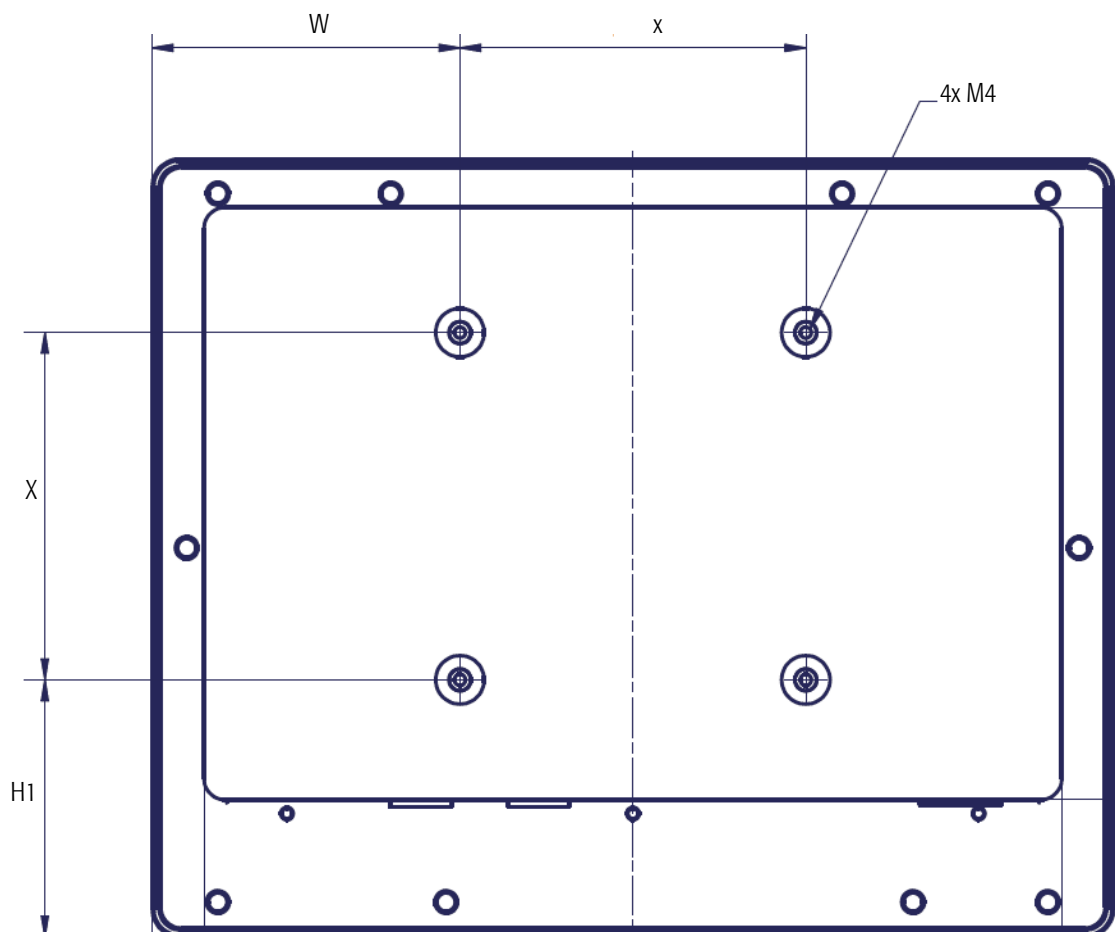


Fig. 9 Fully installed PROTOUCH-8

### 3.1.2 TFT/HVxxxPU8yyy-zzzz

All TFT/HVxxxPU8yyy-zzzz are equipped with a VESA100 (100x100mm) mounting system delivered with M4x8 Philips screws. To mount the device, follow these steps:

1. Remove the screws from the back of the device
2. Screw the device to the VESA100 mounting frame. Maximum thickness of the frame is 3mm. If using a thicker frame replace the screw. The screw must not fit more than 8mm and must fit least fit 5mm. Fix the device with a torque of 1.3Nm.



Device #	X [mm]	W [mm]	H 1 [mm]
TFT/HV104PU8yyy-zzzz	100	89	74
TFT/HV121PU8yyy-zzzz	100	111.5	102
TFT/HV150PU8yyy-zzzz	100	142.5	139

Tab. 14 HVxxxPU8yyy-zzzz VESA dimensions



#### Mounting Angle:

Mounting Angle must be  $90^\circ \pm 15^\circ$

#### Cooling Space:

To ensure cooling leave enough of free space around product to allow free air flow. For best thermal performance use spacer M4 x 5mm between the VESA mounting frame and the device

## 3.2 Installation and cabling

### 3.2.1 Introduction

Installation and cabling of the PROTOUCH system has to be done with great care; the correct cabling is essential for high operational reliability and the correct grounding is necessary for protection and EMC. To meet the requirements of *CE*-certification all cables must be shielded. The enclosure must be connected to ground via the designated fastener (see 0for details).



#### Important Note

To meet the requirements of EMI/RFI *CE*-certification, correct mounting, installation and cabling of the PROTOUCH-WIDE system according to these guidelines is absolutely necessary.

### 3.2.2 Powering the PROTOUCH System

The *logic supply voltage*, i.e. the power driving the electronic circuits (motherboard and extensions) is internally generated from the power supply input. Remember that the power supply is non-isolated. The power supply has to be connected according to paragraph 2.4.3 . When selecting the external power supply, the maximum power dissipation of the system has to be considered.



Please make sure that the input voltage does not exceed the recommended operating range otherwise the electronics board could get damaged and correct operation cannot be guaranteed.

Use an overload protected power supply to prevent damage in case of a short inside the system.

The AC/DC power supply must fulfil the requirements for EMI/RFI *CE*-certification.

### 3.2.3 Cabling the interfaces

Use appropriate cabling for all interfaces. Shielded cabling is required to meet the EMI/EMC limits.

### 3.2.4 Grounding

The system can be grounded using the designated grounding fastener or screw thread with appropriate cable end sleeve. In some cases, it is recommended to connect the shields of the cables to chassis potential at the entry point into the housing cabinet as shown in Fig. 10. If the cables enter a hermetically closed cabinet, use special 360-degree metal clamps (EMI/RFI protected types which contact to the cable shield).



#### Important Note

Grounding of the cable's shields using *pig-tail wires* is not recommended because of their high impedance at high frequencies. It is better to clamp the shields onto a grounded copper rail.

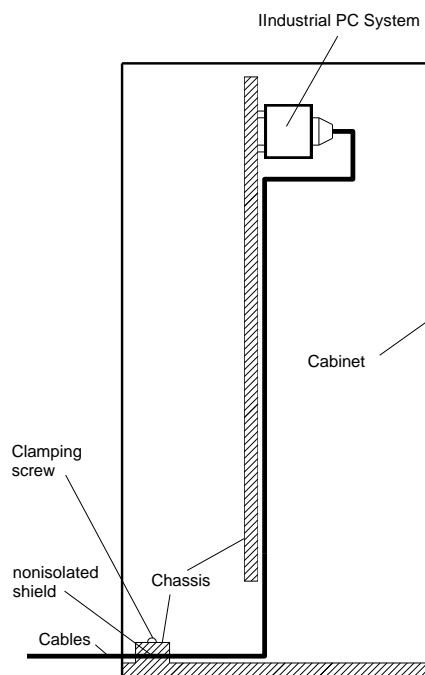


Fig. 10 Additional grounding of the cable shields at the entry point of a cabinet

### 3.2.5 Cabling of communication links

If the communication ports are non-isolated ports, cable shields have to be connected to chassis potential on both sides of the interconnection cable. If the cable is very long, a thick copper wire (10 mm<sup>2</sup>) for potential adjustment is highly recommended. Fig. 12 shows a non-isolated system with common chassis ground.

Some of the communication ports are galvanically isolated ports. In such cases the shield of the interconnection cable must be wired to chassis potential only on one side of the cable. Fig. 11 shows an isolated system with independent grounds.

**!** **Important Note**

Grounding of the cable's shields using *pig-tail wires* is not recommended because of their high impedance at high frequencies. It is better to clamp the shields onto a grounded copper rail.

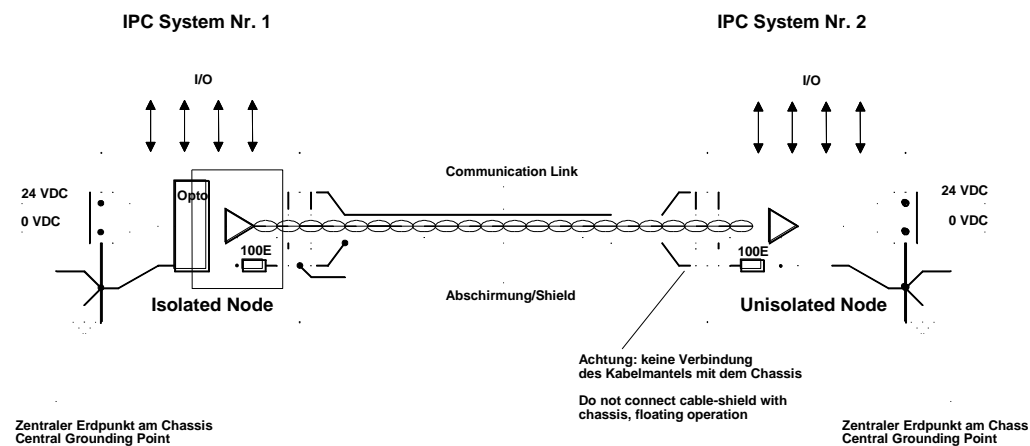


Fig. 11 Isolated communication link

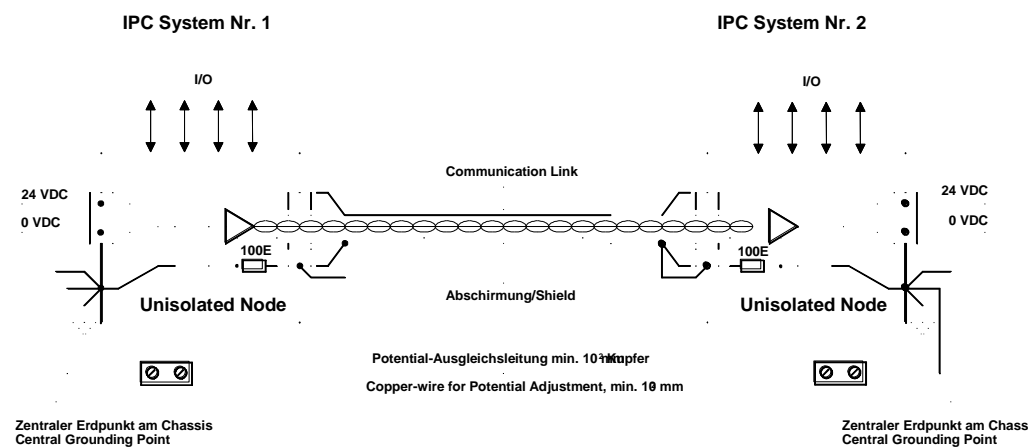


Fig. 12 Non-isolated communication link with common chassis potential

## 4 Technical Data

### 4.1 General Electrical Data (based on Compact8 IPC)

#### Important Note



Do not operate the PROTOUCH-WIDE outside of the recommended operating conditions. Otherwise lifetime and performance will degrade. Operating the board and the display outside of the absolute maximum ratings may damage the hardware.

#### Absolute Maximum Ratings

Parameter	Symbol	min	nom	max	Unit
isolation logic to chassis (AC, 60s, 500m a.s.l., Ta=25°C)		100	500		Vrms
Isolation Ethernet to logic (AC, 60s, 500m asl, Ta=25°C)		1500			Vrms
creepage distance logic to chassis and PCB boarder		0.5			mm
creepage distance Ethernet to logic		1.0			mm
creepage distance Ethernet to chassis and PCB boarder		1.0			mm
storage temperature range	Tst	-25	25	75	°C

Tab. 15 General Absolute Maximum Ratings

#### Recommended Operating Conditions

Parameter	Symbol	min	nom	max	Unit
internal logic supply voltage	Vcc	10	12/24	30	Vdc
Battery backup voltage	Vbatt	2.7	3.0	3.3	V
operating temperature range	Ta	-25 <sup>2</sup>		70 <sup>3</sup>	°C
Operating humidity (not condensing)	Rh	8		90	%
USB 2.0 Supply Current	Iusb2			500	mA
USB 3.0 Supply Current	Iusb3			1000	mA

Tab. 16 General Recommended Operating Conditions



To ensure proper operation of the device keep inside temperature below 70°C.

Operation at 70±0°C inside temperature is only possible during 240 consecutive hours.

For this the temperature sensor on the SL8 board can be used; see board documentation for details

#### Important Note



Maximum ambient temperature is highly dependent on mounting, air flow and CPU/GPU load; with the *Intel Thermal Monitoring Technologies* the processor automatically reduces the internal CPU when the critical thermal trip points are reached to prevent damage.

<sup>2</sup> Cold start up: -20°C

<sup>3</sup> depending on specific use case



### Maximum cable length

Interface	Maximum Length	Comment
RS232	<30m	
USB 2.0	<3m	
USB 3.0	<3m	
Ethernet	<100m	

Tab. 17 Maximum cable length

### Electrical Characteristics

(over recommended operating range, unless otherwise noted)

Parameter	Symbol	min	typ	max	Unit
<b>general parameters</b>					
Power Consumption TFT/Hx104PU8G13-zzzz <sup>4</sup> , Brightness 100%	Ptot		11		W
Power Consumption TFT/Hx121PU8G13-zzzz <sup>5</sup> , Brightness 100%	Ptot		14		W
Power Consumption TFT/Hx150PU8G13-zzzz <sup>6</sup> , Brightness 100%	Ptot		14		W
Power Consumption TFT/Hx104PU8H19-zzzz <sup>4</sup> , Brightness 100%	Ptot		13		W
Power Consumption TFT/Hx121PU8H19-zzzz <sup>5</sup> , Brightness 100%	Ptot		16		W
Power Consumption TFT/Hx150PU8H19-zzzz <sup>6</sup> , Brightness 100%	Ptot		16		W
<b>power fail / remote on/off</b>					
inactive state	PFhigh	2.3		Vp	V
active state	PFlow	-0.5		2.3	V
<b>RTC backup battery</b>					
Vbatt loading (Vcc=off)	Ibat(off)		4	5	uA
Vbatt loading (Vcc=on)	Ibat(on)		2	4	uA
Backup time with new CR2450N battery (Ta=25°C)	t(rtcbup)	6	7		years
Backup time with new CR2450N battery (Ta=50°C)	t(rtcbup)	3	3.5		years
Backup time with new CR2477N battery (Ta=25°C)	t(rtcbup)	8	9		years
Backup time with new CR2477N battery (Ta=50°C)	t(rtcbup)	3.5	4		years
LOWBAT* trip point		2.35	2.5	2.65	V
VRT trip point (RTC Valid RAM and Time Flag)			1.3		V
<b>USB Overcurrent Limit</b>					
USB on internal connector P23	Ilimit		2.8		A
all other USB connectors	Ilimit		1.5		A

Tab. 18 General Electrical Characteristics

<sup>4</sup> 2 x ETH, 50% Cpu load, 100% Backlight, ~400cd/m<sup>2</sup>

<sup>5</sup> 2 x ETH, 50% Cpu load, 100% Backlight, ~500cd/m<sup>2</sup>

<sup>6</sup> 2 x ETH, 50% Cpu load, 100% Backlight, ~400cd/m<sup>2</sup>

**Switching Characteristics (nominal conditions)**

Parameter	Symbol	min	nom	max	
processor clock (TFT/HxxxPU8G13-zzzz)	fcpu		1.33		GHz
processor clock (TFT/HxxxPU8H19-zzzz)	fcpu		1.91		GHz
UART base clock	fuart		1.8459		MHz
COM1/2 baud rate				115.2	kbaud
Watchdog timeout (short period)	Tw	70	100	140	ms
Watchdog timeout (long period)	Tw	1.0	1.6	2.25	s
Timer base clock	ftimer		1.19318		MHz
Timer base clock accuracy				+/-100	ppm
Timer base clock aging				+/-5	ppm/year
Real Time Clock base clock	frtc		32.768		kHz
Real Time Clock accuracy (25°C)				+/-20	ppm
Real Time Clock temperature coefficient				-0.04	ppm/(°C) <sup>2</sup>
Real Time Clock aging				+/-3	ppm/year
LCD inverter brightness PWM base clock	fpwm		16		kHz

Tab. 19 General Switching Characteristics

**4.2 EMI / EMC Specification**

The PROTOUCH-8 system fulfills the following standards:

Emission: EN55032 / CISPR 32 Class A

Immunity: EN55035 / CISPR 35 Class A

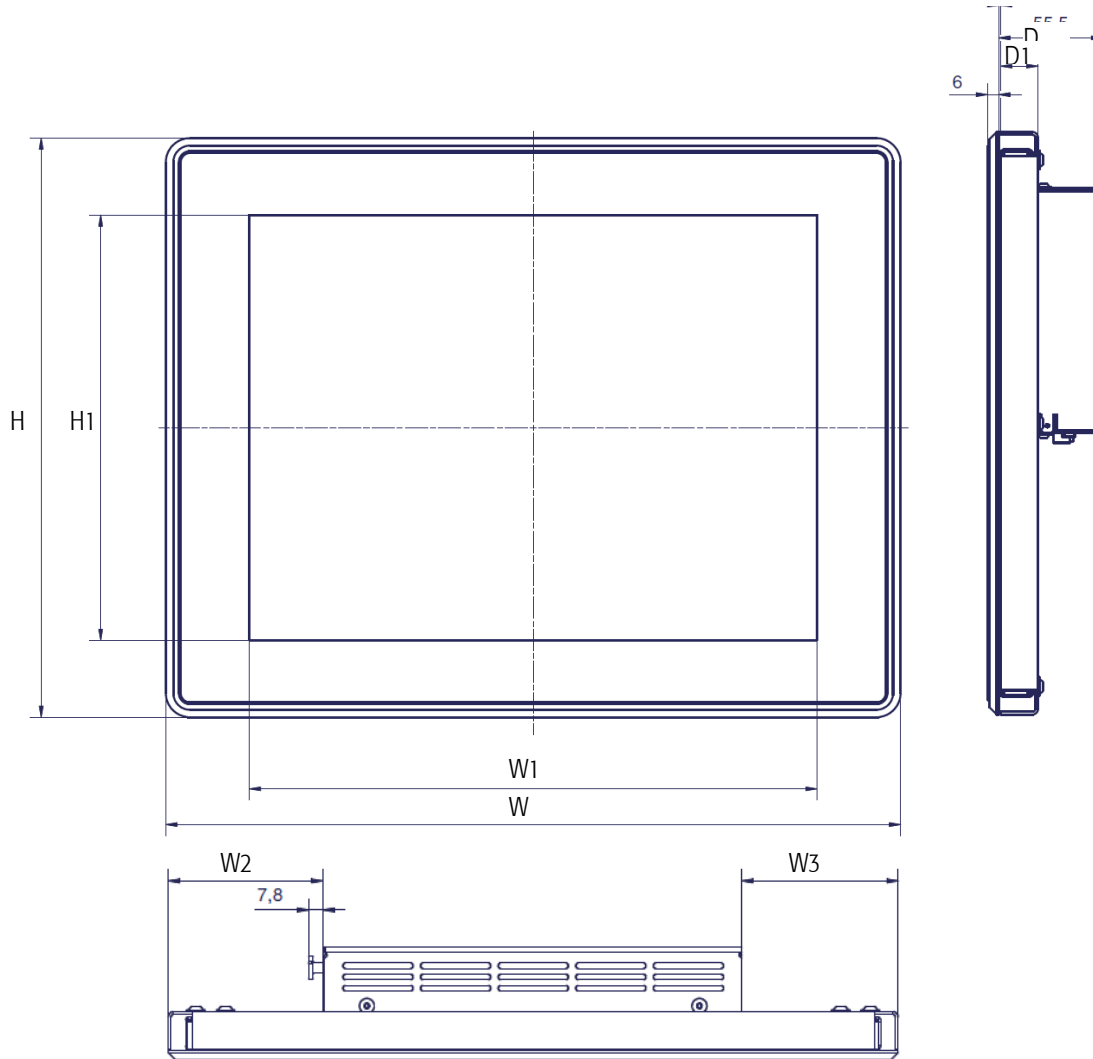


**Important Note**

The PROTOUCH system is a class A system for industrial applications. It is not indented for use in residential or home applications.

### 4.3 Mechanical Data

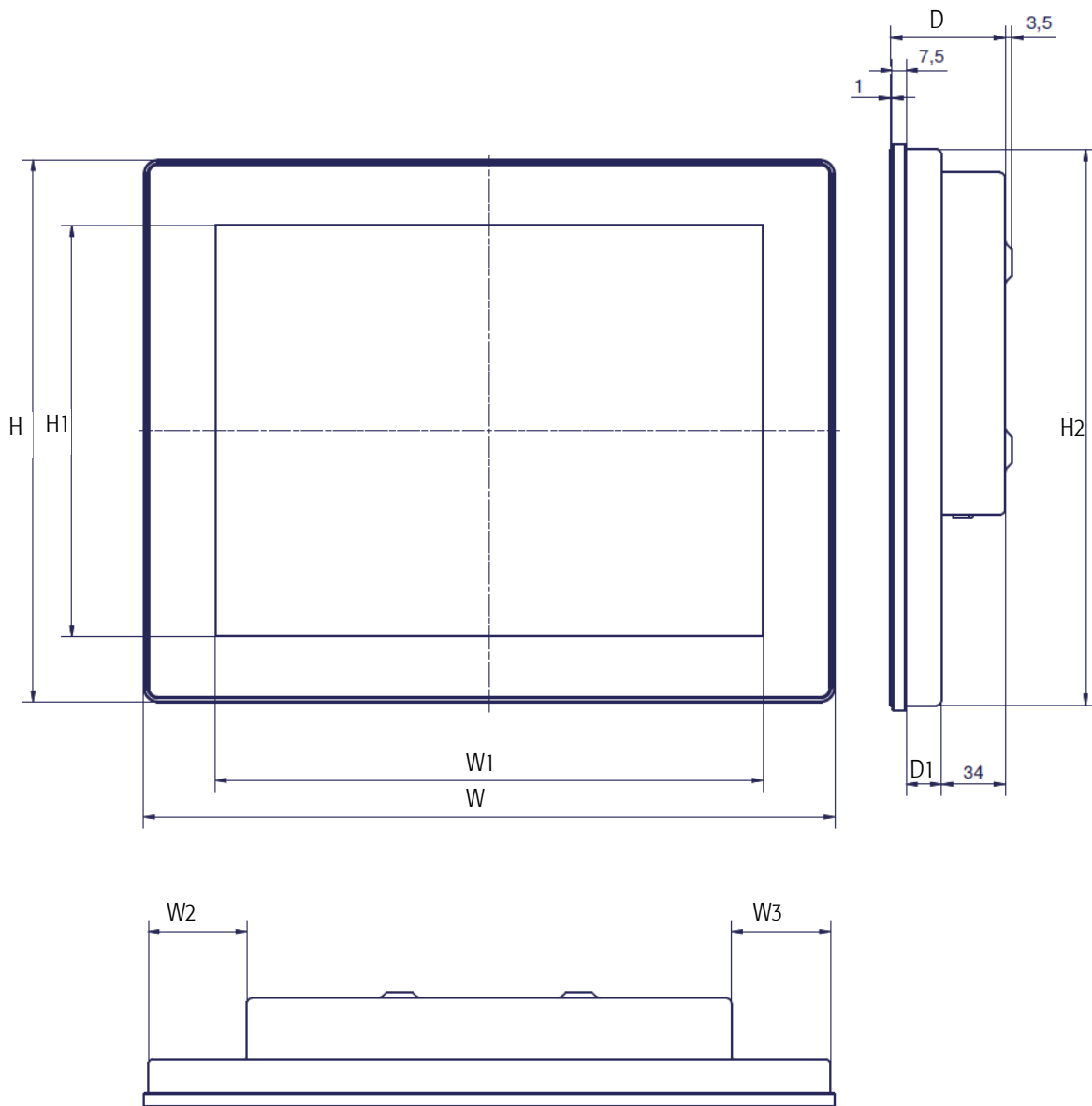
#### 4.3.1 HBxxxPU8yyy-zzzz



Device	W [mm]	W1 [mm]	W2 [mm]	W3 [mm]	H [mm]	H1[mm]	D[mm]	D1 [mm]
TFT/HB104PU8yyy-zzzz	288	212.2	30.2	31.2	234	159.4	53.5	18
TFT/HB121PU8yyy-zzzz	333	246.76	52.7	53.7	275	185.32	53.5	18
TFT/HB150PU8yyy-zzzz	395	305.1	83.7	84.7	312	229.1	55.5	20

Tab. 20 HBxxxPU8yyy-zzzz dimensions

**4.3.2 HVxxxPU8yyy-zzzz**



Device #	W [mm]	W1 [mm]	W2 [mm]	W3 [mm]	H [mm]	H1 [mm]	H2 [mm]	D1 [mm]	D2 [mm]
TFT/HV104PU8yyy-zzzz	278	212.2	12.5	12.5	224	159.4	219	58.5	16
TFT/HV121PU8yyy-zzzz	323	246.76	24	24	265	185.32	260	58.5	16
TFT/HV150PU8yyy-zzzz	385	305.1	55	55	302	229.1	297	61.5	18

Tab. 21 HVxxxPU8yyy-zzzz dimensions

## 5 Firmware

### 5.1 Software Structure

The x86 CPU board based PC/104 system is based on the following software structure:

#### BIOS (Basic Input/Output System)

- Power On Self Test (POST)
  - Initialization of standard peripheral devices
  - Boot procedure for the Operating System
- Note :** Refer to the BIOS documentation for detailed information

#### OS (Operating System)

- Initialization of additional peripheral devices
  - Start procedure for the Application Programs
- Note :** Refer to the OS documentation for detailed information

#### Application Programs

- Initialization of SL8 system, communications and external devices
  - Start procedure for the Control Tasks
- Note :** Refer to the Application Programs documentation for detailed information

### 5.2 Firmware Functions

The SL8 board is setup with BIOS firmware. Some standard PC/AT peripheral devices (e.g. Keyboard/Mouse, Serial Ports, SATA interface) are directly supported by the BIOS, BIOS extensions and Operating Systems. Some peripheral devices (e.g. Ethernet) are directly supported by standard communication software (e.g. TCP/IP stacks, TCP packet drivers) others need special programming according to the freely available sample software (e.g. Watchdog). Please refer to the appropriate documentation for detailed information.

### 5.3 Application Programming Interface (API)

The SL8 system does not contain any special API beside the installed BIOS. Refer to the BIOS and Operating System documentation for API specifications.

## 6 Product Revision History

### 6.1 Hardware

This paragraph lists the different hardware revisions of the PROTOUCH-8 delivered beginning with the first production lot. Note that prototypes are not included and must be returned to factory for upgrade or replacement. All information listed in this document relies on definitive state hardware. Therefore, this information may be incompatible with the prototyping hardware.

#### Important Note



This document always covers the newest product revision listed in Tab. 22. Please contact the manufacturer's technical support for upgrade options.

Board Identification (see product label)	Product Revision	Remarks
TFT/Hx104PU8G13-N102E	#1.0	Original Release
TFT/Hx104PU8G13-N122E	#1.0	
TFT/Hx104PU8H19-N102E	#1.0	
TFT/Hx104PU8H19-N122E	#1.0	
TFT/Hx121PU8G13-N102E	#1.0	Original Release
TFT/Hx121PU8G13-N122E	#1.0	
TFT/Hx121PU8H19-N102E	#1.0	
TFT/Hx121PU8H19-N122E	#1.0	
TFT/Hx150PU8G13-N102E	#1.0	Original Release
TFT/Hx150PU8G13-N122E	#1.0	
TFT/Hx150PU8H19-N102E	#1.0	
TFT/Hx150PU8H19-N122E	#1.0	
TFT/Hx104PU8G13-N102E	#2.0	New touch controller
TFT/Hx104PU8G13-N122E	#2.0	
TFT/Hx104PU8H19-N102E	#2.0	
TFT/Hx104PU8H19-N122E	#2.0	
TFT/Hx121PU8G13-N102E	#2.0	New touch controller
TFT/Hx121PU8G13-N122E	#2.0	
TFT/Hx121PU8H19-N102E	#2.0	
TFT/Hx121PU8H19-N122E	#2.0	
TFT/Hx150PU8G13-N102E	#2.0	New touch controller
TFT/Hx150PU8G13-N122E	#2.0	
TFT/Hx150PU8H19-N102E	#2.0	
TFT/Hx150PU8H19-N122E	#2.0	
TFT/Hx150PU8G13-N102E	#2.1	New touch sensor
TFT/Hx150PU8G13-N122E	#2.1	
TFT/Hx150PU8H19-N102E	#2.1	
TFT/Hx150PU8H19-N122E	#2.1	

Tab. 22 Hardware Revision State

## 6.2 Firmware

This paragraph lists the different firmware versions of the PROTOUCH-8 systems delivered beginning with the first production lot. Note that prototyping boards are not included and must be returned to factory for upgrade or replacement. All information listed in this document relies on definitive state hardware. Therefore, this information may be incompatible with the prototyping board hardware.

<b>Board Identification (see product label)</b>	<b>BIOS Version</b>	<b>Build Date</b>	<b>Remarks</b>
TFT/HxxxPU8G13-N1xE #2.0	L1R021B	06.07.2017	3.1, Default CMOS settings for USB adjusted
TFT/HxxxPU8H19-N1xE #2.0	L2R021B	06.07.2017	3.1, Default CMOS settings for USB adjusted

Tab. 23 Firmware Revision State

### 6.3 Errata

This paragraph lists some important errata of the current SL8 boards to enable workarounds in user software. Additional errata might be present, but a workaround is already implemented in the BIOS. It is important therefore that neither the application software nor the operating systems reprograms the processor chipset's configuration registers.

Note that prototype board errata (boards with revision #0) are not listed here. Contact Syslogic technical support for prototype board information.

Additional errata of the processor chipset can be found at:

<https://www.intel.com/content/dam/www/public/us/en/documents/specification-updates/atom-e3800-family-spec-update.pdf>

<b>IOCHCK#/Watchdog-NMI bug (not working)</b>	
<b>Problem</b>	When Watchdog is configured to activate an NMI or signal IOCHCK# on PC/104 interface is activated, the NMI service routine is not called.
<b>Implication</b>	IOCHCK#/Watchdog-NMI not usable.
<b>Workaround</b>	none.
<b>Correction</b>	This bug might be a BIOS problem and will be corrected in a future BIOS release.
<b>SDCard Interface bug (not working with some SDCard types)</b>	
<b>Problem</b>	The Intel processor chipset contains several issues in SD and SDIO Hostcontroller which can disturb normal operation of the SDCard interface.
<b>Implication</b>	Some SDCard types will not work reliable.
<b>Workaround</b>	Some of the issues have already been solved by a BIOS workaround, some are dependent on OS drivers and some are not fixable. Check with Syslogic for a list of working SDCard types. Some SDCards work if the BIOS setting Advanced > SCC Configuration > SCC eMMC Support is set to eMMC AUTO MODE. Additionally, SDR25 Support for SD Card should be set to enabled. Changes only become active when the BIOS is exited with Save Changes and Exit
<b>Correction</b>	Some of the issues might be solved by new BIOS and/or OS driver releases, but some are not fixable.
<b>Squealing sound</b>	
<b>Problem</b>	Problem with the PWM dimming of the display
<b>Implication</b>	At some brightness levels a squealing sound might occur
<b>Workaround</b>	Change brightness
<b>Correction</b>	Solved in revision 2.0



#### Important Note

This document always covers the latest product revision listed in Tab. 22  
 Please contact the manufacturers technical support for upgrade options.



## 7 Manufacturer Information

### 7.1 Contact

Our distributors and system integrators will gladly give you any information about our products and their use. If you want to contact the manufacturer directly, please send an email message containing a short description of your application and your request to the following address or use one of the information or technical support request forms on our internet homepage:

Syslogic Datentechnik AG  
Taefernstrasse 28  
CH-5405 Baden-Daettwil/Switzerland

e-mail: [support@syslogic.com](mailto:support@syslogic.com)

Web: [www.syslogic.com](http://www.syslogic.com)

T: +41 56 200 90 40

F: +41 56 200 90 50

### 7.2 Warranty

Our products are covered by a world-wide manufacturer's warranty. The warranty period starts at the delivery time from our official distributor to the customer. The duration of the warranty period is specified in the respective product catalogs and the offers. All products carry a date code and a job number for identification. The manufacturing data and deliveries are registered in a high-level Quality Management System.

The warranty covers material and manufacturing defects. All products must be returned via the official distributor to the factory for repair or replacement. The warranty expires immediately if the products are damaged or operation outside of the specified recommended operating conditions. The warranty also expires if the date code or job number listed on the product is altered or rendered unintelligible. The warranty does not include damage due to errors in firmware or software delivered with the products.

### 7.3 RMA Service

Syslogic offers a Return Material Authorization process to simplify handling of devices that needs to be returned to the manufacturer. Please follow the instructions on our web page: <https://www.syslogic.com> to get best service.