



INDUSTRIAL SHIELDS

USER GUIDE

TOUCH PANEL PC 10.1"





Panel 10.1” User Guide:

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1 TOUCHBERRY PI 10.1”

1.1 Controller Specifications:

Panel PC based on Raspberry PI board, encasing a 10.1” resistive Touch Screen for industrial environment using Linux or Windows 10 IoT OSs.

PANEL PC
10,1”

LINUX
LINUX OPERATION
SYSTEM

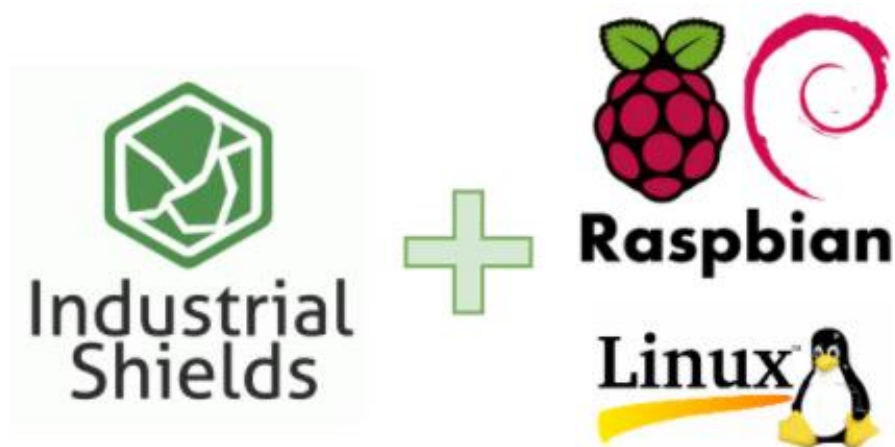
ARDUINO
Compatible with
Arduino IDE

COM
Industrial
Communications

Board	Raspberry Pi 3B +
SoC	Broadcom BCM2837B0
CPU	Quad-core A53 (ARMv8) 64-bit @ 1.4GHz
GPU	Broadcom VideoCore IV, OpenGL ES 2.0, MPEG-2 and VC-1(license) 1080p30 H. 264/MPEG-4AVC
USB	(4) x USB 2.0 (max 300 Mbps)
Storage	Micro SD / MMC / SDIO slot
Network Communication	Ethernet – (3) x TTL - SPI – I ² C
Wireless Communication	Dual-band 802.11ac wireless LAN (2.4GHz and 5GHz) and Bluetooth 4.2
Low level devices	40-pin GPIO header, populated
GPIO Voltage	3,3V
OS	Linux and Unix



- This Panel PC is based on GNU/Linux OS installed on a SD card. It has many interfaces built in: Ethernet, USB, WiFi... Windows 10 IoT is also supported.
Using the Ethernet port or WiFi network you can remotely control all parameters, data and inputs/outputs of your control system.
- Furthermore, Touchberry PI comprises enough I/Os to replace PLCs on simple automation applications.
- Open protocols not only allow communication with other Industrial Shields PLCs, but also third-party devices and machinery.
- In complex systems you can create a network between several TOUCHBERRY PI. Providing integral supervision and control solution for entire production plants and real-time data at hand.





1.2 Touchberry Pi 3 B I/Os Pinout

The Raspberry Pi 3 model B pinout:

Raspberry Pi 3 Model B (J8 Header)					
GPIO#	NAME			NAME	GPIO#
	3.3 VDC Power	1		2	5.0 VDC Power
8	GPIO 8 SDA1 (I2C)	3		4	5.0 VDC Power
9	GPIO 9 SCL1 (I2C)	5		6	Ground
7	GPIO 7 GPCLK0	7		8	GPIO 15 TxD (UART) 15
	Ground	9		10	GPIO 16 RxD (UART) 16
0	GPIO 0	11		12	GPIO 1 PCM_CLK/PWM0 1
2	GPIO 2	13		14	Ground
3	GPIO 3	15		16	GPIO 4 4
	3.3 VDC Power	17		18	GPIO 5 5
12	GPIO 12 MOSI (SPI)	19		20	Ground
13	GPIO 13 MISO (SPI)	21		22	GPIO 6 6
14	GPIO 14 SCLK (SPI)	23		24	GPIO 10 CE0 (SPI) 10
	Ground	25		26	GPIO 11 CE1 (SPI) 11
30	SDA0 (I2C ID EEPROM)	27		28	SCL0 (I2C ID EEPROM) 31
21	GPIO 21 GPCLK1	29		30	Ground
22	GPIO 22 GPCLK2	31		32	GPIO 26 PWM0 26
23	GPIO 23 PWM1	33		34	Ground
24	GPIO 24 PCM_FS/PWM1	35		36	GPIO 27 27
25	GPIO 25	37		38	GPIO 28 PCM_DIN 28
	Ground	39		40	GPIO 29 PCM_DOUT 29

Attention! The GPIO pin numbering used in this diagram is intended for use with WiringPi / Pi4J. This pin numbering is not the raw Broadcom GPIO pin numbers.



Next it is showed a table connection between external DC-37 female connector Pinout and Raspberry Pi Pinout:

DC-37	Raspberry Pi GPIO	DC-37	Raspberry Pi GPIO	DC-37	Raspberry Pi GPIO	DC-37	Raspberry Pi GPIO	DC-37	Raspberry Pi GPIO
1	01	09	17	17	35	25	12	33	28
2	03	10	19	18	37	26	14	34	30
3	05	11	21	19	40	27	16	35	33
4	07	12	23	20	02	28	18	36	36
5	09	13	25	21	04	29	20	37	38
6	11	14	27	22	06	30	22	38	-
7	13	15	29	23	08	31	24	39	-
8	15	16	32	24	10	32	26	40	-



2 Tinker Touch

2.1 Controller Specifications:

Item	Tinker Board
CPU	Rockchip Quad-Core RK3288 processor,
GPU	2GB Dual Channel DDR3
USB	4x2.0 USB (1 is used for Touch)
Storage	Micro SD(TF) card slot
Network Communication	10/100 Ethernet (RJ-45)
Wireless Communication	802.11 b/g/n, Bluetooth V4.0 + EDR
Low level devices	8x GPIO, SPI, I2C, UART
GPIO Voltage	3,3V
OS	Linux Debian / Andorid

PANEL PC
10,1"

LINUX
LINUX OPERATION SYSTEM

ARDUINO
Compatible with Arduino IDE

COM
Industrial Communications

- This Panel PC is based on GNU/Linux OS or on Android OS installed on a SD card. It has many interfaces built in: Ethernet, USB, UART....Using the Ethernet port network you can remotely control all parameters, data and inputs/outputs of your control system.
- Furthermore, Tinker Board comprises enough I/Os to replace PLCs on simple automation applications.
- Open protocols not only allow communication with other Industrial Shields PLCs, but also third-party devices and machinery.
- In complex systems, you can create a network between several Tinker Board Touch. Providing integral supervision and control solution for entire production plants and real-time data at hand.



debian



ANDROID



2.2 Tinker Board Touch Pi I/Os Pinout

Tinker Board pinout:

GPIO.Setmode (GPIO.ASUS)	GPIO.Setmode (GPIO.BOARD)	Pinout	Physical Pin Number	Pinout	GPIO.Setmode (GPIO.BOARD)	GPIO.Setmode (GPIO.ASUS)
	1	VCC3.3V_IO	1 2	VCC5V_SYS	2	
252	3	GP8A4_I2C1_SDA	3 4	VCC5V_SYS	4	
253	5	GP8A5_I2C1_SCL	5 6	GND	6	
17	7	GPOC1_CLKOUT	7 8	GP5B1_UART1TX	8	161
	9	GND	9 10	GP5B0_UART1RX	10	160
164	11	GP5B4_SPIOCLK_UART4CTS	11 12	GP6A0_PCM/I2S_CLK	12	184
166	13	GP5B6_SPIO_TXD_UART4TX	13 14	GND	14	
167	15	GP5B7_SPIO_RXD_UART4RX	15 16	GP5B2_UART1CTS	16	162
	17	VCC33_IO	17 18	GP5B3_UART1RTSN	18	163
257	19	GP8B1_SPI2TXD	19 20	GND	20	
256	21	GP8B0_SPI2RXD	21 22	GP5C3	22	171
254	23	GP8A6_SPI2CLK	23 24	GP8A7_SPI2CSN0	24	255
	25	GND	25 26	GP8A3_SPI2CSN1	26	251
233	27	GP7C1_I2C4_SDA	27 28	GP7C2_I2C4_SCL	28	234
165	29	GP5B5_SPIOCSN0_UART4RTSN	29 30	GND	30	
168	31	GP5C0_SPIOCSN1	31 32	GP7C7_UART2TX_PWM3	32	239
238	33	GP7C6_UART2RX_PWM2	33 34	GND	34	
185	35	GP6A1_PCM/I2S_FS	35 36	GP7A7_UART3RX	36	223
224	37	GP7B0_UART3TX	37 38	GP6A3_PCM/I2S_SDI	38	187
	39	GND	39 40	GP6A4_PCM/I2S_SDO	40	188

Next, a table connection between external DC-37 female connector Pinout and Tinker Board Pinout is shown:

Tinker Board Pinout	External Pinout	DC-37	External Pinout	DC-37	External Pinout	DC-37	External Pinout	DC-37	External Pinout
1	-	09	GND	17	-	25	GND	33	RS232RX
2	5V+	10	RXD	18	GPIO24	26	CS1	34	GND
3	SDA	11	RE	19	MOSI	27	-	35	GPIO19
4	5V+	12	GPIO18	20	GND	28	-	36	TTL RX
5	SCL	13	DE	21	MISO	29	GPIO05	37	TTL TX
6	GND	14	GND	22	GPIO25	30	GND	38	GPIO20
7	GPIO4	15	GPIO22	23	SCLK	31	GPIO06	39	GND
8	TXD	16	GPIO23	24	CS0	32	RS232TX	40	GPIO21



3 General Specifications

Item		Touch Panel 10.1"
Power supply voltage	DC power supply	12Vdc to 24Vdc
Power consumption	DC power supply	22 VAC max.
External power supply	Power supply voltage	12V (30W) // 24Vdc (30W)
	Power supply output capacity	2.5A (12Vdc) // 1,25A (24Vdc)
Shock resistance		80m/s ² in the X, Y and Z direction 2 times each.
Ambient temperature (operating)		0° to 40°C
Ambient humidity (operating)		10% to 90% (no condensation)
Ambient environment (operating)		With no corrosive gas
Ambient temperature (storage)		-20° to 60°C
Power supply holding time		2ms min.
Weight		2.250 gr.

4 Touch Screen Specifications

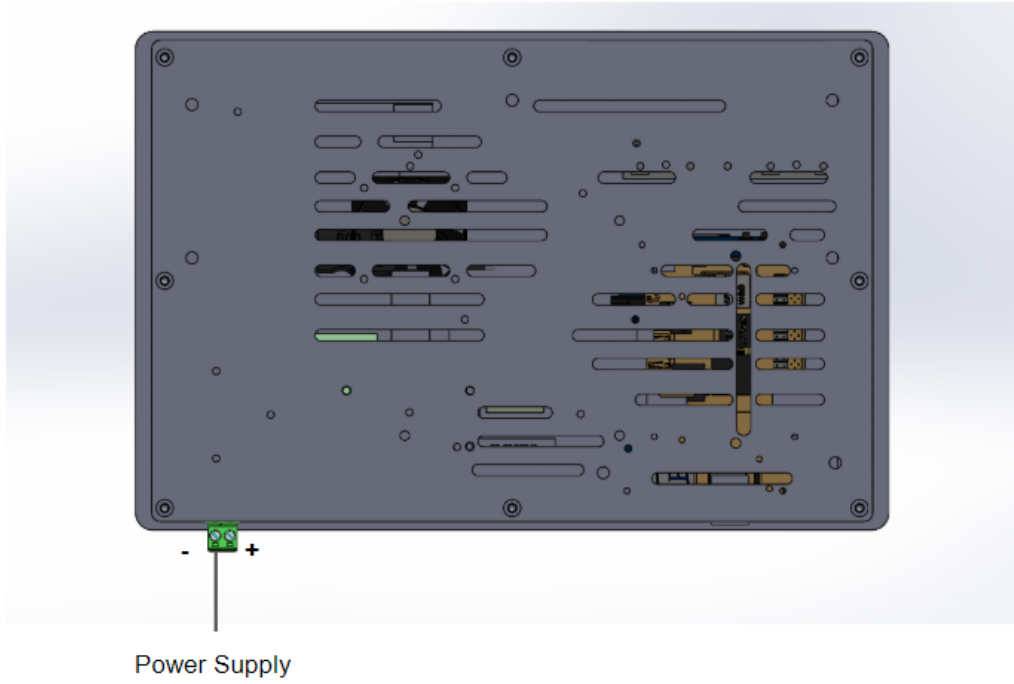
Item	Touch Screen
Technology	Resistive Multitouch LVDS, 315 nits, 170° viewing angle
Image Resolution	1280 x 720
Format	16:9
Size	10.1"



5 Power Supply

DC Power Supply: 12V (30W) // 24Vdc (30W)

Current: 2.5A (12Vdc) // 1,25A (24Vdc)



Power supply: 12/24 Vdc

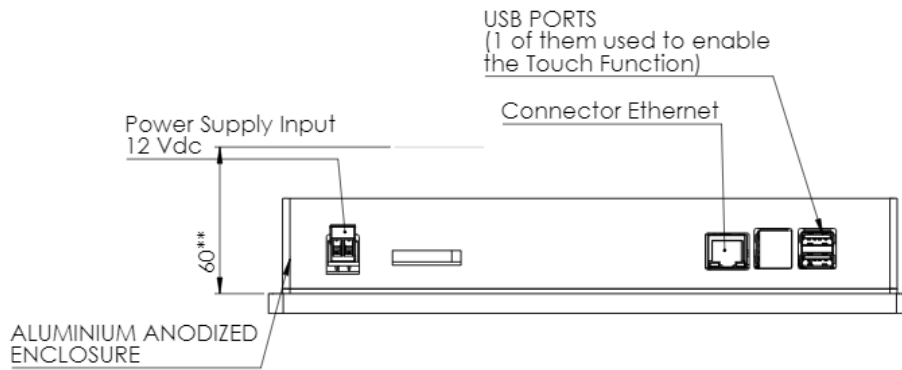


- Plug-in connector
- Pitch: 5,04 mm
- Two contact pins

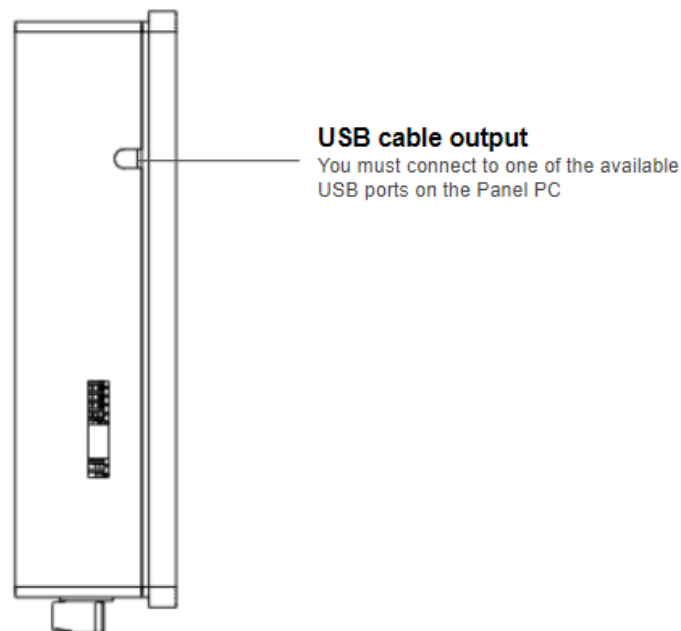


6 Communication Connections

The communication connections are located in the lower part of the panel, at the right part, as you can see in the image below:

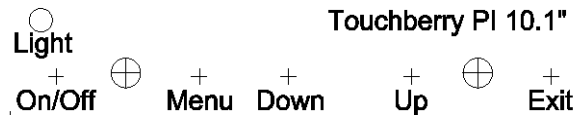


Ethernet and USB port connectors (One of the USB ports is connected in order to activate the attach function)





7 Screen configuration



Light: Operation indication led.

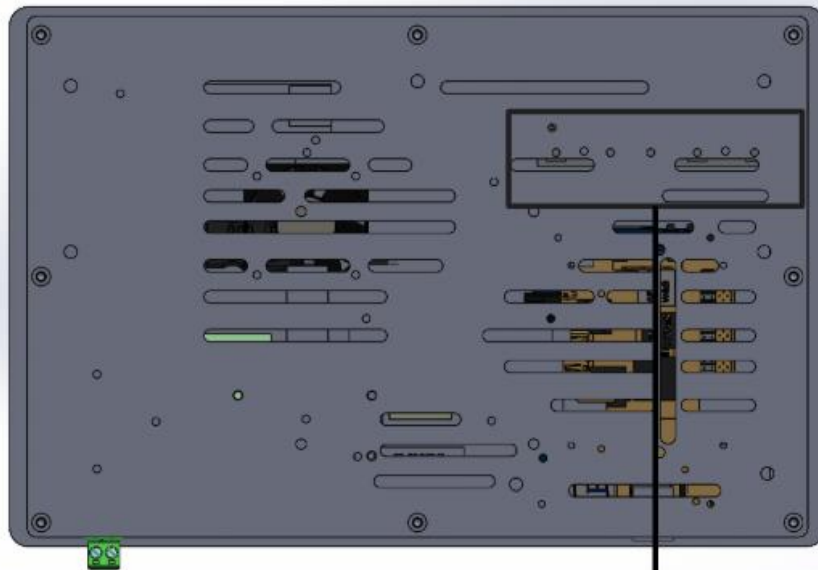
On/Off: Switch ON/OFF the device.

Menu: choose and select the configuration mode.

Down: move down on the configuration menu.

Up: move up on the configuration menu.

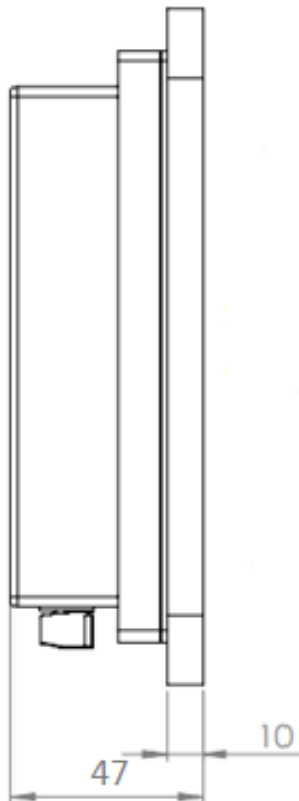
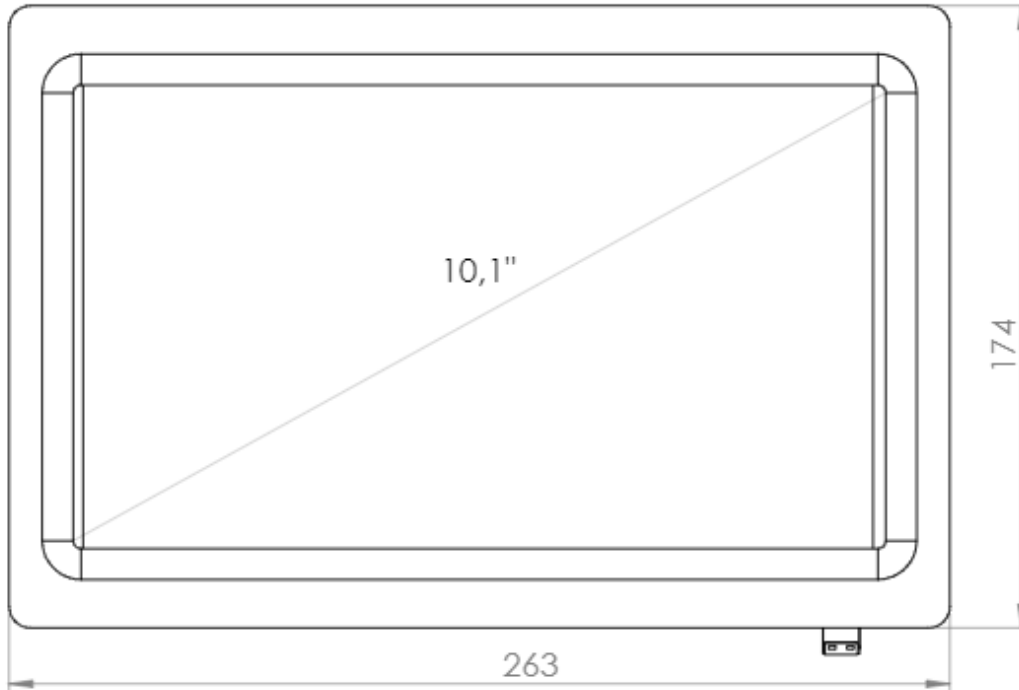
Exit: Select the screen operation mode (HDMI operation mode).

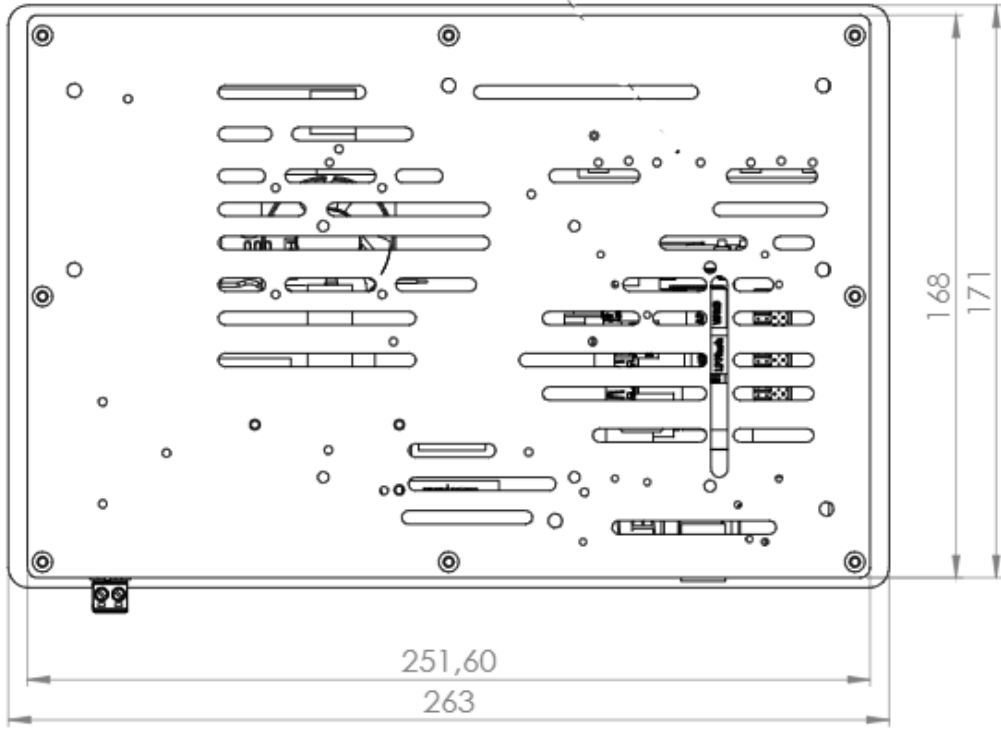


Screen menu
configuration buttons



8 Touch Panels PC 10.1" Size:







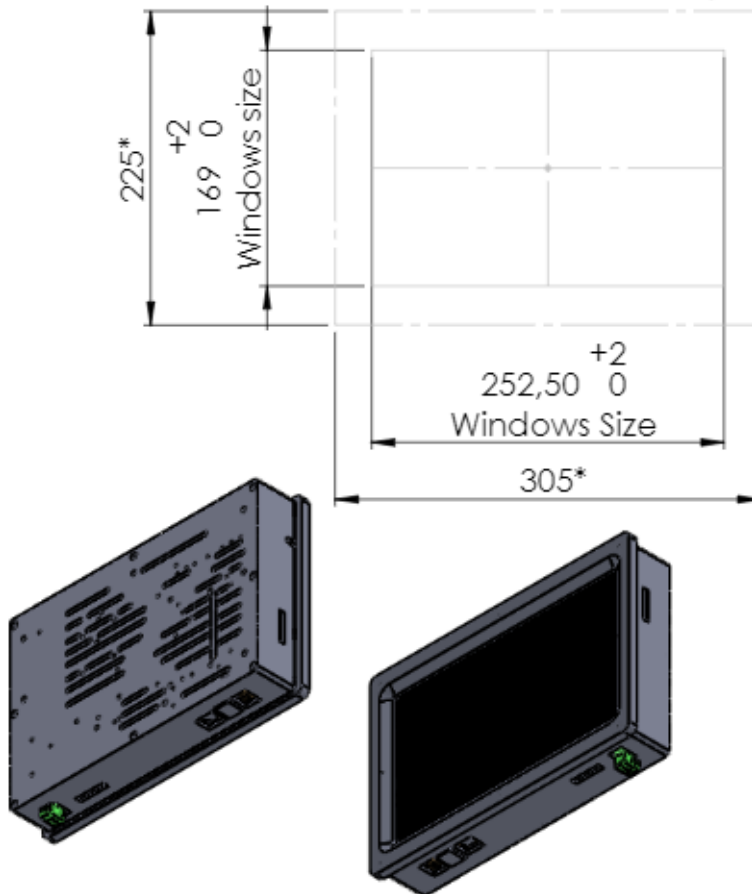
9 Mechanical assembly configuration:

9.1 Panel mounting

Mechanical assembly place (Dimensions in mm):

*NOTE: Space available for assembly. Free space of external elements.

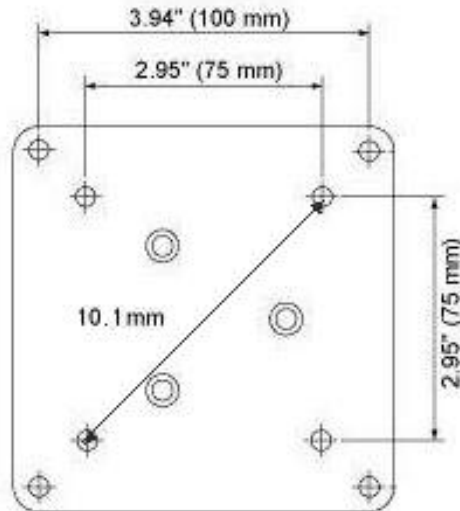
**NOTE: See minimum depth required for right ventilation





9.2 Standard VESA

Our panels are based on the VESA assembly standard (VESA 75 standard):

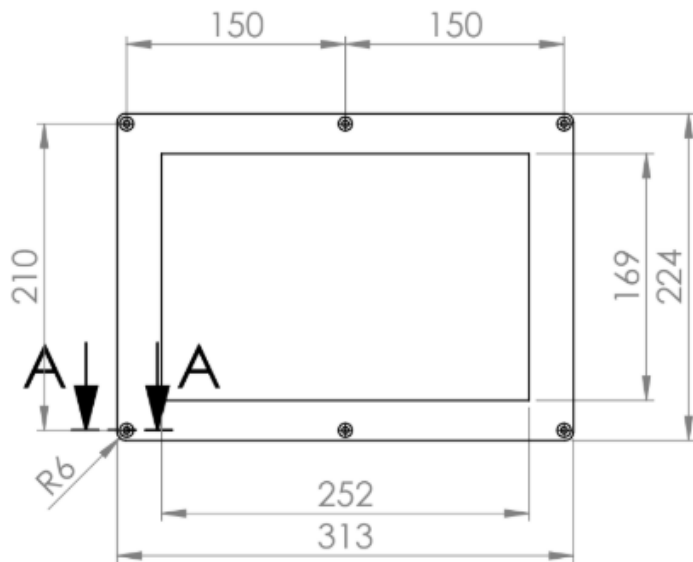
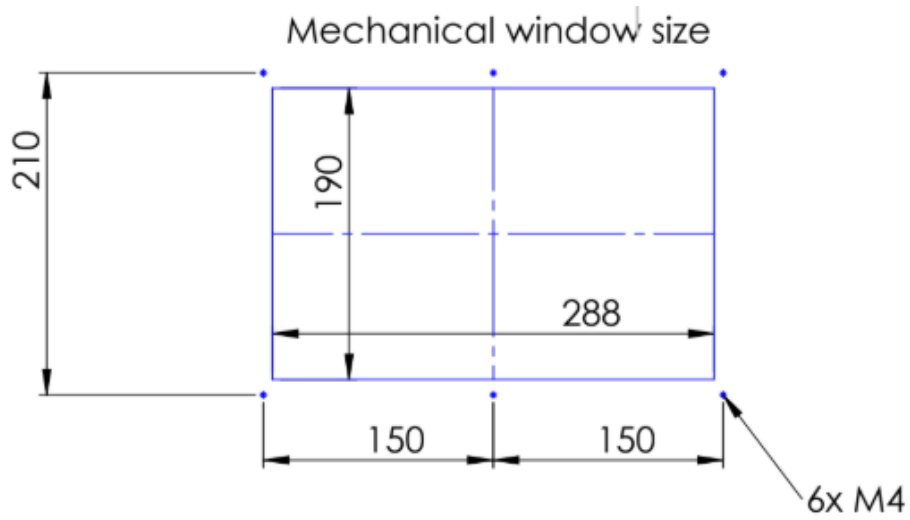


9.3 Trim Plate

The trim plate, is **NOT a product included in the Touch10.1"**, you can buy it through our website.

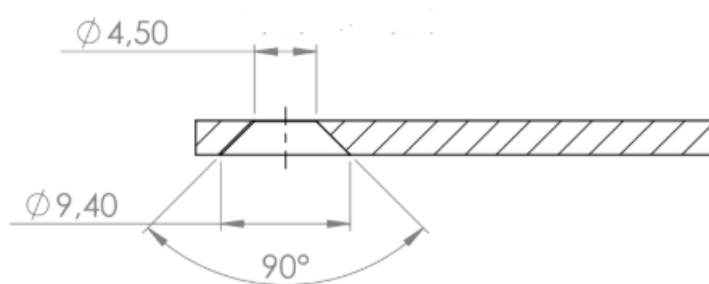
It is an embellisher for the Panel screen,

The measurements for the assembly are specified below:



Section A-A

SCALE 2 : 1





10 Operating System on Touch Panels

10.1 Debian

Debian is Unix-like computer operating system that is composed entirely of free software.

Raspbian, Bananian and Debian Jessie are shorts adaptations of Debian 8 for embedded systems. Debian has a long available row of packages. Also it is possible to develop your own applications, servers, web servers, etc. For example using NodeJS, Qt libraries, DB SQL, Mongo DB, etc.

HummTouch has a default user and password. Their default settings are:

User: HB

Password: hummingboard

Follow the next post to change the password:

<http://blog.industrialshields.com/en/hummtouch-password-and-how-to-change-it/>

More information on: <https://www.debian.org/>



10.2 How to create apps

TouchBerry Pi:

This steps are based on how to download cross-compiler for Raspberry for your own applications.

* Qt, or text program compilations for Touchberry.

From a Linux PC, download "git" app.

From a console do:

```
$ yourpath> git clone https://github.com/raspberrypi/tools.git
```

Now, you have the cross-compiler for Raspberry. Export some variables, and add the compiler path to the environment path variable:

```
PATH=$PATH:<yourpath>/tools/arm-bcm2708/gcc-linaro-arm-linux-gnueabi-hf-  
raspbian/bin  
export ARCH=arm  
export CROSS_COMPILE=arm-linux-gnueabi-hf-
```

Now, you can compile your C++ program doing:

```
$> arm-linux-gnueabi-hf-g++ -o yourprogram yourprogram.cpp
```

If you want to create a project with Qt, you need compile the Qt sources for Raspberry.



First, you will need to download for example:

<http://mirror.netcologne.de/qtproject/archive/qt/5.4/5.4.1/single/qt-everywhere-opensource-src-5.4.1.tar.gz>

Now with your arm-linux-... compiler, you can compile this sources for Raspberry. You can create a project with a Desktop Qt system. (Same as doing it for PC). Finally, you'll have to configure your Qt IDE in order to use the qt-everywhere sources compiled instead of the Desktop ones.

It'll result in a graphical program for raspberry!

10.3 Other interesting available software

Also there are many software's available to run on Debian, next it is showed different link where you can see examples and how to use these software's, also on our blog there are interesting information regarding our Touch Panels:

Node JS: <http://blog.industrialshields.com/en/tcp-server-on-touchberry-pi-3-with-node-js/>

RapidScada: <http://blog.industrialshields.com/en/how-to-install-and-use-rapid-scada-on-touchberry-pi-and-bananatouch/>

Firmata: <http://blog.industrialshields.com/en/software-for-iot-solutions/>

Node-Red: <http://blog.industrialshields.com/en/software-for-iot-solutions/>