Openframe C.TOUCH USR Manual 1.2.2

***** 1.2.2 *****

DATE	REVISION	CHANGE DESCRIPTION
21/10/13	1.0.0	Release
30/01/14	1.0.1	Added 10.1" specifications, added update to U-Boot 1.09
07/02/14	1.0.2	General enhancement on the Bootargs definition
08/04/14	1.0.3	Updated strings of the Bootargs. Modified the mechanical and the assembly plan
18/04/14	1.0.4	General enhancement
23/05/14	1.0.5	General enhancement
10/07/14	1.0.6	Added display interface
14/07/14	1.0.7	Added info on display interface
21/07/14	1.0.8	Added mechanical specifications
29/12/14	1.0.9	Added bootloader's settings command for the new LCDs
18/02/15	1.1.0	Added Information for new carrier revision
02/03/15	1.1.1	Added mechanical information about 10.1"
10/03/15	1.1.2	Updated mechanical specifications and general enhancement
12/03/15	1.1.3	Updated general enhancement
12/03/15	1.1.4	Added USB Updated informations
12/06/15	1.1.5	Added Yocto Bootloader settings
22/06/15	1.1.6	General enhancement
05/11/15	1.1.7	Table 2 information upgraded
19/11/15	1.1.8	Expansion table information upgraded
18/07/16	1.1.9	Updated power supply input voltage reference, General enhancement
02/05/17	1.2.0	Added "Product Compliance" chapter
10/05/17	1.2.1	Corrected rotation on figures 19 and 22
17/05/17	1.2.2	Added Cover.touch and 15.6" specifications

Summary

1. Cable Map Overview

This document is an overview about cable connecting map of Open-Frame system.
It describes the connector and the interface unit available to user, and it specifies the electrical characteristic of the signals.

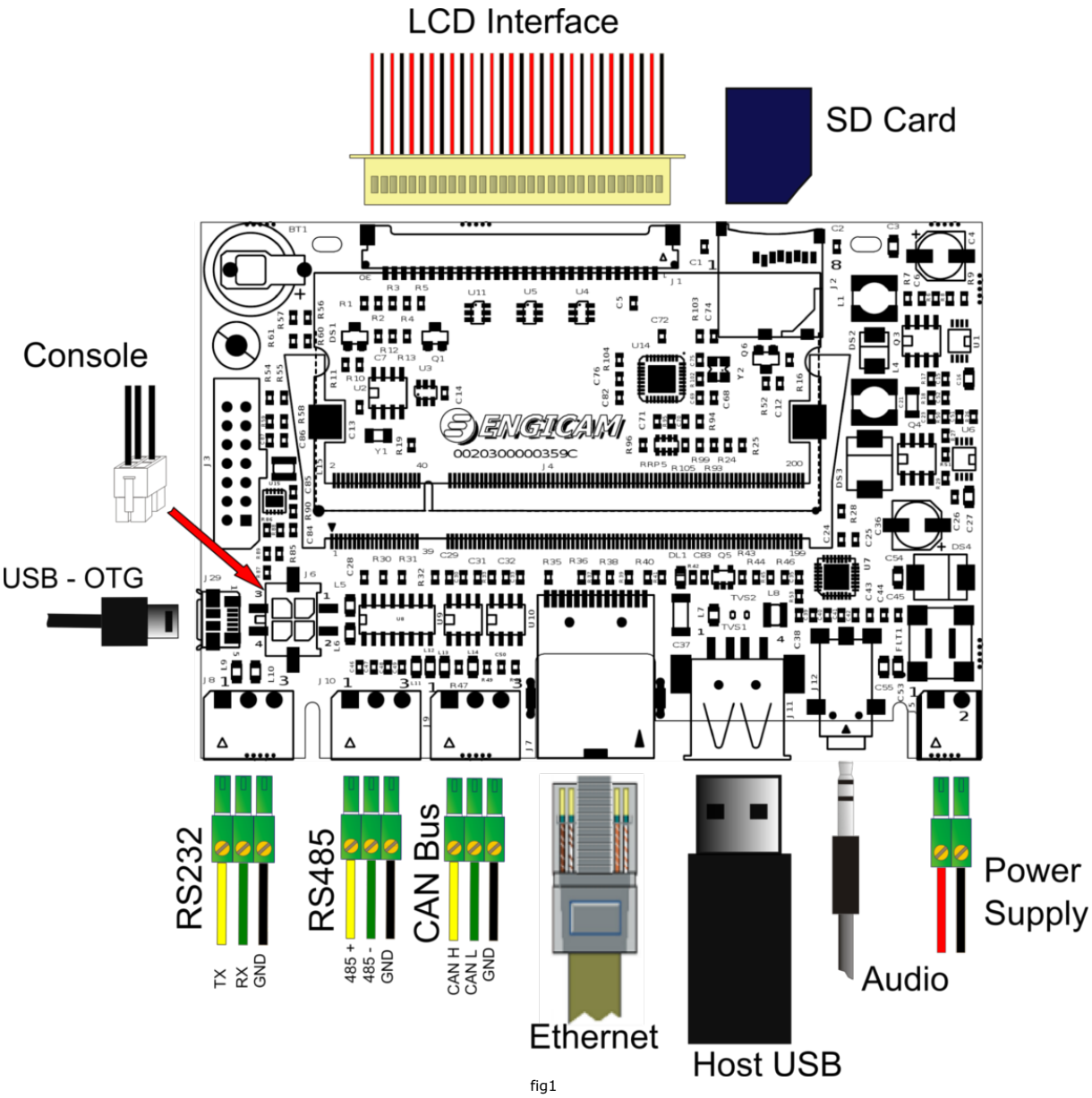

fig1

The figure1 shows the whole wiring map and its join connectors.
This document will try to analyse all type of used connections to help the user's start up.

2. How to start

WARNING!!!

The Open-Frame works with several modules, at the delivery all modules **have only the linux bootloader installed**, therefore to put the Open-Frame in working status you must do the following operations:

1) connect the Linux console to Micro-Fit 3.0 series connector J6
2) connect the LAN cable UTP to RJ connector J
3) run the TFTP application and configure the "serverip"
4) install and configure the kernel using SW manual procedure
5) install and configure the file system using SW manual procedure
6) choice the LCD display configuration

Note: the Linux console is available on the Micro-Fit 3.0 series connector J6 in RS232 format. Another RS232 is available on terminal block connector J8 but it can not be used as a Linux console

Note: For further details about programming please refer to the SW manual

3. Ordering Information

Following we provide the ordering informations and the description for the Basic technical specifications:

Ordering Code	MPQ	Description	Operating temperature range °C
00257000010550	1	C.TOUCH 7" Open frame	-40 to +85 *
0025700003134A	1	C.TOUCH 10.1" Open frame	-40 to +85 *
00257000010560	1	C. TOUCH Open Frame Carrier board	-40 to +85
00257000011880	1	COVER.TOUCH 10.1" Open frame	-40 to +85 *
00257000011920	1	C.TOUCH 15.6" Open frame	-40 to +85 *
00257000003126	1	Frame Option 7”	
00257000003127	1	Carter Option	

Table 1

* LCD components excluded (range -20; +70 °C)

4. HW Compatibility with modules

In the following table are shown the modules available with the Open-Frame

Modules	C.TOUCH 10.1"	C.TOUCH 7”	COVER.TOUCH 10.1"	C.TOUCH 15.6"
i.CoreM6 series	Compliant	Compliant	Compliant	Compliant

Table 2

For further details on displays see also Chapter7.3, Chapter 8.3, Chapter 9.3 and Chapter 10.3

5. Carrier Board Specifications

In this chapter are described the informations about the carrier board C.TOUCH, these specifications include the descriptions of all the available peripheral assembled on the board and the code or the family of any mating connectors for each interface

Concerning the useful requirements for the design of a complete customized system, are reported the informations about the mechanical dimensions of the carrier board, and the fixed points and the size of the holes

5.1 Mechanical informations

In the following picture is reported the drawing and the size of the carrier board. This can be useful for the customer for integrate and fix the carrier into a custom system.

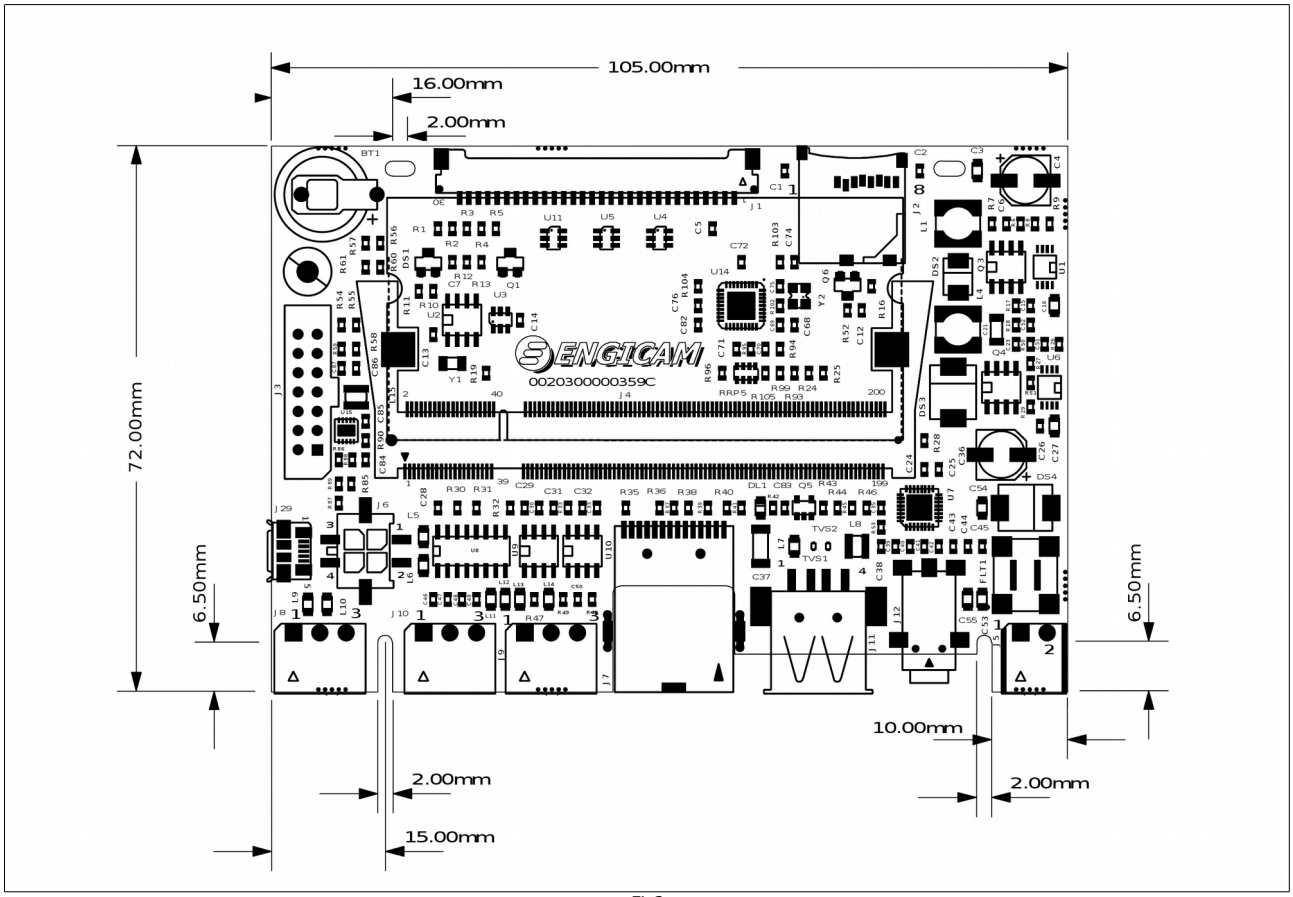

Fig2

***Note**: all the unit reported measure are in mm*

5.2 Micro SD Connections

The Open-Frame board has a Micro SD switch detected connector (J2). It uses both SD standard type card and SD High Capacity type card

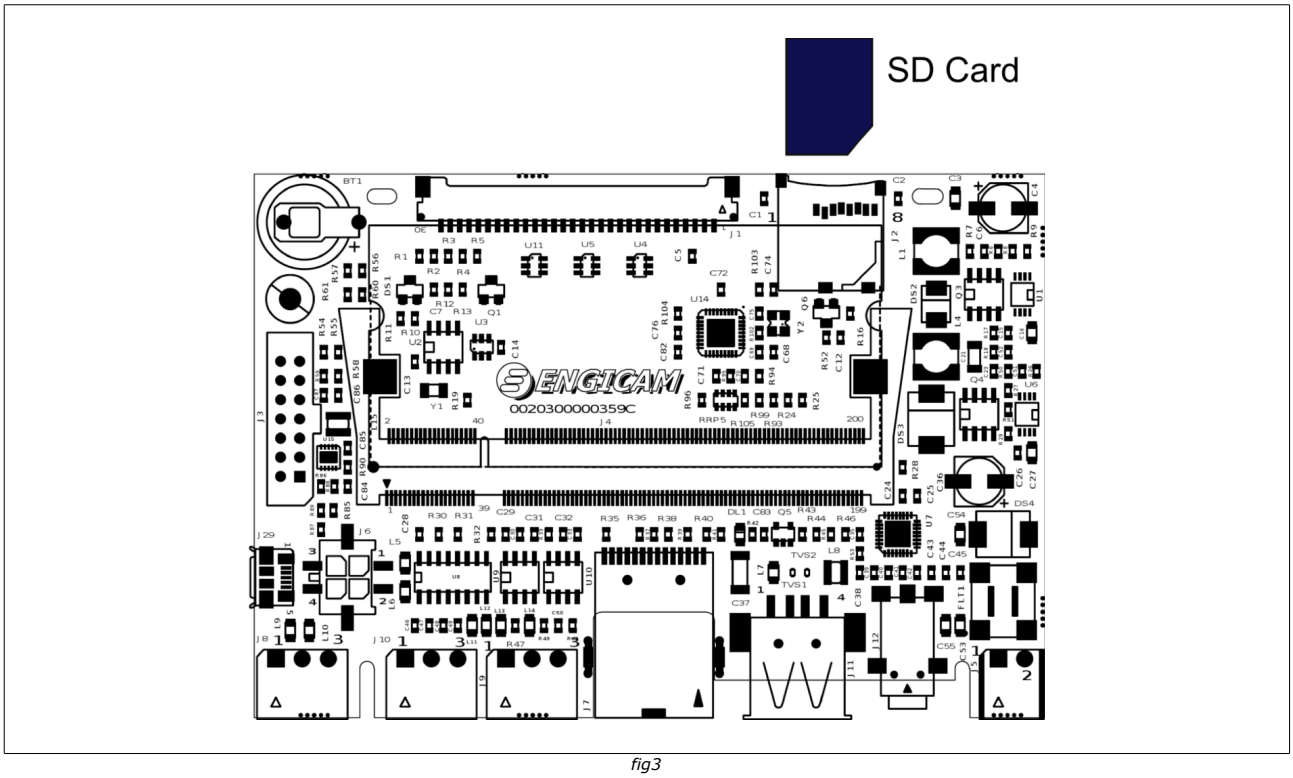

fig3

Micro SD card features are:

- Capacity: variable from 32 MB to 32 GB
- Length: 15 mm
- Depth:11 mm
- Height: 1 mm
- Voltage supply 2,7 V 3,6 V
- Slot: TransFlash
- MTBF: 1.000.000 h/e

5.3 RS 485 RS 232 & CAN Bus Connections

The following figure represents the connections of the RS485, RS232 and CAN bus's signals. Both RS485, RS232 and CAN bus are connected through a terminal male connector (Phoenix code MC 1.5/3-G-3.5-1844223 90° or compliant) mounted on PCB and referenced J8, J9, J10.

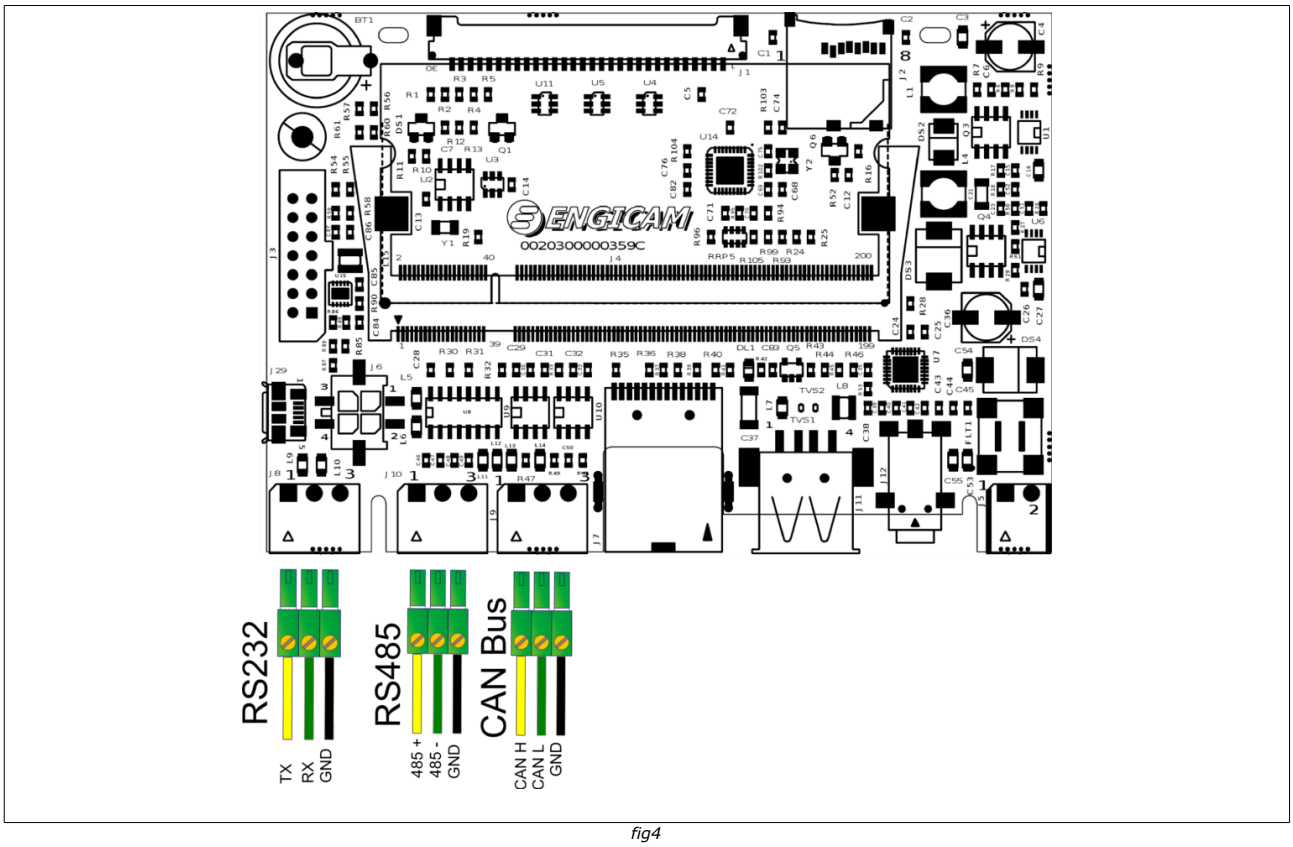

fig4

The wiring map of female connector (Phoenix code MC 1.5/3-ST-3.5 - 1840379) used for UARTs & CAN is shown in the following table.

J9

Pin number	Signal Name	Function Description	Voltage reference
1	CAN H	High level can bus line	Standard CAN Compliant
2	CAN L	Low level can bus line	Standard CAN Compliant
3	GND	Power Signal	-

Table 3

The CAN bus may be terminated by the using the not mount resistor R47 (120 Ohm)

Following are reported the cable maps for the UART interface.

J8

Pin number	Signal Name	Function Description	Voltage reference
1	TX	Transmit Signal Output	RS232 Standard
2	RX	Receive Signal Input	RS232 Standard
3	GND	Power Signal	-

Table 4

J10

Pin number	Signal Name	Function Description	Voltage reference
1	RS485 P	Non Inverting Receiver In/Driver Out	RS485 Standard
2	RS485 N	Inverting Receiver In/Driver Out	RS485 Standard
3	GND	Power Signal	-

Table 5

Note:
Do NOT use the UART on connector J8 as Linux console

5.4 USB Connections

5.4.1 USB HOST

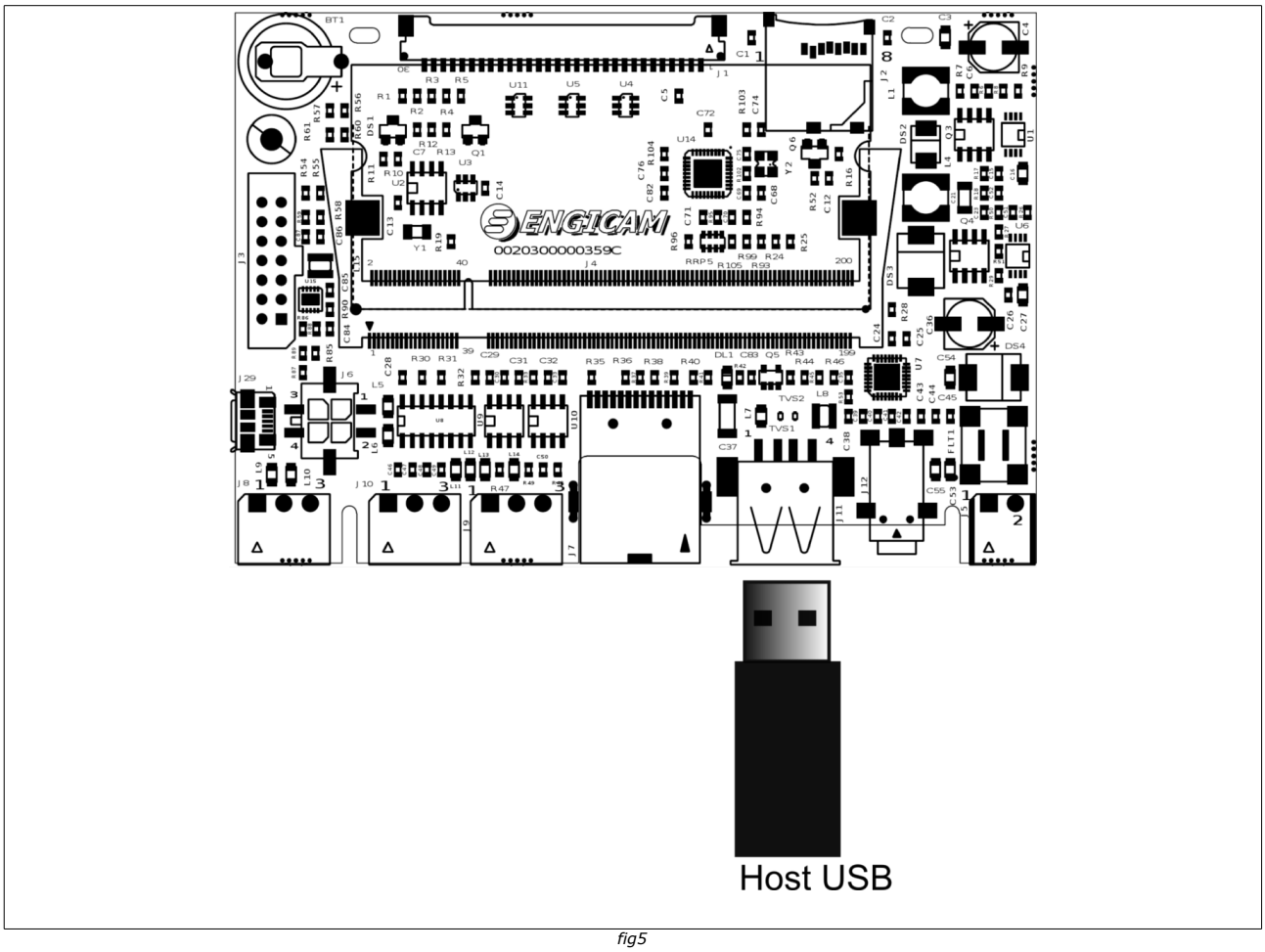

fig5

The USB HOST signal is connected to USB HUB (U14) added on the carrier revision. The HUB's downstream ports are connected to J11 USB HOST connector, to the display interface connector, and to the expansion connector J3 (see the Chapter 5.9)

In the following tables are represented the electrical connection of the USB standard interface (USB type A plug)

Pin number	Signal Name	Function Description	Voltage reference
1	VBUS	Power Signal	Standard USB
2	DM	Data N	Standard USB
3	DP	Data P	Standard USB
4	GND	Power Signal	Standard USB

Table 6

5.4.2 USB OTG (Only Device)

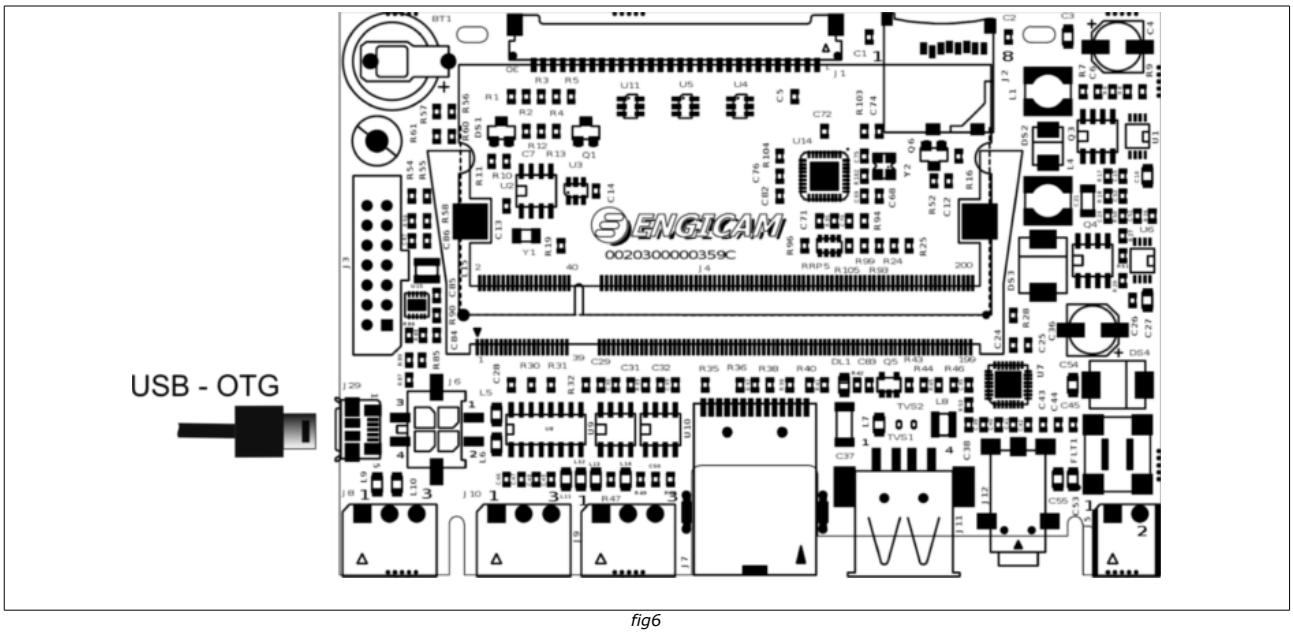

fig6

The Open-Frame provides high performance USB On-The-Go (up to 480Mbps) used only in device mode, compatible with the USB2.0 specification. In the following table are listed all USB/OTG signal connector.

Pin number	Signal Name	Function Description	Voltage reference
1	VBUS	Power Signal	Standard USB
2	DM	Data N	Standard USB
3	DP	Data P	Standard USB
4	ID	Standard USB OTG	Standard USB
5	GND	Power Signal	Standard USB

Table 7

Note:

The USB OTG is used to debug Android with Virtual Machine (VM). Please for further informations about the use of debug refer to Android sw manual.

5.5 Ethernet Connections

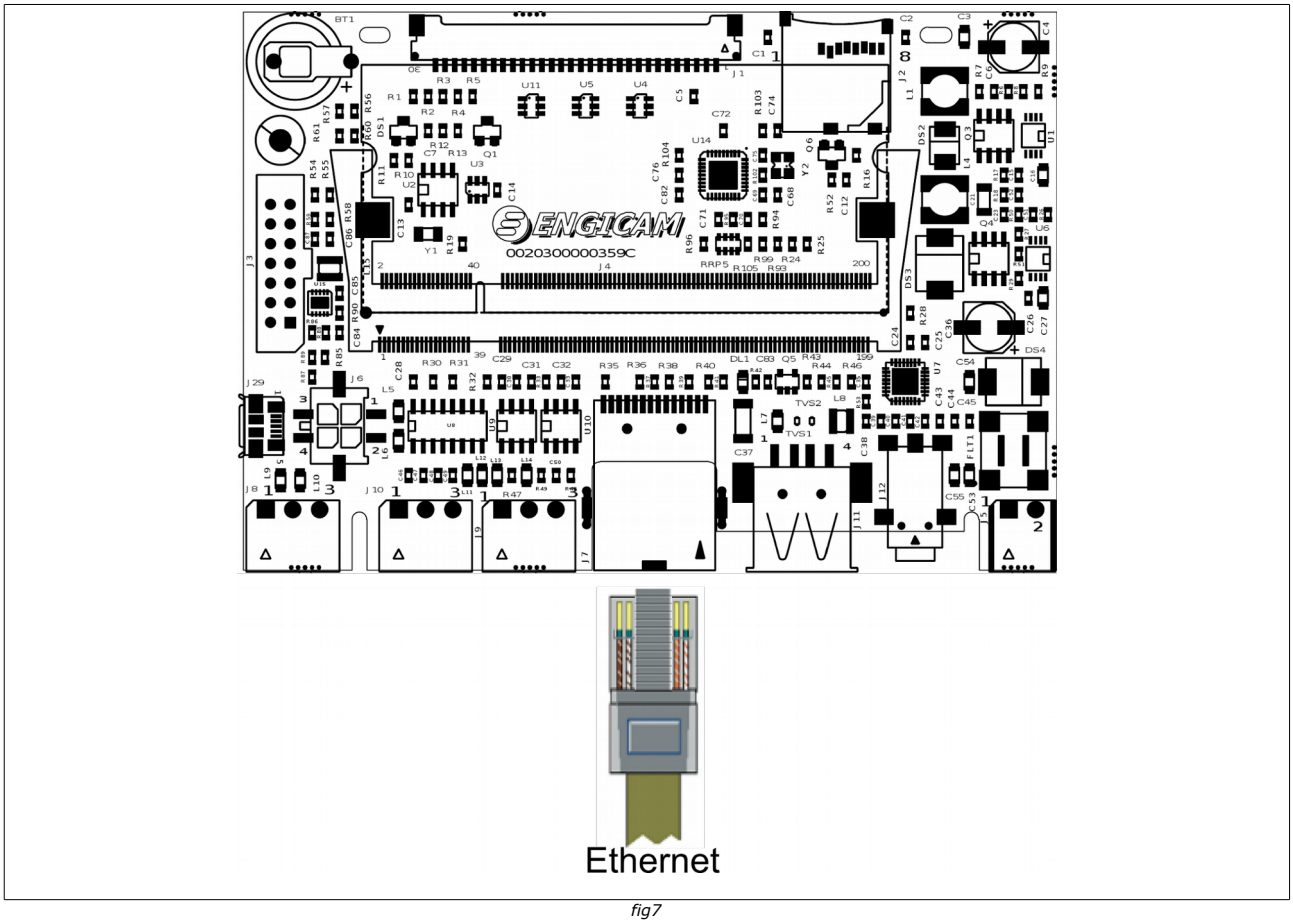

fig7

The figure5 represents the Ethernet 10/100 connection. This connection uses a RJ45 standard plug (8 wires) and the following table shows the wiring map.

Pin number	Signal Name	Function Description	Voltage reference
1	TX-	Transmit positive signal	Standard Ethernet
2	TX+	Transmit negative signal	Standard Ethernet
3	RX+	Receive positive signal	Standard Ethernet
4	NC	-	-
5	NC	-	-
6	RX-	Receive negative signal	Standard Ethernet
7	NC	-	-
8	NC	-	-

Table 8

5.6 Power Supply Connections

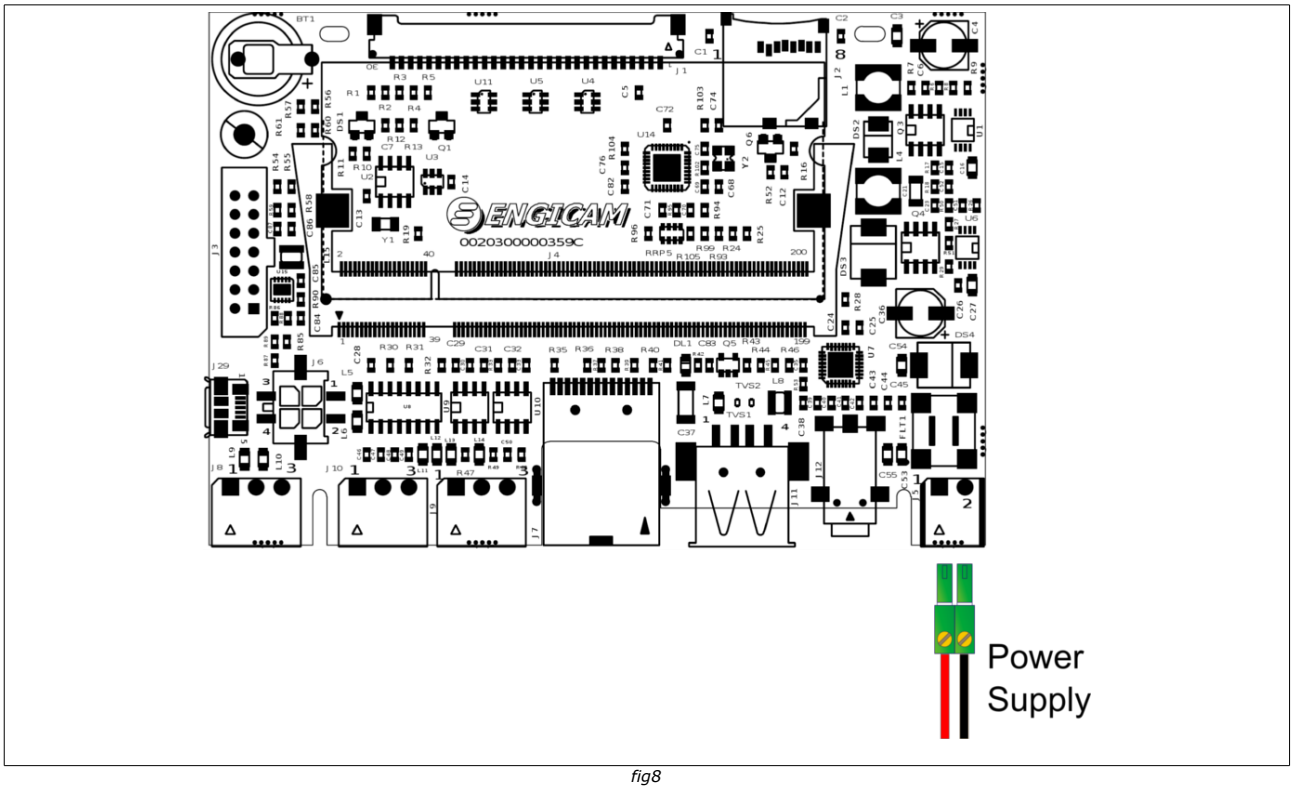

fig8

The figure shows the power supply connection. The Open-Frame receives an input DC voltage, which ranging from +10V to +30V. J5 is Phoenix MC 1.5/2-G-3.5 1844210 90° positions p.3.5mm male connector, linked as follows:

Pin number	Signal Name	Function Description	Voltage reference
1	+VIN	Power Signal	Up 15 to 30 VDC
2	GND	Power Signal	-

Table 9

5.6.1 Current consumption

The following table shows the system's current consumption measured at 12 V and at 24 V

i.CoreM6S on Board	Current @ 12V	Current @ 24V
C.TOUCH 7”	360 mA	200 mA
C.TOUCH 10.1” (AM-1280800F1TNQW-T00)	460 mA	250 mA
C.TOUCH 10.1” (AM-1280800N3TZQW-T00H)	485 mA	270 mA

Table 10

The measure is done during the standard operating mode and the LCD switched

5.7 Linux Console Debug Connections

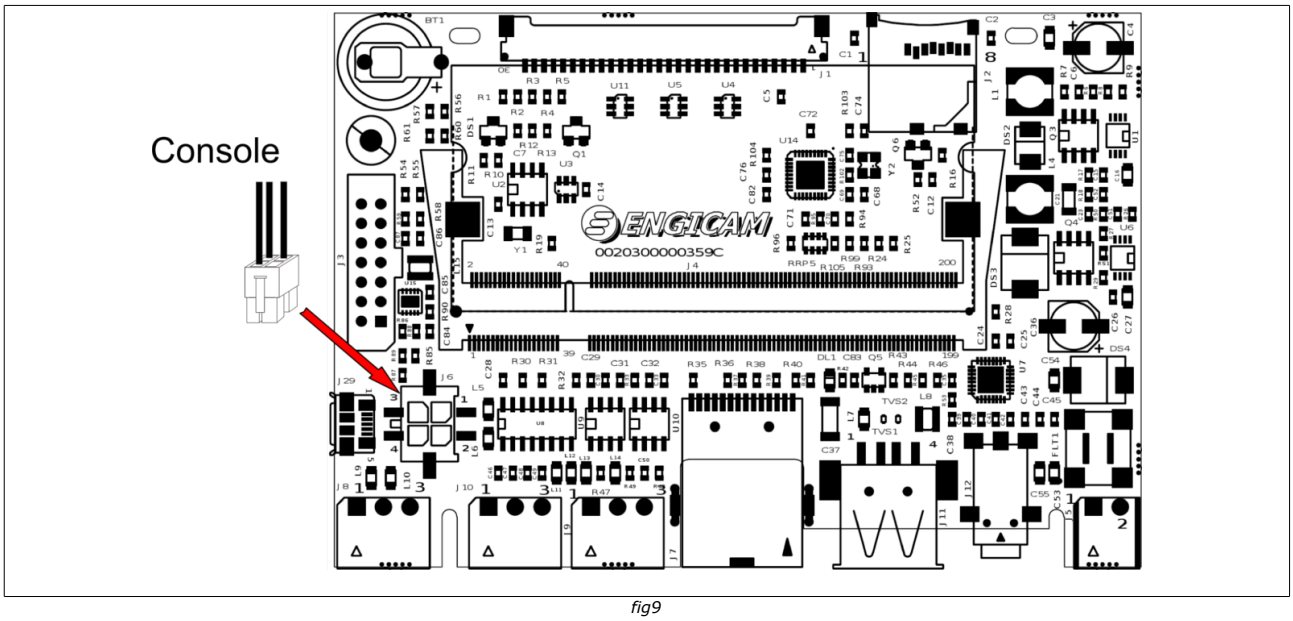

fig9

When Linux OS is installed on the Open-Frame module, UART1 is used as console. The connector used is a vertical Molex Microfit 3.0 2x2 poles, SMT code 43045-0418; in the following table is shown the electrical features:

Pin number	Signal Name	Function Description	Voltage reference
1	TX	Transmit Signal	Standard RS232
2	RX	Receive Signal	Standard RS232
3	GND	Power Signal	-
4	GND	Power Signal	-

Table 11

The default communications settings is shown in following table

Console Default Settings	
Baud rate	115200
Data length	8 bit
Parity	none
Stop	1bit

Table 12

5.8 LCD Interface

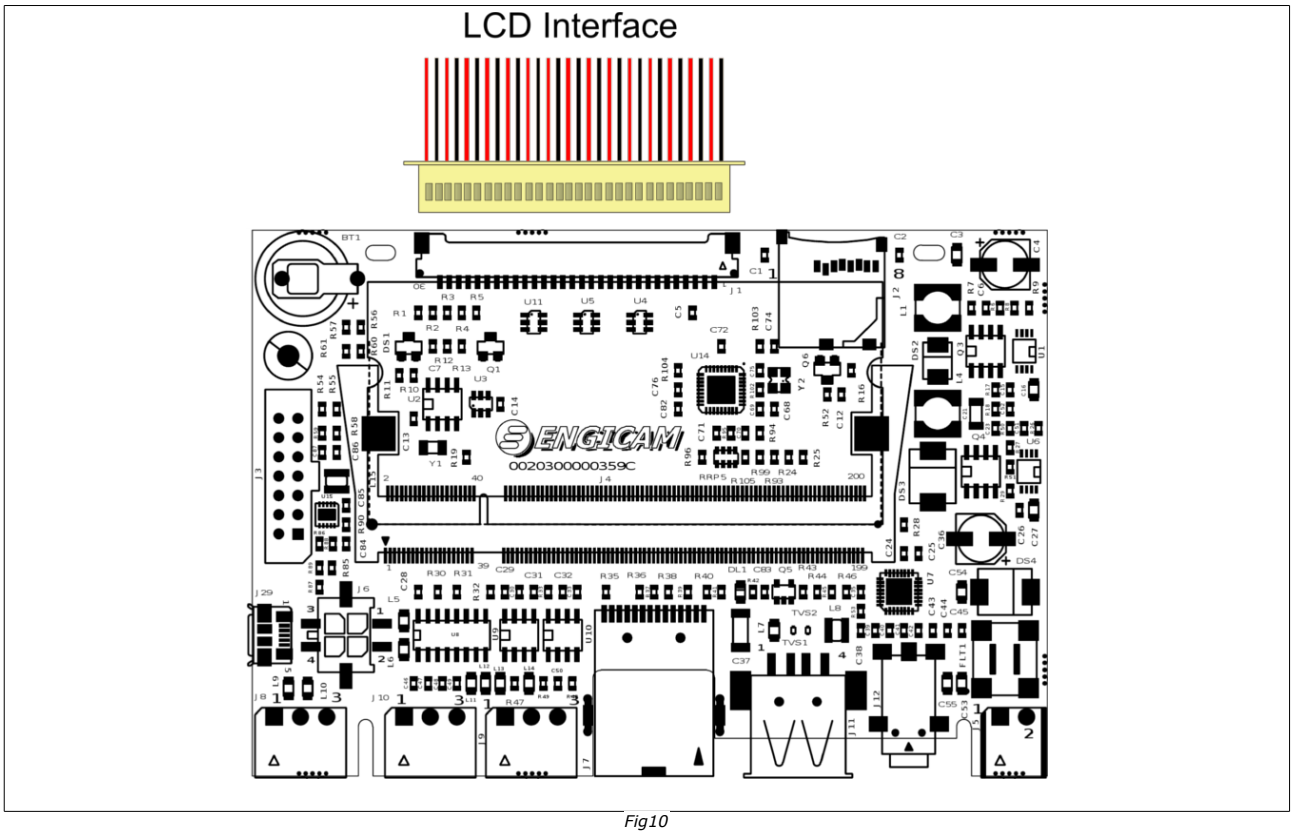

Fig10

The board connector, reference J1, mates with the cable connector code DF14-30S-1.25C (HIROSE) or compliant

Pin number	Signal Name	Function Description	Voltage reference
1	GND	Power PIN	-
2	+3V3_OUT	Power PIN	-
3	+3V3_OUT	Power PIN	-
4	+5V	Power PIN	-
5	+5V	Power PIN	-
6	+12V	Power PIN	-
7	NC	-	-
8	LVDS0_TX0_N	LVDS Interface's Signals	+2,5V
9	LVDS0_TX0_P	LVDS Interface's Signals	+2,5V
10	GND	Power PIN	-
11	LVDS0_TX1_N	LVDS Interface's Signals	+2,5V
12	LVDS0_TX1_P	LVDS Interface's Signals	+2,5V
13	GND	Power PIN	-
14	LVDS0_TX2_N	LVDS Interface's Signals	+2,5V

Pin number	Signal Name	Function Description	Voltage reference
15	LVDS0_TX2_P	LVDS Interface's Signals	+2,5V
16	GND	Power PIN	-
17	LVDS0_CLK_N	LVDS Interface's Signals	+2,5V
18	LVDS0_CLK_P	LVDS Interface's Signals	+2,5V
19	GND	Power PIN	-
20	LVDS0_TX3_N	LVDS Interface's Signals	+2,5V
21	LVDS0_TX3_P	LVDS Interface's Signals	+2,5V
22	GND	Power PIN	-
23	GPIO_1_CONTRAST	PWM (Display Contrast)	+3,3V
24	I2C1_SCL	I2C SCL Signal	+3,3V
25	I2C1_SDA	I2C SDA Signal	+3,3V
26	CSI_D12	General Purpose IO	+3,3V
27	USB_DP	USB interface	-
28	USB_DN	USB nterface	-
29	U/D#	Vertical inversion (selectable by board pull-up/down) [1]	+3,3V
30	Spare Pin	selectable by board pull-up/down [2]	+3,3V

Table 13

[1] U/D# Signal is controlled by:
R4, 5,6K Ohm pull-up resistor (Mounted on the standard PCB configuration)
R3, 100K Ohm pull-down resistor (Not Mounted)

[2] Spare Pin Signal is controlled by:
R2, 5,6K Ohm pull-up resistor (Mounted on the standard PCB configuration)
R1, 100K Ohm pull-down resistor (Not Mounted)

The 24 bit configuration is available on the carrier board revision C.

The resistor involved are positioning under the module (see the following figure)

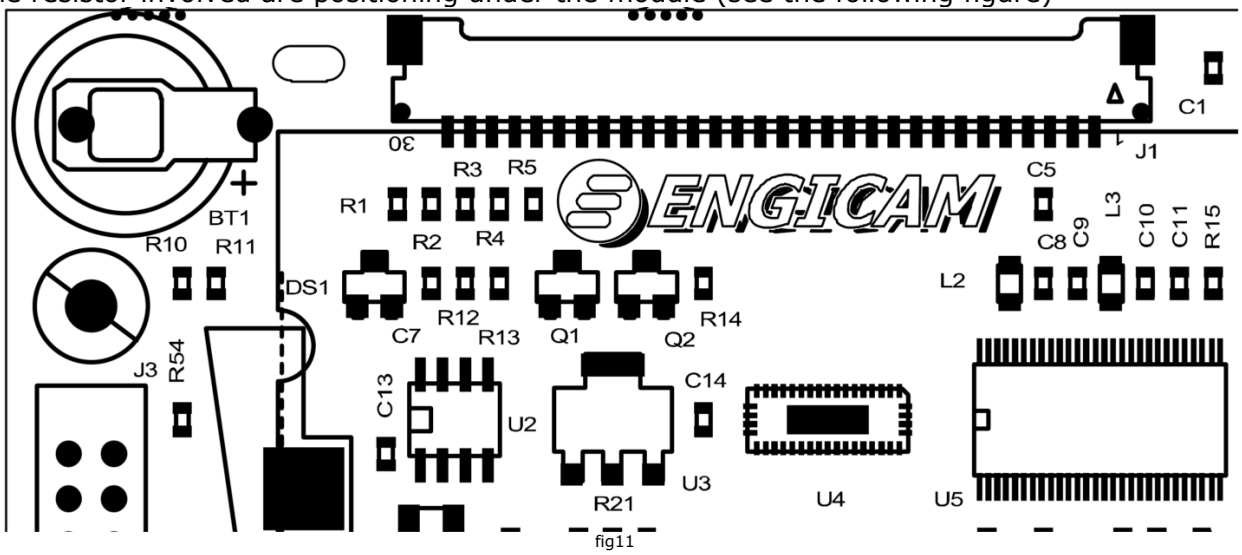

fig11

5.9 Expansion Connector

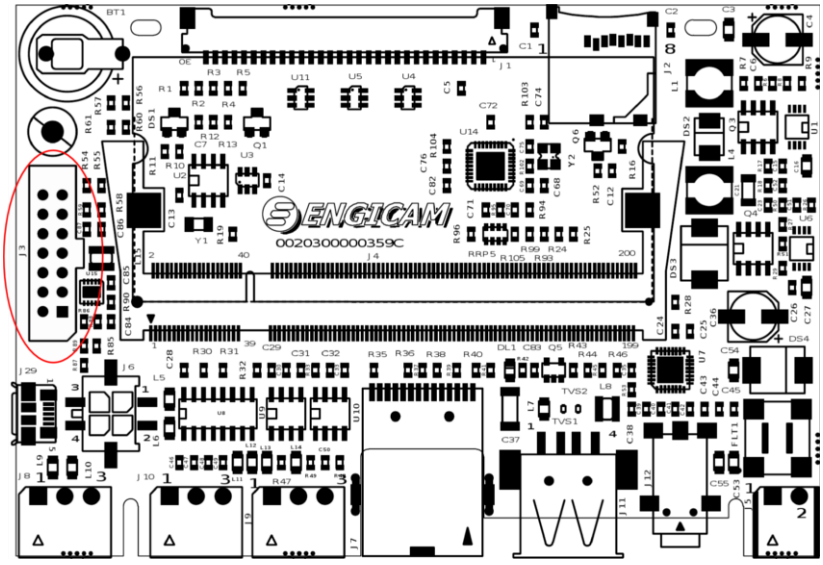

fig12

The Open-Frame is provided of Expansion connector (STRIP 2x7 poles, 2.54mm pitch referenced J3) which allows to connect the following module's pins:

Pin Number on Expansion Connector	Pin on Module	Function Description	Voltage reference
1	-	Power Signal from voltage regulator on board	+3,3V_AUX
2	197, 198, 199, 200	Power Signal	+5V
3	24	* / USB HOST see the table in the following page	+3,3V
4	23	* / USB HOST see the table in the following page	+3,3V
5	171	*	+3,3V
6	170	*	+3,3V
7	169	*	+3,3V
8	168	*	+3,3V
9	167	*	+3,3V
10	166	*	+3,3V
11	12	* / USB HOST see the table in the following page	+3,3V
12	14	* / USB HOST see the table in the following page	+3,3V
13	GND	Power Signal	-
14	GND	Power Signal	-

Table 14

* **Note**: for the signal function please refer to module' s Hardware manual. To customise the use of those signals with alternative pin's functions please consult the modules' reference manual.

WARNING: The red characters highlight the pin, that share the signals, with the carrier board see the following page for further details

The pin couples 3, 4 and 11, 12 of the expansion connector are shared with the USB signals generated by the USB HUB, referenced U14.

In the default configuration the carrier is set to work with the module's standard signals.

The following table describes **how to activate the USB signals** on the spare connector, mounting or removing the **0 Ohm** resistors listed.

Pin Number on Expansion Connector	Pin on Module	Signal from Carrier (USB HUB)	Resistor to mount (USB signal connection)	Resistor to remove (default setting)
....	....	....	....	....
3	24	**USB_DP3**	**R54**	**R58**
4	23	**USB_DN3**	**R55**	**R59**
....	....	....	....	....
11	12	**USB_DP4**	**R56**	**R60**
12	14	**USB_DN4**	**R57**	**R61**

Table 15

The following picture underlines the layout of the resistors involved in the signals share, inside the C.Touch carrier board

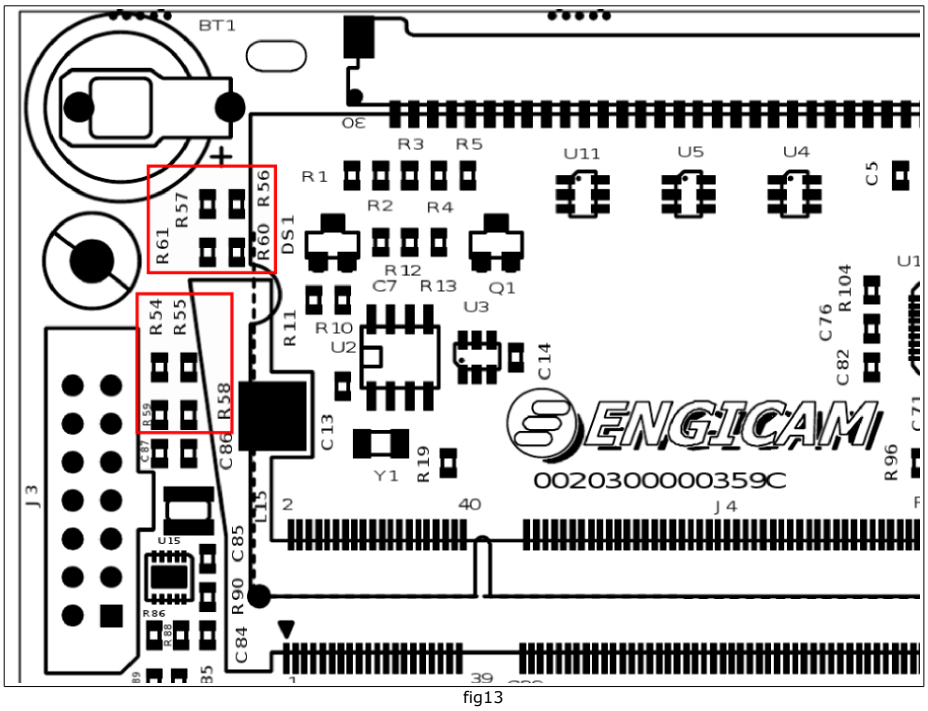

fig13

6. Bootargs Setup

Following is shown how to enable one of the possible display used in the Open-Frame configurations. The Capacitive Open-Frame use different LCD displays. Using i.CoreM6x with the release of U-Boot greater or equal than 1.09, to select one of the display you can use the Open-Frame configurations; you don't need to enabled the touchscreen controller or you don't have to make any changes in the bootargs, just edit the following string in the bootloader:

6.1 Bootloader's settings for C.Touch

6.1.1 U-boot setup using LTIB

Using Carrier Rev. B

If you are using **DISPLAY 7"** Open-Frame code **00257000003123**:

```
set board 'OF.CAP'                    // display 7”
set video_type 'mxcfb0:dev=lcd'
set lcd_panel 'Amp-WD,if=RGB666'
```

if you are using **DISPLAY 10.1"** Open-Frame code **00257000003134:**

```
set board 'OF.CAP'                    // display 10.1”
set video_type 'mxcfb0:dev=lcd'
set lcd_panel 'LCD-WXGAI,if=RGB666'
```

Using Carrier Rev. C

If you are using **DISPLAY 7"** Open-Frame code **00257000010550**:

```
set board 'OF.CAP'                    // display 7”
set video_type 'mxcfb0:dev=ldb'
set lcd_panel 'Amp-WD,if=RGB666'
```

if you are using the new **DISPLAY 10.1"** Open-Frame code **0025700003134A**:

```
set board 'OF.CAP'                    // display 10.1” (new display)
set video_type 'mxcfb0:dev=ldb'
set lcd_panel 'LDB-WXGAI,if=RGB24'
```

For U-Boot version previous to the 1.09 once you have compile and run the kernel (see SW manual) you have to set the bootargs through the following operations Power on the Open-Frame after have connected the serial port and have ran the hyperterminal or similar application. To enter in the U-Boot console pressing any keys on the keyboard before the end of the countdown. Write the following strings in the U-Boot:

if you are using **DISPLAY 7" EDT**:

```
set bootargs 'console=ttymxc3,115200n8 ubi.mtd=2 root=ubi0:rootfs rootfstype=ubifs rootwait rw
video=mxcfb0:dev=lcd,Amp-WD,if=RGB666 arm_freq=800 engi_board=OF.CAP'
```

It's possible to use the 18 or 24 bit mode by changing the following parameter in the bootargs

```
if=RGB666          // to work at 18 bit
if=RGB24           // to work at 24 bit
```

Use "**print**" command to check the setup of **bootargs**.

Note: For further details please refer to "**i.CoreM6x Sw Manual**"

6.1.2 U-boot setup using YOCTO

Using Carrier Rev. B

if developer is using **DISPLAY 7"** Open-Frame code **00257000003123**:

```
set board 'OF.CAP'   // display 7" EDT
set video_type 'mxcfb0:dev=lcd'
set lcd_panel 'Amp-WD,if=RGB666'
```

if developer is using **DISPLAY 10.1"** Open-Frame code **00257000003134**:

```
set board 'OF.CAP' // display 10.1" AMPIRE
set video_type 'mxcfb0:dev=lcd'
set lcd_panel 'LCD-WXGAI,if=RGB666'
```

Using Carrier Rev. C

if developer is using **DISPLAY 7"** Open-Frame code **00257000010550**:

```
set board 'OF.CAP'
set video_type 'mxcfb0:dev=ldb'
set lcd_panel 'Amp-WD,if=RGB666'
```

if developer is using **DISPLAY 10.1"** Open-Frame code **0025700003134A**:

```
set board 'OF.CAP'
set video_type 'mxcfb0:dev=ldb'
set lcd_panel 'LDB-WXGAI,if=RGB24'
```

Note: After the set up remember to **save** the configuration.

Note: For further details please refer to "**i.CoreM6x_Yocto_sw_manual**"

For the display settings please download the device tree or ask to Engicam support

7. C.TOUCH 7” Open-Frame assembly plan

This chapter want to be a guide and illustrate the method to installing an Open-Frame in an own system. First of all it will be specified the methodologies of insertion, of installation and the mechanical dimensions useful to the user to determinate the space requirements to design a custom product containing the Open-Frame.
To help you to achieve the best results will be described the size and dimensions with their tolerances, this will allow the integration of Open-Frame, that will interact with any system through its visual interface and its touchscreen.
Therefore the attention of the user will be focus on the possibility of adjust the positioning through the tolerances left on the constraints and the use of appropriate screws. In this way the user will be able to place the Open-Frame within its system ensuring accuracy and reproducibility of the production process.

7.1 C.TOUCH 7” Overall Dimensions

In the following picture is reported the drawing with the size of the OF. This can be useful to calculate the encumbrance area and the fixing points to consider during the system designing.

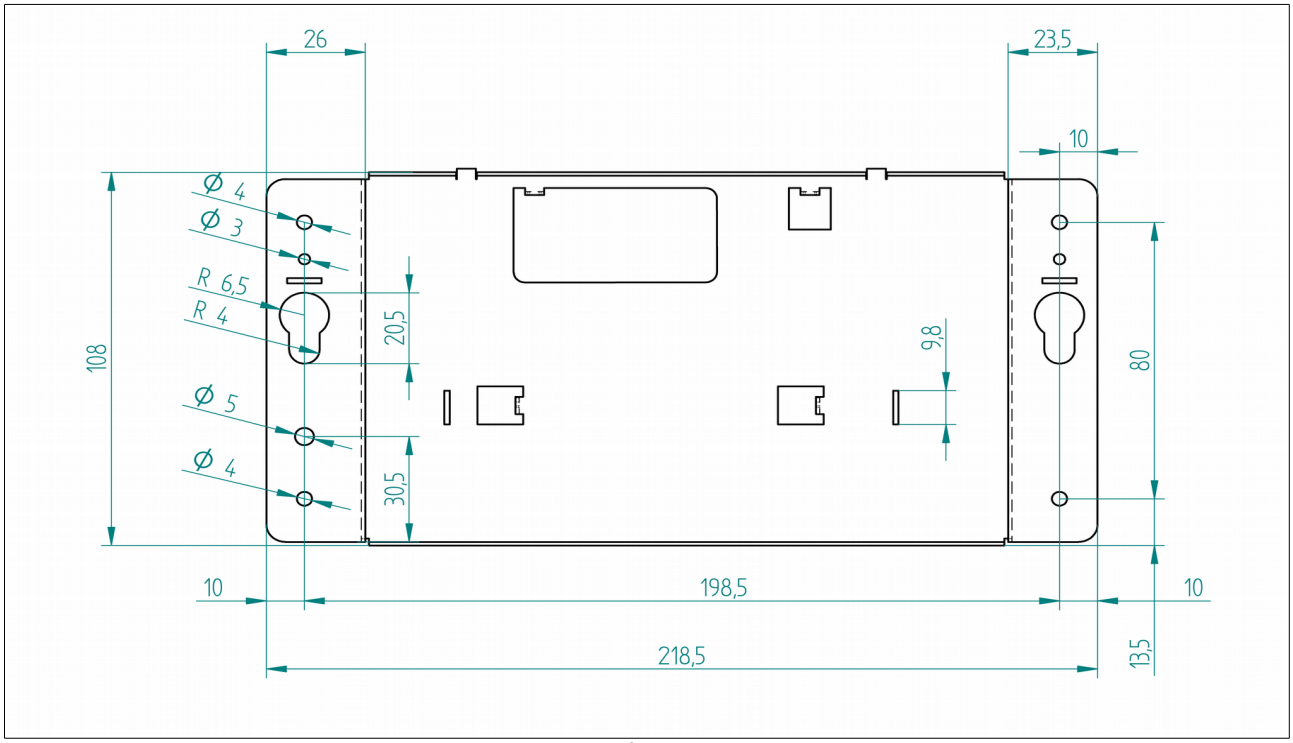

fig14

In the pictures below are shown the maximum size of the Open-Frame system also in its depth (in which are considered also the dimensions of carter that cover the PCB and its components assembled).

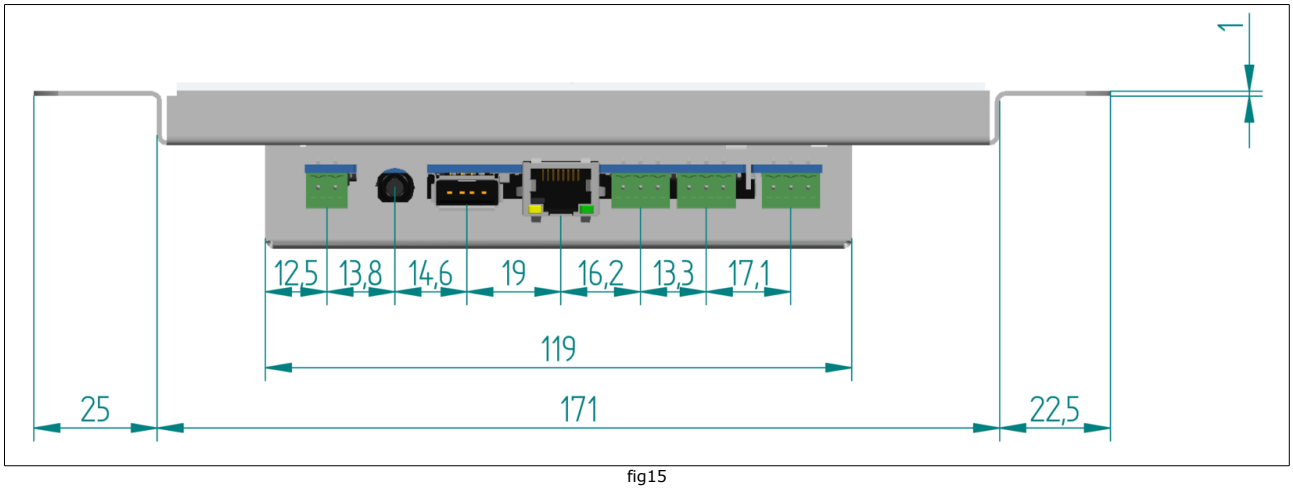

fig15

Those can be useful to calculate and consider the volume necessary to place or to integrate the Open-Frame within another system and to design a suitable mounting points.

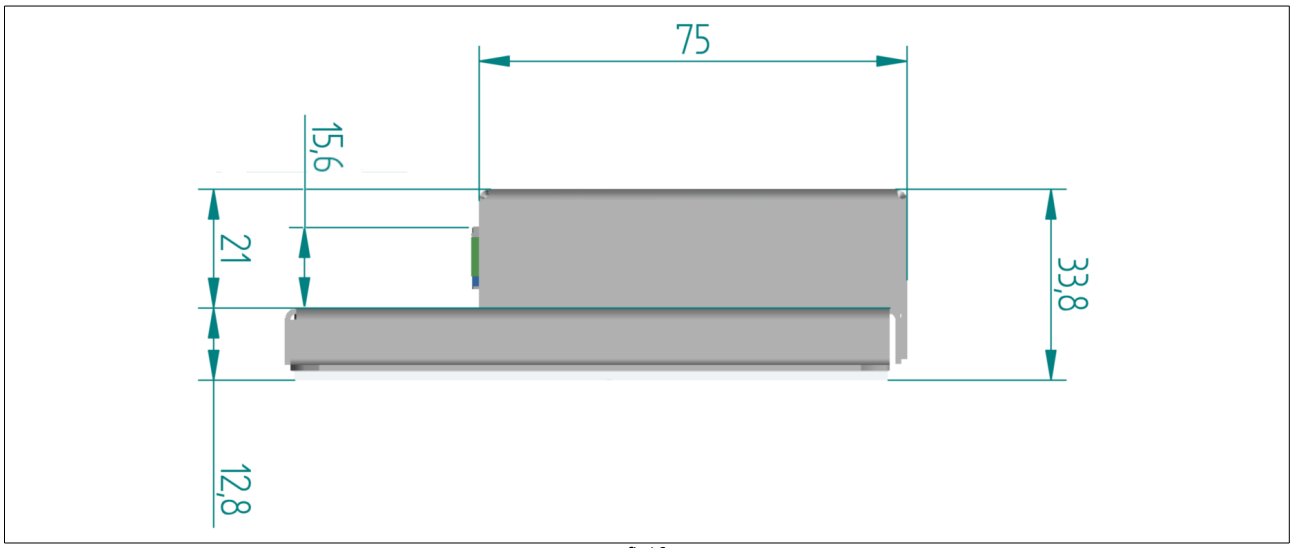

fig16

7.2 Positioning and Balancing

In this chapter it will be explained to the user how positioning the Open-Frame and how to centre the display in a mechanical window. In the following figure the customers will find the spacing between the fixing hole and the centre of the *display's visible area*. Based on following measure the customers can find the position compared to the four fixing hole.

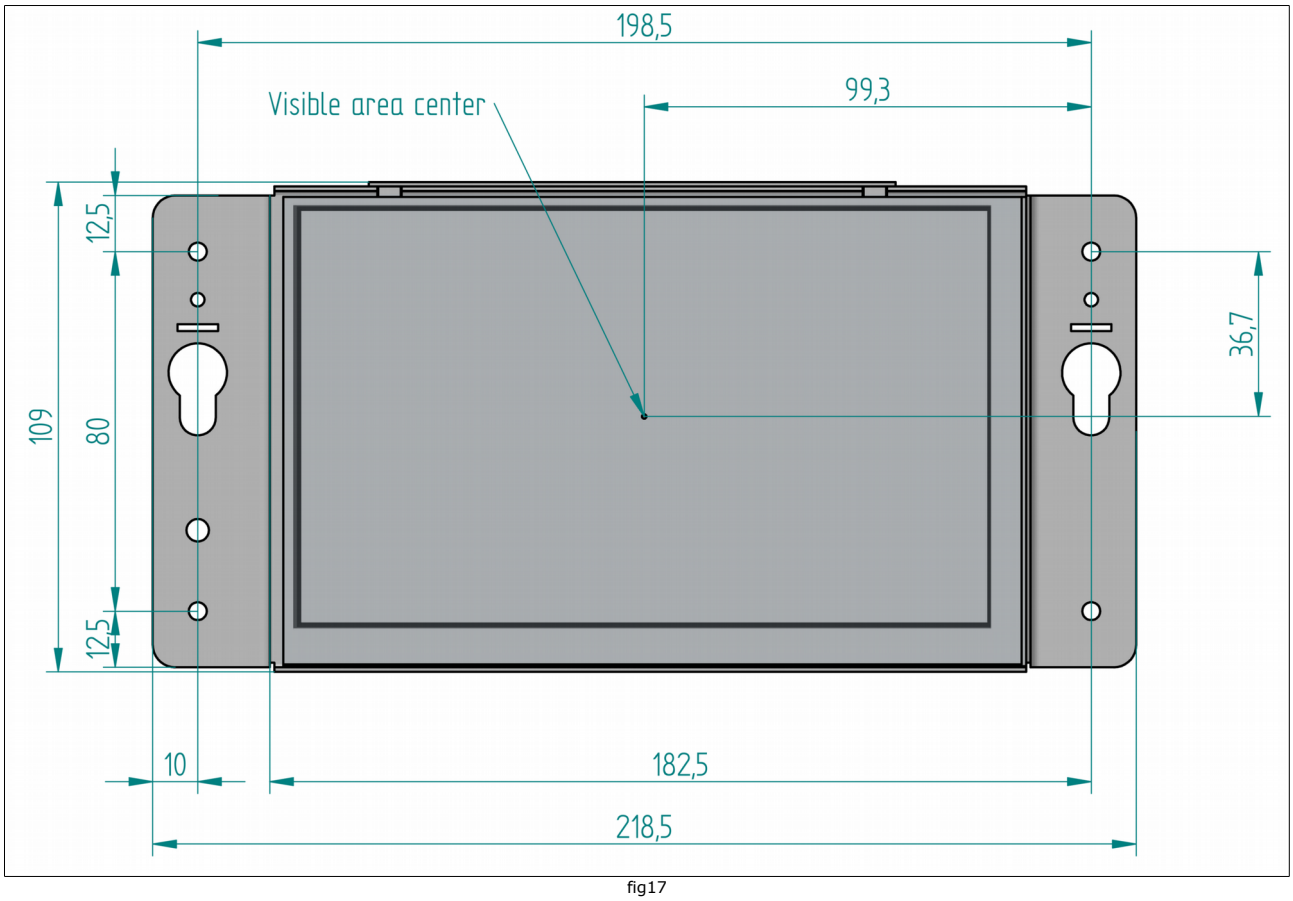

fig17

It's possible to use the smaller screws to have a more flexible constraint during the centring of the Open-Frame within the system. In this way you'll have more tolerance on the centring the display (also considering drilling tolerances). if you use threaded PEM reducing the size of diameter).

Warning:
for any doubt about the positioning do not hesitate to contact Engicam support

7.3 General specifications for display 7”

In the table are shown the displays' specifications driven by C.TOUCH carrier board:

	7”
Operating temperature range	-20; +70 °C
Size	7 inch
Luminance	300 cd/mq
Colour	262K
Resolution	800 (RGB) x 480
View Angles	TYP: 65-70 Deg
Interface	Parallel 18-bit RGB

Table 17

In the following picture is reported the drawing with the size of the display. This can be useful to determinate the encumbrance viewing area and the multiple active area to consider during the system designing.

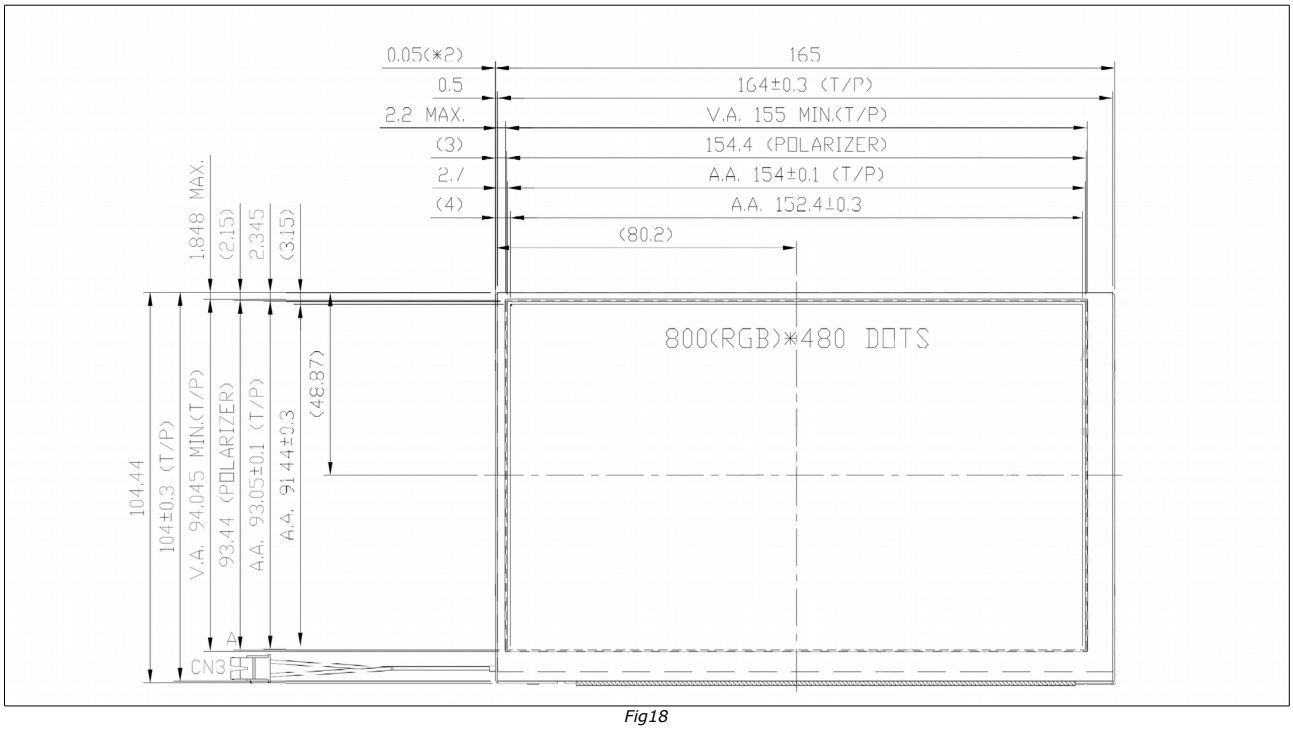

Fig18

***Note**: all the unit reported measure are in mm*

8. CTOUCH 10.1” assembly plan (code 00257000003134A)

This chapter want to be a guide and illustrate the method to installing an Open-Frame in an own system. First of all it will be specified the methodologies of insertion, of installation and the mechanical dimensions useful to the user to determinate the space requirements to design a custom product containing the Open-Frame.
To help you to achieve the best results will be described the size and dimensions with their tolerances, this will allow the integration of Open-Frame, that will interact with any system through its visual interface and its touchscreen.
Therefore the attention of the user will be focus on the possibility of adjust the positioning through the tolerances left on the constraints and the use of appropriate screws. In this way the user will be able to place the Open-Frame within its system ensuring accuracy and reproducibility of the production process.

8.1 C.TOUCH 10.1” Overall Dimensions

In the following picture is reported the drawing with the size of the OF. This can be useful to calculate the encumbrance area and the fixing points to consider during the system designing.

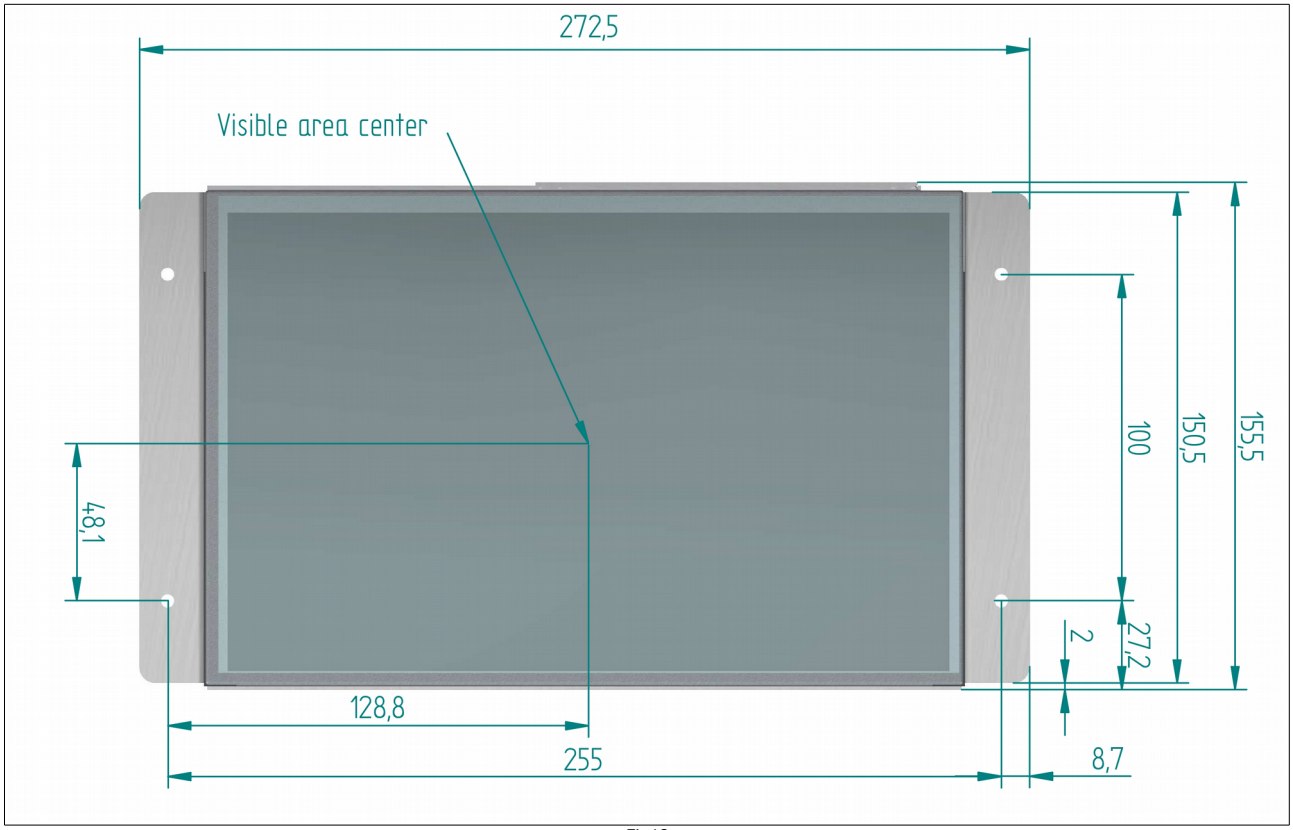

Fig19

In the pictures below are shown the maximum size of the Open-Frame system also in its depth

(in which are considered also the dimensions of carter that cover the PCB and its components assembled).

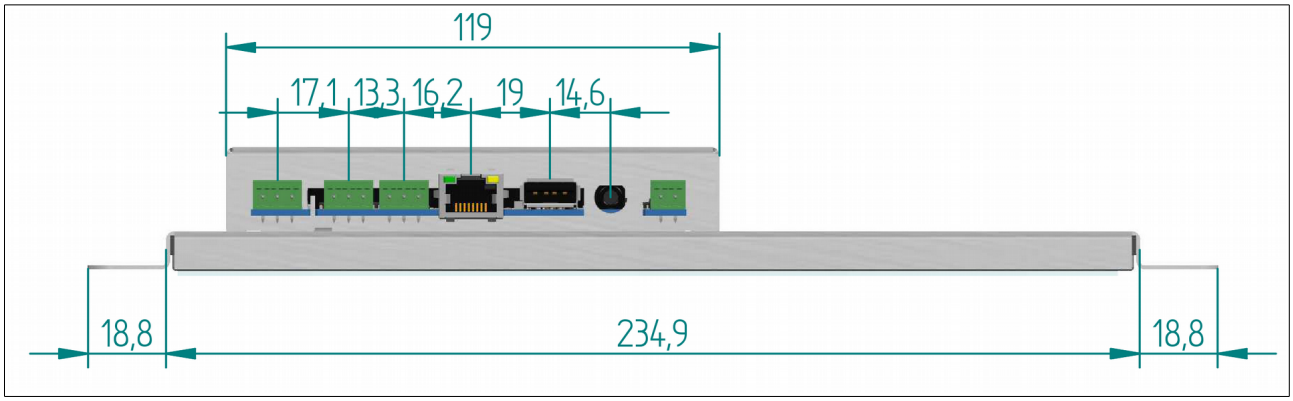

Fig20

Those can be useful to calculate and consider the volume necessary to place or to integrate the Open-Frame within another system and to design a suitable mounting points.

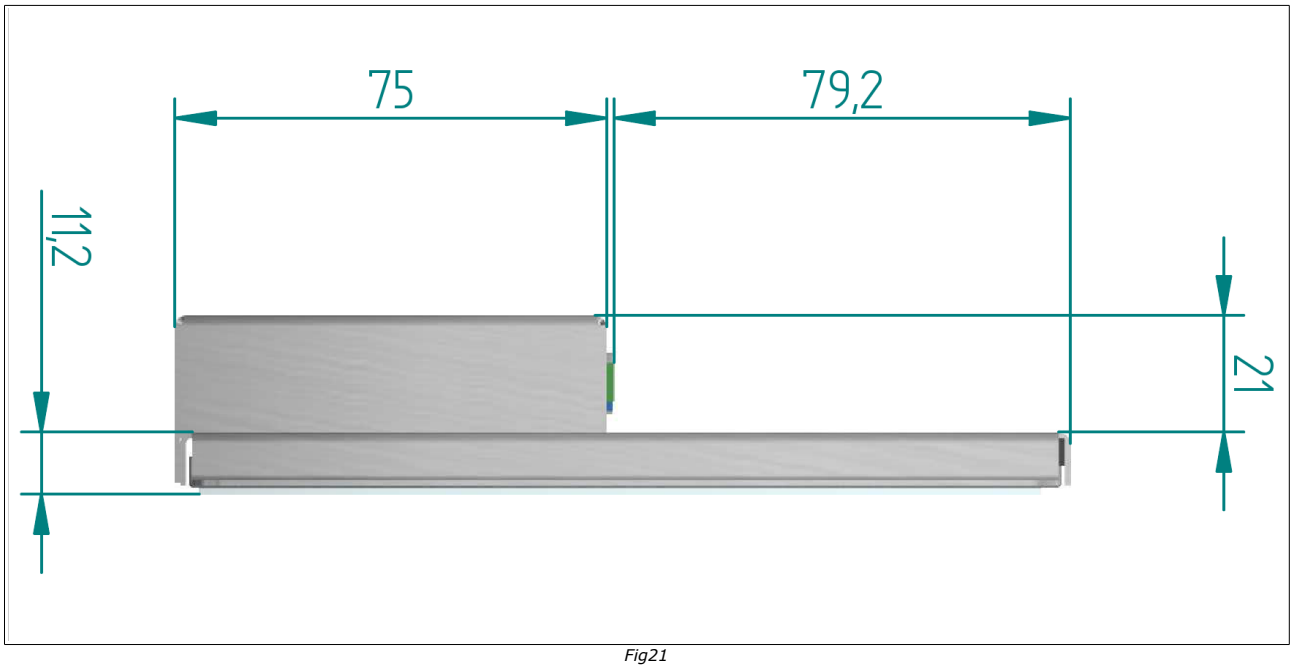

Fig21

8.2 Positioning and Balancing

In this chapter it will be explained to the user how positioning the Open-Frame and how to centre the display in a mechanical window. In the following figure you'll find the spacing between the fixing hole and the centre of the *display's visible area*. Based on following measure you can find the position compared to the four fixing hole.

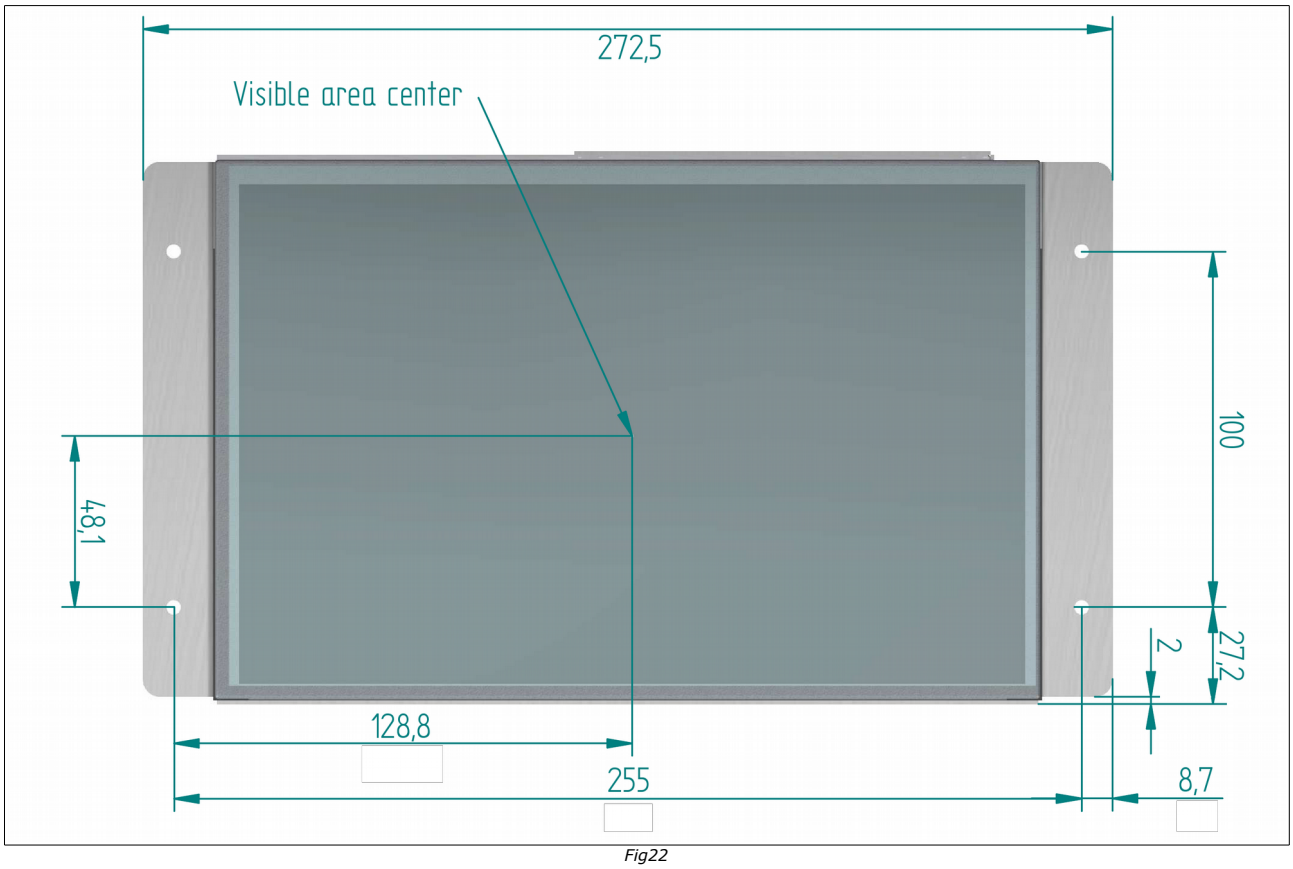

Fig22

It's possible to use the smaller screws to have a more flexible constraint during the centring of the Open-Frame within the system. In this way you'll have more tolerance on the centring the display (also considering drilling tolerances). if you use threaded PEM reducing the size of diameter).

Warning:
for any doubt about the positioning do not hesitate to contact Engicam support

8.3 General specifications for display 10.1” *(AM-1280800N3TZQW-T00H)*

In the table are shown the displays' specifications driven by C.TOUCH carrier board:

AM-1280800N3TZQW-T00H	10.1”
Operating temperature range	-20; +70 °C
Size	10.1 inch
Luminance	295 cd/mq
Colour	262K
Resolution	1280 (RGB) x 800
View Angles	TYP: 85 Deg
Interface	LVDS

Table 18

In the following picture is reported the drawing with the size of the display. This can be useful to determinate the encumbrance viewing area and the multiple active area to consider during the system designing.

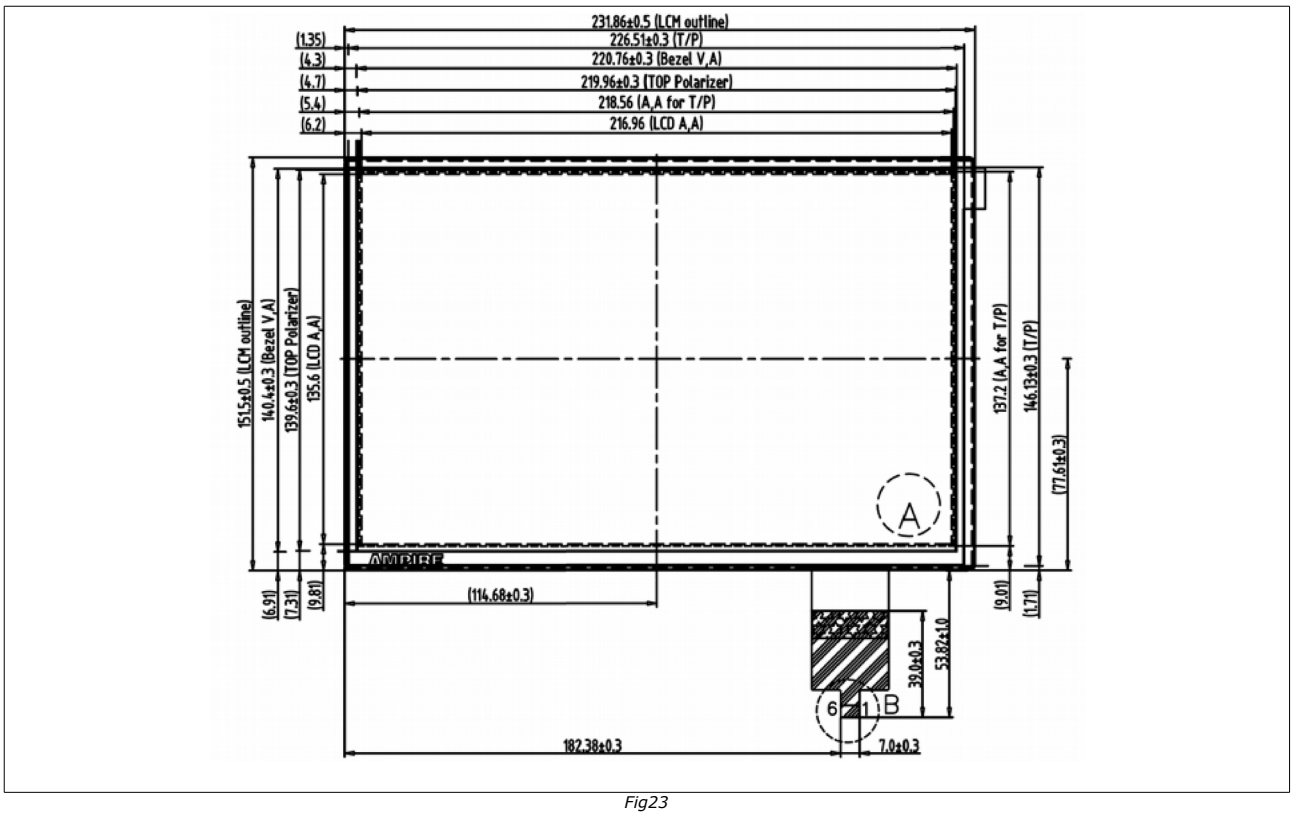

Fig23

***Note**: all the unit reported measure are in mm*

9. COVER.TOUCH 10.1” assembly plan

This chapter want to be a guide and illustrate the method to installing an Open-Frame in an own system. First of all it will be specified the methodologies of insertion, of installation and the mechanical dimensions useful to the user to determinate the space requirements to design a custom product containing the Open-Frame.
To help you to achieve the best results will be described the size and dimensions with their tolerances, this will allow the integration of Open-Frame, that will interact with any system through its visual interface and its touchscreen.
Therefore the attention of the user will be focus on the possibility of adjust the positioning through the tolerances left on the constraints and the use of appropriate screws. In this way the user will be able to place the Open-Frame within its system ensuring accuracy and reproducibility of the production process.

9.1 C.TOUCH 10.1” Overall Dimensions

In the following picture is reported the drawing with the size of the OF. This can be useful to calculate the encumbrance area and the fixing points to consider during the system designing.

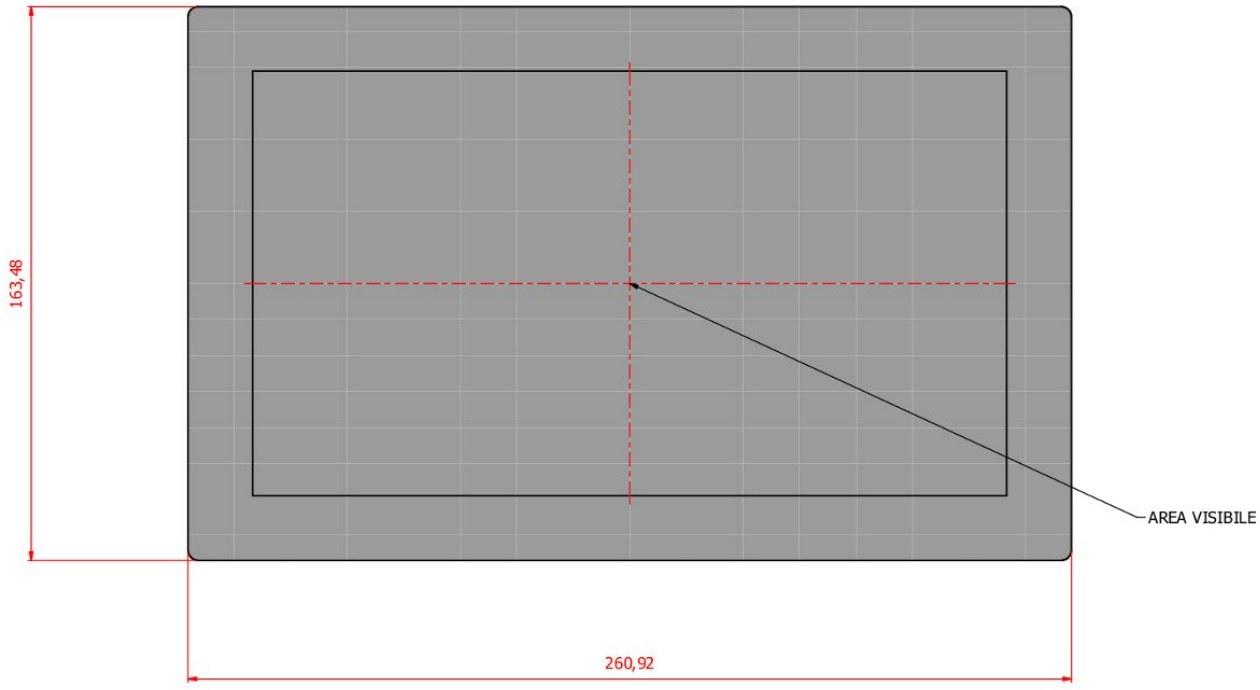

Fig29

In the pictures below are shown the maximum size of the Open-Frame system also in its depth (in which are considered also the dimensions of carter that cover the PCB and its components assembled).

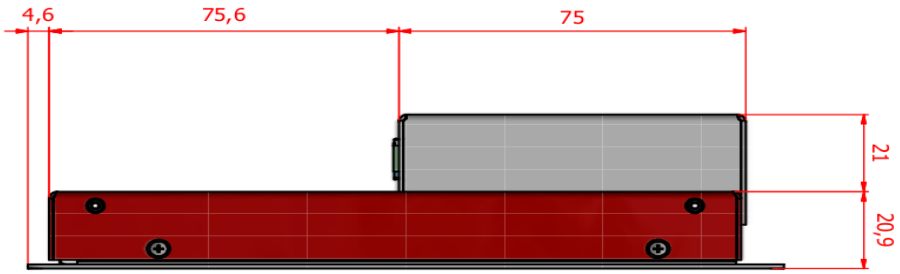

Fig30

Those can be useful to calculate and consider the volume necessary to place or to integrate the Open-Frame within another system and to design a suitable mounting points.

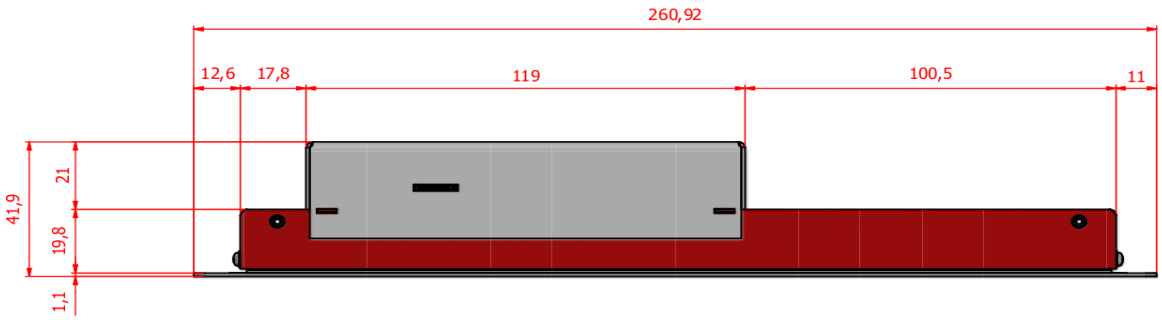

Fig31

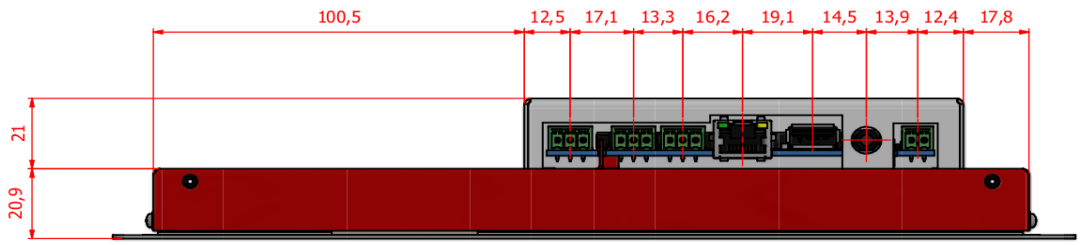

Fig32

9.2 Positioning and Balancing

In this chapter it will be explained to the user how positioning the Open-Frame and how to centre the display in a mechanical window. In the following figure you'll find the spacing between the fixing hole and the centre of the *display's visible area*. Based on following measure you can find the position compared to the four fixing hole.

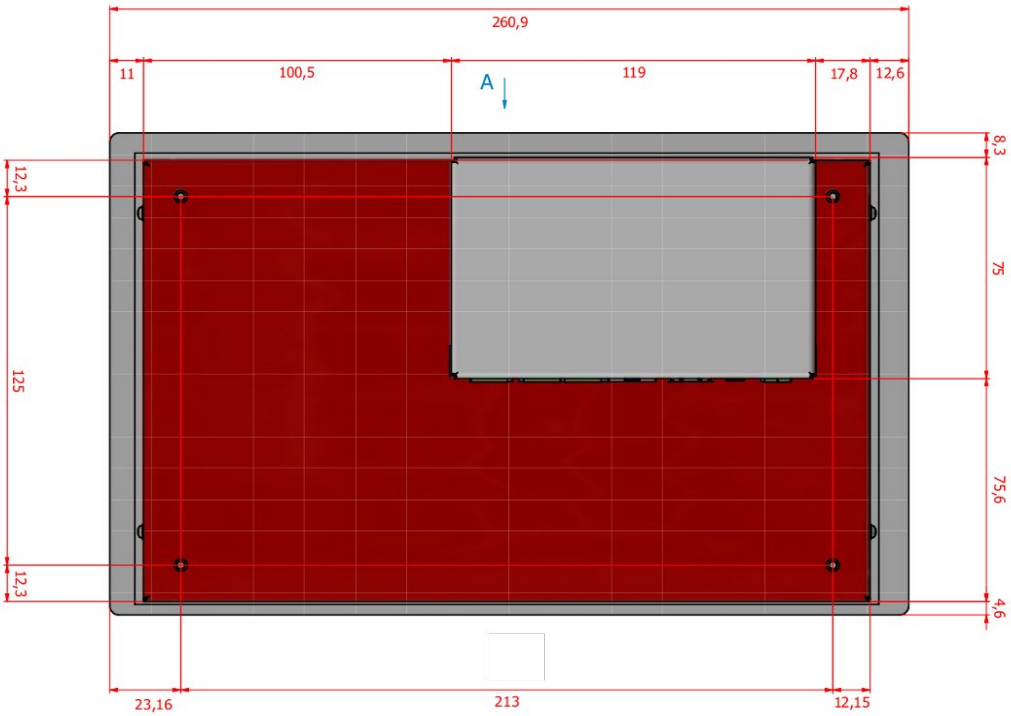

Fig33

The screws usable are the M3 standard type. It's possible to use the back or lateral side holes to secure the open frame to the system

Warning:
for any doubt about the positioning do not hesitate to contact Engicam support

9.3 General specifications for display

In the table are shown the displays' specifications driven by C.TOUCH carrier board:

AM-1280800N3TZQW-T00H	10.1”
Operating temperature range	-20; +70 °C
Size	10.1 inch
Luminance	800 cd/mq
Colour	262K
Resolution	1024 (RGB) x 600
View Angles	TYP: 50-70
Interface	6 bit LVDS

Table 19

In the following picture is reported the drawing with the size of the display. This can be useful to determinate the encumbrance viewing area and the multiple active area to consider during the system designing.

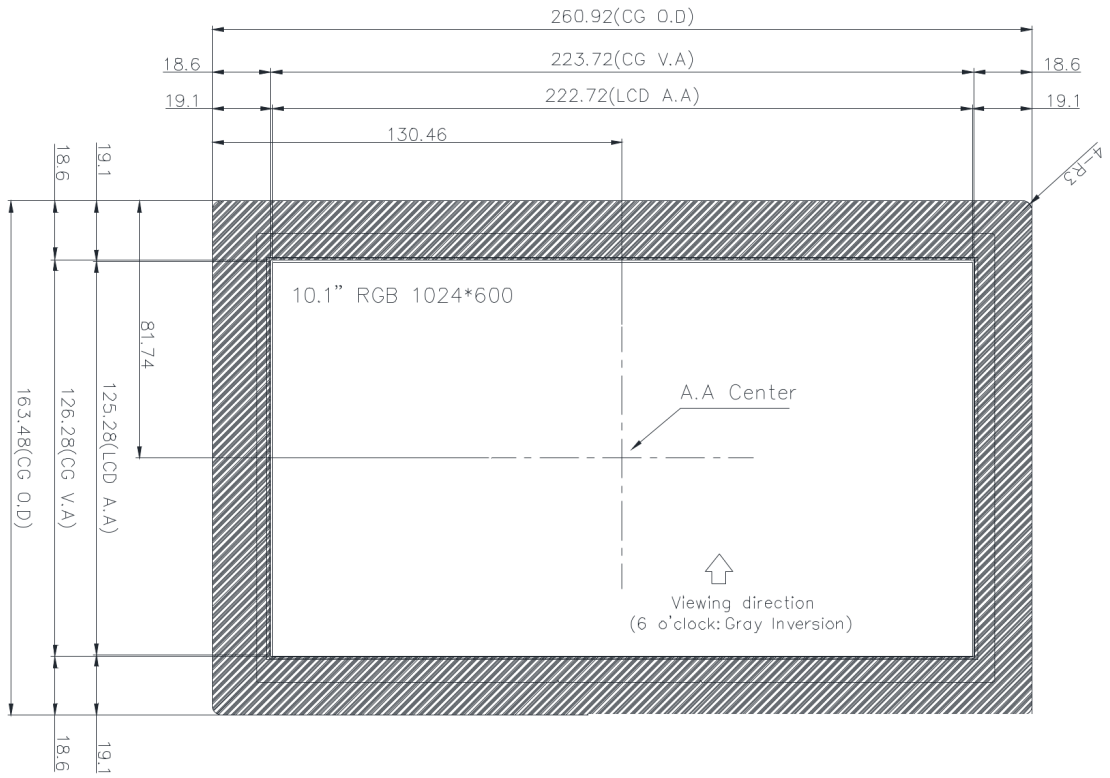

Fig34

***Note**: all the unit reported measure are in mm*

10. COVER.TOUCH 15.6” assembly plan

This chapter want to be a guide and illustrate the method to installing an Open-Frame in an own system. First of all it will be specified the methodologies of insertion, of installation and the mechanical dimensions useful to the user to determinate the space requirements to design a custom product containing the Open-Frame.
To help you to achieve the best results will be described the size and dimensions with their tolerances, this will allow the integration of Open-Frame, that will interact with any system through its visual interface and its touchscreen.
Therefore the attention of the user will be focus on the possibility of adjust the positioning through the tolerances left on the constraints and the use of appropriate screws. In this way the user will be able to place the Open-Frame within its system ensuring accuracy and reproducibility of the production process.

10.1 C.TOUCH 15.6” Overall Dimensions

In the following picture is reported the drawing with the size of the OF. This can be useful to calculate the encumbrance area and the fixing points to consider during the system designing.

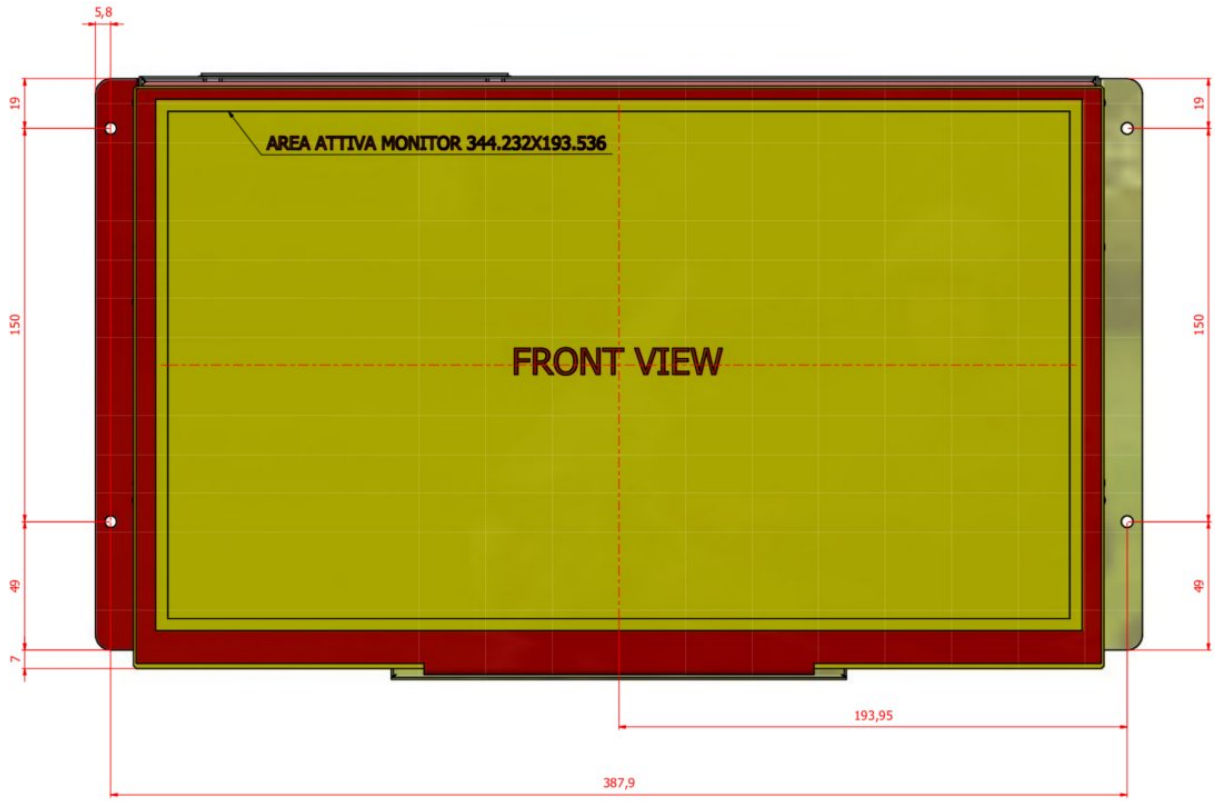

Fig35

In the pictures below are shown the maximum size of the Open-Frame system also in its depth (in which are considered also the dimensions of carter that cover the PCB and its components assembled).

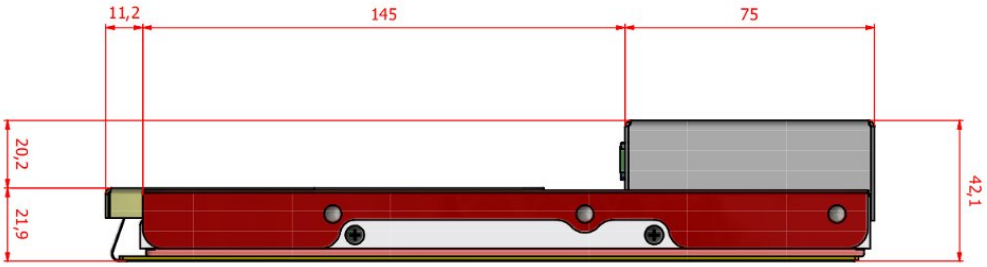

Fig36

Those can be useful to calculate and consider the volume necessary to place or to integrate the Open-Frame within another system and to design a suitable mounting points.

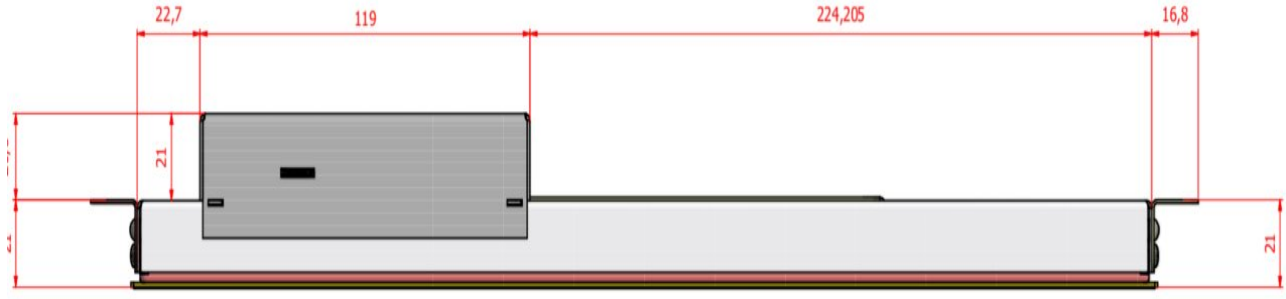

Fig37

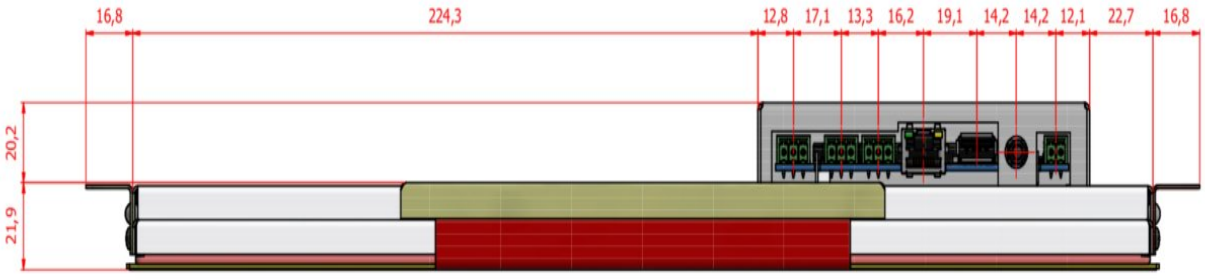

Fig38

10.2 Positioning and Balancing

In this chapter it will be explained to the user how positioning the Open-Frame and how to centre the display in a mechanical window. In the following figure you'll find the spacing between the fixing hole and the centre of the *display's active area*. Based on following measure you can find the position compared to the four fixing hole.

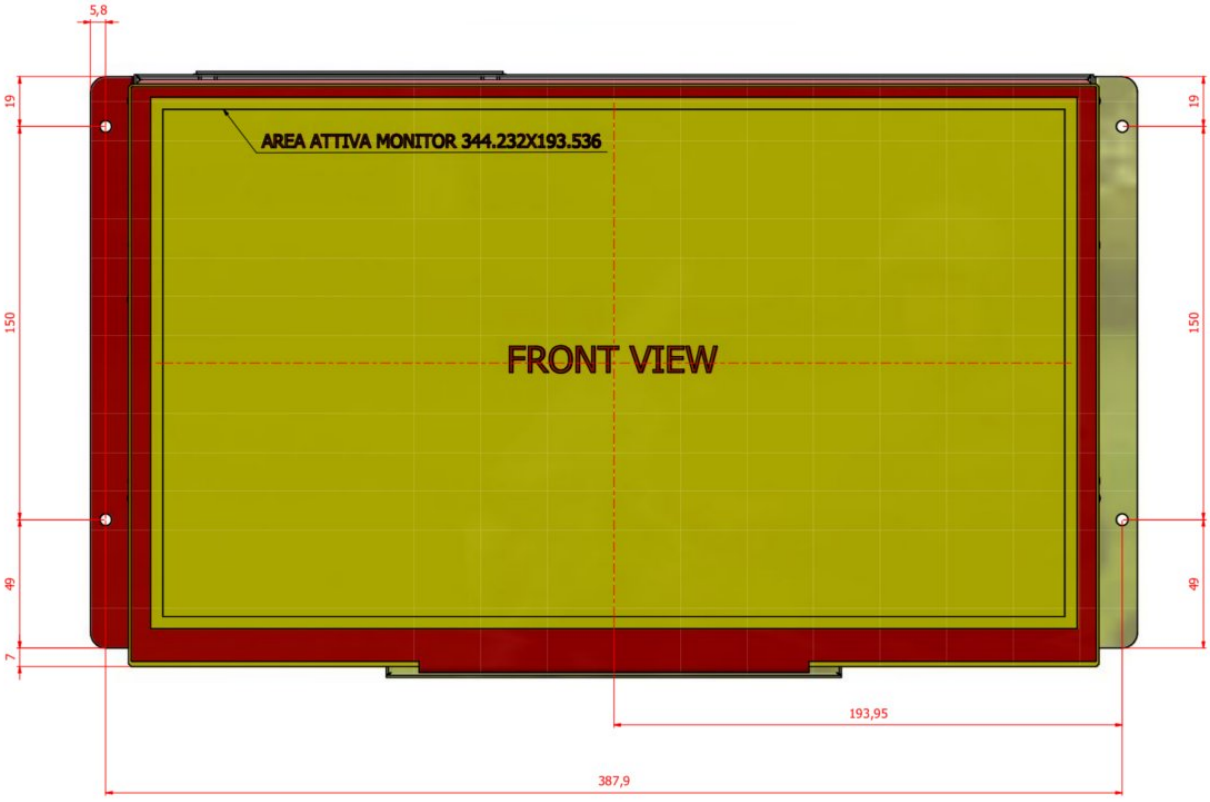

Fig39

The screws usable are the M3 standard type. It's possible to use the smaller screws to have a more flexible constraint during the centring of the Open-Frame within the system. In this way you'll have more tolerance on the centring the display (also considering drilling tolerances). if you use threaded PEM reducing the size of diameter).

Warning:
for any doubt about the positioning do not hesitate to contact Engicam support

10.3 General specifications for display

In the table are shown the displays' specifications driven by C.TOUCH carrier board:

AM-1280800N3TZQW-T00H	10.1”
Operating temperature range	0; +60 °C
Size	15.6 inch
Luminance	300 cd/mq
Colour	262K/16.7M
Resolution	1366 x R.G.B. x 768
View Angles	TYP: 80
Interface	8 bit LVDS

Table 20

In the following picture is reported the drawing with the size of the display. This can be useful to determinate the encumbrance viewing area and the multiple active area to consider during the system designing.

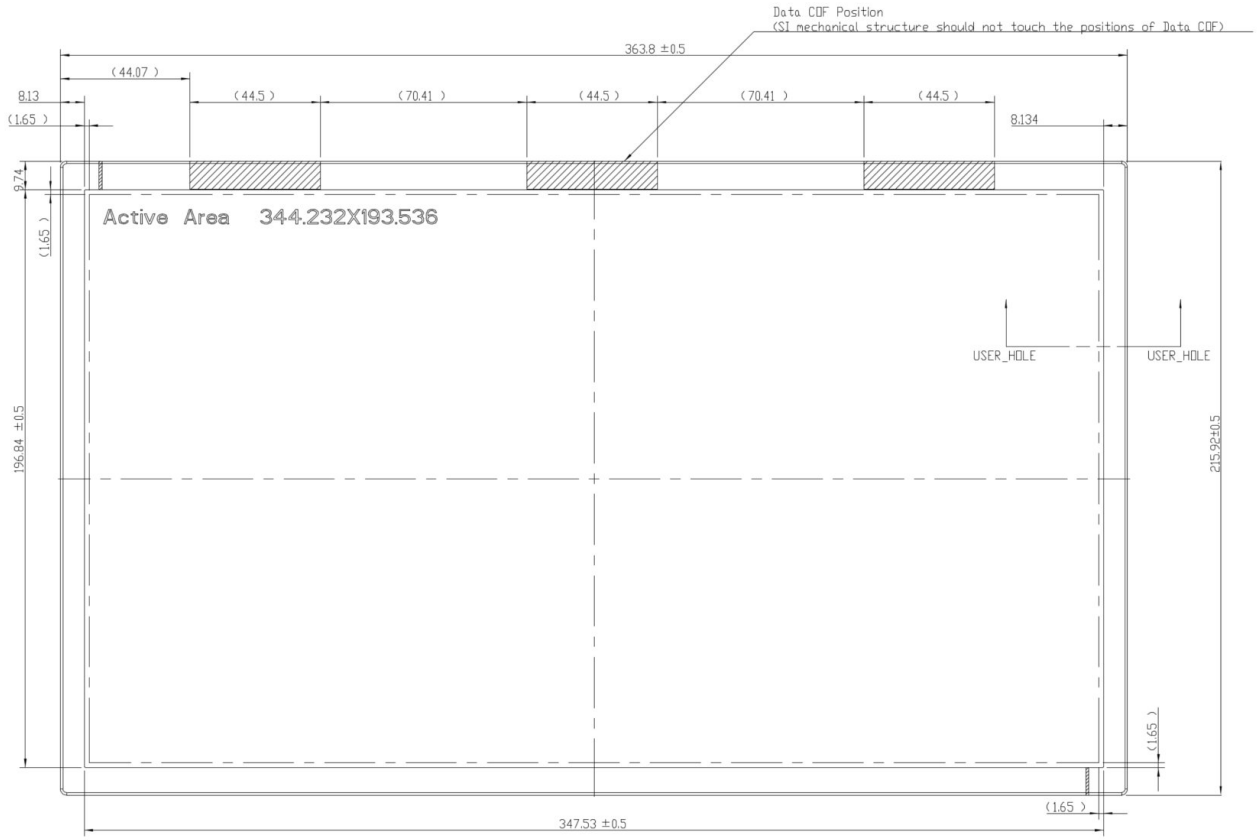

Fig40

following the touch screen quotes

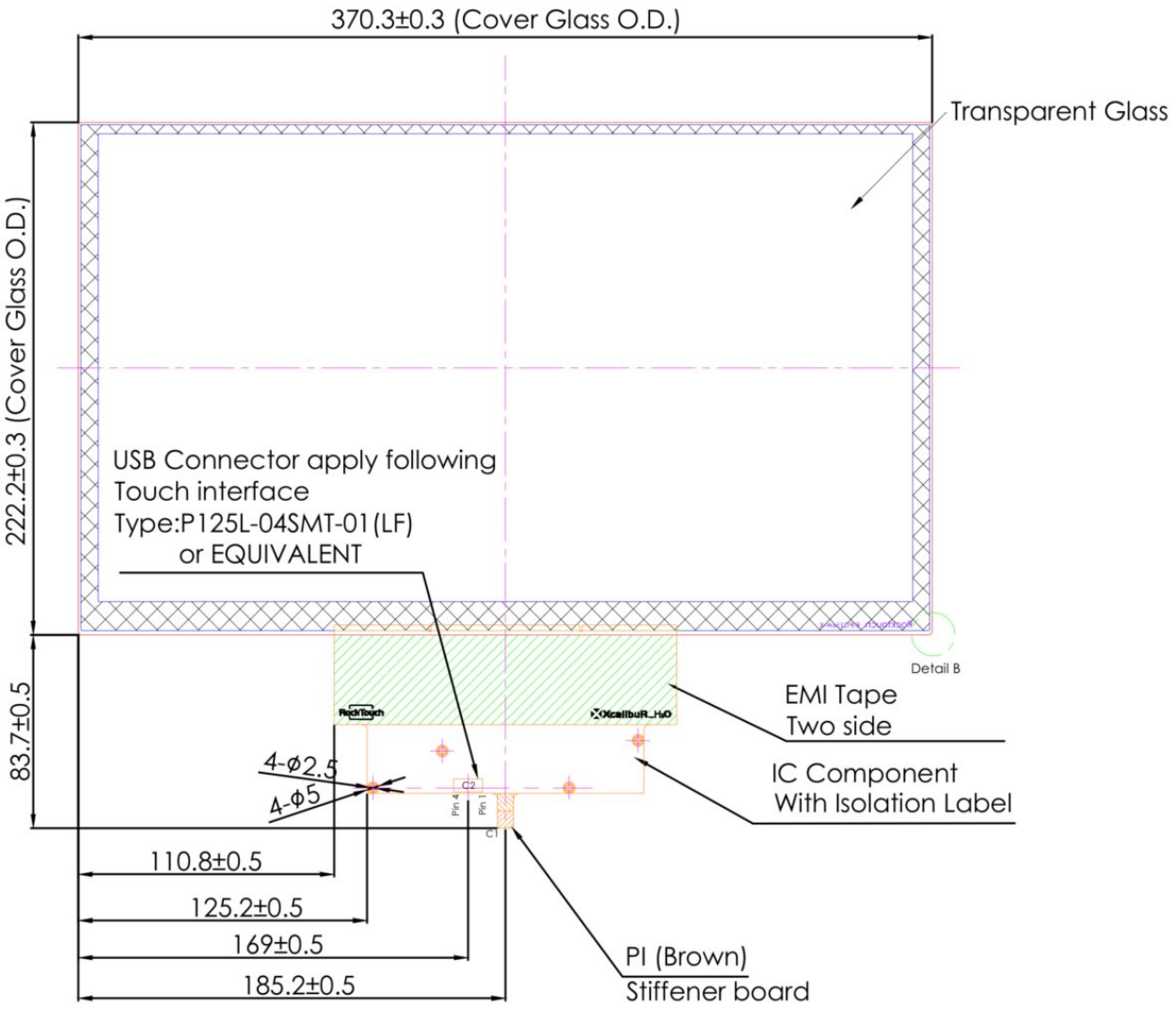

Fig41

***Note**: all the unit reported measure are in mm*

11. Product Compliance

In order to respect own internal policy regarding the environmental regulations and safety laws, Engicam in this chapter confirms the compliant, when applicable, of its own products to the normatives ROHS and REACH and to the recognized hazards.

Warning!
The current product board mounts a VL-1220/HFN Rechargeable Battery, that has the following elements included into the SVHC list:

- ***1,2-dimethoxyethane, ethylene glycol dimethyl ether (EGDME)***

12. On-line Support

We offer an on-line support to allow the customer to stay updated on the development of software release and on the enhancement of the documentation.

Following is shown the references for ENGICAM on-line support.

12.1 Support

ENGICAM Product Experts are available to answer questions via email:

support@engicam.com

12.2 Disclaimer