Clairitec

HMI Solution & Graphic Products



AIP 7"

Hardware manual

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CHAPTER 1: VERSION'S HISTORICAL BACKGROUND

Reference	Modifications	Date
DOC-20160313-1A-UK	Creation	13/03/2017
DOC-20160313-1B-UK	Colors number and casings modification	10/10/2018

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CHAPTER 2: GENERAL DESCRIPTION

The Programmable Intelligent Display is a "Plug & Play" graphic display module with integrated specific inputs and outputs. This product is developed & produced in France.

It consists of a TFT-LCD 7" WVGA (800 x 480 pixels) touchscreen display driven by an integrated HMI board from CLAIRITEC and an I/O management board. All these components are integrated into an IP65 protected casing. The Programmable Intelligent Display is EMC compliant and withstands a temperature range from -20°C to +70°C. It can easily fit into electronic equipment thanks to the modular structure of the casing.

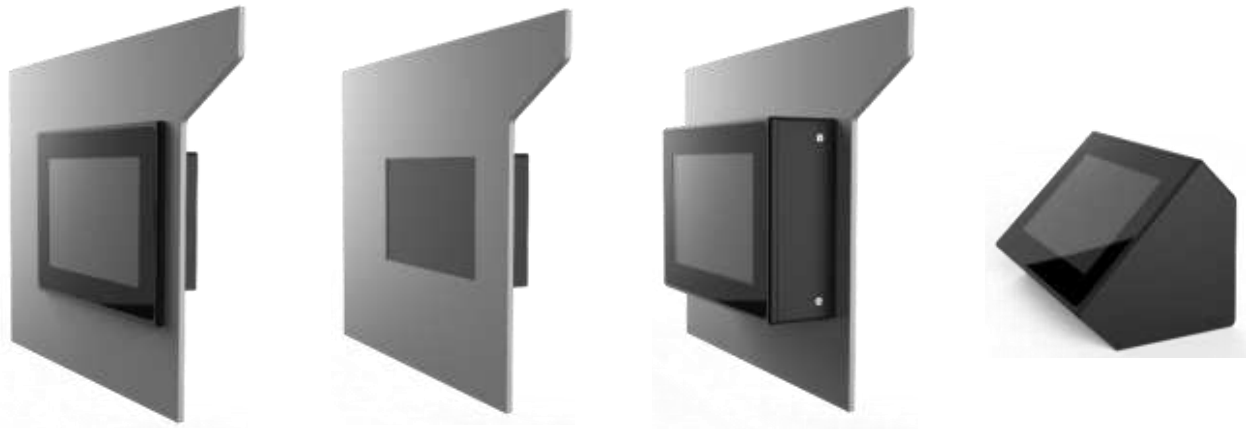
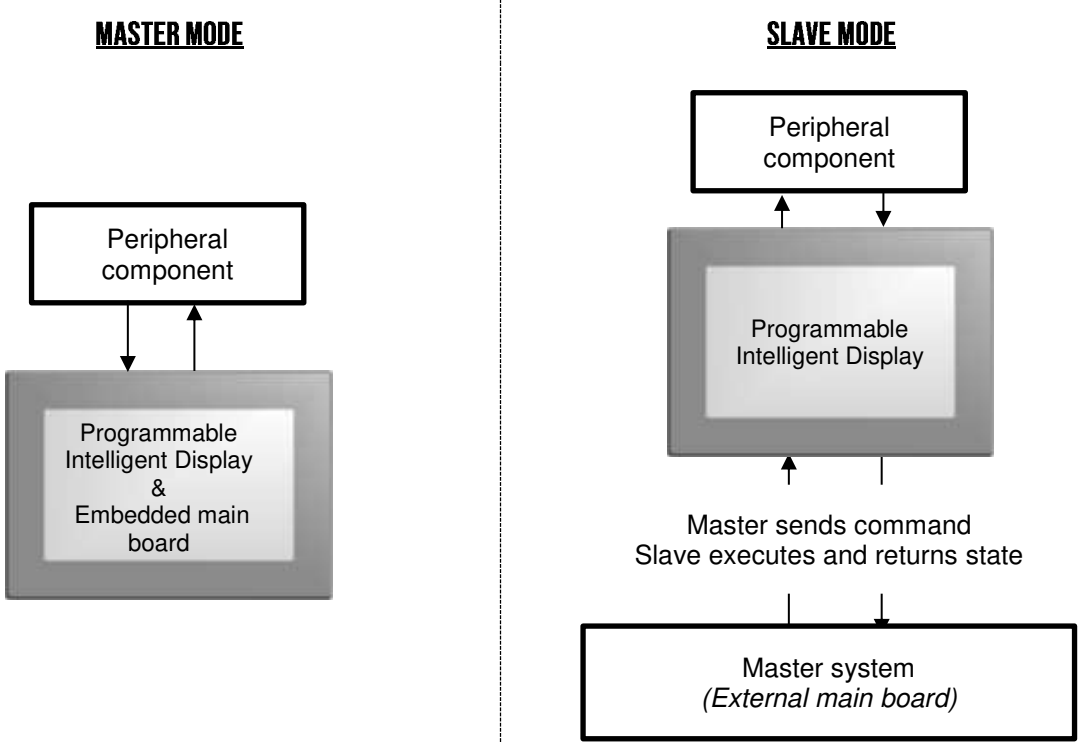


Figure 1 – Casing types

The product range consists of different versions, allowing for various application types. It can be used in 2 different modes: slave and master mode:



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CHAPTER 3: LIST OF ENVIRONMENTAL REQUIREMENTS

ENVIRONMENTAL NORMS AND EMC

The following table lists the environmental and EMC requirements that the Programmable Intelligent Display meets.

Norm	Minimum required
	Environmental
RoHS	All the components used in the Programmable Intelligent Display respect the RoHS norm
	Electromagnetic compatibility (electronic board alone)
NF EN-61000-4-3	Susceptibility 30 MHz - 1 GHz, 25Watt 10V/m
NF EN-55022	Conducted emission 150Khz – 30 MHz class B Radiated emission 30Mhz – 1Ghz class B
NF-EN-61000-4-2	Protected against 8kV electrostatic discharge in the air, 4kV at contact
UL 94 V-0	E76251 PCB agreement
	Mechanical
IP65	The front side is waterproof with the "from the front" casing
IP40	All the components are protected by this norm
Vesa 75x75	The "surface" and "table-top" casings are compatible with the VESA 75x75 system



WARNING: Any handling on the electronic board involves the risk of electrostatic discharge (ESD), which could destroy components.
We strongly advise you to wear an antistatic wrist strap connected to Earth. Similarly, the electronic boards must be transported inside a specific antistatic packaging

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CHAPTER 4: SPECIFICATION OF THE PROGRAMMABLE INTELLIGENT DISPLAY

MECHANICAL AND ENVIRONMENTAL CHARACTERISTICS

Item	Specifications
Size	7'' Diagonal
Resolution	800 x RGB x 480 dots (WVGA)
Viewing direction	6 o'clock
Viewing area	155.3 (W) x 94.3 (H) mm
Horizontal / Vertical flip	Available
Backlight	White LED
Brightness	400 cd/m^2
Viewing angle (typ.)	120° Vertical / 140° Horizontal
Touch screen	4-wire resistive / 1 million touch times by finger Capacitive / Minimum of 50 million touch times by finger
Operating temperature	-20°C ~ +70°C
Storage temperature	-30°C ~ +80°C
EMC compliant	NF-EN55022 class B (Frequency range 150 kHz to 2 GHz) NF-EN61000-4-2 (8 kV contact discharge / 15 kV air discharge) NF-EN61000-4-3 (Frequency range : 30 MHz to 1 GHz – 10 V/m)
IP Certification	IP65 on the front side with recessed "from the front" casing IP40 on the other sides.

HMI CHARACTERISTICS

Item	Specifications
Color LCD Management	262k colors (display) – 16M (controller) TFT transmissive active matrix
Touchscreen Management	Advanced clicking area processing
Graphic Engine	Advanced display algorithms
Graphic layer Management	Two layers dynamically managed
Storage Memory	32 Mb
Graphical Layout Management	The GraphConverter®3 software tool enables you to build your HMI's graphic library and user interface and upload it to the HMI board's flash memory

IO SPECIFICATION

	Digital	Analogic	Relay	Thermocouple	PT100	PWM	Internal RTC	Internal Buzzer
Input	6	5	-	2	1	-	1	1
Output	6	2	6	-	-	2		

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ELECTRICAL CHARACTERISTICS

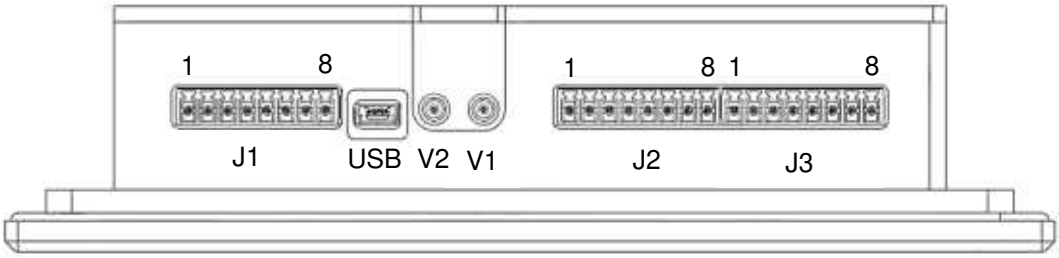
	Item	Symbol	Min	Typ	Max	Unit
Power	Power Supply voltage	V_{cc}	12	-	36	V
	Power Supply consumption*	I_{cc}	260	-	TBC	mA
	Max Intensity	I_{sat}	-	-	2	A
RS232	speed transmission	Bds	9,6	-	355	kBd
RS485	speed transmission	Bds	9,6	-	355	kBd
CAN	CAN 2.0B	Bds	100	-	500	kBd
USB	voltage reference	V_{USB}	2.7	5	5.5	V
	Continuous output current	I_{USB}	0	-	500	mA
PWM	PWM voltage high level	$V_{PWM\ OH}$	-	V_{cc}	-	V
	PWM voltage low level	$V_{PWM\ LH}$	-	0	-	V
	PWM intensity	$V_{PWM\ I}$	0	-	100	mA
	Frequency	$V_{PWM\ F}$	10	-	500k	Hz
	Duty cycle	$V_{PWM\ Dt}$	0	-	100	%
Thermocouple	Temperature range	$T°_{MIN\ MAX}$	TBM	-	TBM	°C
PT100	Temperature range	$T°_{MIN\ MAX}$	TBM	-	TBM	°C
Analog Input	Voltage	$V_{in\ MAX}$	0	-	10	V
	Resolution	R	-	10	-	bit
Analog Output	Voltage	$V_{out\ MAX}$	0	-	10	V
	Frequence	f	0	-	3	kHz
	Intensity	I_{out}	0	-	20	mA
	Resolution	R	-	8	-	bit
Relay NO	Intensity	I_{in}	0	-	2	A
	Voltage	V_{in}	0	-	220	Vdc
Relay NO/NC	Intensity	I_{in}	0	-	2	A
	Voltage	V_{in}	0	-	220	Vdc
Digital Output	Voltage Com	COM	5.5	-	40	V
	Voltage Out	V_{out}	0	-	COM	V
	Intensity per channel	I_{max}	0	-	2	A
Digital Input	Voltage Digital Input	V_{in}	0	-	V_{cc}	V

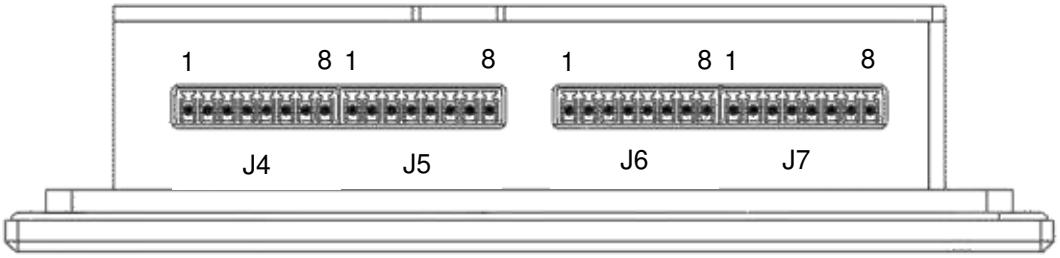
*Without peripherals

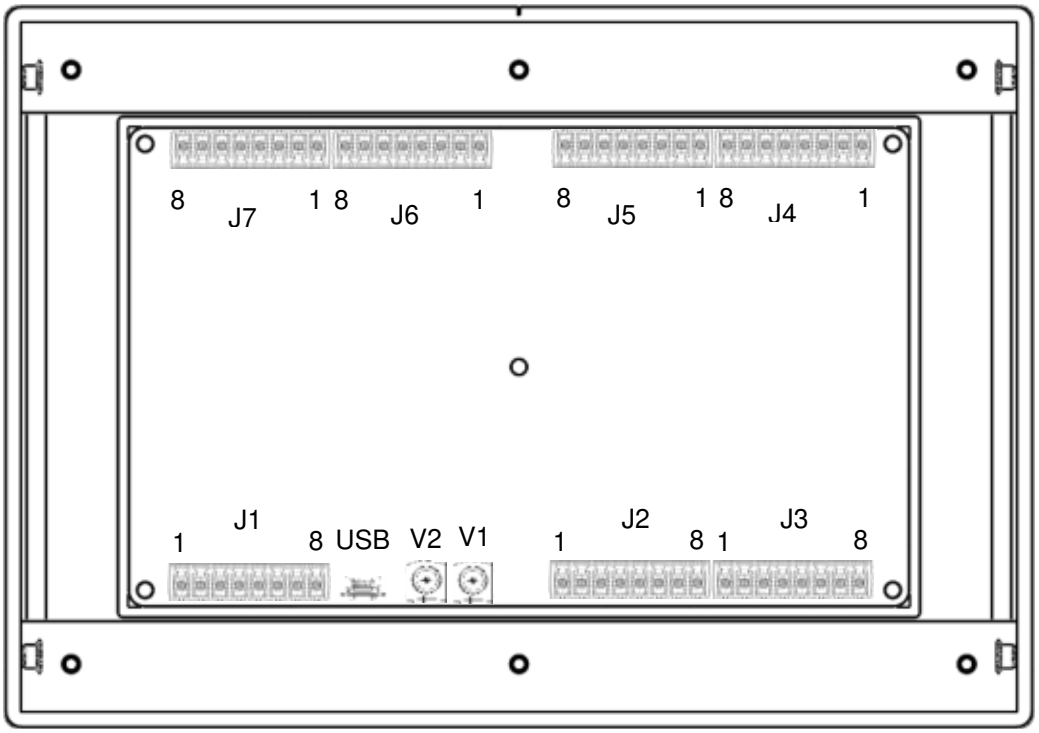
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CHAPTER 5: PIN OUT







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J1	1	Power Supply	POWER
	2	GND	
	3	CAN L	COMMUNICATIONS
	4	CAN H	
	5	RS485 A	
	6	RS485 B | RS232 TX	
	7	RS485 Z | | RS232 RX	
	8	RS485 Y	
J2	1	Output PWM 2	PWM OUTPUTS
	2	Output PWM 1	
	3	Thermocouple 2 +	THERMAL INPUTS
	4	Thermocouple 2 -	
	5	Thermocouple 1 +	
	6	Thermocouple 1 -	
	7	PT100	
	8	GND	
J3	1	Analog Input 5	ANALOG INPUTS
	2	Analog Input 4	
	3	Analog Input 3	
	4	Analog Input 2	
	5	Analog Input 1	
	6	GND	POWER
	7	Analog Ouput 1	ANALOG OUTPUTS
	8	Analog Ouput 2	
J4	1	GND	POWER
	2	Digital Input 6	DIGITAL INPUTS
	3	Digital Input 5	
	4	Digital Input 4	
	5	Digital Input 3	
	6	Digital Input 2	
	7	Digital Input 1	
	8	GND	POWER
J5	1	Power Supply	
	2	Digital Output COM	DIGITAL OUTPUTS
	3	Digital Output 1	
	4	Digital Output 2	
	5	Digital Output 3	
	6	Digital Output 4	
	7	Digital Output 5	
	8	Digital Output 6	
J6	1	Digital Output 7	
	2	Digital Output 8	
	3	Relays 2 NO	RELAYS NO/NC
	4	Relays 2	
	5	Relays 2 NC	
	6	Relays 1 NO	
	7	Relays 1	
	8	Relays 1 NC	
J7	1	Relays 4 -	RELAYS
	2	Relays 4 +	
	3	Relays 3 -	
	4	Relays 3 +	
	5	Relays 2 -	
	6	Relays 2 +	
	7	Relays 1 -	
	8	Relays 1 +	

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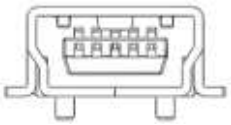
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CHAPTER 6: DESCRIPTION OF CONNECTIONS

The Clairitec Programmable Intelligent Display has three different connectors as shown in the drawing below:

CONNECTOR USB

This connector allows you to update the firmware and the graphic user interface via a computer or an USB key. Thanks to the transfer via USB connection, the loading time is decreased. It is required a standard adapter USB -> mini USB, available in the starter kit.



Pin	I/O	Description
1	Power	Power Supply +5V / 500mA max
2	I/O	USB -
3	I/O	USB +
4	-	Reserved
5	Power	GND

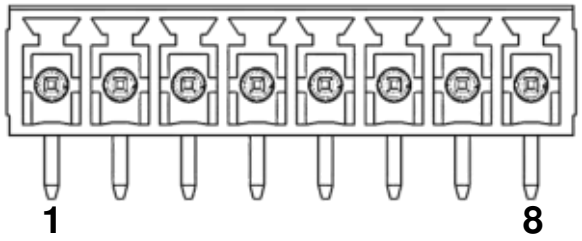
CONNECTOR V1 & V2

This connector allows you to directly connect to cameras with a 75Ω impedance male connector. It is recommended to be used with the MCX 75Ω impedance female connector, like the R213182007 Radiall component reference or the 73415-4490 Molex component reference.



Connector	I/O	Description
1	Video 1	Signal PAL or NTSC
2	Video 2	Signal PAL or NTSC

CONNECTOR FROM J1 TO J7



There are many different crosslinks models for this Plug and play connector:

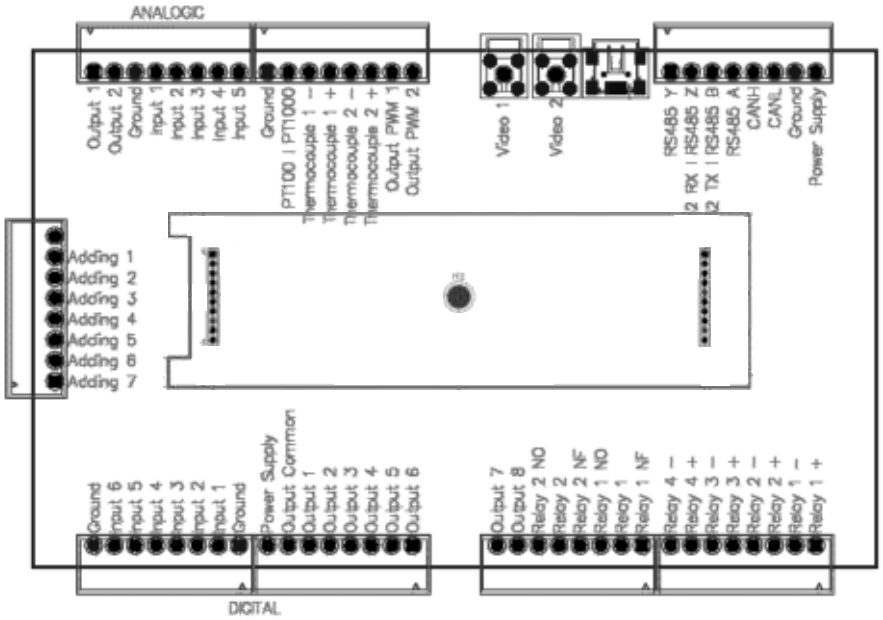
- Wurth 691361300008
- Wurth 691368300008B
- Wurth 691366310008
- Wurth 691363310008

CHAPTER 7: EMBEDDED MAIN BOARD – *MASTER MODE VERSION*

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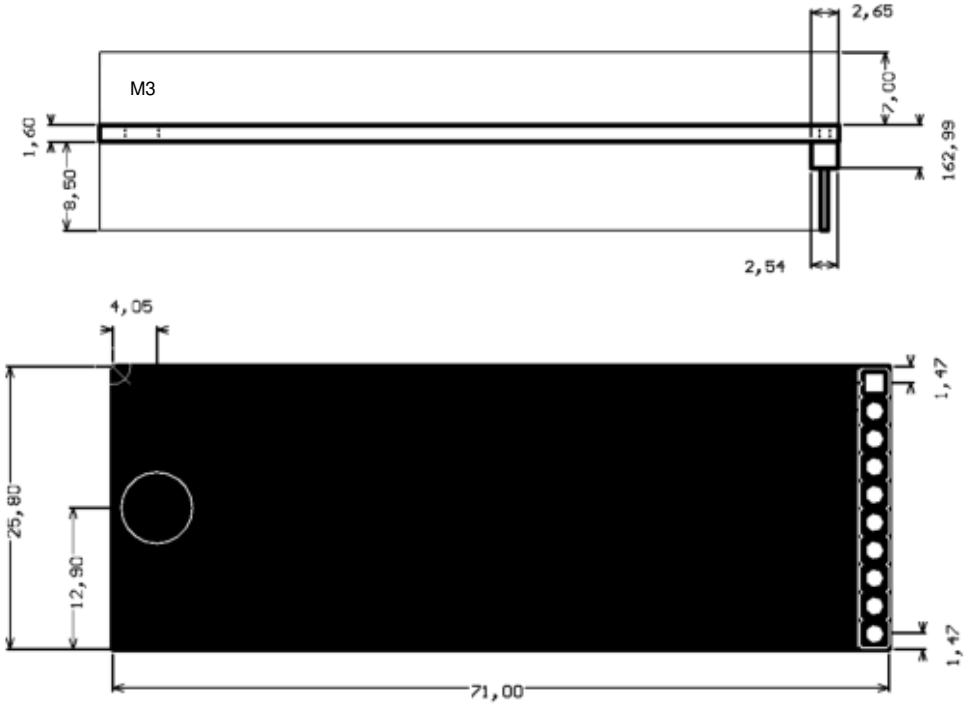
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To be operated in Master mode, our system needs to embed a board which is programed like a state machine. Moreover, this board can integrate other specific I/O pinouts: protocol communication, and electronic system.
Clairitec provides a standard main board, to which additional connectors or modules can be added upon request. You can also choose your own processor and schematic circuit.
The following figures present the maximal and minimal dimension of this board. You can find this board dimension on the STEP file attached.



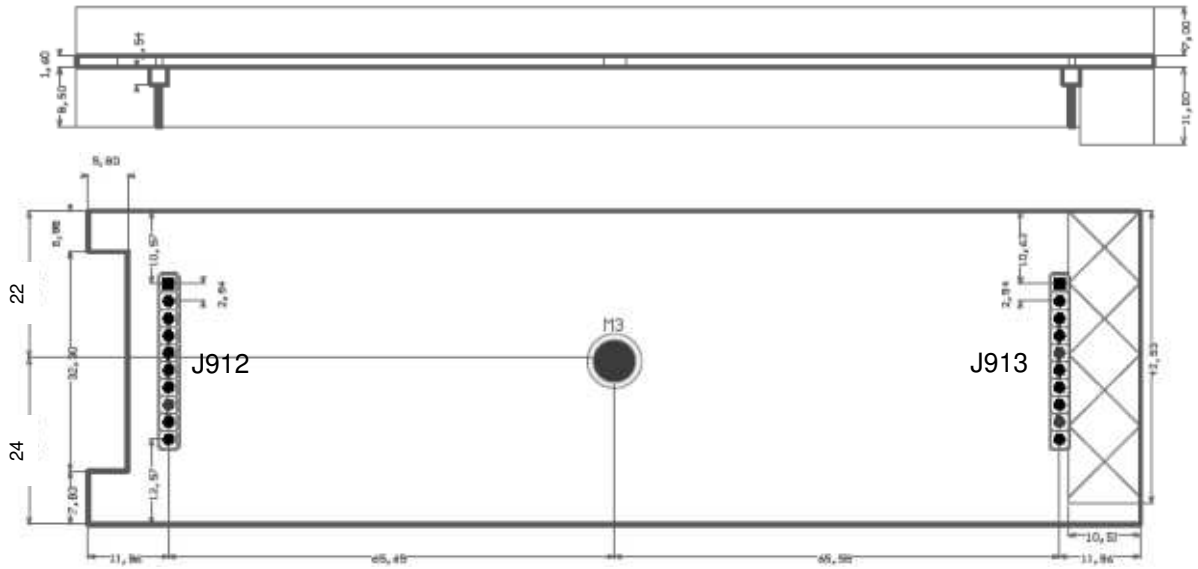
As can be seen in this scheme, the programmable board is placed above the HMI board. It is fixed by a screw in the middle and gets connected to the HMI board through a number of connectors (left and right).

MECHANICAL CONSTRAINTS



Unit : mm

The embedded main board cannot be smaller than the figure cannot be higher than 7mm on the upper side, and lower than 8,50mm on the bottom side. Beware of the connector and the screw hole.

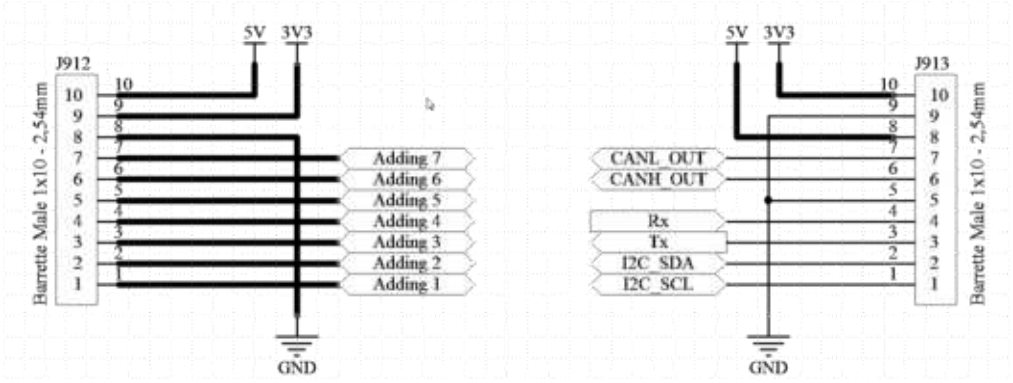


Unit : mm

The embedded main board cannot be bigger than the figure above (these dimensions are the maximum size. Components cannot be higher than 7mm on the upper side, and lower than 8,50mm on the bottom side. An exception is the right-hand bottom side (marked with crosses): Here components can go down to 11 mm. Beware of the connector and the screw hole.

ELECTRICAL CHARACTRISTICS

The mechanical constraints show you that there is 2 connectors Male Barrel 1x10 with a 2,54mm step. This connectors allow to be connected with our main board.



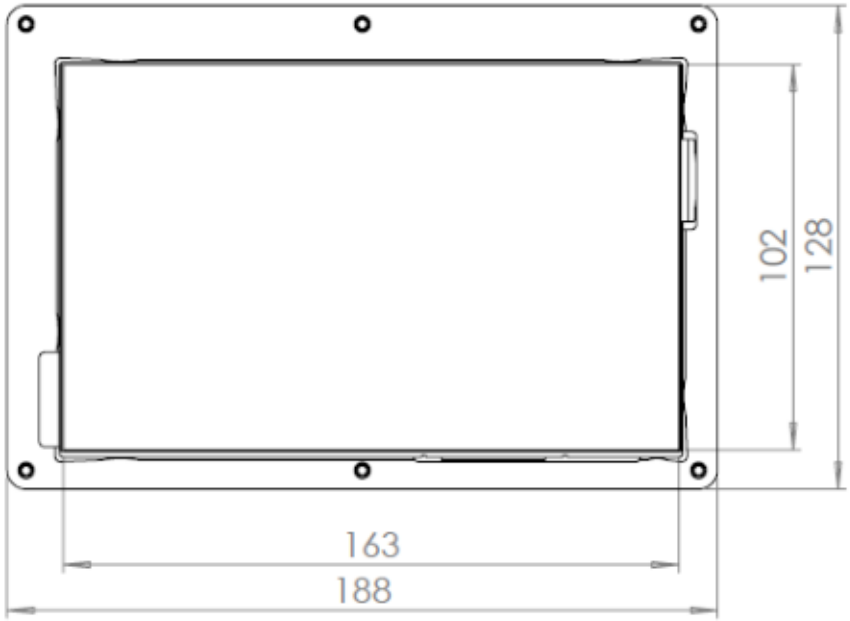
	Item	Symbol	Min	Typ	Max	Unit
5V	Power Supply voltage	V_{cc}	-	5	-	V
	Power Supply consumption	I_{cc}	0	-	500	mA
3V3	Power Supply voltage	V_{cc}	-	3.3	-	V
	Power Supply consumption	I_{cc}	0	-	300	mA
RS232 TTL *	Bauderate	Bds	9,6	-	355	kBd
CAN 2.0B *	Bauderate	Bds	100	-	500	kBd
I2C	Address Used - TBC	Addr	58 59 55 38			Hex
	Frequency - TBC	f	-	391	-	kHz
Adding	Intensity per Output	I_{out}	0	-	3	A

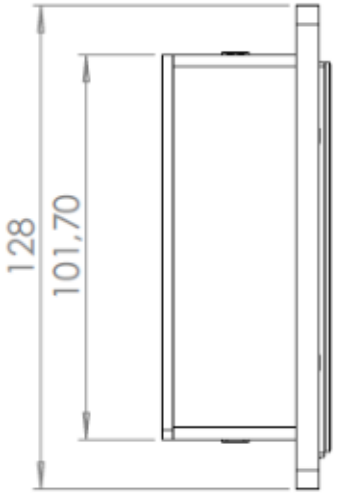
* PROGRAMMABLE INTELLIGENT DISPLAY COMMANDS ONLY

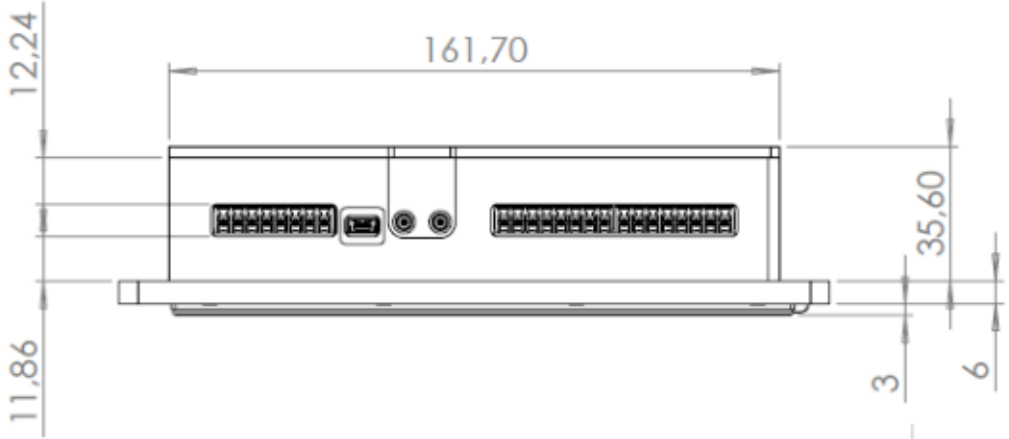
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CHAPTER 8: MECHANICAL DESCRIPTION







Title :

AIP CASE
From the behind

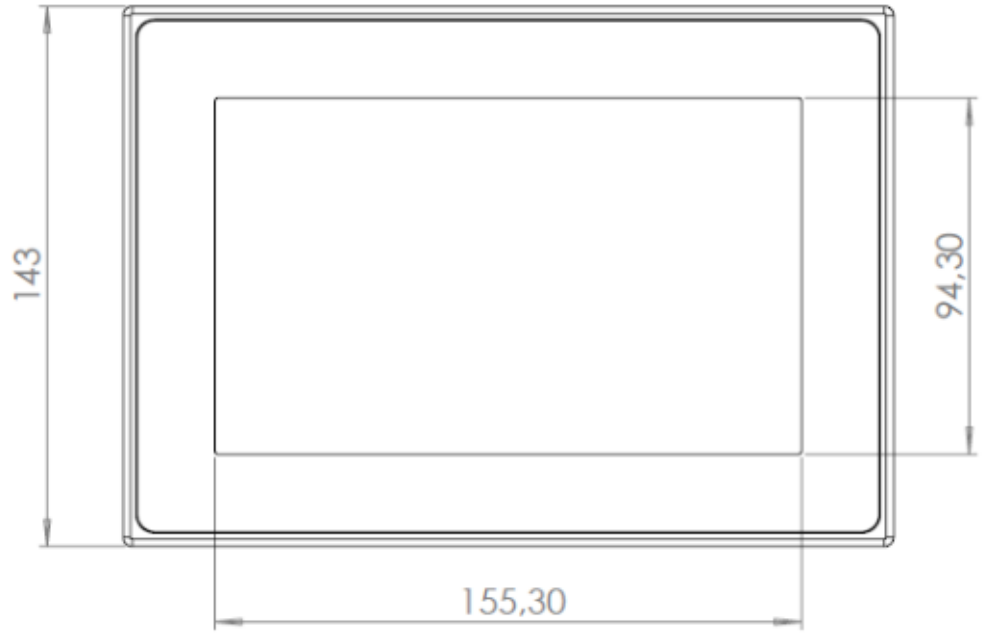
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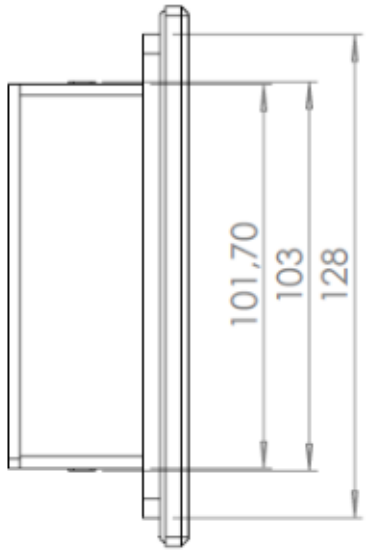
V1.0 rev A

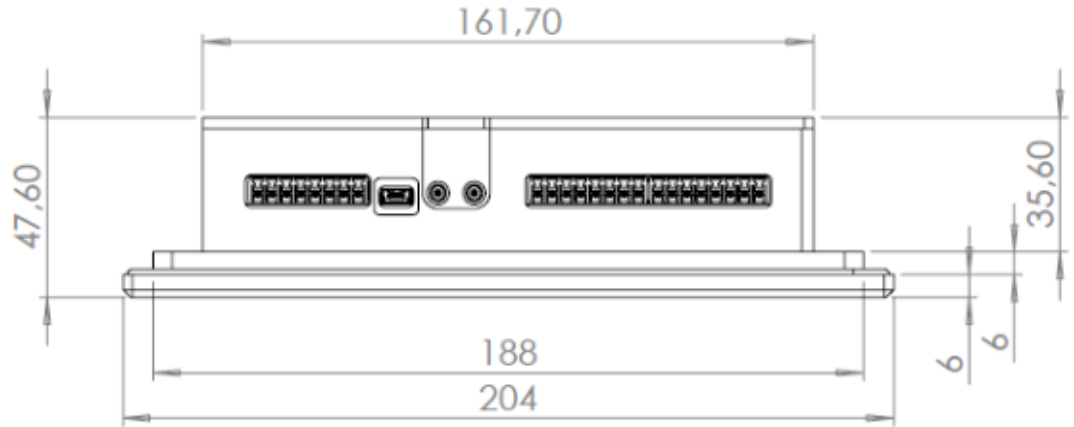
A4

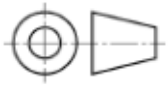
SCALE:1:2

SHEET 1/ 1









Title :

AIP CASE
From the front

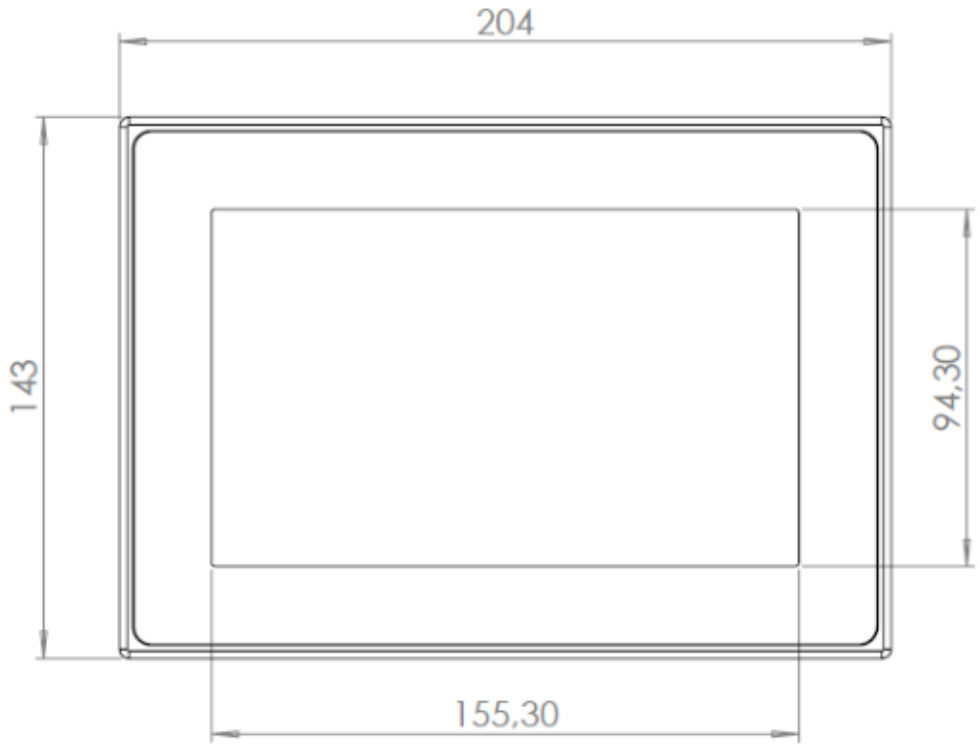
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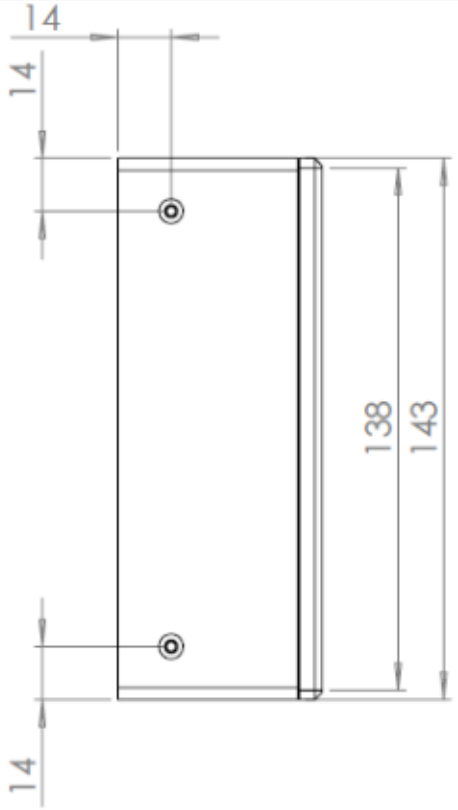
V1.0 rev A

A4

SCALE:1:2

SHEET 1/ 1







Title :

AIP CASE surface

No.

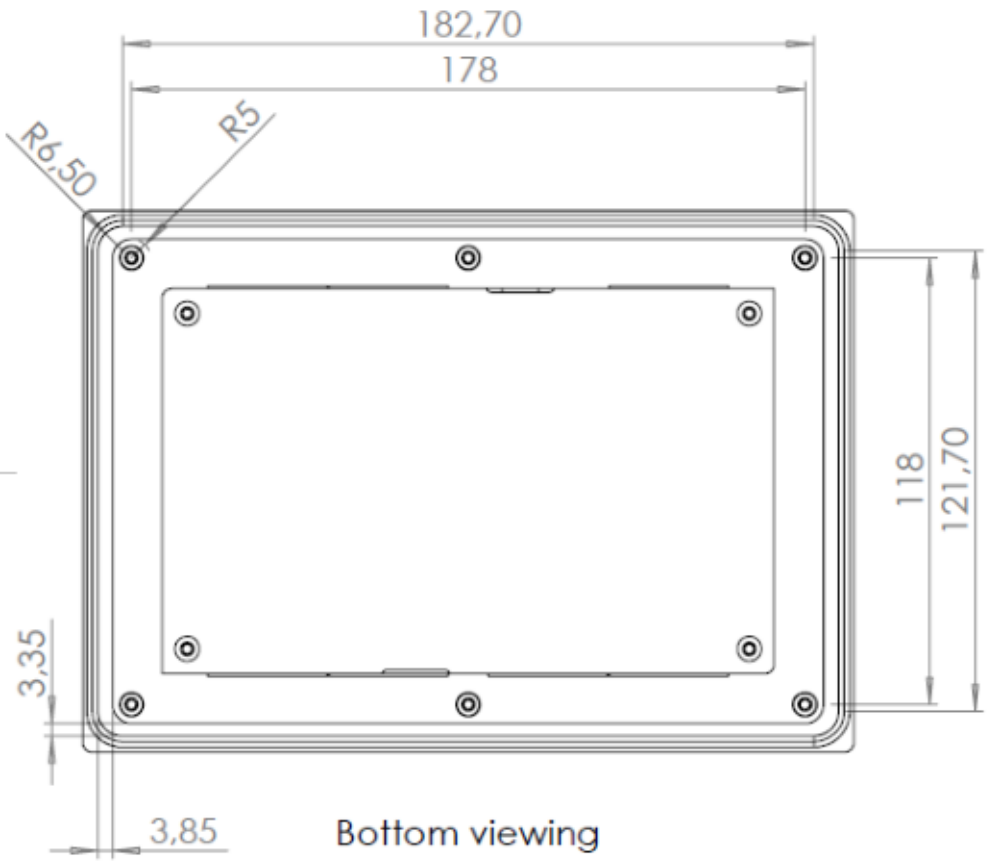
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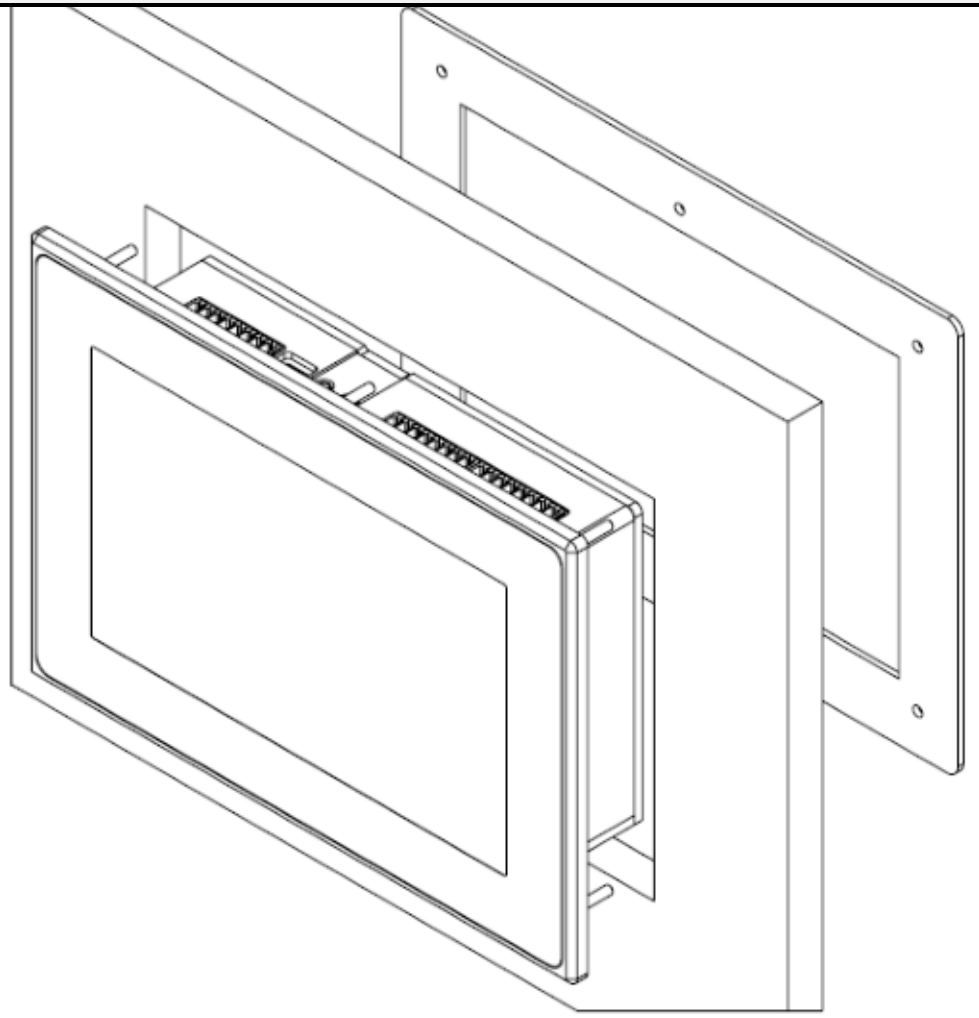
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SHEET 1 / 1

CHAPTER 9: MOUNTING RECOMMENDATION



Bottom viewing



Title :

AIP CASE
From the front

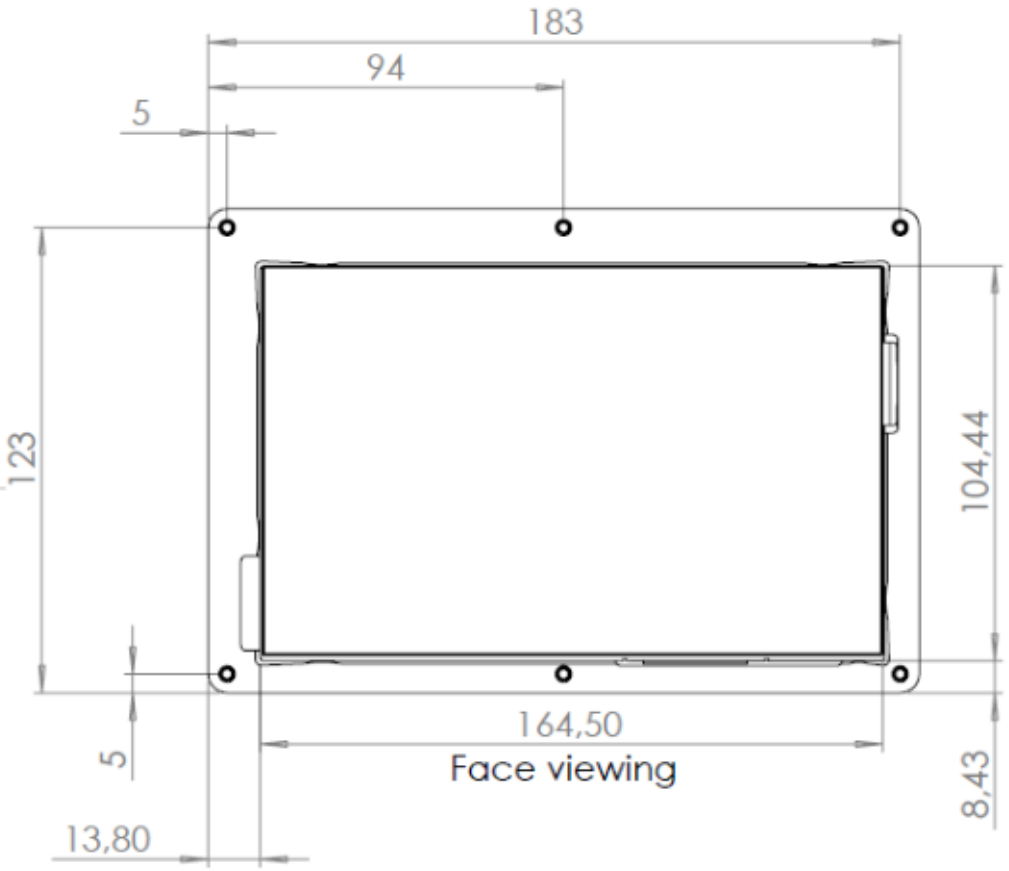
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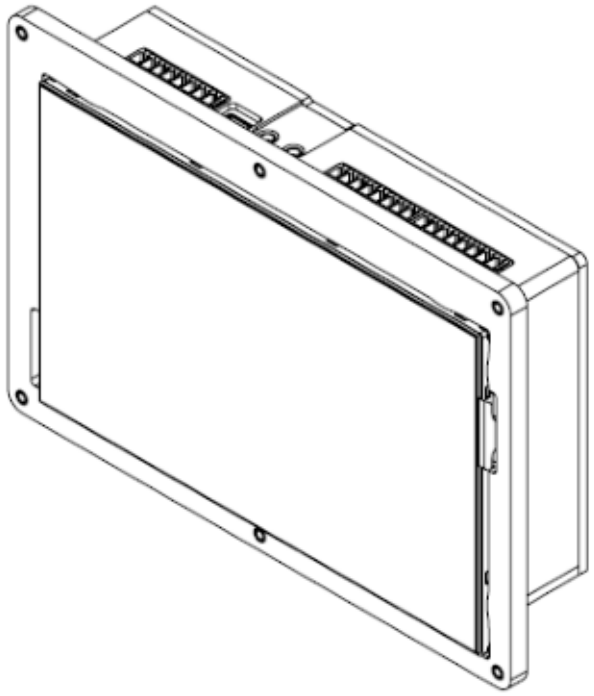
V1.0 rev A

A4

SCALE:1:2

SHEET 1 / 1





Title :

AIP CASE
From the behind

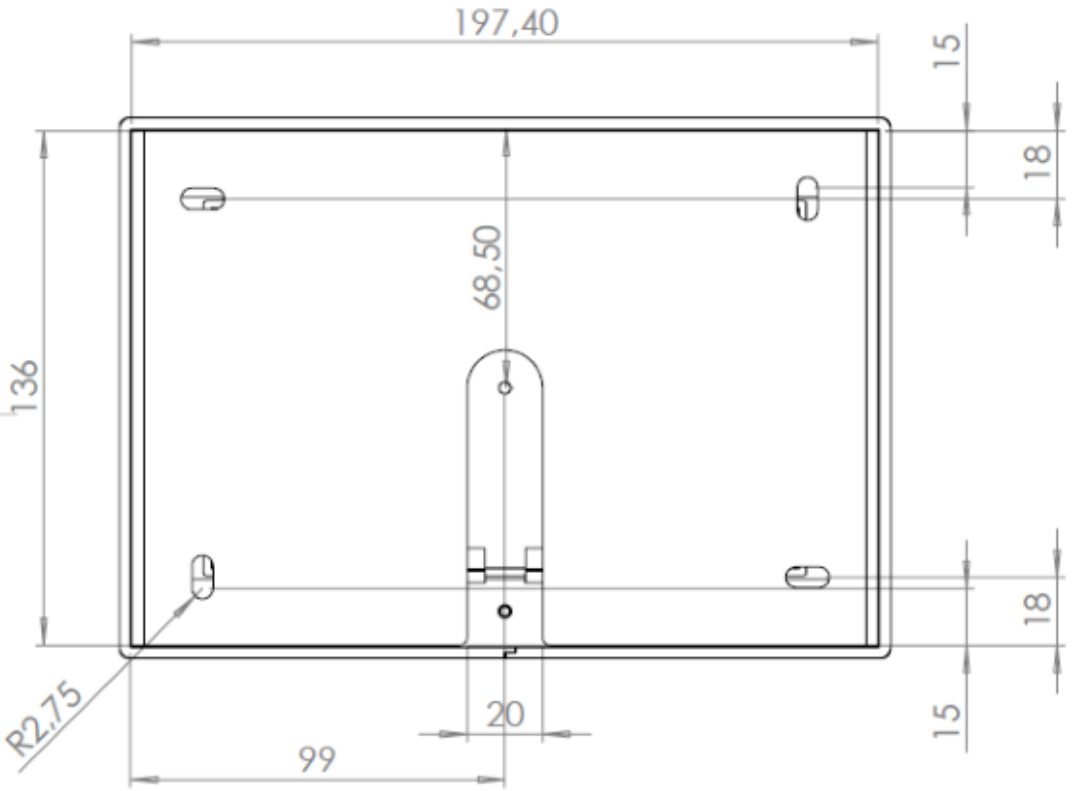
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V1.0 rev A

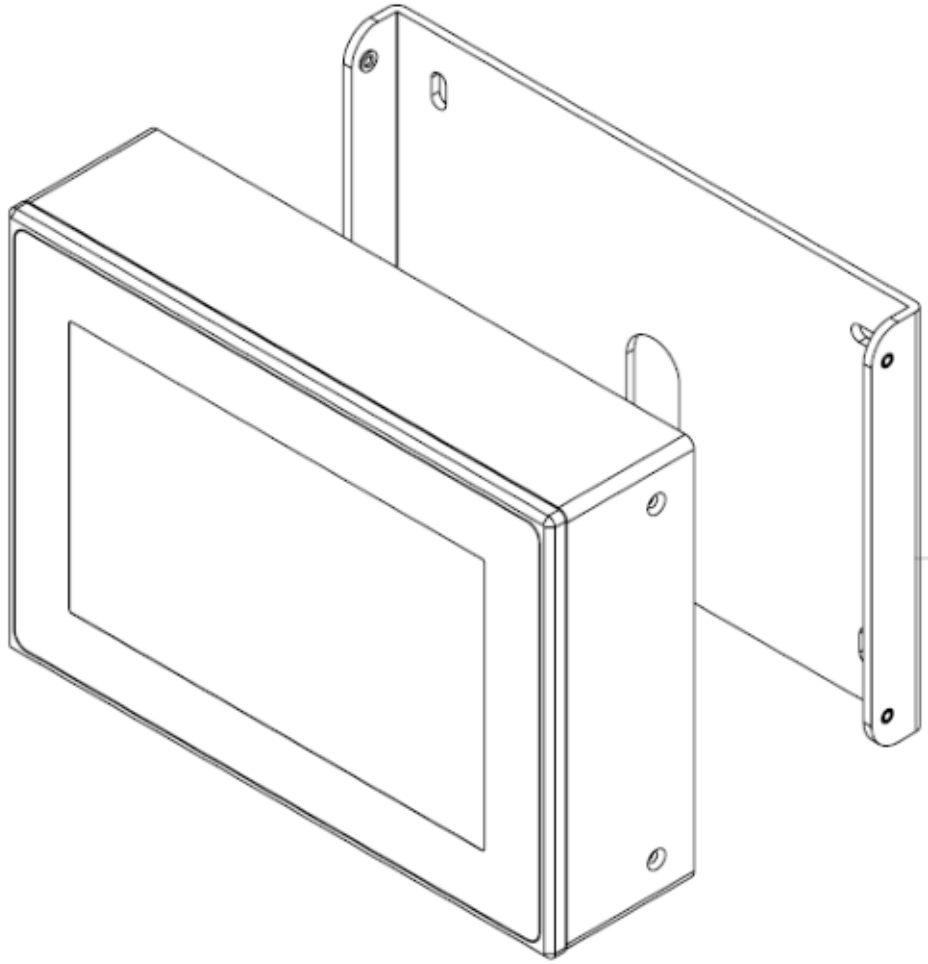
A4

SCALE:1:2

SHEET 1 / 1



Bottom viewing



Title :	AIP CASE Surface
No.	V1.0 rev A
	A4
SCALE:1:2	SHEET 1 / 1

CHAPTER 10: CLAIRITEC'S CONTACT

Clairitec

CLAIRITEC
11 avenue Henri Becquerel
33700 Mérignac
FRANCE

Website: www.clairitec.com

Clairitec's services

Customer relation service: contact@clairitec.com

Technical support service: support@clairitec.com

Non-contractual pictures

Clairitec

11, avenue Henri Bequerel - 33700 - MERIGNAC - FRANCE

Email: contact@clairitec.com
www.clairitec.com