Clairitec

HMI Solution & Graphic Products

AIP 9"

Hardware manual

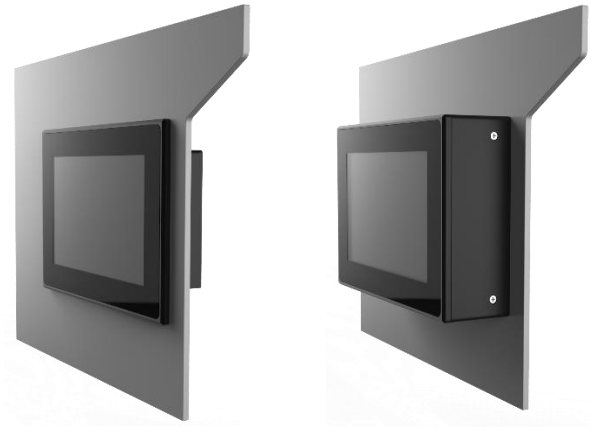
CHAPTER 1: VERSION'S HISTORICAL BACKGROUND

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

CHAPTER 2: GENERAL DESCRIPTION

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

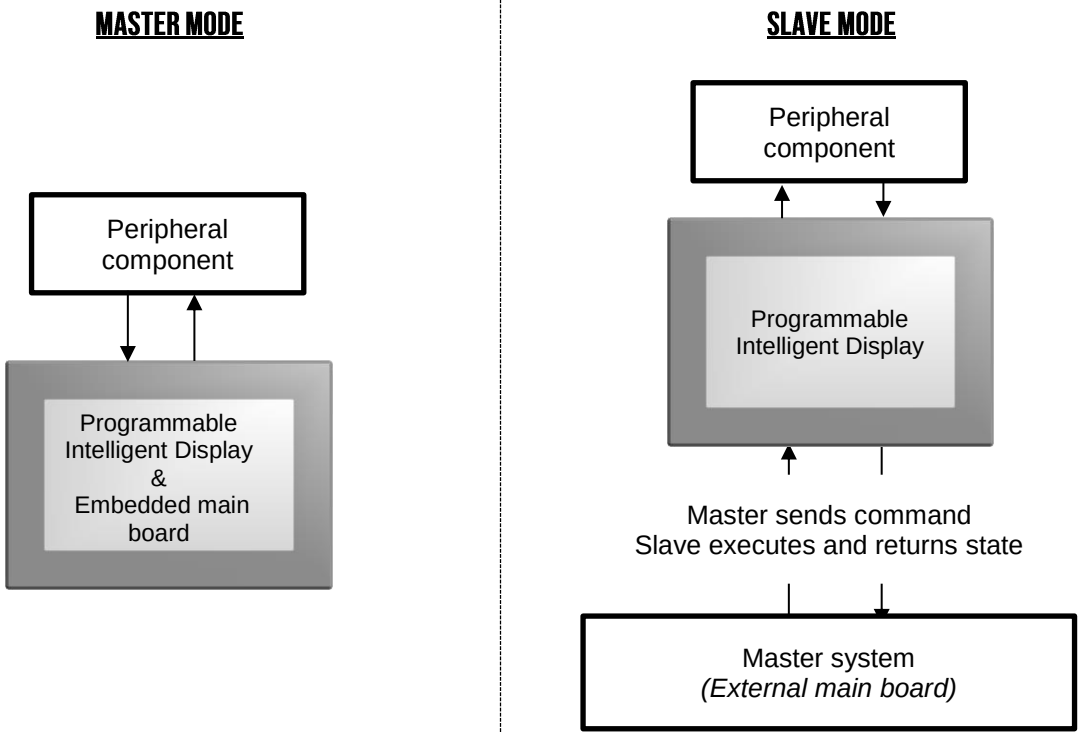
It consists of a TFT-LCD 7" WVGA (800 x 480 pixels) touchscreen display driven by an integrated HMI board from CLAIRITEC and an I/O management board. All this components are enclosed in an IP65 case. The Programmable Intelligent Display is EMC compliant and withstands a temperature range from -20°C to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



From the front **Surface**

Figure 1 – Case's Topology

The easy to use product range embedded lots of different version to be modular for your own system. It can be used in 2 different modes: slave and master mode:



CHAPTER 3: LIST OF ENVIRONMENTAL REQUIREMENTS

ENVIRONMENTAL NORMS AND EMC

The following table lists the environmental and EMC requirements that the GraphLight meets.

Norm	Minimum required
	Environmental
RoHS	All the components used in AIP 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	Immunity against 8kV electrostatic discharge in the air, 4kV when contact
UL 94 V-0	E76251 PCB agreement
	Mechanical
IP65	Protection with the "from the front" case is waterproof
IP40	All the components are protected by this norm
Vesa 75x75	The "surface" and "hand" cases 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

CHAPTER 4: SPECIFICATION OF THE PROGRAMMABLE INTELLIGENT DISPLAY

MECHANICAL AND ENVIRONMENTAL CHARACTERISTICS

Item	Specifications
Size	9'' Diagonal
Resolution	800 x RGB x 480 dots (WVGA)
Viewing direction	6 o'clock
Viewing area	198.0 (W) x 111.7 (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 front face with recessed case IP40 in others faces

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 layer dynamically managed
Storage Memory	32 Mb
Graphical Layout Management	GraphConverter®3 software tool enables you to build your HMI's graphic library and upload it to the board flash memory

IO SPECIFICATION

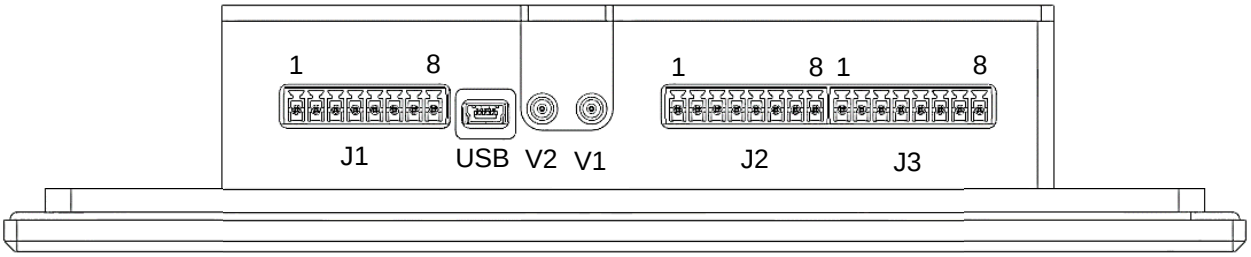
	Digital	Analogic	Relay	Thermocouple	PT100	PWM	Add
Input	6	5	-	2	1	-	8
Output	6	2	6	-	-	2	

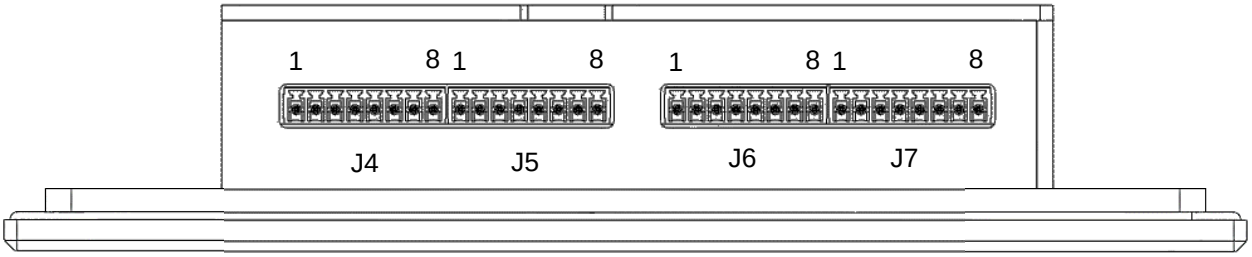
ELECTRICAL CHARACTERISTICS

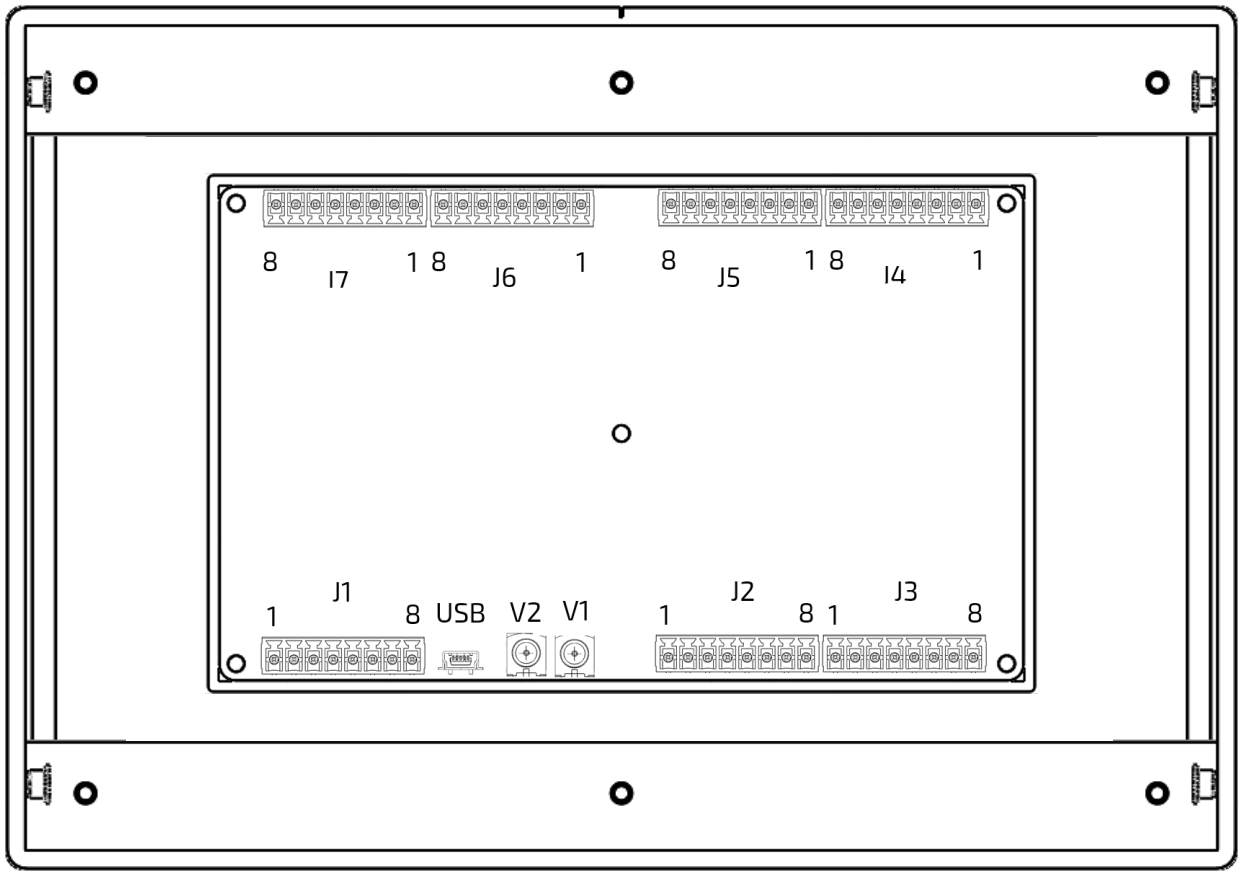
	Item	Symbol	Min	Typ	Max	Unit
Power	Power Supply voltage	V_{cc}	12	-	36	V
	Power Supply consumption*	I_{cc}	260	-	TBC	mA
	Max Intensity	I_{sat}	-	-	2	A
RS232	speed transmission	Bds	9,6	-	355	Kbds
RS485	speed transmission	Bds	9,6	-	355	Kbds
CAN	CAN 2.0B	Bds	100	-	500	Kbds
USB	voltage reference	V_{USB}	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	%
Thermcouple	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

CHAPTER 5: PIN OUT







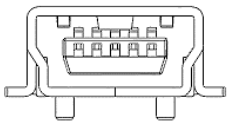
J1	1	Power Supply	**POWER**
	2	GND	
	3	CAN L	COMMUNICATIONS
	4	CAN H	
	5	RS485 A	
	6	RS485 B | RS232 TX	
	7	RS485 Z | | RS232 RX	
	8	RS485 Y	
J2	1	Output PWM 2	PWM OUTPUTS
	2	Output PWM 1	
	3	Thermocouple 2 +	THERMAL INPUTS
	4	Thermocouple 2 -	
	5	Thermocouple 1 +	
	6	Thermocouple 1 -	
	7	PT100	
	8	GND	
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 +	

CHAPTER 6: DESCRIPTION OF CONNECTIONS

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

CONNECTOR USB

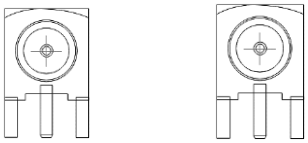
This connector allows you to update firmware and the graphics chart via a computer or a USB key. Thanks to its transfer via USB, the loading time is decreased. It requires a standard adapter USB -> mini USB, available in the starter kit.



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

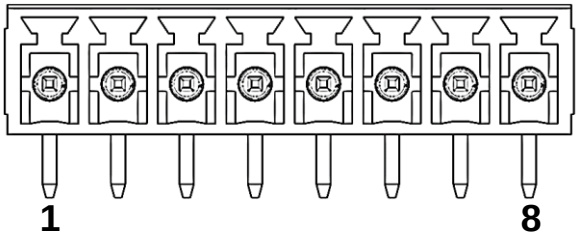
This connector allows you to connect directly to cameras with a 75Ω impedance male connector. It is recommended to be plugged with the MCX 75Ω impedance female connector, like the R213182007 Radiall component reference or the 73415-4490 Molex component reference.



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

CONNECTOR FROM J1 TO J7

Connection Interface for peripheral module.
Connection Interface for serial communication EIA / RS232E or CAN2.0B between the Clairitec HMI board and your application board.



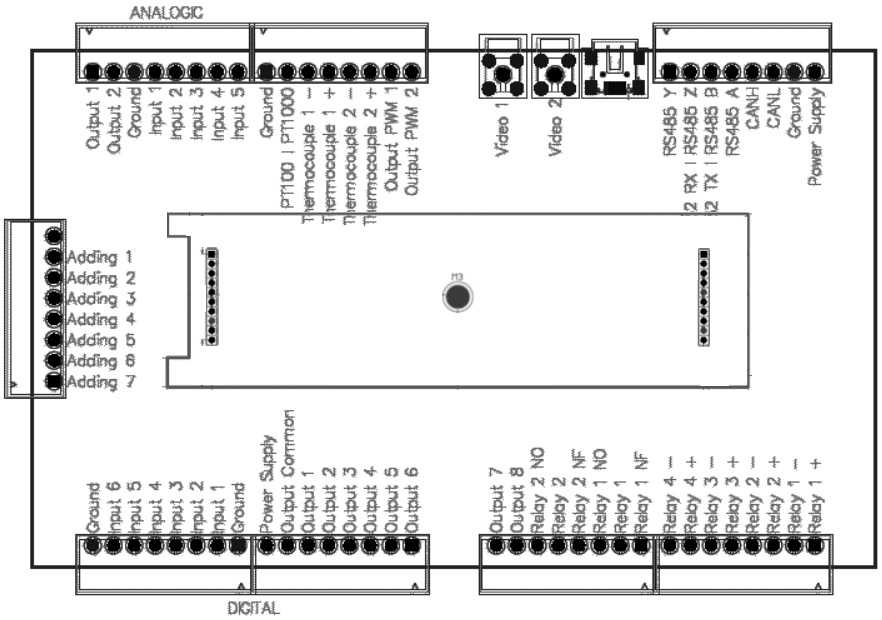
→ Update the firmware with the RS232 SpiderGraph protocol,
→ Update your graphic chart with the RS232 SpiderGraph protocol,
→ Send and receive commands with the RS232 or Can2.0B SpiderGraph protocol

There are many different crosslinks models for this Plug and play connector:
- Wurth 691361300008
- Wurth 691368300008B
- Wurth 691366310008
- Wurth 691363310008

The total number of this connector type is 7 for the existing functionality. It is necessary to add a connector if your system contains I / O specific to your system.

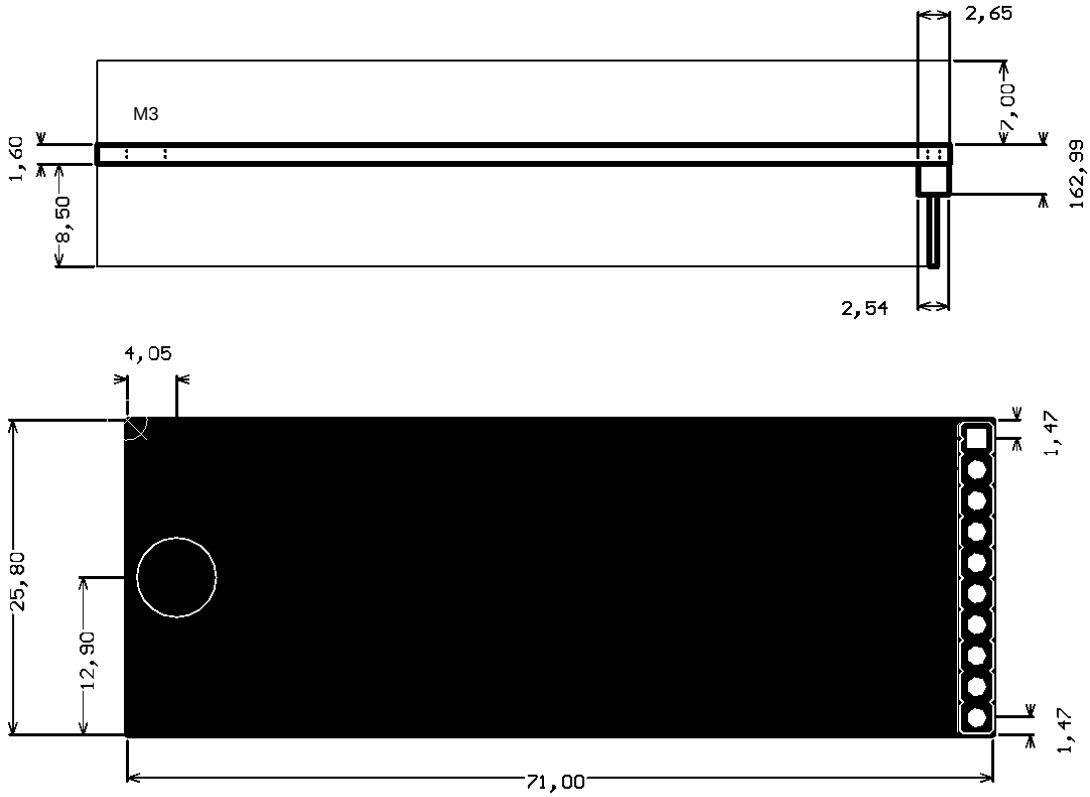
CHAPTER 7: EMBEDDED MAIN BOARD – *MASTER MODE MODEL*

For the Master mode, our system has to embed a board which is programed like a state machine. In fact, this board can integrate other specific I/O pinouts: protocol communication, and electronic system.
Clairitec can add it on his main board or you can 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.



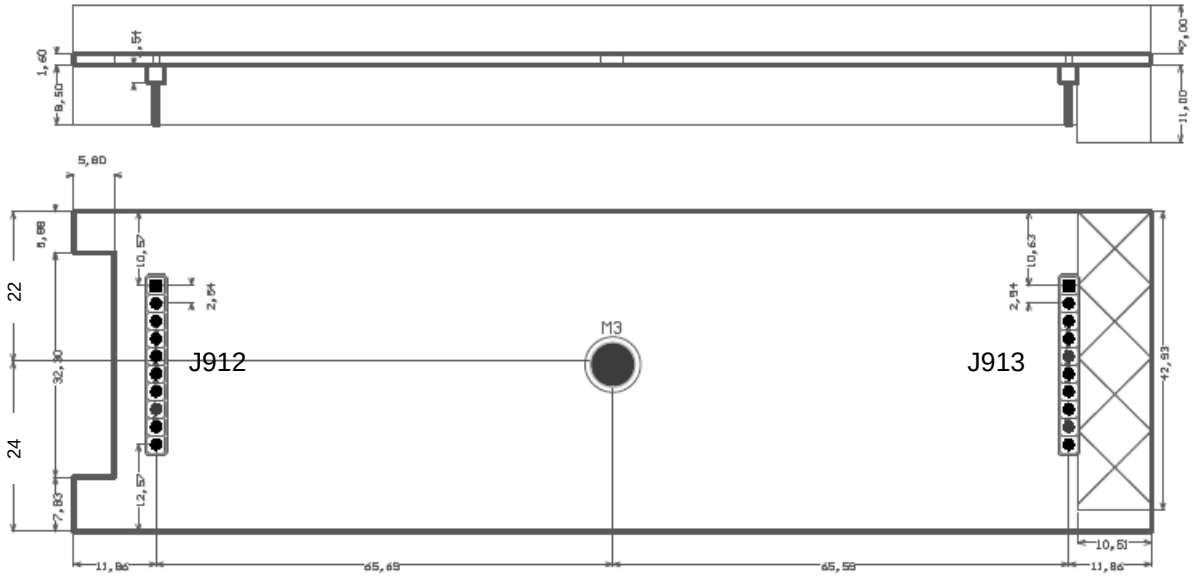
As you see in this figures, you embedded your board thanks to two connectors on our HMI board. Just plug on it.

MECHANICAL CONSTRAINTS



Unit : mm

The embedded main board can't be smaller than the figure above. Otherwise, the PCB will not be screwed. On the other hand, components on the top board can't be higher than 7mm. On the bottom face, the maximal width is 8,50mm. Beware of the connector and the screw hole.

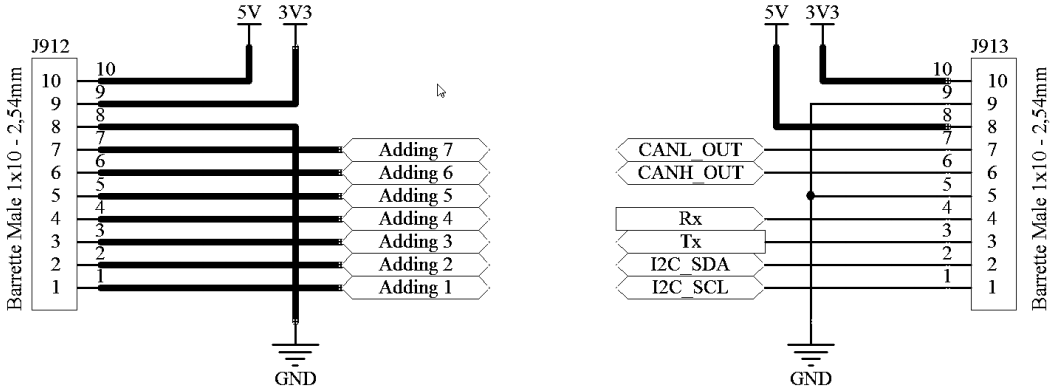


Unit : mm

The embedded main board can't be bigger than the figure above. This is the absolute maximum size to fit in our case. Beware as well of the connector and the screw hole, just like the smaller PCB and the component width too. Only on the bottom right face can the component be bigger. Our case accepts a main board specific connector up to 11mm of size (hatched area).

ELECTRICAL CHARACTRISTICS

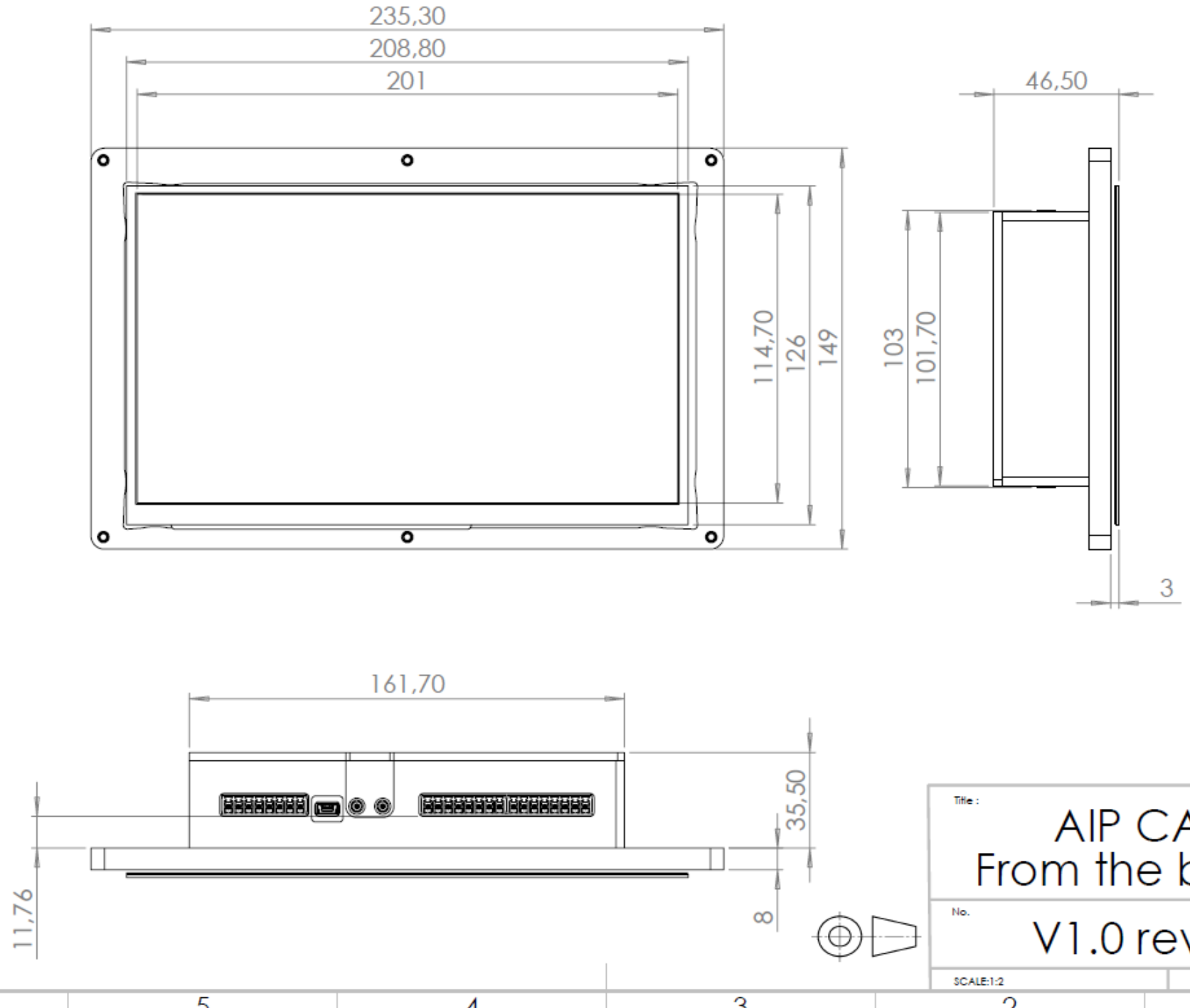
The mechanical constraints show you that there is 2 connectors Male Barrel 1x10 with a 2,54mm step. This connectors allow to be connected with our main board.

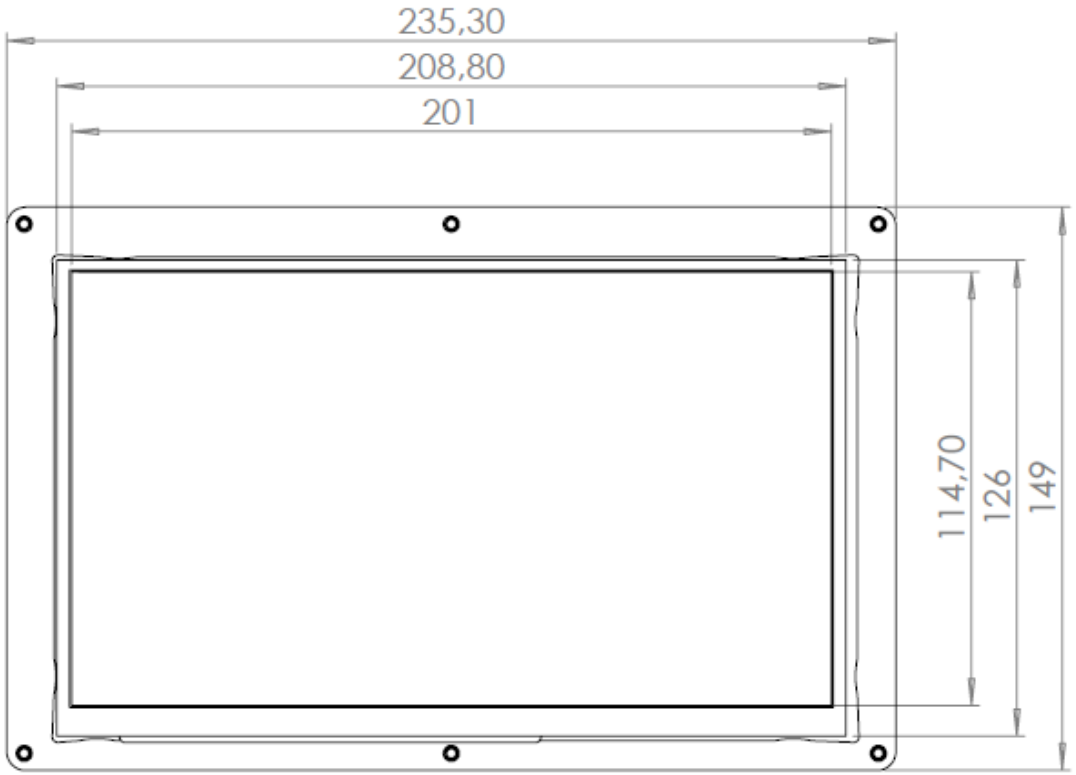


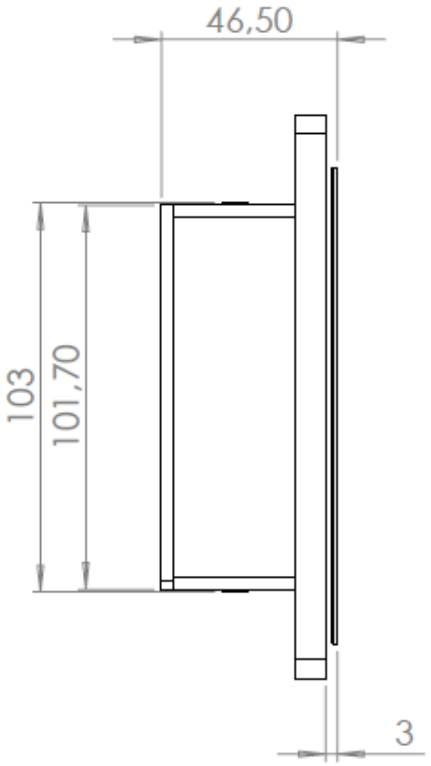
	Item	Symbol	Min	Typ	Max	Unit
5V	Power Supply voltage	V_{cc}	-	5	-	V
	Power Supply consumption	I_{cc}	0	-	500	mA
3V3	Power Supply voltage	V_{cc}	-	3.3	-	V
	Power Supply consumption	I_{cc}	0	-	300	mA
RS232 TTL *	Bauderate	Bds	9,6	-	355	Kbds
CAN 2.0B *	Bauderate	Bds	100	-	500	Kbds
I2C	Address Used - TBC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

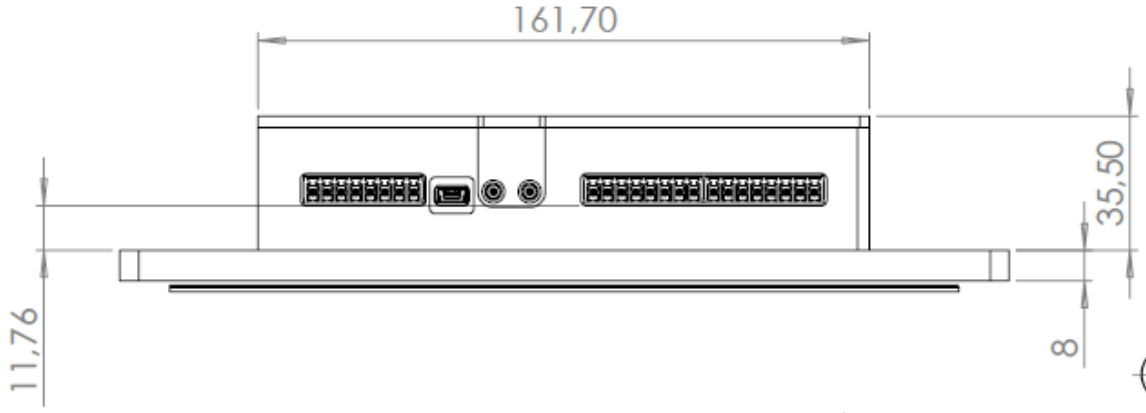
* PROGRAMMABLE INTELLIGENT DISPLAY COMMANDS O

CHAPTER 8: MECHANICAL DESCRIPTION









Title :

AIP CASE
From the behind

No.

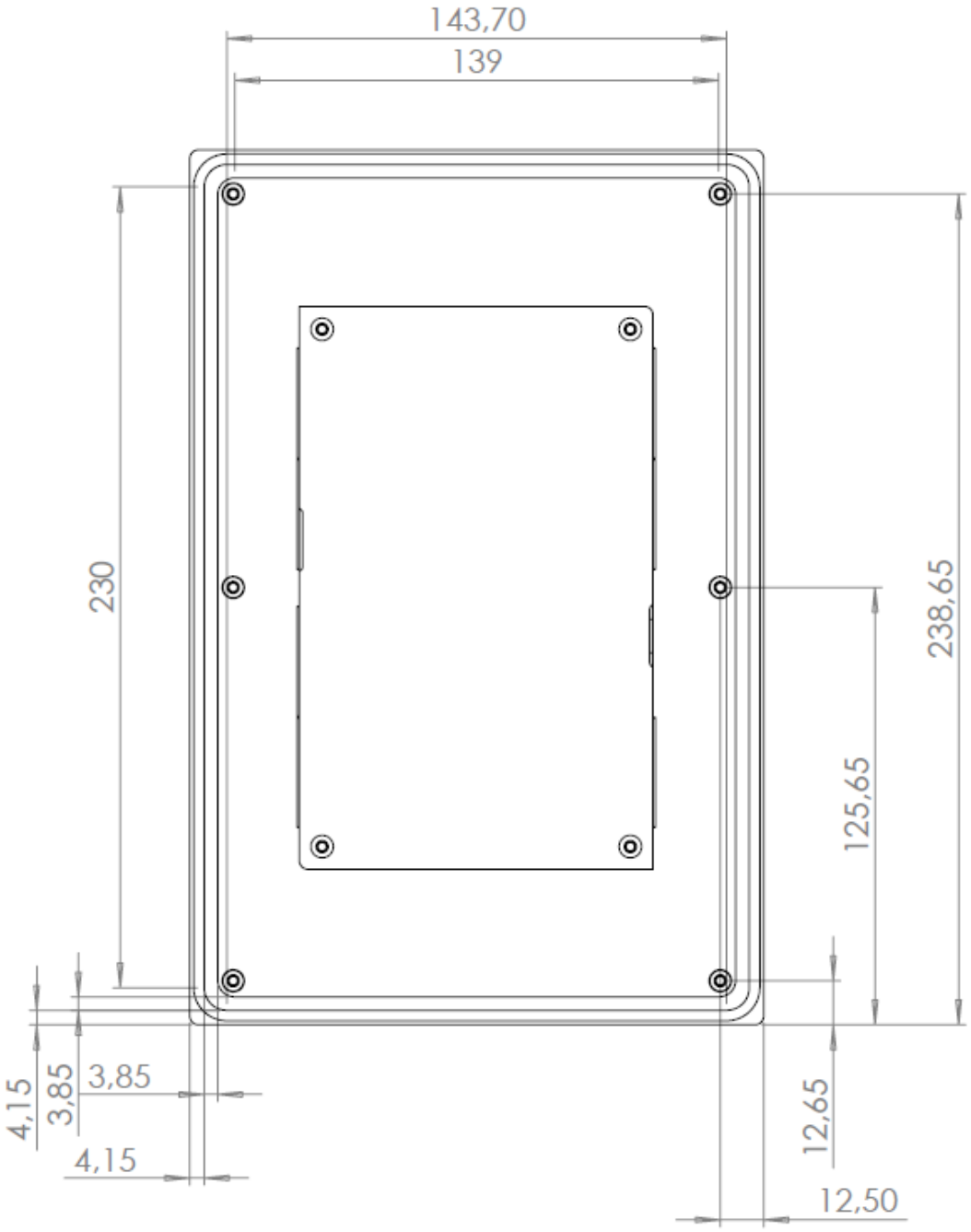
V1.0 rev A

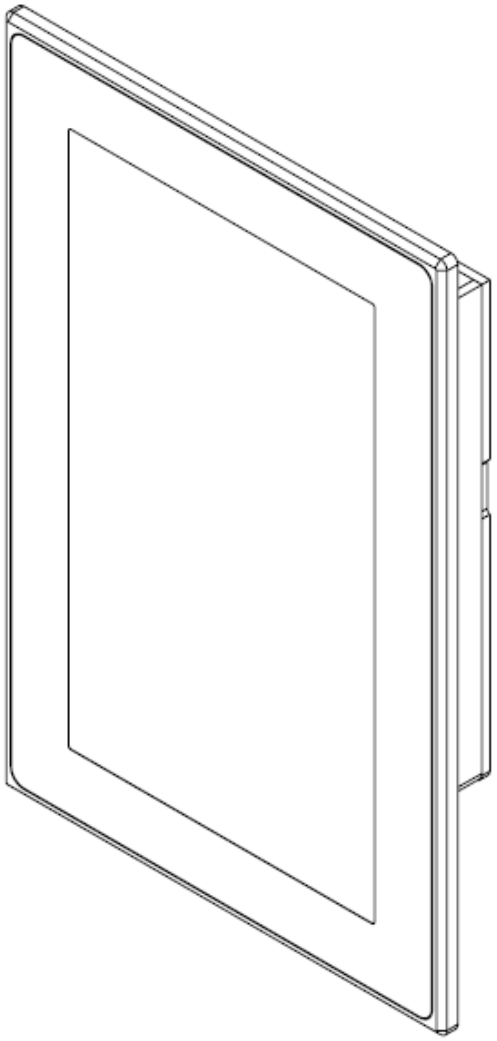
A4

SCALE:1:2

SHEET 1/ 1

CHAPTER 9: MOUNTING RECOMMENDATION





Title :

AIP CASE
From the behind

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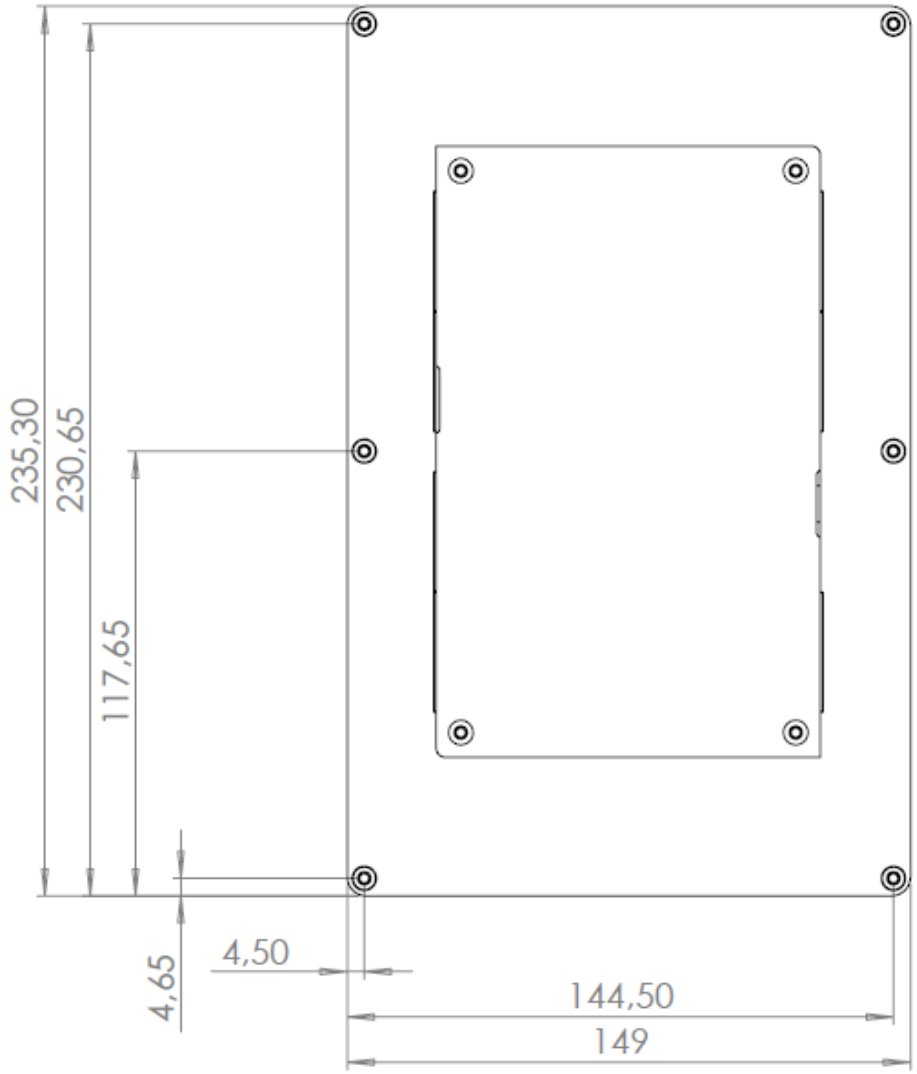
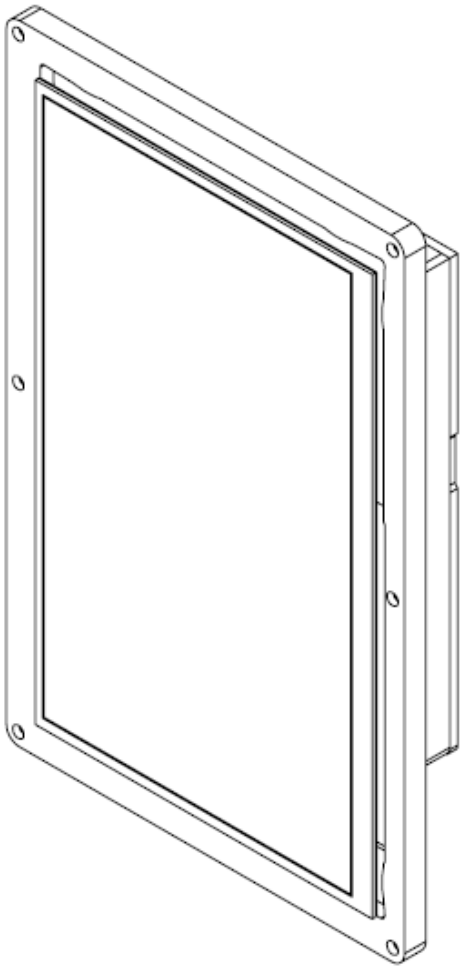
V1.0 rev A

A4

SCALE:1:2

SHEET 1/ 1





Title :

AIP CASE
From the behind

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

Web site: 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