

Cleartex

Cleartex Vision

User guide

Version: 1.4.0



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Document revisions

Version	Date	Description
1.4.0	2026-25-06	Updated Modbus TCP Server section
1.3.0	2026-02-06	- Added I/O module options - Fixed errors in table of contents
1.2.0	2025-09-03	- Temperature and humidity chart for passive variants - Small adjustments to layout and styling
1.1.0	2025-04-01	First document version

1. Safety guidelines

1.1 Intended use

National and international standards, regulations and safety measures must always be taken into account.

Panel PC described in this manual is intended for industrial applications.

Product can be used only in original condition. Modifications and extensions are not permitted.

Cleartex excludes liability for damage of any kind resulting from the use of Cleartex products in any intended way.

1.2 Protection against electrostatic discharge

Electrical assemblies can be damaged by electrostatic discharge (ESD) and must be handled accordingly:

- Do not touch connector contacts of interfaces
- Do not touch connector contacts of connected cables
- Do not touch connector contacts during connecting of interfaces
- Always connect all interfaces only in OFF state and zero voltage level

1.3 Operation

To minimize the risk of damage, death or injury, the equipment must be always properly grounded using CHASSIS pin on power connector.

The presence of aggressive gasses in the environment can result in malfunctions. In combination with high temperature and relative humidity, aggressive gasses - for example with sulfur, nitrogen and chlorine components - trigger chemical processes that can very quickly impair or damage electronic components. Blackened copper surfaces and cable ends in existing installations are indicators of aggressive gasses.

2. Device description

2.1 Technical data

2.1.1 Model 10.1"

	Passive cooling	Active cooling
	Main properties	
Cooling	Fanless. Silent operation. Heat dissipated by aluminium back.	Integrated cooling fan. Air intake and exhaust on back panel.
Operating system	Windows 11 (64-bit), Windows 10 (64-bit), Linux Ubuntu, Linux Mint, other Linux distributions	
Operating temperature	-20 to 60°C (non-condensing humidity)	
Storage temperature	-20 to 80°C (non-condensing humidity)	
Transport temperature	-20 to 80°C (non-condensing humidity)	
Materials	Front panel aluminum IP65, backside stainless steel IP20	
Weight	1.4 kg	1.8 kg
Mounting	VESA 100×100 or cutout	
Power voltage	12-30 VDC	
Power consumption	30 W	35 W Intel N100 45 W Intel N305
Lifetime	45000 h (max. temperature 45 °C)	
	Dimensions	
Width	249.8 mm	
Height	156.8 mm	
Active area width	224 mm	
Active area height	126 mm	
Depth	53 mm	61 mm
Cutout installation depth	41 mm	49 mm
	Display	
Type	IPS, Capacitive Multi-Touch	
Size (diagonal)	10.1"	
Resolution	1920×1080 (Full HD)	
Brightness	300 cd/m2	
Colors	16.7 million (RGB, 8 bits per channel)	
	Controller	
CPU	Option 1 (passive or active cooling): Intel N100, 4 cores up to 3.4GHz, 8GB LPDDR5 Option 2 (active cooling only): Intel Core i3-N305, 8 cores up to 3.8GHz, 16GB LPDDR5	
Performance under load¹	Intel N100: maximum CPU freq. 1.6 GHz	Intel N100: maximum CPU freq. 2.2 GHz Intel N305: maximum CPU freq. 2.9 GHz
Interfaces	2×USB 3.0 (front side, dust and waterproof) 4×USB 2.0 (back side) 2×Gigabit Ethernet 1×RGB programmable LED optional I/O module (Inputs, outputs, advanced communication, etc.)	
	Storage	
HDD	easily accessible M.2 NVMe SSD	
Other	MicroSD slot next to SSD	

Table 1: Technical data 10.1"

¹ Measured during 2 h continuous stress test at 100% load, ambient temperature 25 °C, vertical mount, free air conditions

2.1.2 Model 15.6"

	Passive cooling	Active cooling
	Main properties	
Cooling	Fanless. Silent operation. Heat dissipated by aluminium back.	Integrated cooling fan. Air intake and exhaust on back panel.
Operating system	Windows 11 (64-bit), Windows 10 (64-bit), Linux Ubuntu, Linux Mint, other Linux distributions	
Operating temperature	-20 to 60°C (non-condensing humidity)	
Storage temperature	-20 to 80°C (non-condensing humidity)	
Transport temperature	-20 to 80°C (non-condensing humidity)	
Materials	Front panel aluminum IP65, backside stainless steel IP20	
Weight	2 kg	2.4 kg
Mounting	VESA 100×100 or cutout	
Power voltage	12-30 VDC	
Power consumption	33 W	38 W Intel N100 48 W Intel N305
Lifetime	45000 h (max. temperature 45 °C)	
	Dimensions	
Width	372.5 mm	
Height	266.5 mm	
Active area width	345 mm	
Active area height	195 mm	
Depth	38.5 mm	46.5 mm
Cutout installation depth	26.45 mm	34.5 mm
	Display	
Type	IPS, Capacitive Multi-Touch	
Size (diagonal)	15.6"	
Resolution	1920×1080 (Full HD)	
Brightness	300 cd/m2	
Colors	16.7 million (RGB, 8 bits per channel)	
	Controller	
CPU	Option 1 (passive or active cooling): Intel N100, 4 cores up to 3.4GHz, 8GB LPDDR5 Option 2 (active cooling only): Intel Core i3-N305, 8 cores up to 3.8GHz, 16GB LPDDR5	
Performance under load¹	Intel N100: maximum CPU freq. 1.6 GHz	Intel N100: maximum CPU freq. 2.2 GHz Intel N305: maximum CPU freq. 2.9 GHz
Interfaces	NFC reader 2×USB 3.0 (front side, dust and waterproof) 4×USB 2.0 (back side) 2×Gigabit Ethernet 1×Display port 2×RGB programmable LED optional I/O module (Inputs, outputs, advanced communication, etc.)	
	Storage	
HDD	easily accessible M.2 NVMe SSD	
Other	MicroSD slot next to SSD	

Table 2: Technical data 15.6"

¹ Measured during 2 h continuous stress test at 100% load, ambient temperature 25 °C, vertical mount, free air conditions

2.1.3 Model 23.8"

	Passive cooling	Active cooling
	Main properties	
Cooling	Fanless. Silent operation. Heat dissipated by aluminium back.	Integrated cooling fan. Air intake and exhaust on back panel.
Operating system	Windows 11 (64-bit), Windows 10 (64-bit), Linux Ubuntu, Linux Mint, other Linux distributions	
Operating temperature	-20 to 60°C (non-condensing humidity)	
Storage temperature	-20 to 80°C (non-condensing humidity)	
Transport temperature	-20 to 80°C (non-condensing humidity)	
Materials	Front panel aluminum IP65, backside stainless steel IP20	
Weight	2.7 kg	3.1 kg
Mounting	VESA 100×100, VESA 200×100 or cutout	
Power voltage	12-30 VDC	
Power consumption	38 W	43 W Intel N100 53 W Intel N305
Lifetime	45000 h (max. temperature 45 °C)	
	Dimensions	
Width	563.15 mm	
Height	377.75 mm	
Active area width	528 mm	
Active area height	297 mm	
Depth	45.2 mm	
Cutout installation depth	28 mm	
	Display	
Type	IPS, Capacitive Multi-Touch	
Size (diagonal)	23.8"	
Resolution	1920×1080 (Full HD)	
Brightness	300 cd/m2	
Colors	16.7 million (RGB, 8 bits per channel)	
	Controller	
CPU	Option 1 (passive or active cooling): Intel N100, 4 cores up to 3.4GHz, 8GB LPDDR5 Option 2 (active cooling only): Intel Core i3-N305, 8 cores up to 3.8GHz, 16GB LPDDR5	
Performance under load¹	Intel N100: maximum CPU freq. 1.6 GHz	Intel N100: maximum CPU freq. 2.2 GHz Intel N305: maximum CPU freq. 2.9 GHz
Interfaces	NFC reader 2×USB 3.0 (front side, dust and waterproof) 4×USB 2.0 (back side) 2×Gigabit Ethernet 1×Display port 2×RGB programmable LED optional I/O module (Inputs, outputs, advanced communication, etc.)	
	Storage	
HDD	easily accessible M.2 NVMe SSD	
Other	MicroSD slot next to SSD	

Table 3: Technical data 23.8"

¹ Measured during 2 h continuous stress test at 100% load, ambient temperature 25 °C, vertical mount, free air conditions

2.2 Operating system

- Windows 10 IoT
- Windows 11 IoT
- Linux Mint
- Without operating system

2.3 Drawings

2.3.1 Model 10.1" - passive cooling

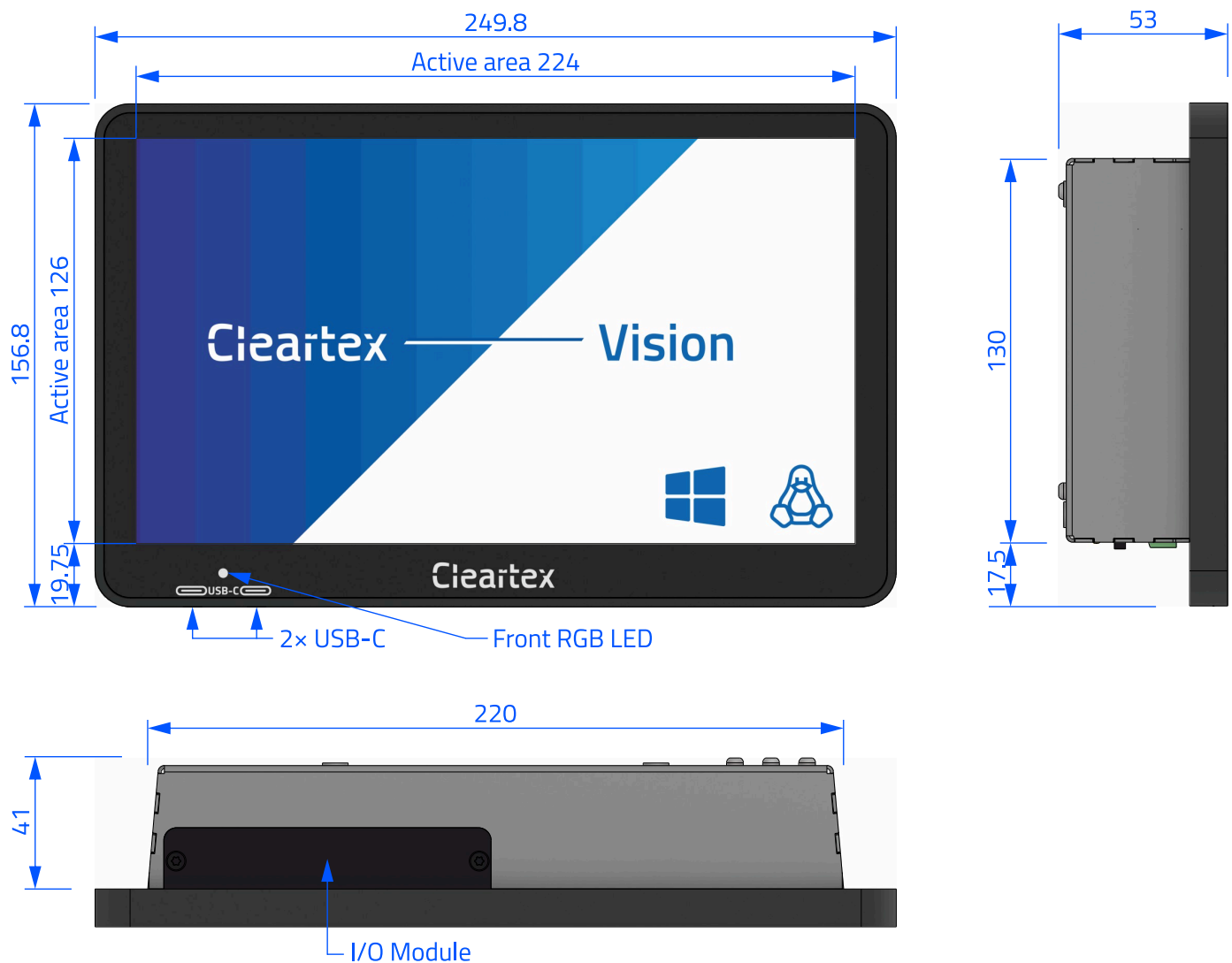


Image 1: Model 10.1" - front side drawing - passive cooling

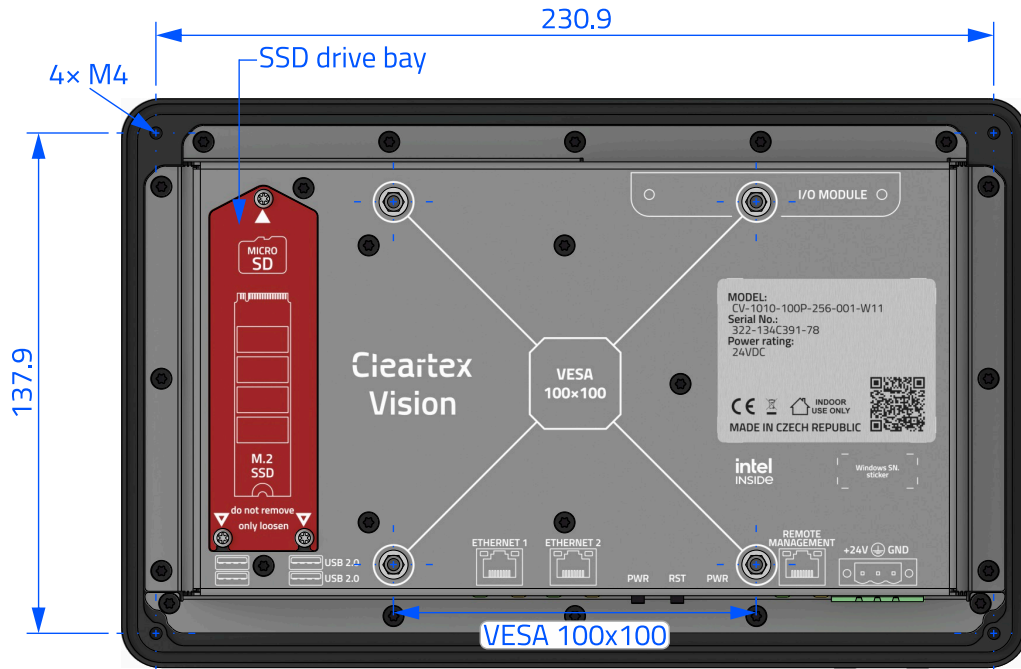


Image 2: Model 10.1" - back side drawing - passive cooling

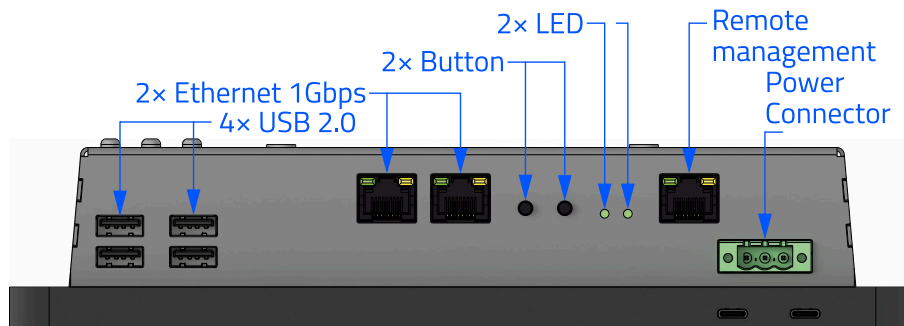


Image 3: Model 10.1" - bottom view - passive cooling

2.3.2 Model 10.1" - active cooling

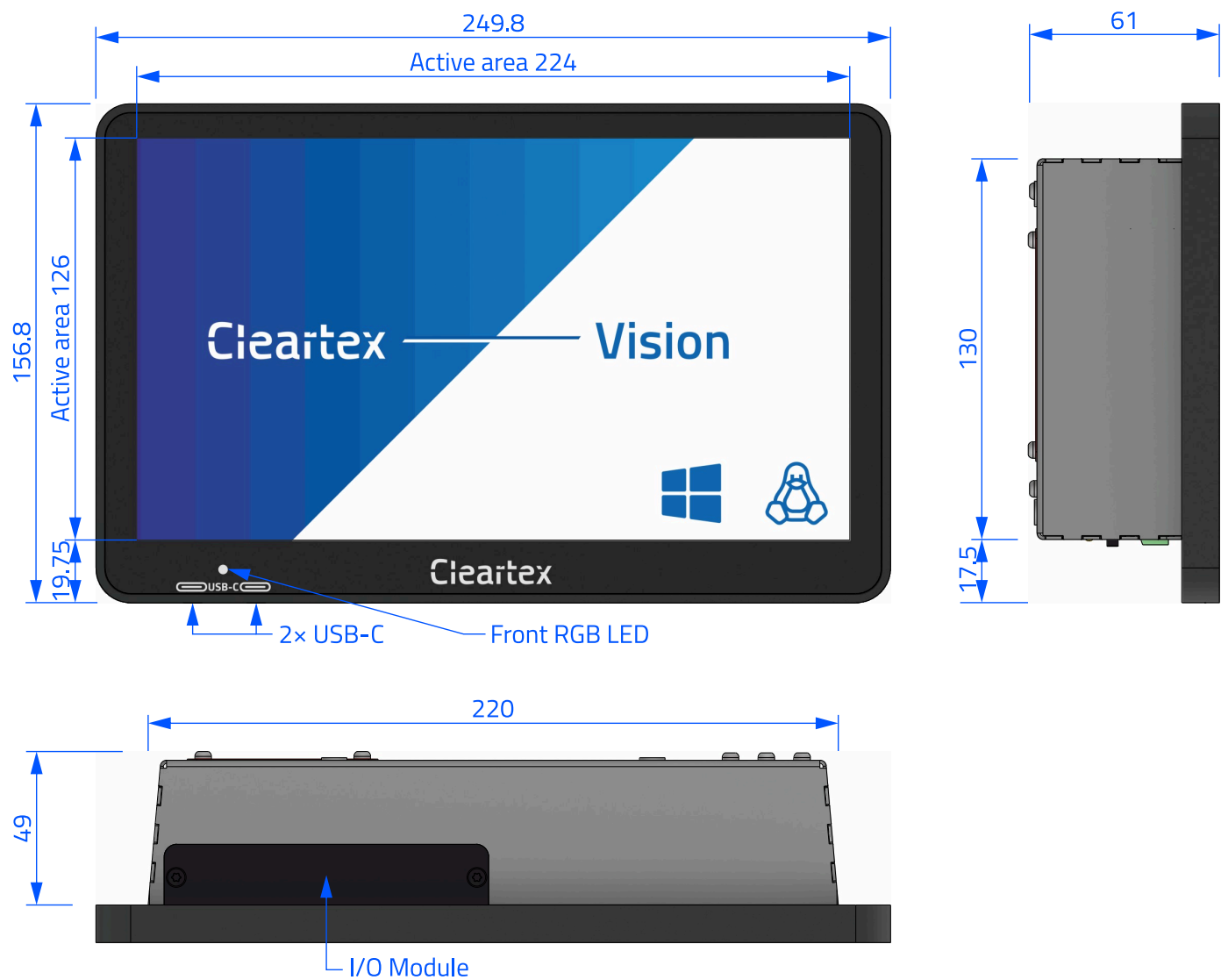


Image 4: Model 10.1" - front side drawing - active cooling

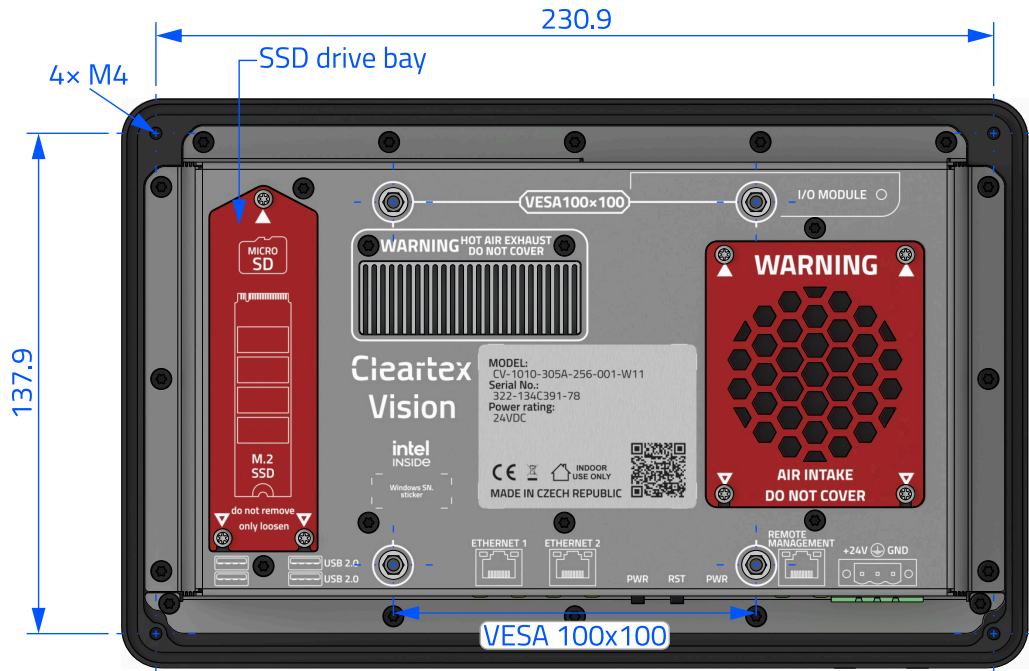


Image 5: Model 10.1" - back side drawing - active cooling

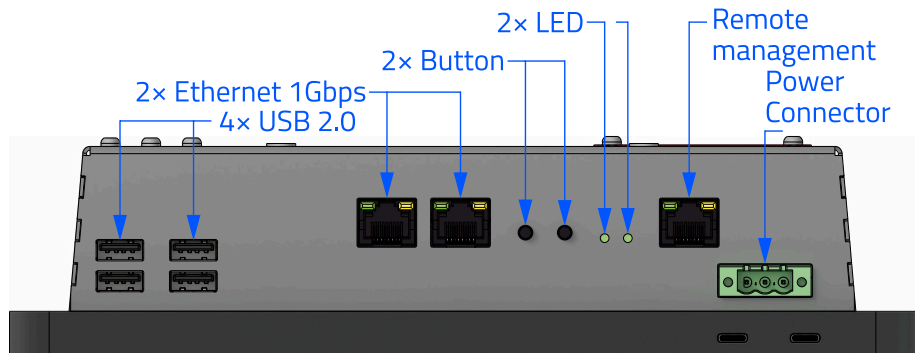


Image 6: Model 10.1" - bottom view - active cooling

2.3.3 Model 15.6" - passive cooling

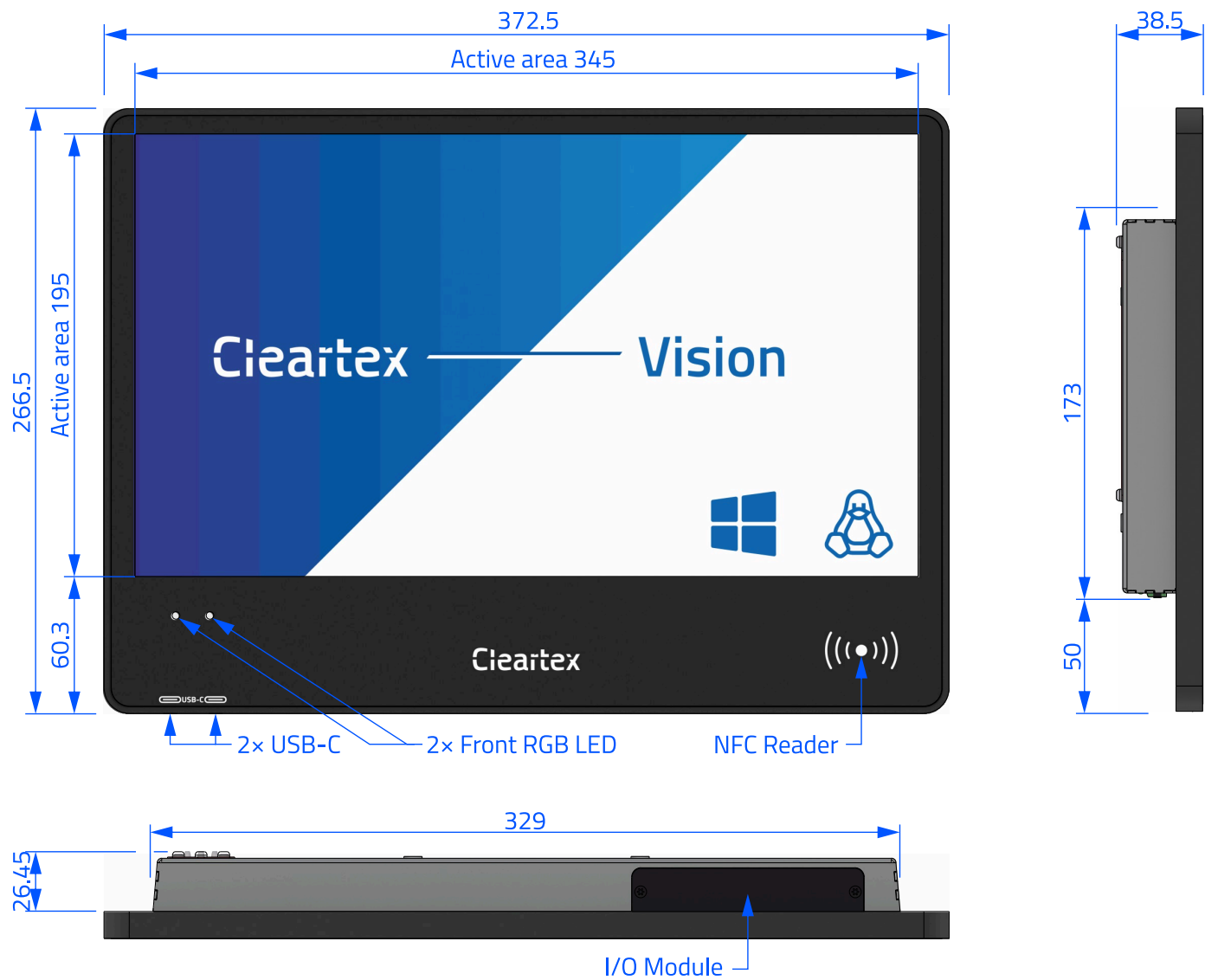


Image 7: Model 15.6" - front side drawing - passive cooling

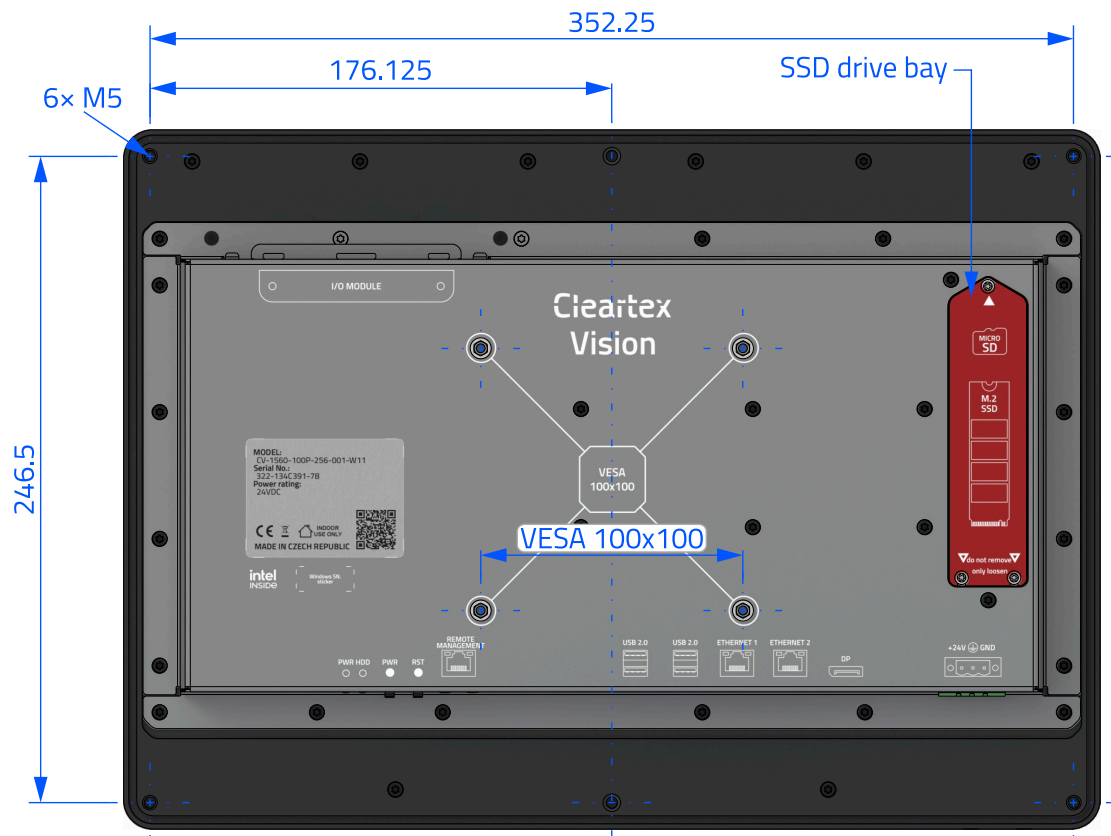


Image 8: Model 15.6" - back side drawing - passive cooling

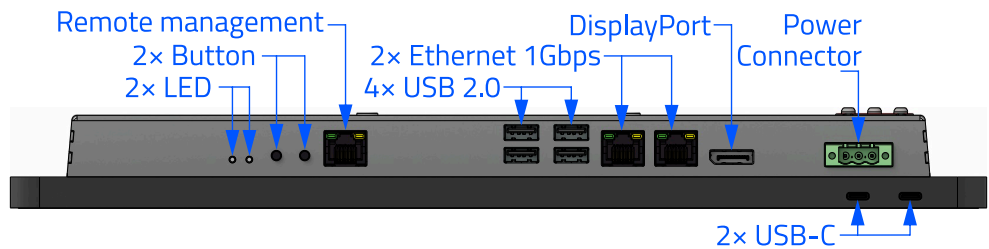


Image 9: Model 15.6" - bottom view - passive cooling

2.3.4 Model 15.6" - active cooling

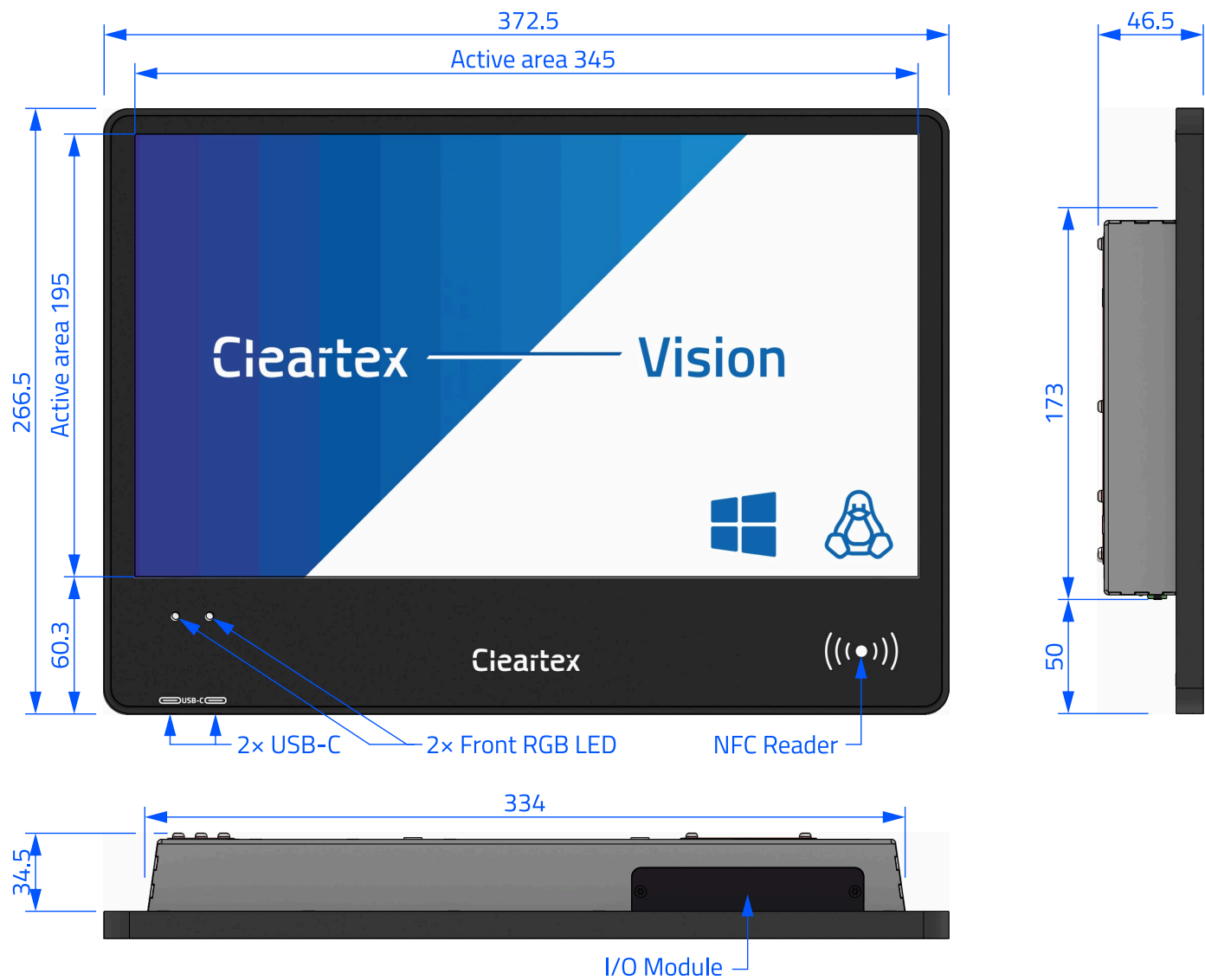


Image 10: Model 15.6" - front side drawing - active cooling

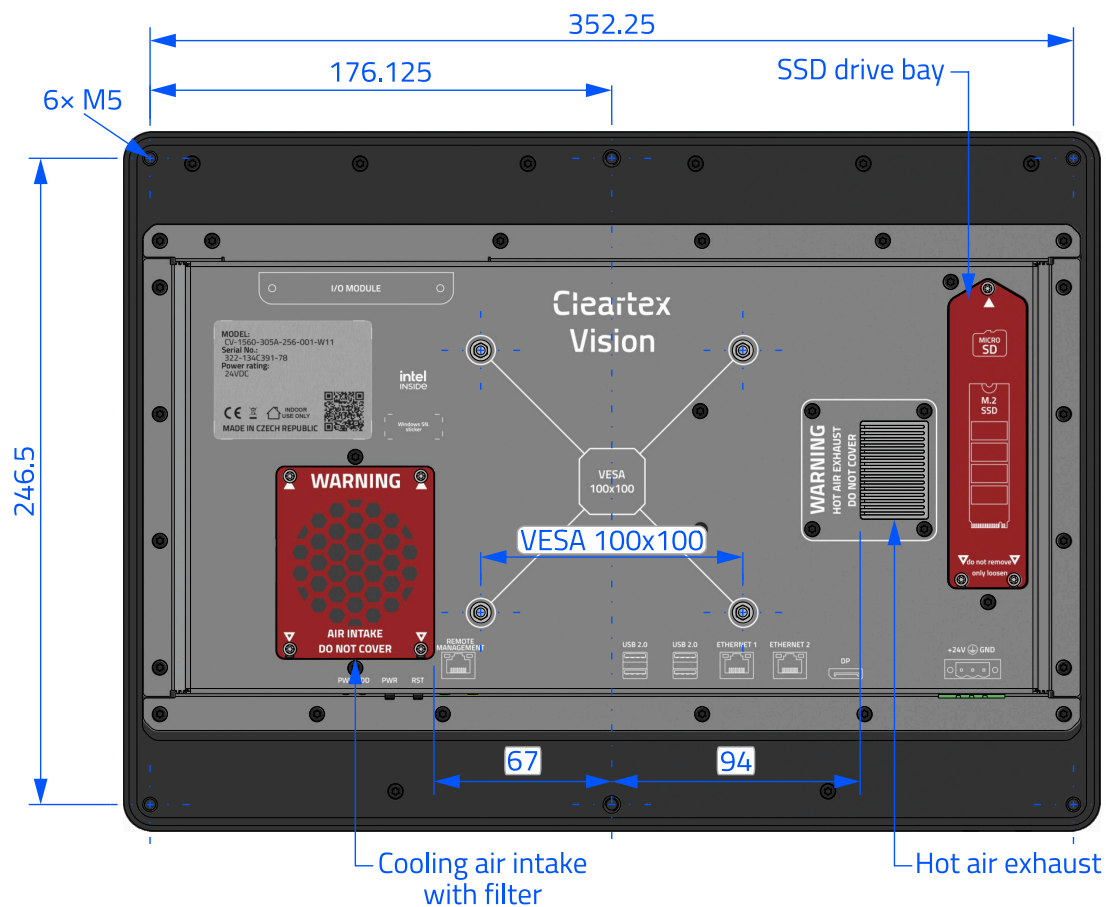


Image 11: Model 15.6" - back side drawing - active cooling

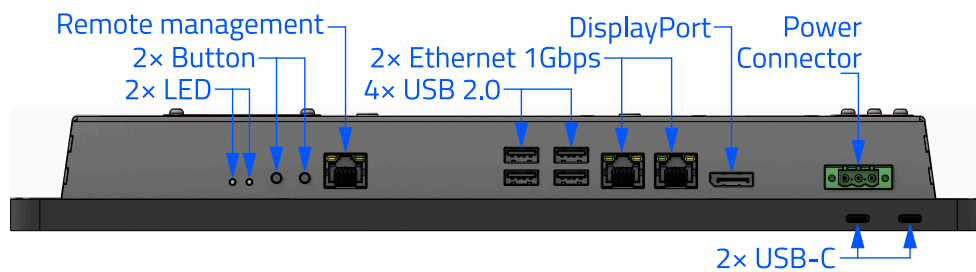


Image 12: Model 15.6" - bottom view - active cooling

2.3.5 Model 23.8" - passive cooling

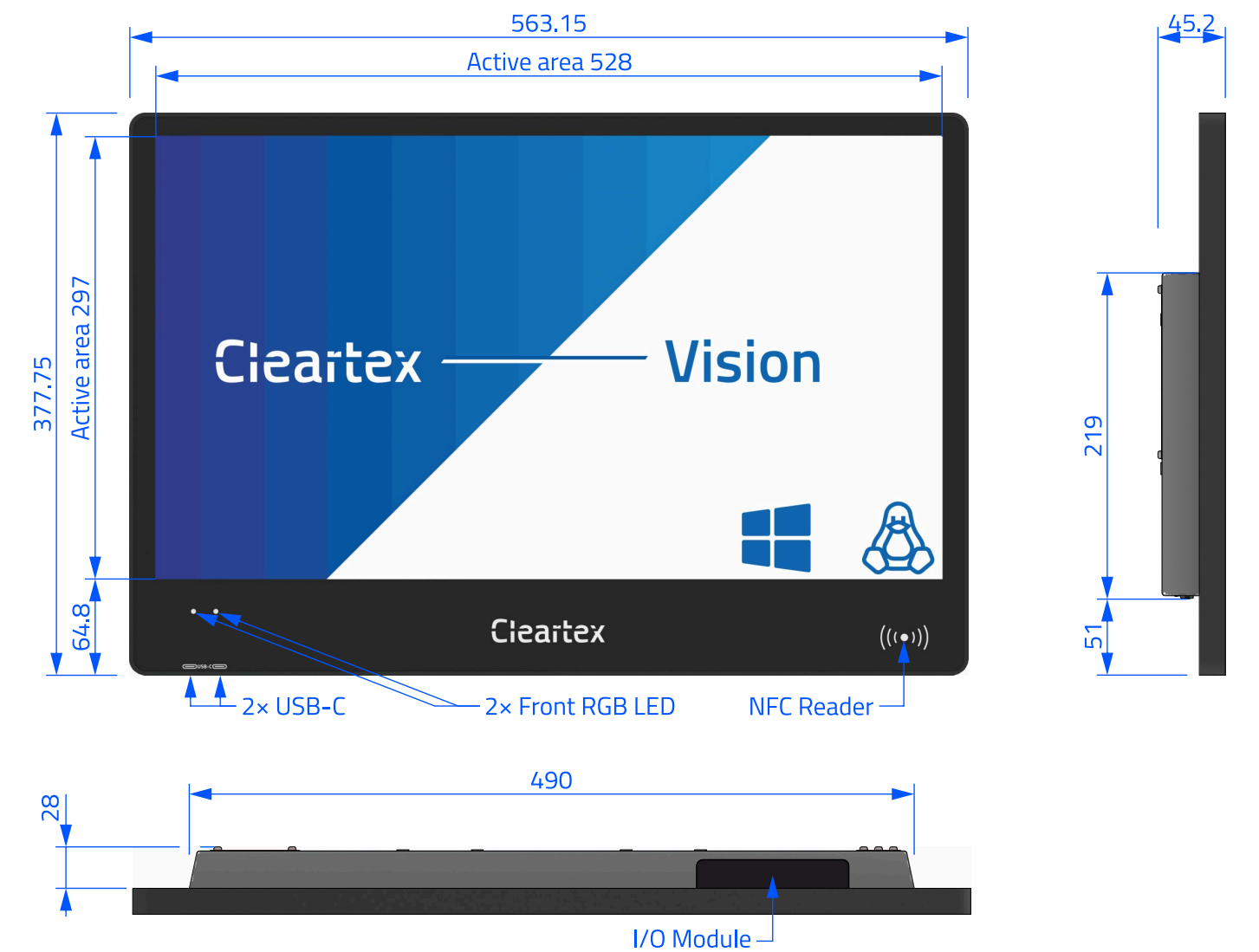


Image 13: Model 23.8" - front side drawing - passive cooling

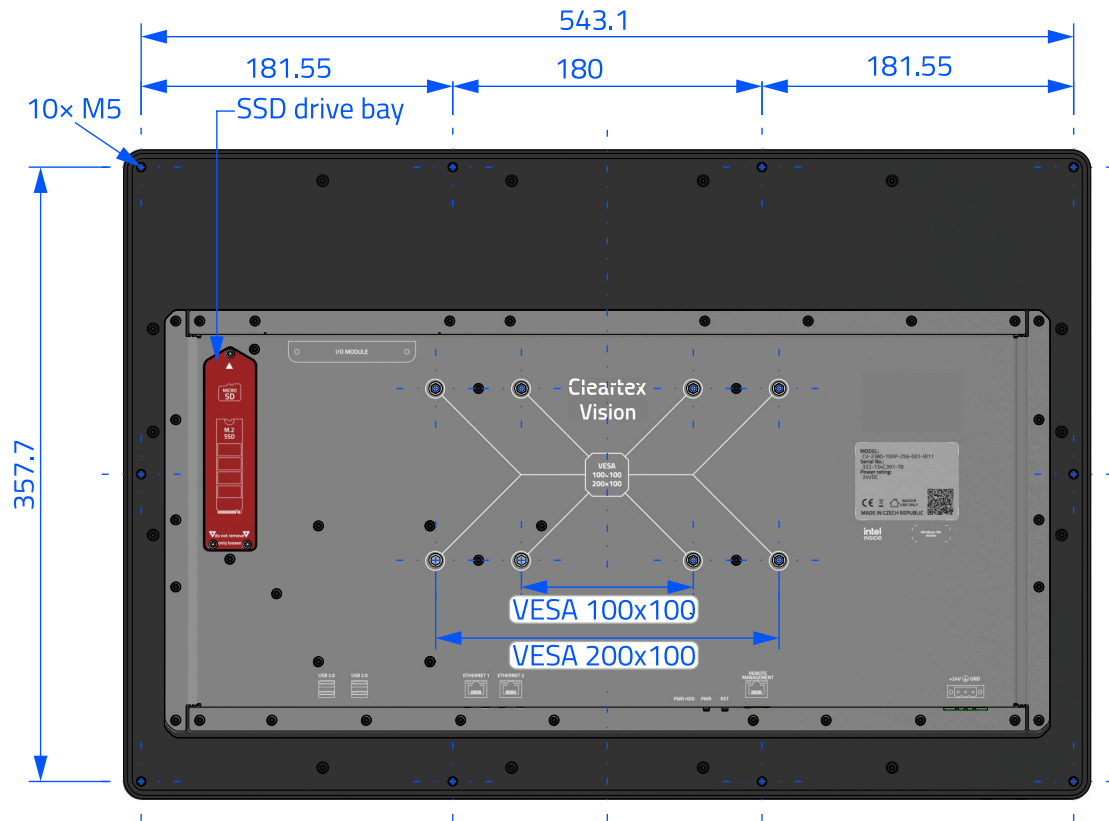


Image 14: Model 23.8" - back side drawing - passive cooling

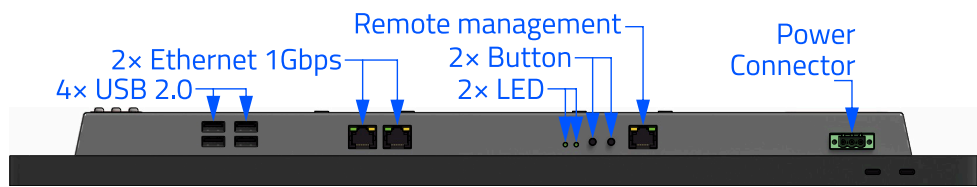


Image 15: Model 23.8" - bottom view - passive cooling

2.3.6 Model 23.8" - active cooling

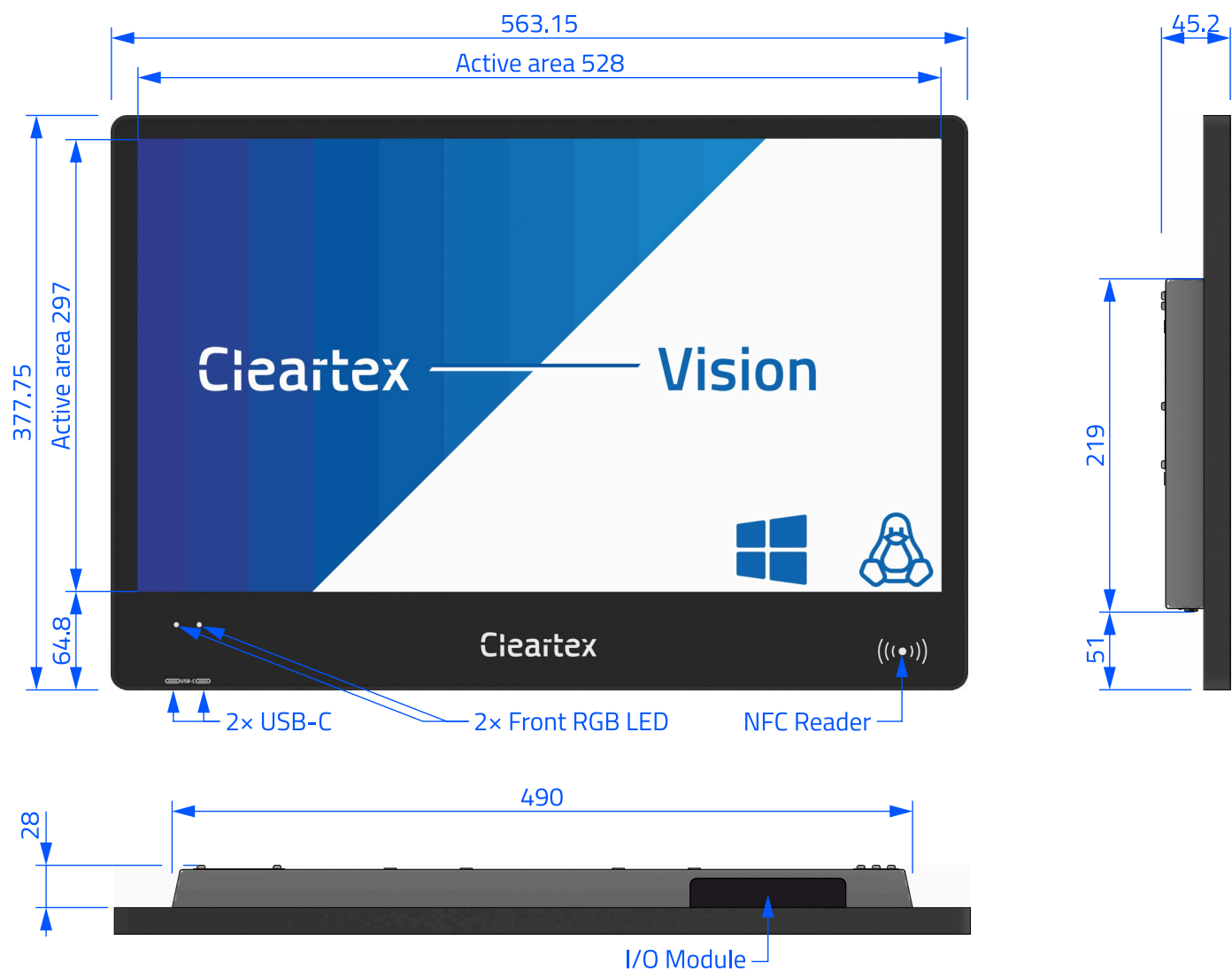


Image 16: Model 23.8" - front side drawing - active cooling

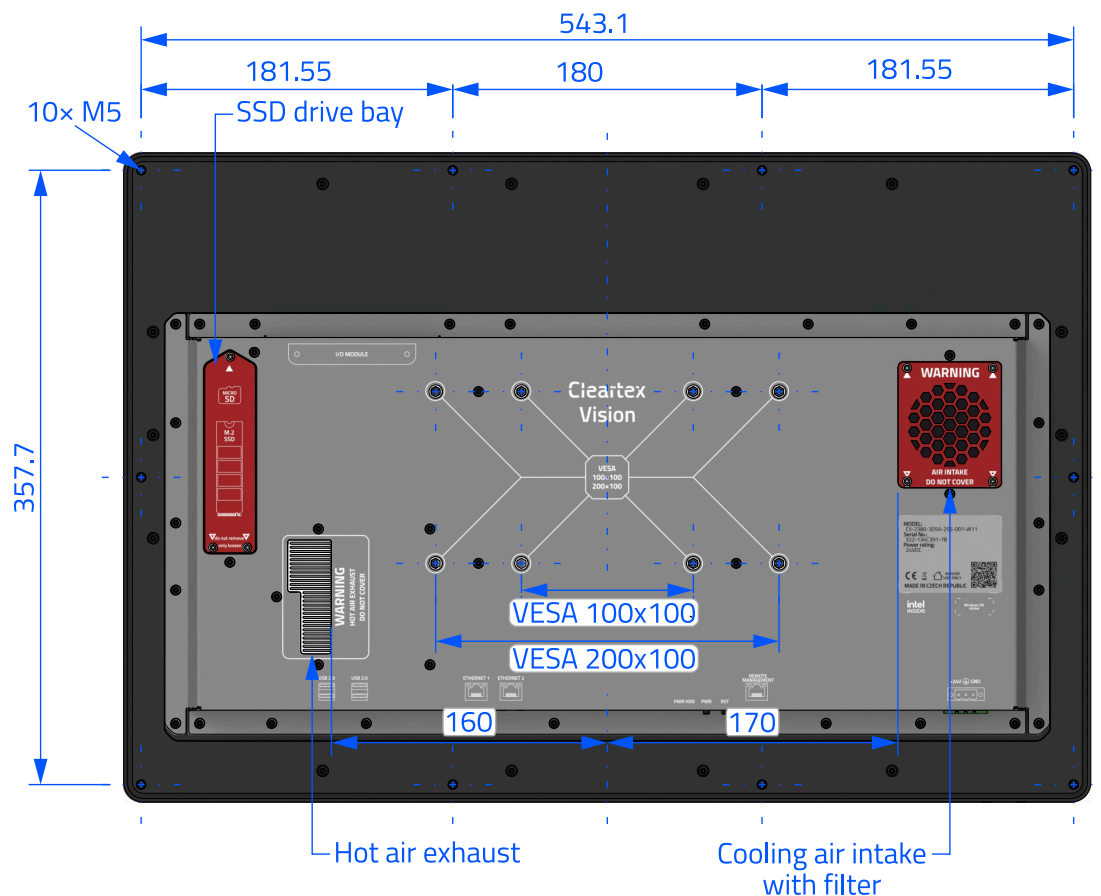


Image 17: Model 23.8" - back side drawing - active cooling

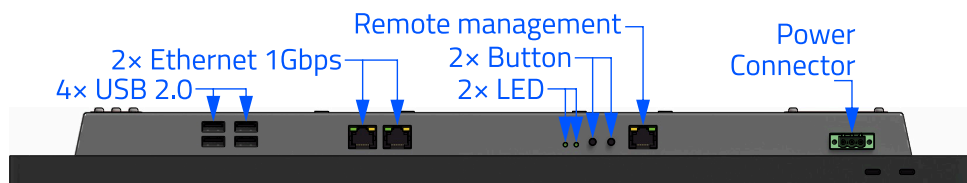


Image 18: Model 23.8" - bottom view - active cooling

2.4 Interfaces

Some interfaces are specific to panel size, refer to table below:

- number specifies quantity of given interface available
- cross sign (X) specifies interface is not available

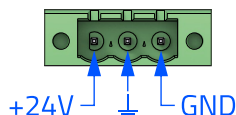
	10.1"	15.6"	23.8"
USB 3.0	2 (front side, dust and waterproof)		
USB 2.0	4 (rear side)		
Ethernet	2		
Remote management port	1		
I/O expansion slot	1		
Display port	×	1	×
Programmable LEDS	1	2	
NFC reader	×	1	

Table 4: Interfaces table

Refer to chapter [Drawings \(page 10\)](#) for exact interface layout.

2.4.1 PWR connector

PanelPC PWR Connector
Phoenix Contact
MSTB 2.5/ 3-GF-5.08



Mating Connector
Phoenix Contact
MSTB 2.5/ 3-STF-5.08

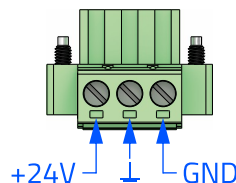


Image 19: PWR connector pinout

Power input: 12-30 VDC, mating connector Phoenix PN# 1777992

Max. power consumption: refer to corresponding table in chapter [Technical data \(page 7\)](#)

2.4.2 NFC reader

NFC reader is available on models 15.6" and 23.8" only. It is located on front side, below the display.

Supported frequency: 13.56 MHz

Tested tags: RFID MIFARE Classic 1K

Other RFID tags on frequency 13.56 Hz should work as well

2.4.3 I/O expansion slot

The slot for installing I/O expansion modules is located on the top side of the device. The modules themselves are described in a separate chapter [I/O Modules \(page 25\)](#).

2.5 Temperature/humidity

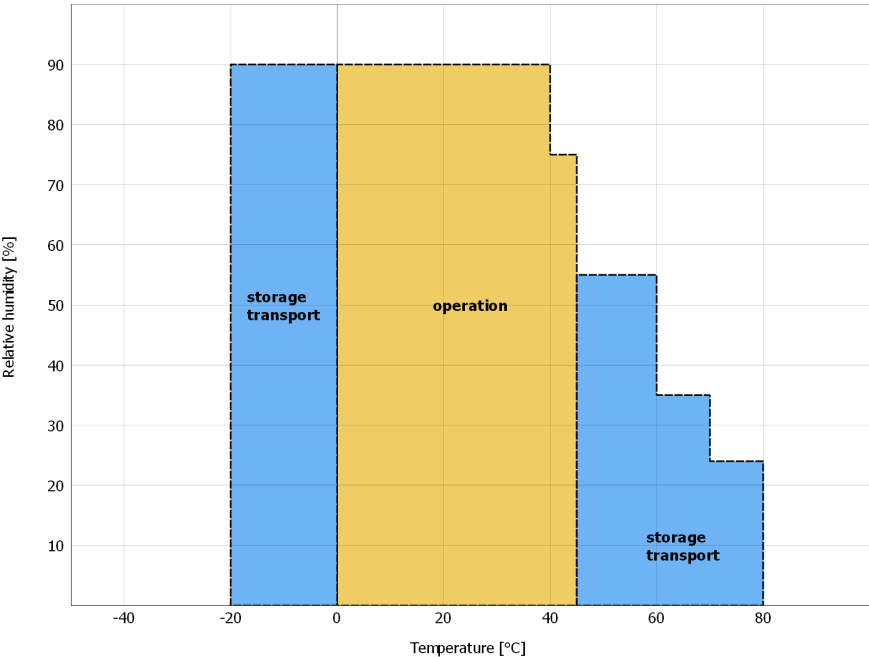


Image 20: Temperature and humidity - passive cooling models

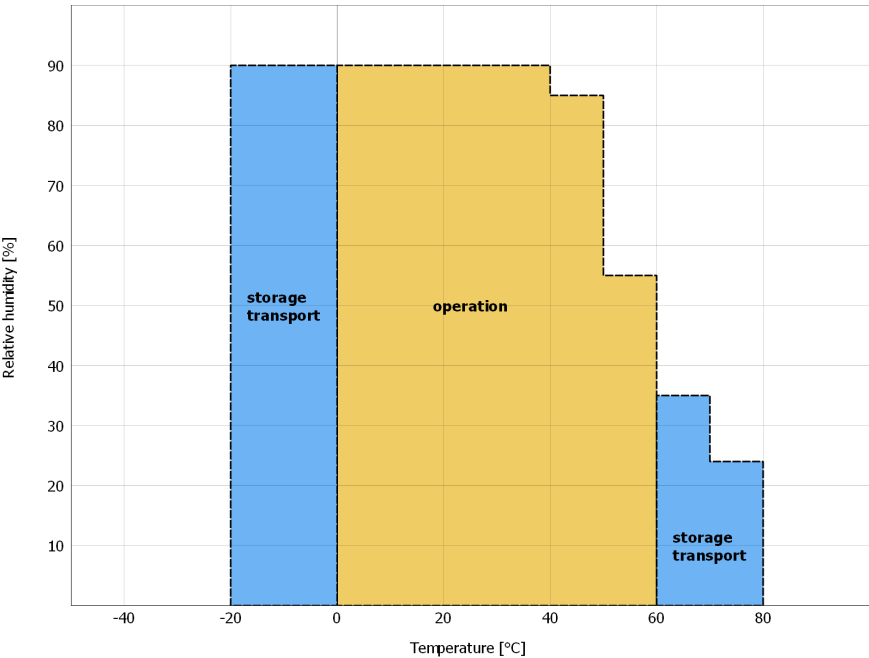


Image 21: Temperature and humidity - active cooling models

* Maximum operating temperature can be affected by installation angle. More information in chapter [Installation \(page 27\)](#).

2.6 Touch function

Panel must be used only by hand - usage of stylus and other objects is prohibited.

2.7 Surface resistance

Front glass is resistant to following chemicals for an exposure time of 24 hours without visible changes:

- Acetone
- Alkaline cleaning solutions
- Ammonia 5%
- Unleaded gasoline
- Beer
- Brake fluid
- Chlorine-alkaline cleaning and disinfecting agents (pH value min. 11) 1.5%
- Hydrogen chloride 6%
- Coca Cola
- Diesel
- Diesel oil
- Dimethylbenzene
- Vinegar
- Ethanol
- Grease
- Ammonia-based glass cleaners
- Sidolin glass cleaner
- Graphite
- Hydraulic fluid (Skydrol)
- Isopropyl
- Coffee
- Ink
- Lysol
- Methyl benzene
- Methyl ethyl ketone
- Naphtha
- Caustic soda 5%
- Nitric acid 70%
- Hydrochloric acid 5%
- Lubricants
- Sulphuric acid 40%
- Suntan oil and UV radiation
- Cooking oil
- Stamping ink
- Tea
- Turpentine
- Turpentine oil replacement (thinner)
- Trichloroethylene

3. I/O Module Options

Panel can be expanded using different modules described in this chapter. Customer modules can be developed - contact Cleartex for more information.

3.1 IO-1 (DI, DO, relays, RS485)

Module have separate power, two inputs, two outputs and two relays. The module additionally provides RS485 interface.

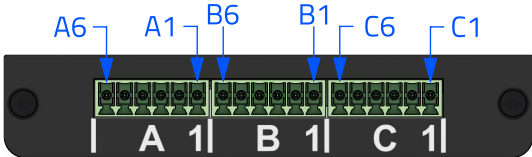


Image 22: IO-1 - inputs, outputs, relays, RS485

I/O characteristics:

- **Outputs:** 24 V, 150 mA output current, configurable as PNP, NPN or PUSH-PULL
- **Inputs:** opto-isolated, maximum voltage 24 V
- **Relays:** maximum switching voltage and current 0.3 A at 125 VAC / 1 A at 30 VDC

I/O module interface consists of three separate connectors. Connectors are marked A, B, C when viewed from back of panel.

Mating connectors: Phoenix PN# 1757051.

24V	24V_DX	OUT2	OUT1	GND_DX	GND
A6	A5	A4	A3	A2	A1
Connector A pinout					

IN2	IN1	IN_COM	NC1	COM1	NO1
B6	B5	B4	B3	B2	B1
Connector B pinout					

NC2	COM2	NO2	485_B	485_A	485_GND
C6	C5	C4	C3	C2	C1
Connector C pinout					

Table 8: Default I/O module pinout

Connector	Pin	Descripton
A	24V	Display PWR (can be uset to bypass display PWR to I/O module PWR)
	24V_DX	I/O module PWR
	OUT2, OUT1	I/O outputs
	GND_DX	I/O module GND
	GND	Display GND (can be used to bypass display GND to I/O module GND)
B	IN1, IN2	I/O inputs
	IN_COM	Inputs common
	NC1, COM1, NO1	Pins of relay 1
C	NC2, COM2, NO2	Pins of relay 2
	485_B, 485_A, 485_GND	485 communication lines

Table 9: Default I/O module pins description

3.2 IO-2 (ProfiNET, ethernet)

Module provides two ProfiNET and two 1 Gbps ethernet connectors.

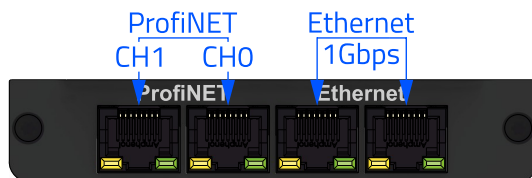


Image 23: IO-2 - profinet + ethernet

4. Installation

Panel PC can be mounted in two ways:

- Using VESA mount 100×100 (200×100 for 23.8")
- Inside cutout using four mounting holes

In case of cutout installation, following conditions must be met:

- **Maximum deviation from surface evenness:** 0.5 mm
- **Maximum roughness:** 120 μm
- **Minimum wall thickness:** 2 mm

Panel is expected to be mounted vertically. Maximum vertical tilt of panel is $\pm 25^\circ$.

! In case of higher vertical tilt or horizontal mounting, maximum operating temperature is lowered by 5 °C.

Drawings for cutout installation:

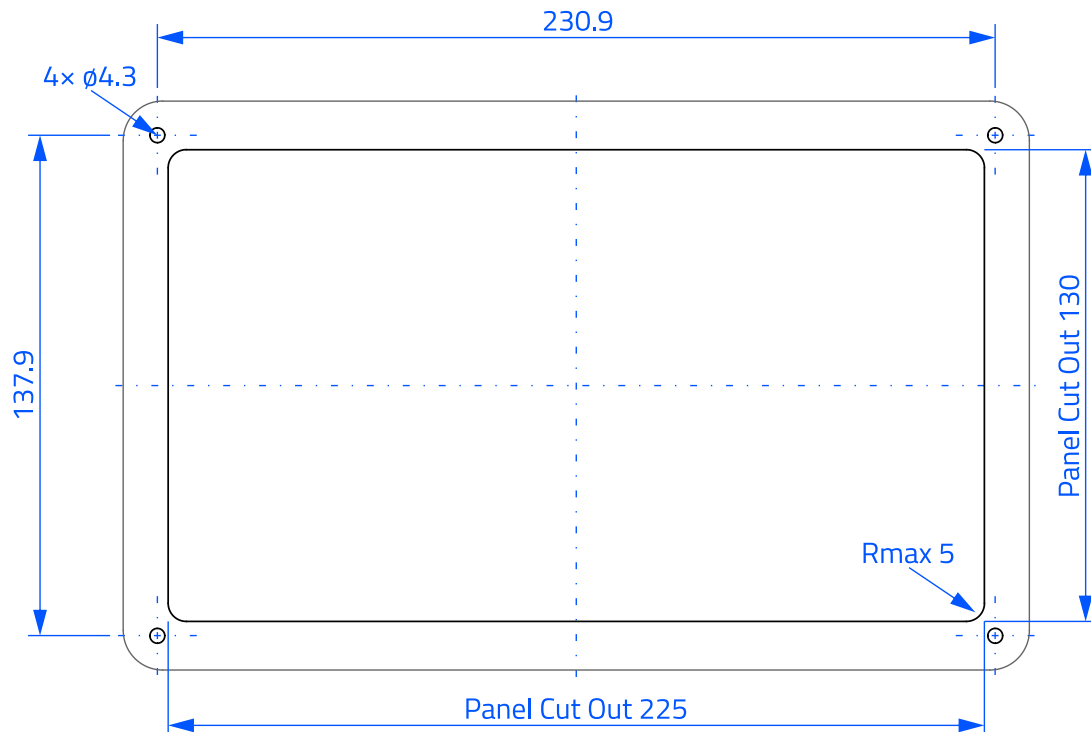


Image 24: Installation cutout drawing 10.1"

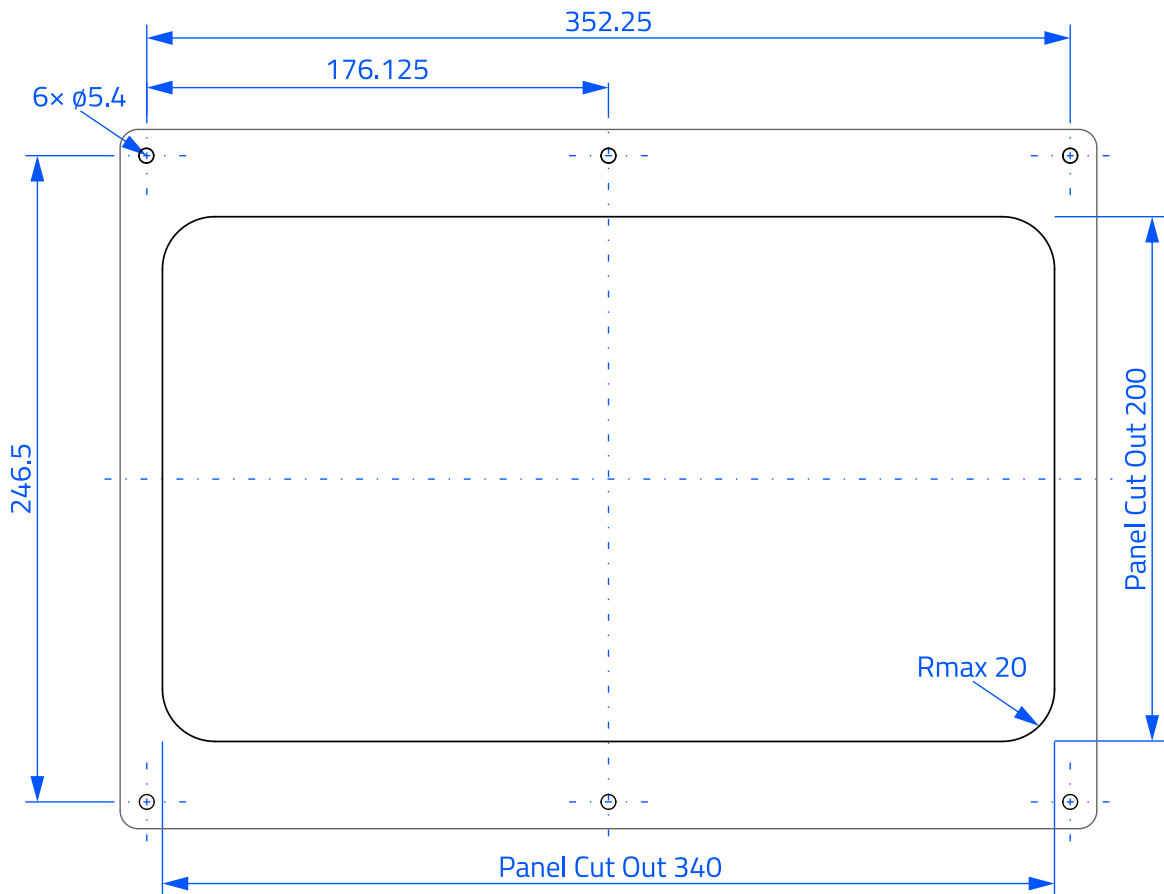


Image 25: Installation cutout drawing 15.6"

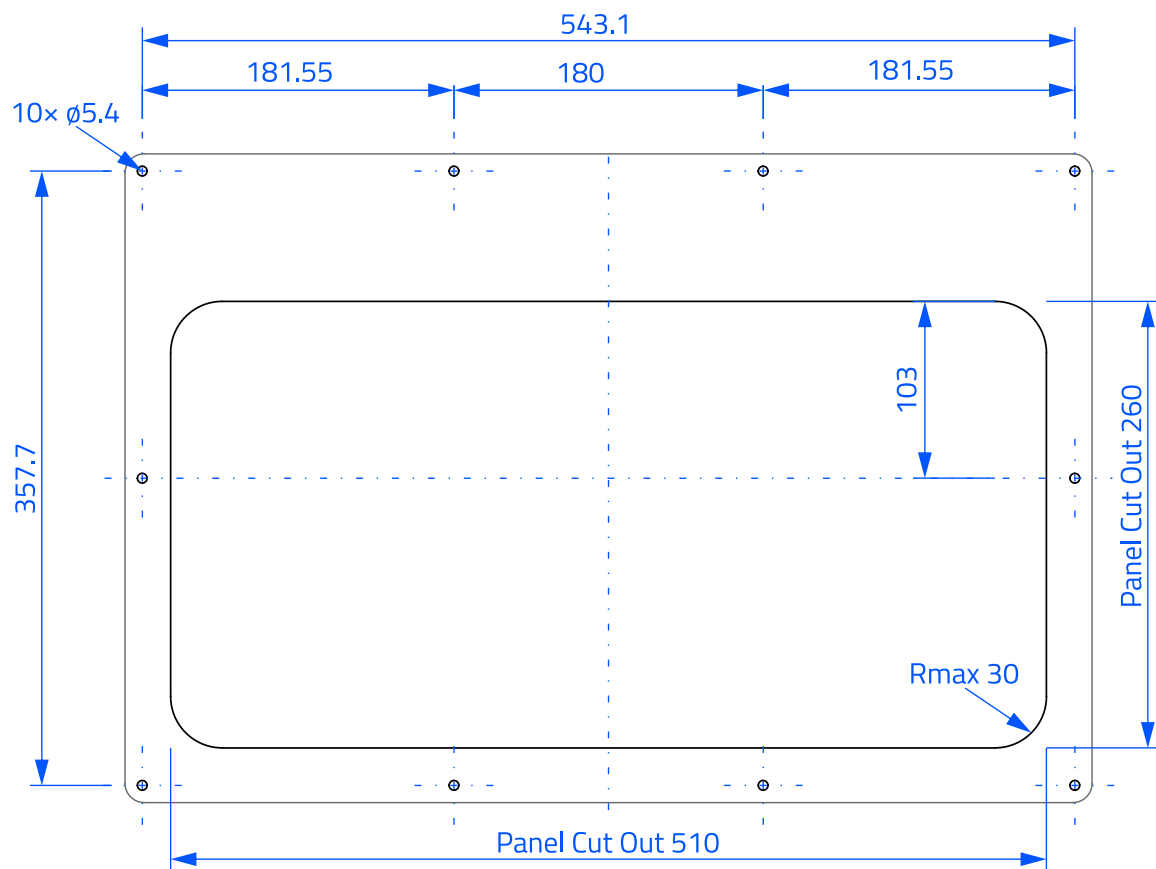


Image 26: Installation cutout drawing 23.8"

5. Communication protocols

This chapter provides the technical description and communication protocols for a device consisting of two primary components:

- Main Unit
- IO Module

5.1 Main Unit

Main unit provides following interfaces and services for communication with external and in-built devices:

- Physical Ethernet interface
- Internal serial interface for reading UID from NFC reader
- Modbus TCP server
- UDP Discovery protocol

5.1.1 Physical ethernet

Two ethernet sockets on main unit provides physical ethernet interface for connection with external networks and devices. Interfaces are displayed in network settings and support DHCP or static IP configuration.

5.1.2 Internal serial interface

The UART interface is used for communication with the in-built RFID reader. It is configured with the following settings:

- Baudrate: 115200 bps
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow Control: None

RFID UID messages are transmitted in the following format:

```
[8 HEX chars]\n
Example: 04A1B2C3\n
```

Each UID message ends with a line feed character (`\n`).

5.1.3 Modbus TCP Server

The Modbus TCP server is used for communication with the in-built RFID reader and reading main unit device information. Implemented functions are 0x3 and 0x6 from protocol definition: <https://www.modbus.org/file/secure/modbusprotocolspecification.pdf>.

- IP: dynamic, according to network configuration
- Port: 502
- Slave Address: 1

! Address used in the tables is physical address on the bus.

Read-only registers (function 0x3)		
Address	Name	Description
40100	Firmware Version	Upper byte: Major, Lower byte: Minor (e.g., 0x0102 = v1.2)
40101	Build Number	Build number of the current firmware (decimal)
40200	RFID UID Low	Lower 16 bits of last UID read
40201	RFID UID High	Upper 16 bits of last UID read
40202	RFID Detect Timestamp Low	Lower 16 bits of detection timestamp
40203	RFID Detect Timestamp High	Upper 16 bits of detection timestamp
40204	RFID Status	0 = Idle, 1 = Reading, 2 = Error

Table 10: Main Unit Read-only Modbus TCP Registers

Writable registers (function 0x6)		
Address	Name	Description
40001	IO Outputs	Reserved
40102	Boot Mode	0 = Application, 1 = Bootloader, 0xA5A1 triggers DFU mode
40300	System Led Global Intensity	0 - 100 [%]
40301	User Led Global Intensity	0 - 100 [%]
40302	User Led Red Level	0 - 255
40303	User Led Green Level	0 - 255
40304	User Led Blue Level	0 - 255

Table 11: Main Unit Writable Modbus TCP Registers

Example of RFID UID readout using mbpoll tool

Tool used: <https://github.com/epsilon-rt/mbpoll>

Low part: `mbpoll -m tcp 10.1.1.10 -a 1 -r 40200 -c 1`

High part: `mbpoll -m tcp 10.1.1.10 -a 1 -r 40201 -c 1`

5.1.4 UDP Discovery Protocol

Discovery Protocol enables device discovery over the network using an XML-based message. The device periodically broadcasts message in following format over UDP:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
  <zeroconf version="1.0">
    <device type="C006_0600_1.0.0"
      mac="xx:xx:xx:xx:xx:xx"
      serial="SERIAL_NUMBER"
      userstring="USER_STRING"
      firmware="FW_VER"
      mode="bootloader">
      <ip version="4"
        address="192.168.0.2"
        netmask="255.255.255.0"
        gateway="192.168.0.1" />
      <protocols>
        <protocol type="ETHIO" port="6008"/>
        <protocol type="TFTP_FWIMG" port="69"/>
      </protocols>
    </device>
  </zeroconf>
```

5.2 IO-1 module

The IO Module provides additional IO interfaces and acts as a Modbus TCP server.

Modbus TCP Server properties:

- Static IP: 192.168.200.1
- Port: 502
- Slave Address: 1

Address	Name	Description	Read/write
40001	Output Status	Bit 0: Digital Out 1, Bit 1: Digital Out 2, Bit 2: Relay 1, Bit 3: Relay 2	Read/write
40002	Input Status	Bit 0: Input 1, Bit 1: Input 2	Read

Table 12: IO-1 Module Modbus TCP Registers

6. Directives and declarations

6.1 CE marking

All directives applicable to the respective product and their harmonized EN standards are met.



6.2 EMC Directive

Requirements of EMC Directive 2014/30/EU are met:

- EN 61131-2:2007** Programmable controllers - Part 2: Equipment requirements and tests
- EN 61000-6-2:2005 + AC:2005** Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
- EN 61000-6-4:2007 + A1:2011** Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

7. Ordering

Example ordering number:
CV-1560-N100P-256-001-W11

Breakdown:

