



Embedded SBCs & HMIs

2018/2019



SOLUTIONS THAT COMPLETE!

GARZ  **FRICKE**

Full Featured Embedded Systems

	Size of RAM and Flash memory		CPU architecture class and clockrate		2D/3D graphics acceleration		Support for video en-/decoding
	Display size		Wide viewing angle		High brightness		TTL display interface
	LVDS display interface		Dual channel LVDS		HDMI interface (Full HD)		Resistive touch technology
	PCAP touch technology		Ambient light sensor		Ideal for Outdoor		
	PCIe		WiFi Bluetooth		LTE 4G		GPS
	Various audio interfaces		SD card		Micro SD card		USB host and OTG
	Serial RS-232, debug		Multi Drop Bus		SPI and/or I ² C		Digital and/or analogue inputs and outputs
	RS-485		Ethernet		CAN bus		
	Windows Embedded Compact		Linux Yocto		Android		

Interfaces are described on each product page

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About Garz & Fricke

Our offer and our history



A good product must be fun for both sides:
the manufacturer and the customer

Manfred Garz, founder

We are organized as two business units which jointly share our resources:



Embedded Systems

Our range extends from typical single components and modules to ARM-based microcomputer systems and seamlessly integrated HMI systems. We develop our complete solutions with electronics, software and enclosures, either cost-effectively by adapting and modifying a standard solution or from scratch in line with a customer request.

At Garz & Fricke all our R&D resources, technical staff and customer service personnel are located on site in our modern facilities in Hamburg. We support our customers from the design stage of the specification, via prototyping and mass production, through customer service. This is how we can achieve short processing times without compromising the highest quality standards.

Garz & Fricke

We are a medium-sized company established in 1992. We design, develop and manufacture microelectronics exclusively at our home base in Hamburg. Our customers are OEMs and system integrators, mainly from the medical, automation, professional kitchen equipment, mobile computing, security, measurement and control, transport and naval industries, all of whom appreciate our high level of vertical integration. To us "Made in Germany" does not only mean a local integration of end products, but our own design and production of the entire electronics solution on one site - from the first concept through to the final mass production.

Cloud-based Smart Vending

How can you deliver your products in a cost-effective manner to your customers?

Smart Vending machines are nothing new. But what really is new is a user-friendly and engaging experience with touchscreens up to 32", which are intelligent enough to optimize all logistics processes and thus cut operational costs. Smart energy management, unified interfaces for service technician and user together with highly sophisticated software all help to further reduce costs, especially for larger machine installations. A wide range of banknote readers and coin changers is available to meet almost all the payment needs of your smart vending solution. Our cloud-based telemetry platform - e.g. for predictive maintenance or filling level information - created this IoT application even before the term IoT was first coined.

Our VISION

- We aim to become the European market leader for ARM-based HMI systems by 2020.

Our MISSION

- We make our customers happy and satisfy their current and future needs by using our extensive know-how and experience to offer complete solutions from a single source: products of the highest quality at competitive prices, which we design, develop and manufacture ourselves.
- This is what makes us an innovative and reliable partner for our customers.

Our RESPONSIBILITY

- We see ourselves as a company committed to our employees, customers, and shareholders but also to our environment and society. We are a multicultural, equal-opportunity and non-discriminatory company.
- Our principles are transparency and honesty, as well as a respectful interaction with each other both inside and outside the company.

The founders: Engineers driven by passion

In 1992 Manfred Garz and Matthias Fricke, who were Electrical Engineering students at Braunschweig in Germany, founded the company Garz & Fricke. Their first office was exactly 86 m² and included a production room at the hit-Technopark in Hamburg. Today, Garz & Fricke GmbH employ more than 130 people in a modern facility over an area of more than 3,000 m².

■ Reliable
■ Quality
■ Made in Germany

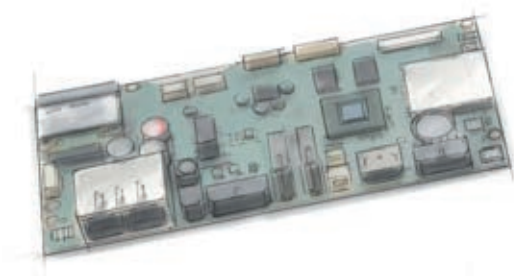


Our Product Form Factors

Select the product that fits perfectly

Single Board Computers

Focus on your application and core know-how! The use of our turnkey pre-integrated embedded computer systems minimizes development risks and saves time, money and headaches.



Avoid unnecessary stress and take advantage of our experience and highly scalable platform concept with our unified software distribution concept. We integrate the standard operating systems Linux, Android or Windows Embedded Compact for you so that they are "application-ready". This saves you having to worry about operating systems, drivers or libraries. Instead, you can focus your resources entirely on your application. Our systems are reliable as well as durable, and we proudly manufacture them in Germany ourselves to meet the highest quality standards.

Rear Mount HMIs

To enable a simple installation into your device, we offer our single board computers for HMI applications as matched turnkey systems including touch display and housing. The Rear Mount HMI is installed from the inside of the front panel and easily fastened with screws. We will be glad to advise you on the selection of suitable sealings or scratch-resistant cover foils.



Panel Mount HMIs

To enable easy panel mount integration into your device, we offer our HMI applications as matched turnkey systems in this design too.



The Panel Mount HMI is installed from the front into a cutout in the front of your housing. The system as a whole can then be fixed with screws from the inside or with clamping screws against the front panel. This design type features extreme robustness and is particularly suitable for quick installation into control panels or consoles. It is also easy to mount as it can stand larger cut tolerances. Pre-assembled seals allow high IP protection classes without any great effort. On request, cover glass or foil can be individually printed to the customer's needs.

Brand new!



Wall Mount HMIs

The Garz & Fricke HMI systems of the Wall Mount family are the perfect base for all centralized operating or visualization requirements of different kinds of building automation and management applications. In contrast to our other HMI families, these wall mount HMIs typically are installed separately from a central unit that runs the application and can even be easily integrated retrospectively. Various wired and wireless communication standards can be integrated for communication with these central units.

Flush Mount HMIs

When an HMI with a homogeneous glass and/or plastic front and many décor options is required, our systems in Flush Mount design are the perfect solution. They allow completely seamless or even flush integration into the housing of your application. The assembly is carried out from the front into a cutout of the surface. The fastening can be performed individually, according to the overall concept of the device inside.



DIN-Rail

Some of our turnkey pre-integrated single board computers can also be purchased "boxed" in a rugged housing for DIN Rail mounting. This saves you time and money and avoids development risks and unnecessary stress.

Take advantage of our experience and our highly scalable platform concept with uniform software distribution! We integrate the standard operating systems Linux, Android or Windows for you so that they are "application-ready". This saves you having to worry about operating systems, drivers or libraries and you can focus your resources entirely on the applications.

The New Wall Mount Series

Central wall-mounted control systems for your application

By virtue of their very elegant front and rear design, the Garz & Fricke Wall Mount HMIs blend perfectly and seamlessly with the overall architecture of every room. Energy-efficient components help to keep power consumption very low and minimize heat dissipation issues. This allows a slim HMI design with no moving parts, such as cooler fans, and contributes to a pleasant and efficient working atmosphere!

The Wall Mount series HMIs are packed with technological features:

- Power over Ethernet (PoE)
- Proximity and ambient light sensor for energy-saving operation
- Microphone and speaker (e.g. for intercom application)
- Expansion slot (with mPCIe and USB interface, e.g. for WIFI, Bluetooth, KNX etc.)
- The optical bonded touch display offers excellent readability even in surroundings with bright sunlight

More details on page 126/127.

Our HMI systems are able to operate applications perfectly. Some examples are provided below.

Building automation

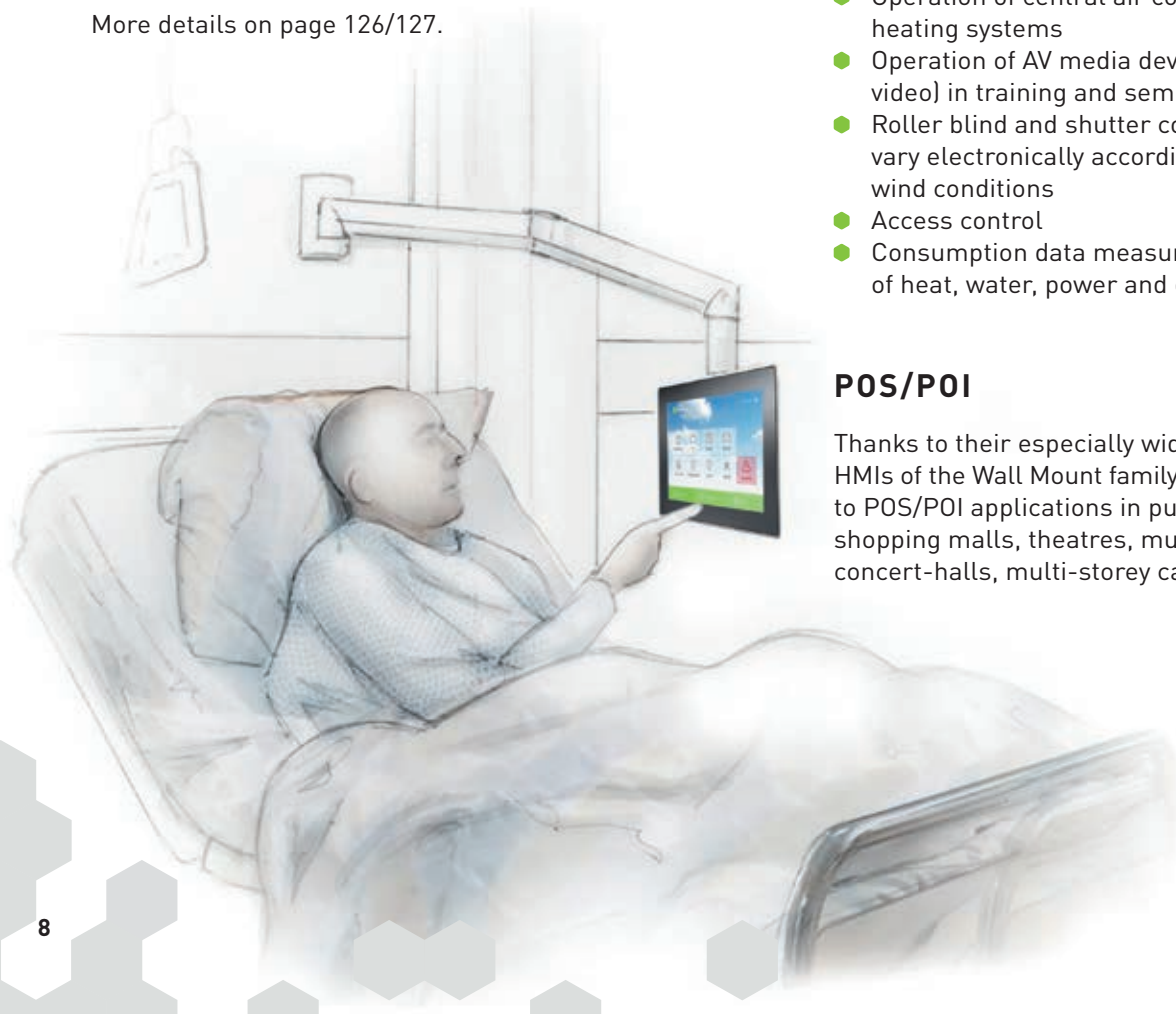
The SANVITO Wall Mount HMIs are a perfect fit for typical building automation applications such as HVAC (Heating, Ventilation and Air Conditioning), conference room and meeting space management as well as light regulation.

Self-explanatory icons on high-brightness touch-displays with personalized user guidance or process-orientated menus are just a few of the requirements that can be solved easily by this state-of-the-art and highly flexible HMI platform. The following are examples of building automation systems that can be controlled efficiently:

- Time-controlled and/ or motion-triggered light switching and dimming, as well as complete light presets or scenarios
- Operation of central air conditioning and heating systems
- Operation of AV media devices (audio and video) in training and seminar rooms
- Roller blind and shutter control systems that vary electronically according to sunlight and/or wind conditions
- Access control
- Consumption data measurement and charting of heat, water, power and gas meters

POS/POI

Thanks to their especially wide viewing-angle, the HMIs of the Wall Mount family are perfectly suited to POS/POI applications in public buildings, shopping malls, theatres, multiplex-cinemas, concert-halls, multi-storey car parks, etc.



10.1" Version
Available
Q4/2018



Hospitals and laboratories

The Wall Mount family of HMIs is particularly suited to hygienically sensitive ecosystems, such as hospitals (e.g. patient terminals) or clinical/diagnostic laboratories because the glass front of the HMI can be easily disinfected. The even, smooth and gap-free surface of the housing is resistant to disinfectants and dust and makes the cleaning of the front side very simple and effective.

The optional VESA mounting permits easy installation of a movable holding-arm (e.g. for hospital trolleys).



SANVITO
Wall Mount HMI

Our Services

What you can expect from us

Your Design



Product Design

- Proof of concept prototype
- Customer development & feedback
- Wireframes
- Realistic prototype

Hardware Development

- Hardware design analysis
- Selection of components
- Circuit diagram development
- PCB Layout
- FPGA/VHDL design
- Signal & power integrity analysis
- Building and testing of prototypes



Consulting

- Research
- System level design
- Key technology research
- Product specification and acceptance test criteria
- Visualizations and mock ups
- Project management

Mechanical Design

- CAD drafting
- 3D modelling
- Simulation and analysis
- Iterating 3D model
- Simulation and analysis
- Final design
- Prototyping & testing

Software Development

- System analysis
- Bootload development
- Board support package adaption
- Device driver development
- Track support and change management

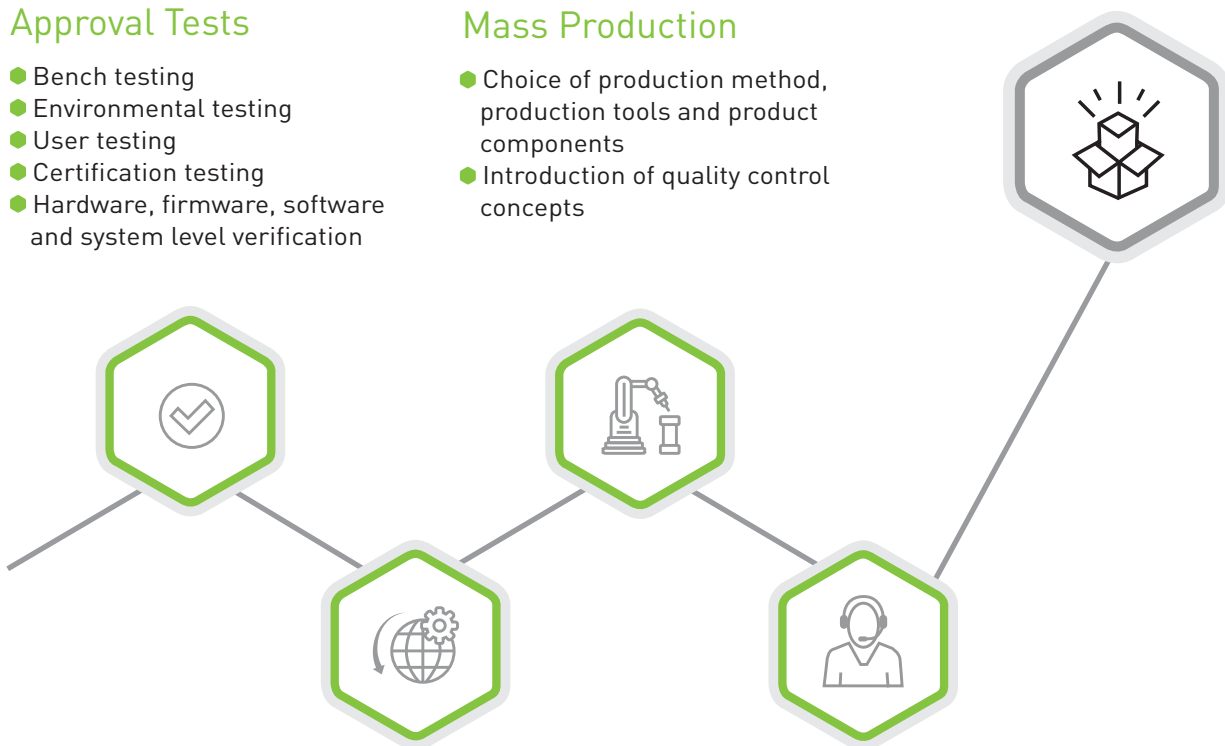
Your Product

Approval Tests

- Bench testing
- Environmental testing
- User testing
- Certification testing
- Hardware, firmware, software and system level verification

Mass Production

- Choice of production method, production tools and product components
- Introduction of quality control concepts



Pre-Production & Sourcing

- BOM optimization
- Packaging development
- Supply chain development
- Pre-production manufacturing
- Industrial design tooling

After Sales Support

- Ongoing product support
- Product lifecycle mapping
- Product modifications

Garz & Fricke Product Longevity

Our Embedded Lifecycle Management

In contrast to consumer-orientated IT hardware, we guarantee our customers long-term availability for our embedded products (typically 10 years and more) in terms of mechanical, electrical and functional compatibility. This is accompanied by appropriate lifecycle management.

If a component change is inevitable, e.g. due to the announcement of discontinuation by a supplier at short notice, we will inform you by a Product Change Notification (PCN). This includes information as to whether your application might be affected in any way by the usage of the selected replacement component.

Prototype programme

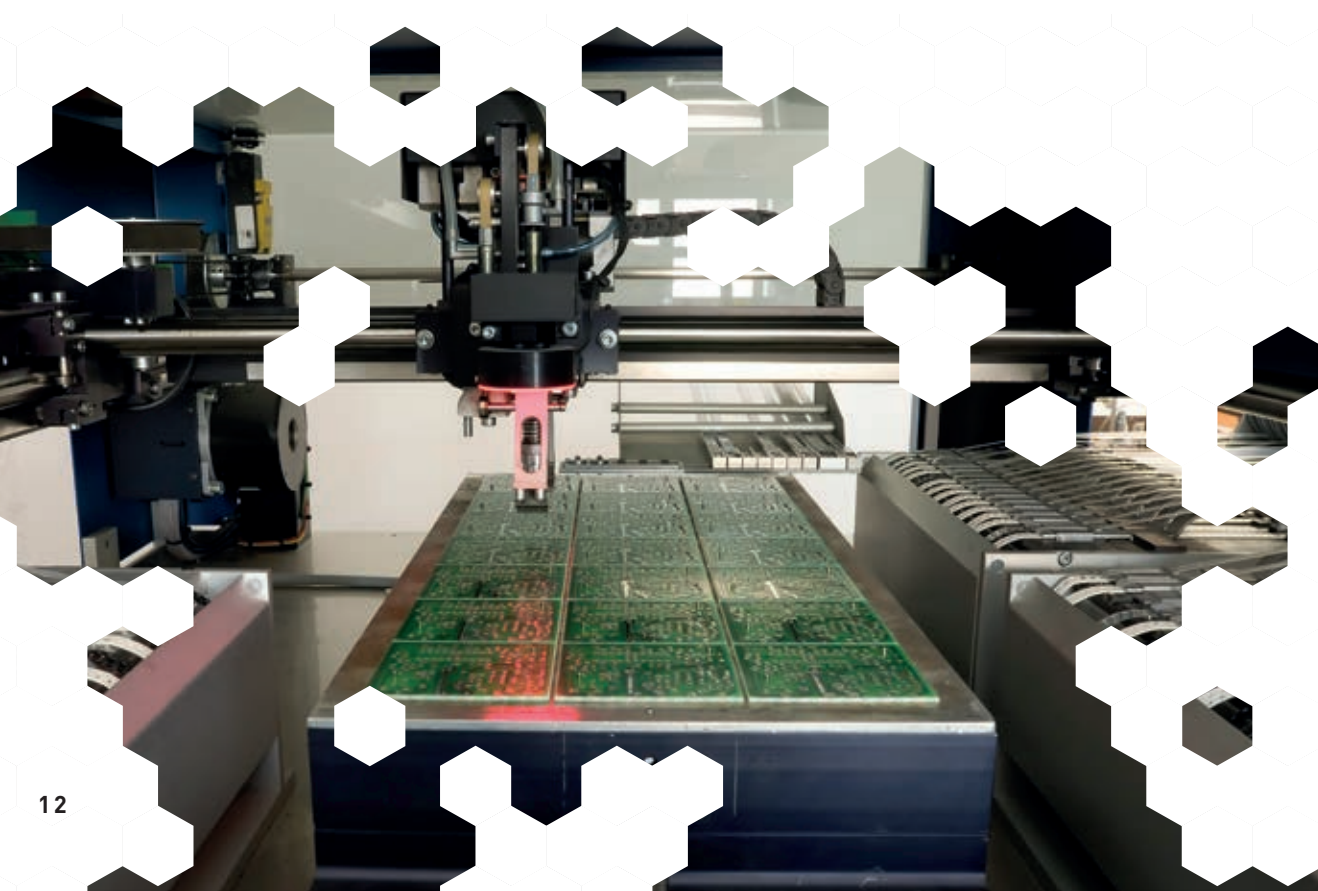
This means that, shortly after the announcement of a new product or system, we start the prototype programme to allow you the earliest possible design-in with full technical support from our side.

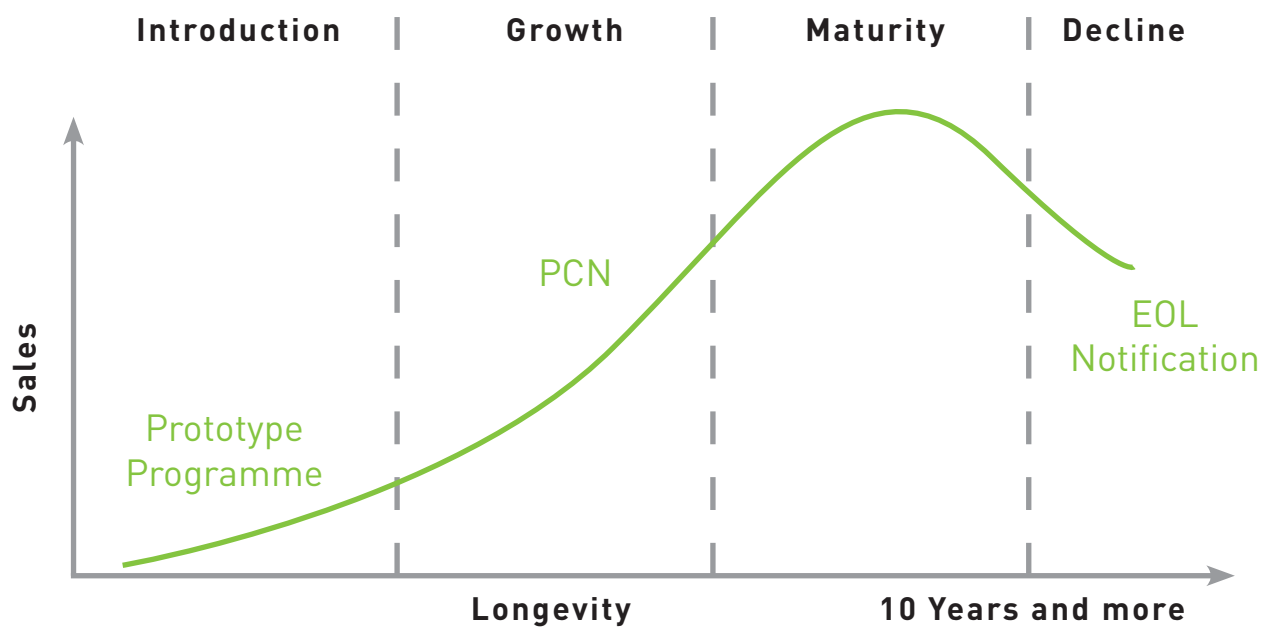
Product Change Notification (PCN)

Garz & Fricke products have been manufactured reliably and in consistently high quality for many years. During the development process of new products, we set a risk class for each relevant component and define appropriate measures to ensure the long-term procurement without any changes to the components over the full lifetime of a product.

End of Life Notification (EOL)

When a standard product has reached the end of its lifecycle and the production is to be stopped, we inform the affected customers by e-mail six months in advance to give them the chance of a definite Last Time Buy (LTB) placement and to start the design-in of the recommended replacement product. Garz & Fricke collect the incoming orders and produce the final batches. Another twelve months later, the Last Time Delivery (LTD) period ends. Special extended lifetime agreements for customized systems can be negotiated.





Our Vertical Markets

Garz & Fricke HMI's are designed for



Energy

Long-lasting and robust with scalable performance.



Building Security

Highest standards of availability, safety and security under all working conditions.



Digital Signage

User-friendly and robust with random scalability.



Industrial Automation

Long-lasting and reliable with widely scalable performance.



Transportation

Highest demands for robustness, reliability and availability. Must withstand toughest environments



Catering Equipment

User-friendly and robust to fulfil highest demands.



Vending Machines

Rugged and flexible for use with all kinds of items.



Tobacco Vending Machines

Proven and innovative featuring latest technology.



Kiosk POS

User-friendly and robust; flexibly configurable to meet individual demands.



Med/ Lab Equipment

User-friendly with wide scalability and certified safety.



Solutions for every Industry

At Garz & Fricke we combine creativity with experience. We are capable of designing and manufacturing almost everything ourselves. This enables us to always find the perfect solution for you – no matter what business you are in or what challenge you face. This solution can be cost-efficient and based on standards or individually tailored to your specific demands.

Integrated electronics and software development: Illustrated by BSN medical GmbH's "Curasul®" Therapeutic Unit

Modern high-tech-based wound care expedites the recovery from illnesses and injuries which had complicated and lengthy healing processes until very recently. At the same time, this places special demands on the technology employed. Tailored solutions based on standard components from display and microcontroller specialists Garz & Fricke assist implementation – as can be seen in the example of the Curasul® therapeutic unit for negative pressure wound therapy (NPWT) by BSN medical.

BSN Curasul® is a system to heal wounds, a joint device development from CogniMed GmbH and BSN medical GmbH, following the specifications of BSN medical GmbH's client. The device was developed for clinical use as well as domestic care and nursing

One of the key demands was that the HMI should be capable of displaying state-of-the-art graphics and also supply a modern user interface. It was also required to offer fast response times and uncomplicated programming.



Customer Quote:

"The constructive collaboration at the beginning proved to be very fruitful, offering great benefits. Garz & Fricke pointed out potential difficulties to us, which could in turn be overcome right away."

Holger Panier, CogniMed

Key factors for success

- Special technology offers mobility
- Selecting the right "touch" for the right display
- Specially modified LINUX
- Saving energy by deep-sleep implementation
- Extensive documentation for an easy approval
- Reliable hardware development, also in EMC



Learn more about this and other successful customer projects on our website at "Support & Resources".

Embedded Systems Navigator

Variety of Garz & Fricke Form Factors



Performance

In the last ten years the performance of ARM-based CPUs has improved significantly. In 2008, a clock rate of 400 MHz was standard and today, we use Cortex-A9 CPUs with up to four cores of 1 GHz each. The bandwidth ranges from single and dual core up to quad core versions of the i.MX6.

In direct correlation with the CPU performance, graphics features such as 3D acceleration, video playback and full HD support have to be considered as well as the memory size of RAM and flash.

As a result of today's design orientation, sliding and rotating GUI elements, shades and transparency effects have become standard and require a matching graphical computing power. An absence of this could easily make your application look very outdated.

But this is only half the story: sophisticated databases, security features and IoT functionality are demanded as well as the GUI. Last but not least, the selected operating system has a strong influence on the required performance

For all your needs, we offer reasonable embedded systems scaled from ARM9 with 400 MHz up to 1 GHz Quadcore Cortex-A9 CPU.

Display size

The selection process of the matching display is driven by several key factors. At the top of the wish list, there are requirements regarding the size, temperature range, brightness, wide viewing angle and resolution. On the other hand, there are limitations on the mechanical dimensions and the available budget. In our standard product range, we always achieve a good compromise between the most popular requirements.

Garz & Fricke offer HMIs starting with 4.3" displays and a resolution of 480 x 272 pixels up to 19.0" with 1280 x 1024 pixels. However, full HD resolution on a 32" display with 1920 x 1080 pixels can also be handled easily by the i.MX6 based platforms.

Current portfolio by display size

	4.3"	5.0"	7.0"	10.1"	10.4"	≥12.1"
SANTINO LT	X	X				
SANTINO			X			
SANTARO			X	X	X	X
SANTOKA			X	X	X	X
SANTVEND			X			X

SANTINO and SANTINO LT

Perfect Price-Performance Ratio

In other words, we offer high-quality Single Board Computers (SBCs) that provide excellent value for money. An optimized PCB layout based on the NXP i.MX6 CPU series combined with predefined touch-display-combinations means high performance "Made in Germany" at a very competitive price level.



SANTINO LT

Small sized form factor with high performance and TTL interface



SANTINO

The i.MX6 economy solution with industrial features and TTL interface

SANTARO and SANTOKA

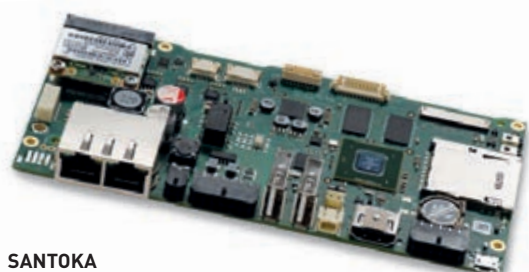
High Performance - Made in Germany

The SANTARO und SANTOKA Single Board Computers are significantly more adaptable to the individual requirements of your application: whether for an individual placement, a display selected by you or the design of a complete HMI to your specifications – almost everything is possible.



SANTARO

The Garz & Fricke business class: flexible, powerful all-rounder for demanding applications with 2 Ch-LVDS Interface



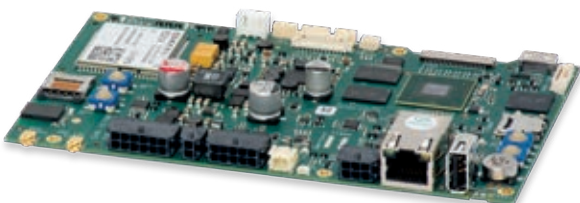
SANTOKA

Our IoT solution: PCIe interface for wireless connectivity with two Ethernet ports and 2 Ch-LVDS Interface

SANTVEND

IoT Smart Vending Machine Controller

SANTVEND is a modern Linux-based vending machine control system. The powerful graphics unit allows the operation of high-resolution touch displays up to 32". The proven vending machine controllers of the Garz & Fricke family can be regarded as state-of-the-art replacements for conventional vending machine controllers.



SANTVEND

Our smart vending and IoT solution:
MDB interface, 2G/3G/4G mobile network connectivity. Display focus up to 32" (with 2-Ch-LVDS Interface)

Integration of Customized Glass Panels

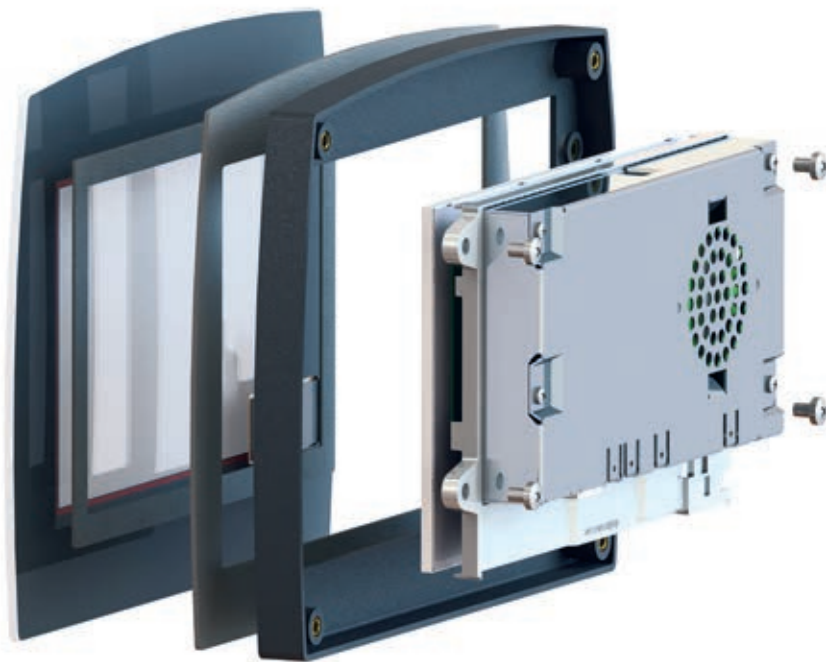
Examples to integrate our product in your design

Customized integration

In addition to the standard installation options called rear mount, panel mount and flush mount, Garz & Fricke offer different options for system integration. The images on these pages show examples of integration options for our 7.0" HMI systems for different versions of existing or planned housing fronts.

The type of integration depends on whether the customers' own housing front is to be completed by Garz & Fricke or whether they are to have a system delivered that is already fitted with a customized glass front. In the latter case, they can insert the glass front into their front panel themselves and fasten the glass with our adhesive pad.

We will help you to select the solution that best suits you.





Design option 1 - Front surface flush with chassis front

Sample fields of application:

- The housing front is bigger than the customized glass
- The housing front contains additional features such as speaker, encoder wheels or buttons, etc.



Design option 2 - Glass side flush with chassis front

Sample fields of application:

- Glass ends exactly flush with the sides
- Glass remains free-standing due to special design aspects
- Limited space conditions at the sides, no space for peripheral frame



Design option 3 - Protection/ design framework all around

Sample fields of application:

- The glass needs to be protected (peripheral edge protection)
- HMI system is detached from the housing front
- Stand-alone solution

Customized Solutions

We make it yours



Flexibility

The high flexibility of our products makes them ideally suitable for the development of customized solutions.

In the best case, no major adjustments are necessary when we are helping our OEM customers to achieve a successful launch.

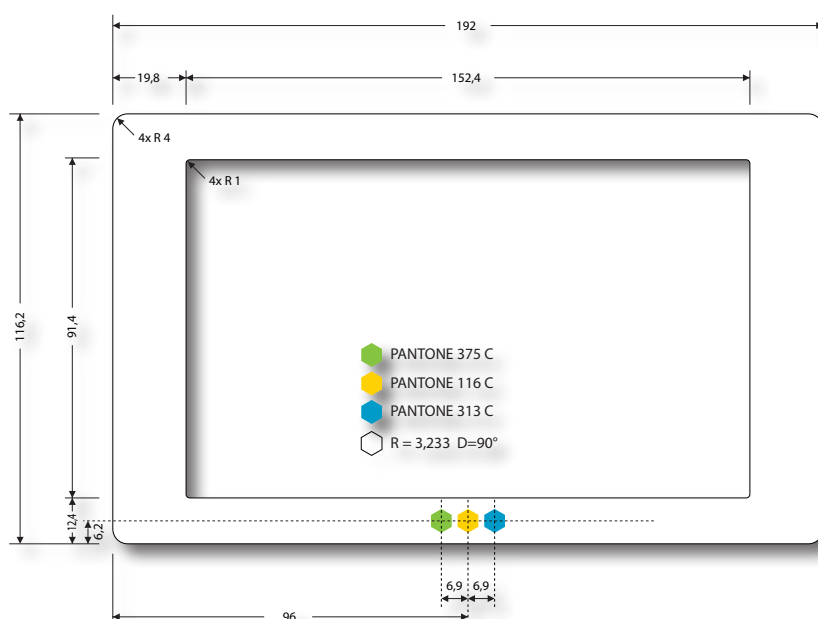
We have proven more than once that our customers can rely on us, especially in apparently difficult situations.

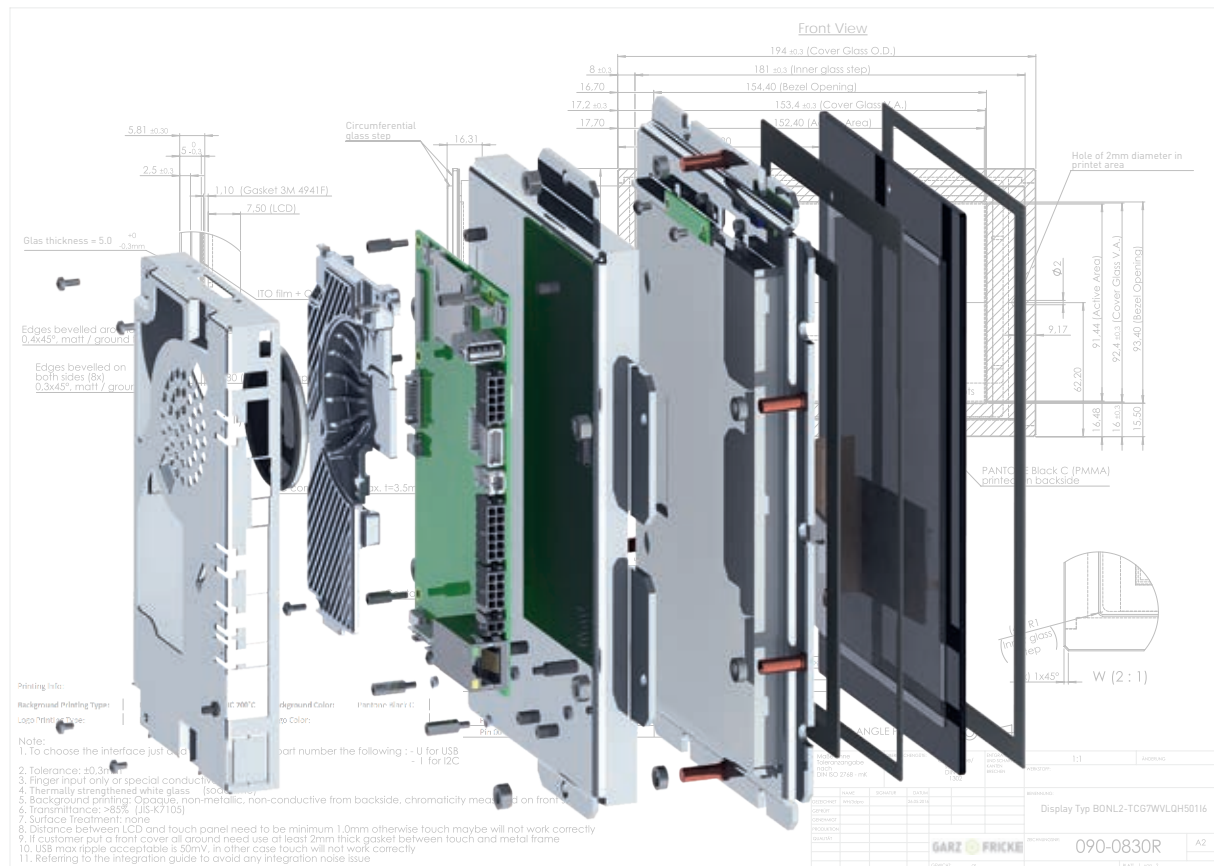
Modification

After selecting the correct standard product that best matches the customer's needs, we are able to adapt it to the specific requirements within the shortest time. These may be an alternative display, additional interfaces or very reduced systems for low-cost production.

Our Panel Mount systems with silk printed décor film are especially designed for quick integration into the customer's product portfolio. We provide all the necessary data, such as DXF or CAD files.

If required, we assist our customers to comply with their CI guidelines.

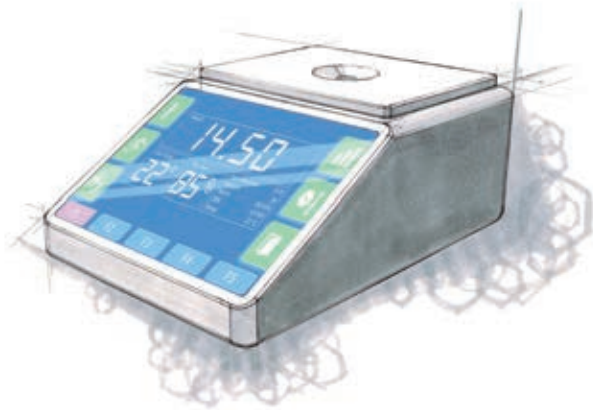




Mechanics and electronics

We support our customer's project all the way from construction drawing through to market maturity.

This includes not only the electronic components, but also the procurement of mechanical parts.



Consulting

An embedded system that meets all requirements off the shelf is difficult to find. Such systems contain components related to software, hardware and mechanics that have to be adjusted to interact with each other.

At Garz & Fricke, the entire development procedure is transparent and reproducible, from the technological concept through to the approved and certified end-product.

Moreover, embedded systems require expert consultancy, before and - as is often forgotten - during their lifecycle.

Embedded System as MDB Master

MDB-based solutions

Experience in electronics for Smart Vending

Garz & Fricke have many years of experience in providing electronics and components for vending machines.

Many of the Garz & Fricke HMI systems are therefore suitable for applications in vending and professional gastronomy machines thanks to their special distinguishing features.

Besides the well-known industrial interfaces such as RS-485, RS-232 and CAN bus, we offer our products with optional MDB interface and stack.

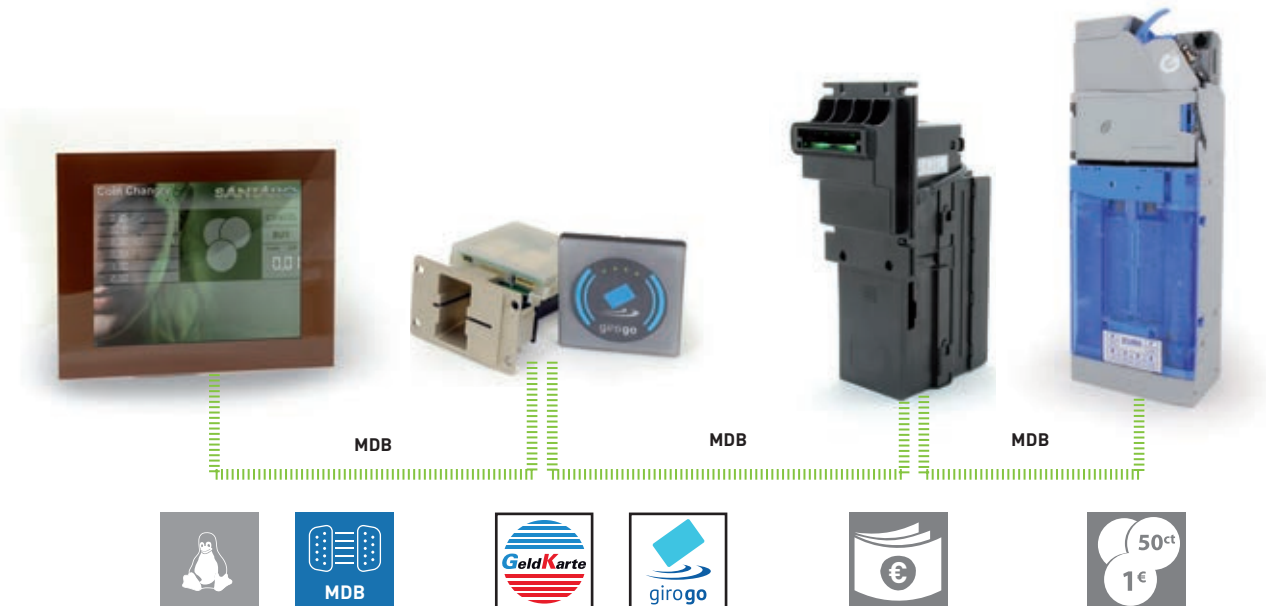
Using these optional features permits solutions that are completely based on MDB.

Implementing the MDB stack on the HMI system means that it takes on the role of the MDB master. All connected components will then be controlled by the HMI via the stack.



Sample design

This sample design shows a solution that is completely based on MDB. It consists exclusively of Garz & Fricke MDB payment components. The system is based on Linux.



Connected components

KarL³ payment terminal: supports cashless payment via GeldKarte and all necessary standards for contactless payment by card. Currently applicable to girogo and GeldKarte.

Bill validator: for indoor and outdoor applications. Tailor-made with 4-way cognition and very low power consumption that works at low voltages. High acceptance rate of 98%.

Coin changer: features 6-tube coin cassette and MFT high-security validation technology. Well suited for indoor and outdoor use. Works with all MDB-based vending machine controllers.



TFT - Displays

A selection of proven components

Garz & Fricke are not just your professional partners for single board computers and complete HMI systems solutions, but also offer you a wide range of products such as industrial TFT displays and touch screens as single and individual components or as a complete preconfigured set including cables, adapter and backlight driver boards.

We support you from the first choice of the right TFT display up to the integration into your application. Furthermore, our starter-kits give you the chance to set up your display ready-to-run quickly.











The Garz & Fricke product portfolio is therefore rounded off by the wide range of single TFT displays up to complete HMI systems and offers our customer a target-oriented range, custom-fitted to each industrial application.

Our TFT displays score with high optical performance, superior quality and long product lifetimes. The following list offers an overview of some of the available sizes and features that have proven their worth in our HMI products.





RGB displays from 4.3" up to 7.0"

also available as a starter-kit with PCAP or Resistive Touch and adapter boards for our budget lines SANTINO LT

	Resolution	Manufacturer	Available features
4.3"	480 x 272	Ampire, Data Image, Giantplus, EDT	 
5.0"	800 x 480	Data Image, OLT, Solomon Goldentek	  
5.7"	640 x 480	Ampire, Data Image, Kyocera, JDI	 
7.0"	800 x 480	Ampire, Data Image, JDI, DLC	  

LVDS displays from 5.7" up to 21.5"

for our new single board computers SANTARO and SANTOKA, available as a starter-kit with PCAP or Resistive Touch, cable assembly and adapter boards.

	Resolution	Manufacturer	Available features
5.7"	640 x 480	Ampire	
7.0"	800 x 480	Ampire, Data Image, LG, KOE, Mitsubishi, Kyocera, AUO, NLT	  
7.0"	1024 x 600	Ampire, Data Image, Onation	
8.0"	800 x 480	Ampire, JDI, NLT	  
8.4"	800 x 600	Ampire, Data Image, AUO, NLT, Solomon Goldentek	  
9.0"	800 x 480	Ampire, JDI, AUO	  
10.1"	1280 x 800	Ampire, Data Image, AUO, Onation	  
10.4"	800 x 600	Ampire, AUO, Solomon Goldentek, Chimei Innolux, Kyocera	  
10.4"	1024 x 768	Chimei Innolux, Kyocera	  
12.1"	800 x 600	LG, Chimei Innolux	 
12.1"	1024 x 768	Ampire, AUO, Chimei Innolux, Kyocera	  
13.3"	1280 x 800	AUO, Chimei Innolux	
15.0"	1024 x 768	Data Image, LG, AUO, Chimei Innolux	  
15.4"	1280 x 800	Chimei Innolux	
15.6"	1366 x 768	AUO	
18.5"	1366 x 768	AUO, Chimei Innolux	
19.0"	1280 x 1024	LG, Chimei Innolux, AUO	
21.5"	1920 x 1080	LG, Chimei Innolux	



Wide viewing angle



High brightness



Extended temperature range

Still looking for a display that works for you? Please tell us the manufacturer and the model or your requirements and we will provide the perfect solution. For the Garz & Fricke single board computer, please refer to the previous pages.

PCAP Touch Screens

A wide range of touch components

Capacitive touches have become integral parts of the modern communication between humans and machines. "PCT" = "Projected Capacitive Touch" became very popular due to its use in smartphones and tablets. In certain areas of industry, the features of PCAP touches are indispensable, as this technology enables design-oriented, modern, elegant and plain surfaces for various indoor and outdoor applications.

PCAP touch offers a lot of advantages: it works under up to 6 mm cover glasses, or with thick gloves, and has the latest multi-touch functionalities, excellent optical features and perfect performance even in harsh environments

Key features

- Highly noise-resistant
- Excellent sensitivity and fast detection
- High transparency >88%
- Lifetime >500,000,000 touches
- Driver support for many operating systems
- High resolution (2048 x 2048)
- Space-saving design with Chip-On-Flex technology



In order to take advantage of these benefits, Garz & Fricke developed their own line of PCAP touches - the Garz & Fricke touches, shown on the following page. The fully customized touches are produced to our own high standards and use our many years of experience in the industrial HMI environment.

Our customers thus benefit from the latest technologies as well as special coatings and various optical bonding processes to achieve the best performance in their specific applications.

Thanks to their long-term cooperation with professional partners, Garz & Fricke provide both a wide selection of standard touches up to 32" as Glass-Glass or Glass-Film Sensors and fully customized touches to meet your requirements and specifications. All touches are delivered with the necessary operating system driver (Windows Embedded Compact, Windows CE, Linux, Android). Furthermore, Garz & Fricke customize the firmware of the touch according to customer requirements.

TAKE ADVANTAGE OF THE BENEFITS AND LEARN MORE ABOUT COVER GLASS, PCAP TOUCH CONTROLLERS AND OUR DESIGN-IN SERVICE ON THE NEXT PAGES

FEATURED GARZ & FRICKE TOUCHES

	Controller	Supply Voltage	Dimensions	Viewing Area	Temperature
7.0"	EETI EXC7200	3.3V	160.0 x 99.5 mm	154.6 x 92.4 mm	-20 to +70 °C
7.0"	EETI EXC3132 + EXC5440	3.3V	160.0 x 99.5 mm	154.6 x 92.4 mm	-30 to +85 °C
8.4"	EETI EXC3000	3.3V/5V	184.3 x 144.9 mm	174.2 x 131.2 mm	-30 to +85 °C
10.1"	EETI EXC3132 + EXC5440	5V	226.5 x 147.5 mm	218.6 x 137.2 mm	-30 to +85 °C
10.4"	EETI EXC3000	3.3V/5V	225.0 x 175.0 mm	214.8 x 162.7 mm	-30 to +85 °C
12.1"	EETI EXC3146 + EXC5440	3.3V	272.9 x 208.4 mm	247.87 x 186.4 mm	-30 to +85 °C

AbonTouch

RockTouch

AMPIRE

HIGGSTEC
Touch Solution Provider and Manufacturer

**DATA
IMAGE**



Touch Controller Optimization

We meet your requirements perfectly

Garz & Fricke offer customized PCAP touch screens for industrial applications with highest requirements.

Thanks to our years of experience, we have the capability and know-how necessary for the integration and fine-tuning of PCAP controllers.

Compliance with EMC standards is always a particular challenge and unique to each project.

For our customers, we offer in-house tests as well as all the necessary external laboratory tests to support you from the design stage through to the mass production of your product.

As a long term partner of the PCAP IC manufacturer eGalax_eMPIA Technology Inc. (EETI) in Taiwan, we can fine-tune the controllers on your system according to your requirements and offer a wide range of features such as water protection or glove touch to optimize each application within its environment.

The following tests are offered:

- Immunity to conducted disturbances, induced by radio-frequency fields (IEC 61000-4-6:2013)
- Electrical fast transient/burst immunity test (IEC 61000-4-4:2012)
- Immunity standard for industrial environments (DIN EN 61000-6-2:2016)
- Immunity standard for residential, commercial and light-industrial environments (DIN EN 61000-6-1:2016)



Features of EETI Touch Controllers

	EXC7200	EXC3000	EXC31xx
Accuracy	+	++	++
Water resistance	++	+	+++
Passive Pen support	-	+	++
Active Pen support	-	-	+
Thick glass	++	+	++
Thin glass	-	++	++
Air-gap solution	-	+	++
Immunity to conducted emissions	-	+	++
Immunity to radiated emissions	-	++	++
Immunity to LCD noise	+	+	++

Features of ILITEK Touch Controllers

	ILI2117A	ILI2118A	ILI2511	ILI2510	ILI2510PB	ILI2312	ILI2312PB	ILI2315	ILI2315PB/C
Support Size (Non Win 10)	≤ 7	≤ 10.1	≤ 15.6	≤ 21.5	≤ 21.5	≤ 27	≤ 27	≤ 32	≤ 32
Win 10 Logo	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CS Capability (conductive Susceptibility)	10Vrms (Highest Level)	10Vrms (Highest Level)	10Vrms (Highest Level)	10Vrms (Highest Level)	10Vrms (Highest Level)	10Vrms (Highest Level)	10Vrms (Highest Level)	10Vrms (Highest Level)	10Vrms (Highest Level)
RS Capability (Radiated Susceptibility)	30V/m (Highest Level)	30V/m (Highest Level)	30V/m (Highest Level)	30V/m (Highest Level)	30V/m (Highest Level)	30V/m (Highest Level)	30V/m (Highest Level)	30V/m (Highest Level)	30V/m (Highest Level)
Cover Glass thickness	Max: 3mm	Max: 3mm	Max: 10mm	Max: 10mm	Max: 10mm	Max: 8mm	Max: 8mm	Max: 8mm	Max: 8mm
Palm Rejection	○	○	○	○	○	○	○	○	○
Waterproof	○	○	○	○	○	○	○	○	○
Glove Thickness	Max: 3mm	Max: 3mm	Max: 5mm	Max: 5mm	Max: 5mm	Max: 5mm	Max: 5mm	Max: 5mm	Max: 5mm

ILITEK



Cover Glasses

The perfect surface for your application

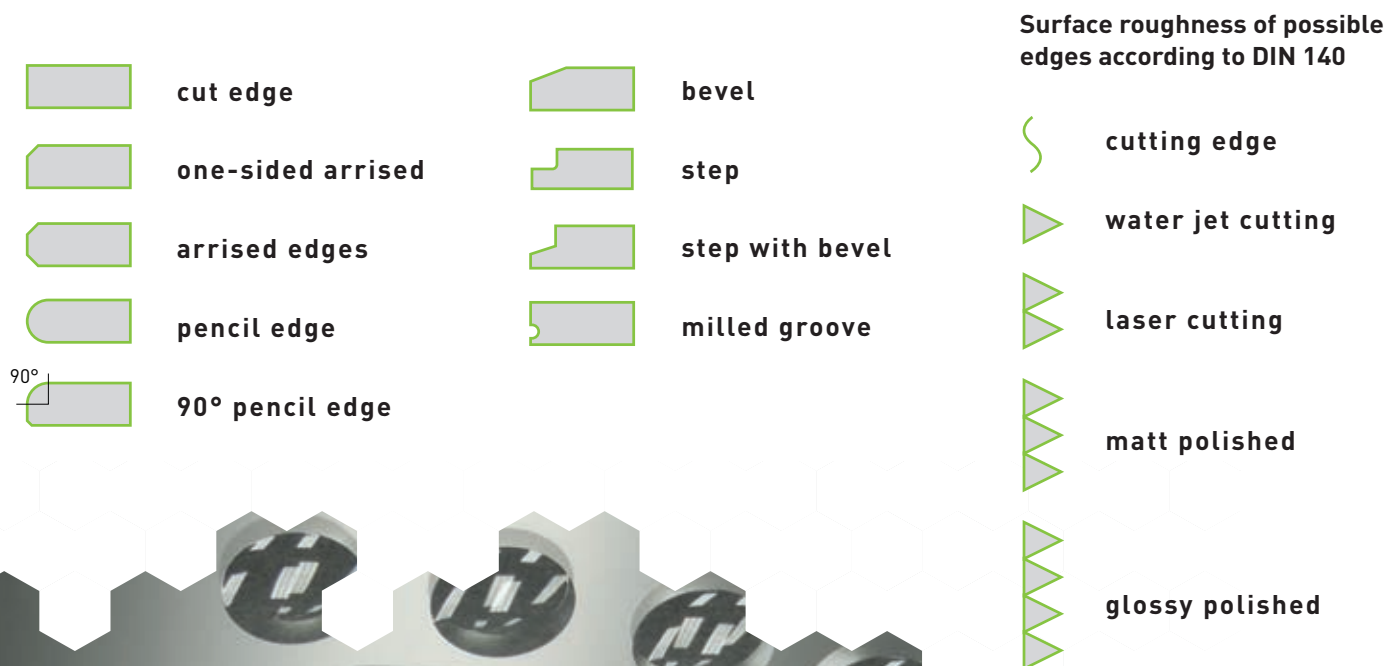
A wide selection of different raw materials can be used for the production of cover glass. They include aluminosilicate glasses and soda lime glass. The glass is also available as colour-neutral, white glass, transparent green float glass or coloured versions.

Cover glass offers a range of features, such as the edge processing, surface treatment as well as chemical and thermal strengthening processes. Together with our long term partner company Irlbacher, we would like to introduce and further explain these features a little bit more.

Edge processing

Multiple shapes and edges are available for cover glass, as shown in the graphic below, which can be supplied with a matt or polished finish. Some special edges require a minimum glass

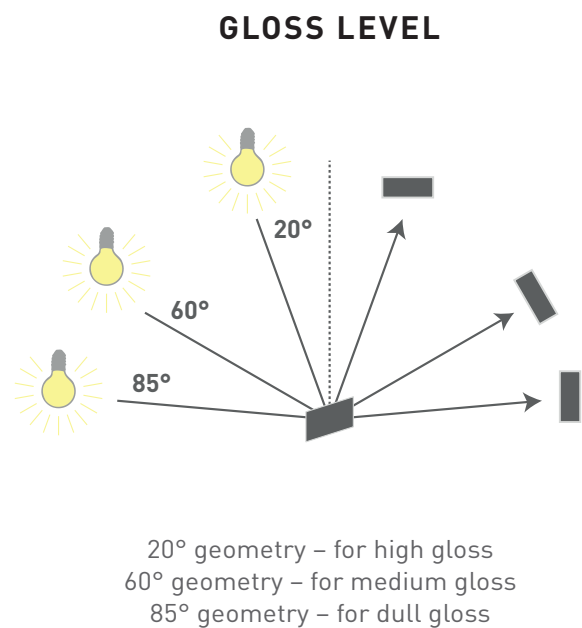
thickness, which means than not all edges and shapes shown below are available for aluminosilicate glass



Surface treatment

The right choice of surface treatment is absolutely vital for the optical and haptic characteristics, especially for PCAP cover glass. While non-treated surfaces are requested for several kinds of glass applications, we have different requirements for PCAP cover glass. This anti-reflective or anti-glare glass has to protect a TFT display and thus needs specific optical characteristics.

However, as you touch it or rather slide your finger on it for multitouch gestures, the glass surface often needs a smooth surface. A significant factor in achieving the best performance of an anti-glare coating is the gloss-value, which is dependent on a combination of the customer's requirements, as well as the TFT display and its resolution to avoid sparkling effects. The gloss value represents the proportion of the light reflected depending on the irradiation angle.



Strengthening processes

The mechanical stress resistance of a cover glass is achieved by chemical or thermal strengthening processes. During thermal strengthening, the glass, including its ceramic print, first undergoes a high-temperature process and is then cooled down immediately. In this process the ceramic print is sintered and the glass becomes either a semi-tempered or a safety glass, depending on temperature and glass thickness.

This process offers high-stress-resistant soda-lime glass, which has crumb-structured glass breakage with less risk of injury.

As this high-temperature process cannot be used for aluminosilicate glass, chemical strengthening is necessary, which involves ion exchange on the surface leading to a higher resistance. This strengthening process can be performed on soda lime glass as well; however, this only applies when ceramic print is not required, as there is no temperature process.

Overview of the main finishing variants including combination options for cover glasses.

	Sodalime glass	Aluminosilicate glass
Available thicknesses	2 – 25mm	0,5 – 1,8mm
Edge processing	+	+
Etching	+	+
Organic printing	+	+
Ceramic printing	+	-
Semi-toughening (TVG) and toughening (ESG)	+	-
Chemical toughening	+	+
Optical bonding	+	+
Glueing on printed areas	+	+
Mechanical stability	+	+
UV resistance (printing)	+	-
Thermal stability (printing)	+	+

Here we offer different kinds of organic prints such as 2-component varnish. Their many years of experience in PCAP technology ensure that Garz & Fricke and Irlbacher are reliable partners for your project.



Technology.Precision.Variety: [Glass](#)



SBC Feature Comparison

i.MX6 Series Single Board Computer

Product	SANTINO LT		SANTINO		SANTARO	
Series	x1	x2L	x1	x2L	x1	x2
CPU Type	i.MX6Solo	i.MX6Duallite	i.MX6Solo	i.MX6Duallite	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex-A9™		ARM Cortex-A9™		ARM Cortex-A9™	
Core Clock	1 GHz		1 GHz		1 GHz	
Vector Floating Point Unit	NEON™		NEON™		NEON™	
3D GPU	Vivante GC880 (1 shader) 35 Mtri/s 266 Mpxl/s OpenGL ES 1.1/2.0/3.0		Vivante GC880 (1 shader) 35 Mtri/s 266 Mpxl/s OpenGL ES 1.1/2.0/3.0		Vivante GC880 (1 shader) 35 Mtri/s 266 Mpxl/s OpenGL ES 1.1/2.0/3.0	Vivante GC2000 (4 shaders 594 MHz) 200 Mtri/s 1000 Mpxl/s OpenGL ES 1.1/2.0/3.0 & Halti, OpenCL EP
2D GPU (Vector Graphics)	Emulated on GPU 3D		Emulated on GPU 3D		Emulated on GPU 3D	Vivante GC355 300 Mpxl/s, OpenVG 1.1
2D GPU (Composition)	Vivante GC320 600 Mpxl/s, 2DBLT		Vivante GC320 600Mpxl/s, 2DBLT		Vivante GC320 600Mpxl/s, 2DBLT	
Video decode	HD 1080p30		HD 1080p30		HD 1080p30	HD 1080p 60 H.264
Video encode	1080p30 H.264 BP/ Dual 720p		1080p30 H.264 BP/ Dual 720p		1080p30 H.264 BP/ Dual 720p	
Memory / External Storage						
RAM Standard (DDR3) default	512 MB	1 GB	512 MB	1 GB	1 GB	1 GB
RAM Standard (DDR3) max.	1 GB	2 GB	1 GB	2 GB	2 GB	4 GB
Flash (eMMC)	4 GB		4 GB		4 GB	
Storage Card Slot	micro SD		SD		SD	
Operating System						
Windows Embedded Compact	○		○		○	●
Linux	●		●		●	
Android	● / (min. 1 GB RAM)		● / (min. 1 GB RAM)		●	
Interfaces						
Ethernet / PoE / PoE+	● / - / -		● / - / -		● / ○ / ○	
RS-232	●		● [2x]		● [2x]	
RS-485 *ngi / **gi	● / -	● / -	● / ○	○ / ●	● / -	● / -
USB Host	●		●		●	
USB OTG	●		●		●	
CAN *ngi / **gi	● / -	○ / -	● / ○	○ / ●	● / -	- / ●
MDB	○ (instead of 2nd RS-232)		○ (instead of 2nd RS-232)		○ (instead of 2nd RS-232)	
Keypad / SPI / I²C	- / - / -	● / - / ●	● / - / ●	● / - / ●	- / - / -	● / ● / ●
Digital I/O	-		-		● [2/2]	
Wireless	-		○ [Bluetooth]		-	
Audio						
Speaker 1.5 W (RMS) 8 Ω	●		●		●	
Display / Touch						
Interface Type	TTL		TTL		LVDS	LVDS / HDMI
Analogue Resistive Touch	○		-		●	
Projected Capacitive Touch	●		●		●	

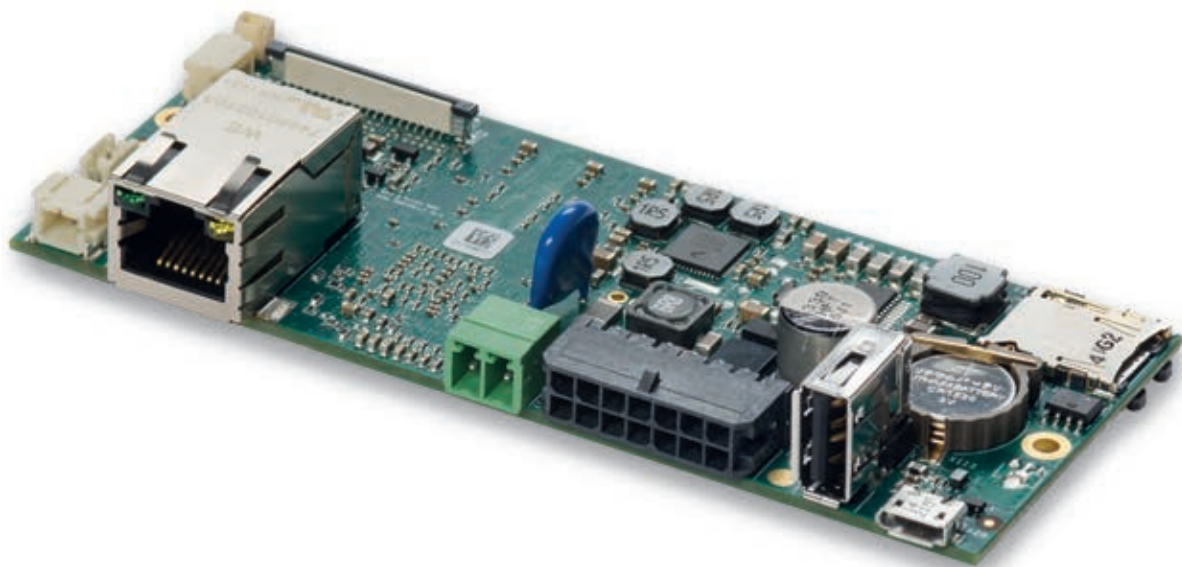
*ngi: non-galvanically isolated / **gi: galvanically isolate

○ optional, on request / ● standard / - not available

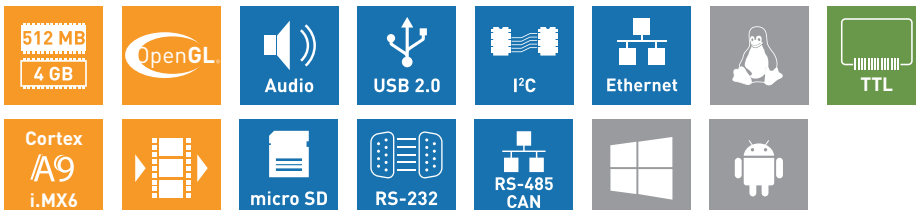
Product	SANTOKA		SANTVEND	SANTVEND BATTERY
Series	x1	x2	x2	x1
CPU Type	i.MX6Solo	i.MX6Dual	i.MX6Dual	i.MX6Solo
Core Class	ARM Cortex-A9™		ARM Cortex-A9™	ARM Cortex-A9™
Core Clock	1 GHz		1 GHz	1 GHz
Vector Floating Point Unit	NEON™		NEON™	NEON™
3D GPU	Vivante GC880 (1 shader) 35 Mtri/s 266Mpxl/s OpenGL ES 1.1/2.0/3.0	Vivante GC2000 (4 shaders 594 MHz) 200 Mtri/s 1000 Mpxl/s OpenGL ES 1.1/2.0/3.0 & Halti, OpenCL EP	Vivante GC2000 (4 shaders 594 MHz) 200 Mtri/s 1000 Mpxl/s OpenGL ES 1.1/2.0/3.0 & Halti, OpenCL EP	Vivante GC880 (1 shader) 35 Mtri/s 266Mpxl/s OpenGL ES 1.1/2.0/3.0
2D GPU (Vector Graphics)	Emulated on GPU 3D	Vivante GC355 300 Mpxl/s, OpenVG 1.1	Vivante GC355 300 Mpxl/s, OpenVG 1.1	Emulated on GPU 3D
2D GPU (Composition)	Vivante GC320 600 Mpxl/s, 2DBLT		Vivante GC320 600 Mpxl/s, 2DBLT	Vivante GC320 600 Mpxl/s, 2DBLT
Video decode	HD 1080p30	HD 1080p 60 H.264	HD 1080p30 / H.264	HD 1080p30
Video encode	1080p30 H.264 BP/ Dual 720p		1080p30 H.264 BP/ Dual 720p	1080p30 H.264 BP/ Dual 720p
Memory / External Storage				
RAM Standard (DDR3) default	1 GB	1 GB	2 GB	1 GB
RAM Standard (DDR3) max.	2 GB	4 GB	2 GB	1 GB LP-DDR2
Flash [eMMC]	4 GB		4 GB	4 GB
Storage Card Slot	SD		micro SD	micro SD
Operating System				
Windows Embedded Compact	-		-	-
Linux	●		●	●
Android	●		-	-
Interfaces				
Ethernet / PoE / PoE+	● [2x] / - / -		● / - / -	● / - / -
RS-232	● [2x]		● {1x RX, TX, RTS, CTS; 1x RX, TX}	● {1x RX, TX, RTS, CTS; 1x RX, TX}
RS-485 ngi / gi	● / ○	○ / ●	- / -	- / -
USB Host	● [2x]		●	-
USB OTG	●		-	●
CAN ngi / gi	● / -	- / ●	● / -	● / -
MDB	○ [instead of 2nd RS-232]		● [Master + Slave]	● [Master + Slave + Power]
Keypad / SPI / I²C	● / ● / ●		- / ● / ●	- / ● / ●
Digital I/O	-		-	-
Wireless	● [PCIe: Wifi, Bluetooth]		● [LTE] / ○ [UMTS], BLE / GPS	● [LTE] / ○ [UMTS], BLE / GPS
Audio				
Speaker 1.5 W (RMS) 8 Ω	●		● [connector]	● [connector]
Display / Touch				
Interface Type	LVDS	LVDS / HDMI	LVDS / HDMI	LVDS / HDMI
Analogue Resistive Touch	●		-	-
Projected Capacitive Touch	●		●	●

SANTINO LT core

ARM Cortex-A9 Single Board Computer

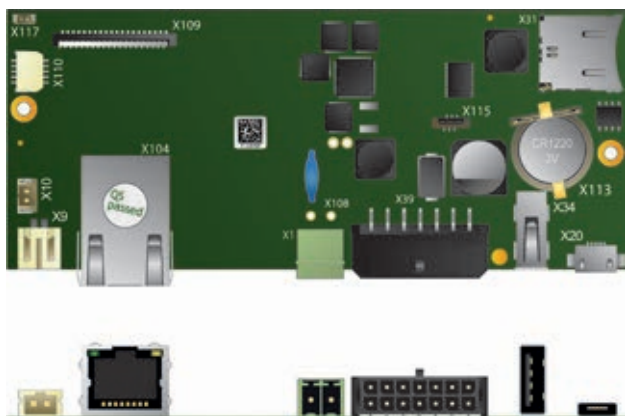
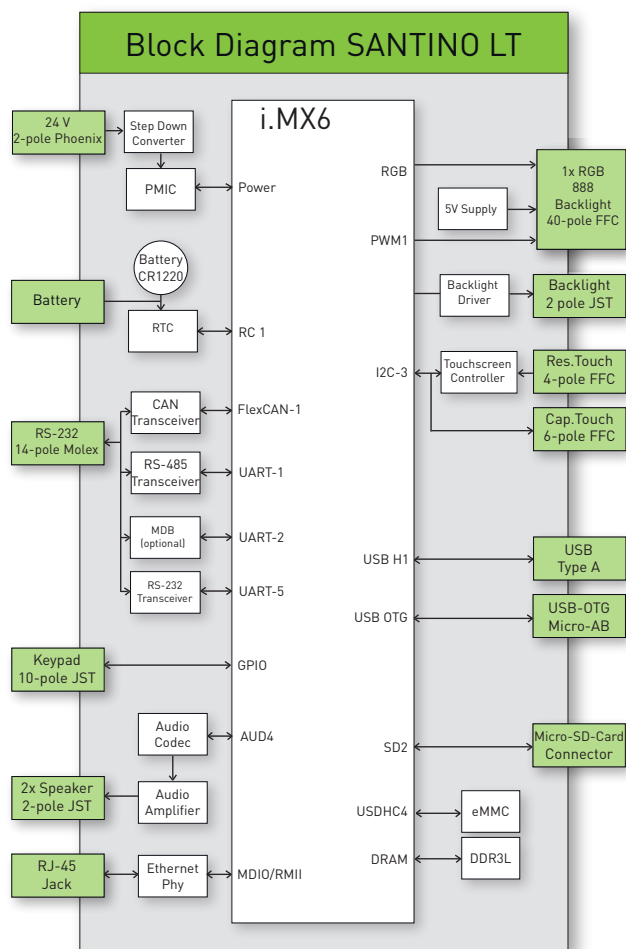


Small sized form factor with high performance for displays up to 5.0".



TECHNICAL SPECIFICATION

SANTINO LT Single Board Computer

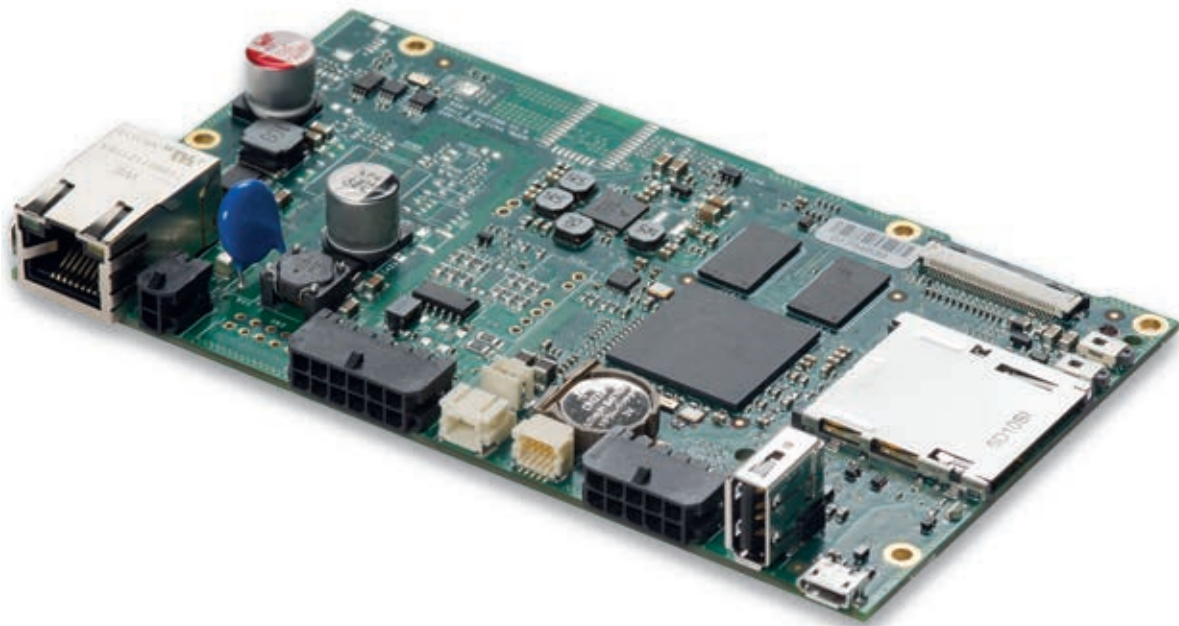


CPU	x1		x2L	
CPU Type	i.MX6Solo		i.MX6DualLite	
Core Class	ARM Cortex - A9			
Core Clock	1 GHz			
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache,32 KB for instruction and data caches; Unified 512 KB L2 cache			
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 [Emulated on 3D GPU]			
RTC	Accuracy: +/- 30 ppm at 25°C			
Memory				
eMMC Flash	4 GB eMMC			
RAM Standard	512 MB 32 bit DDR3L		1 GB 32 bit DDR3L	
Micro SD Card Slot	4 bit MMC/SDIO/SD/SDHC			
Operating Systems				
Supported OS	Windows EC on request, Linux Yocto, Android			
Communication Interfaces				
Network	1x 10/100 Mbit/s Ethernet (RJ-45)			
RS-485	1x RS-485 (Half duplex)			
RS-232	1x RS-232 (RX/TX/CTS/RTS)			
Synchronous Serial Interfaces	I²C, Matrix keypad up to 4 x 4			
High-Speed USB 2.0	1x 480 Mbit/s Host (Type A), 1x 480 Mbit/s OTG (Type Micro-AB)			
CAN Fieldbus	1x CAN (ISO/DIS 11898)			
Audio				
Speaker Output	1x speaker (connector), 1.5 W RMS (8Ω)			
Audio Internal	1x speaker connector parallel to external output			
Display and Touch				
Display Interface	TTL, 24 bit (RGB)			
Touch Interface	4-wire analogue resistive; PCAP I²C			
Backlight	111 mA Backlight drives			
Device Dimensions				
W x H x D	113.8 x 18.0 x 47.3 mm			
Weight	55 g			
Power Supply				
Supply Voltage	Nom. 9 to 32 V DC			
Consumption	Typ. 1.9 W; max. 15.0 W			
Typical Environmental Conditions				
Storage Temp.	-20 to +70 °C			
Operating Temp.	0 to +60 °C			
Humidity	5 to 95 % RH			

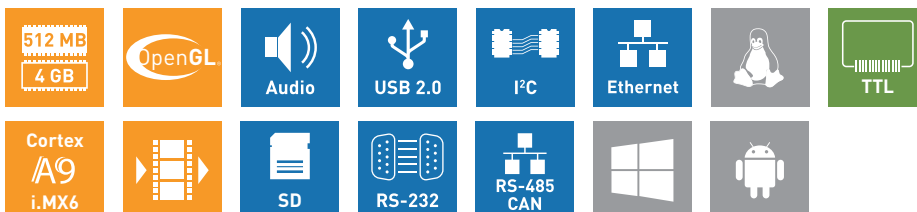
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SANTINO core

ARM Cortex-A9 Single Board Computer

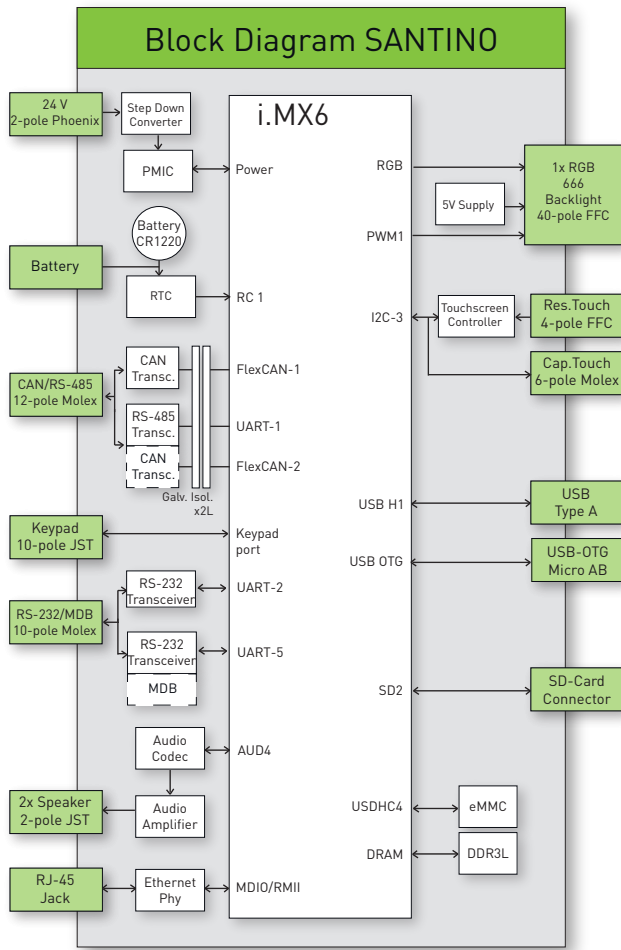


The i.MX6 economy solution for 7.0" TTL displays with industrial features.



TECHNICAL SPECIFICATION

SANTINO Single Board Computer

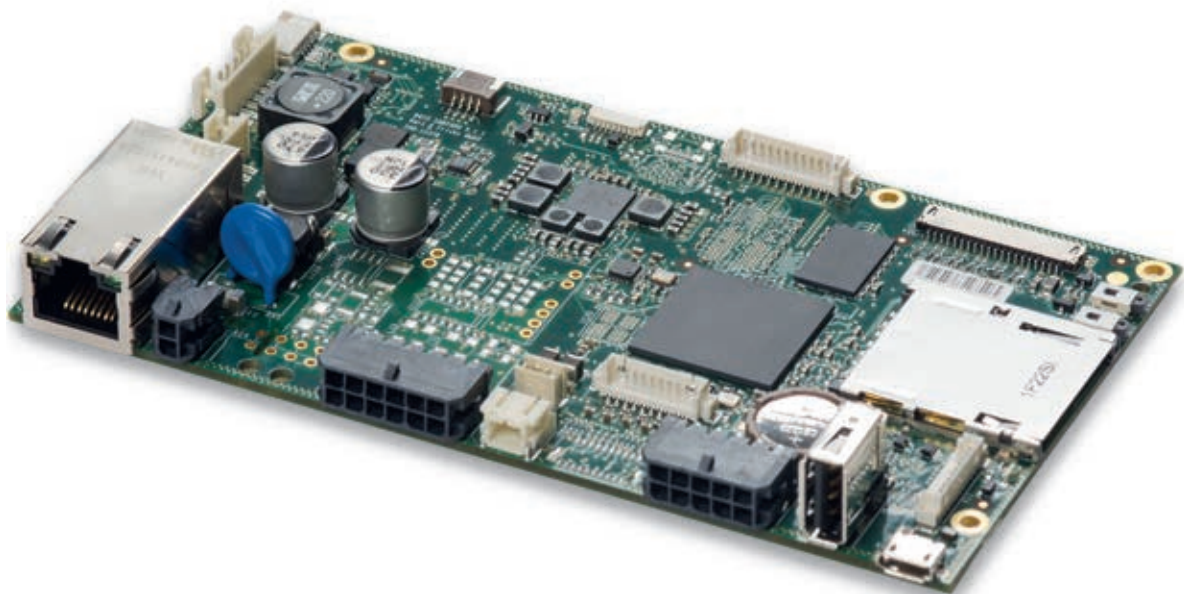


CPU	x1	x2L
CPU Type	i.MX6Solo	i.MX6DualLite
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data; 512 KB L2 cache	
HW Accelerators	OpenGL ES 2.0, Open VG 1.1 (Emulated on 3D GPU)	
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	512 MB 32 bit DDR3L	1 GB 32 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus/ RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	I ² C, Matrix keypad up to 4 x 4	
Audio		
Speaker Output	1x speaker (connector), 1.5 W RMS (8Ω)	
Audio Internal	1x speaker connector parallel to external output	
Display and Touch		
Display Interface	TTL, 18 bit (RGB)	
Touch Interface	4-wire analogue resistive; PCAP I ² C	
Device Dimensions		
W x H x D	138.0 x 18.0 x 80.0 mm	
Weight	97g	
Power Supply		
Supply Voltage	Nom. 9 to 32V DC	
Consumption	Typ. 2.0; max. 19.6 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 95 % RH	

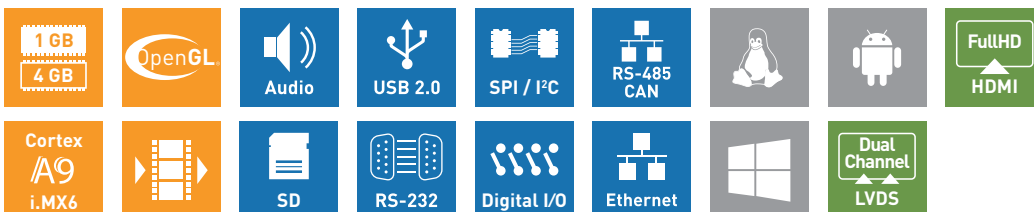
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SANTARO core

ARM Cortex-A9 Single Board Computer

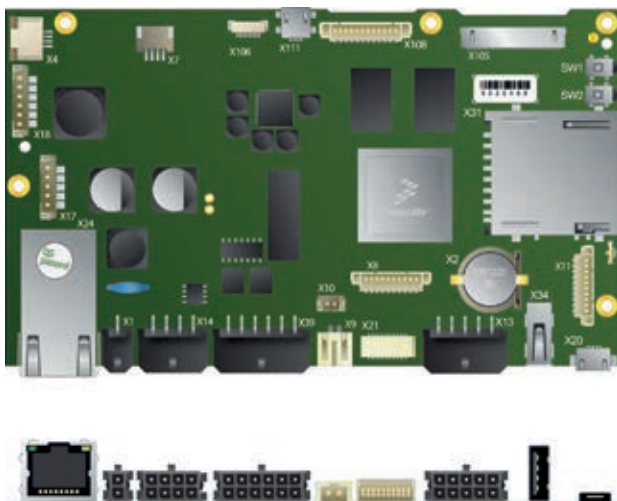
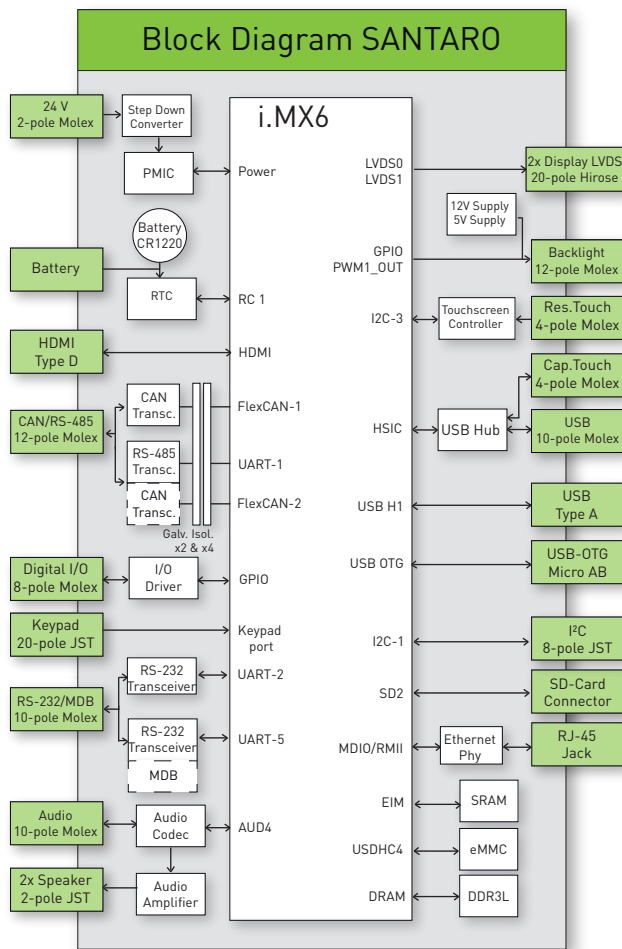


The Garz & Fricke business class: Flexible, powerful all-rounder for any demanding applications.



TECHNICAL SPECIFICATION

SANTARO Single Board Computer



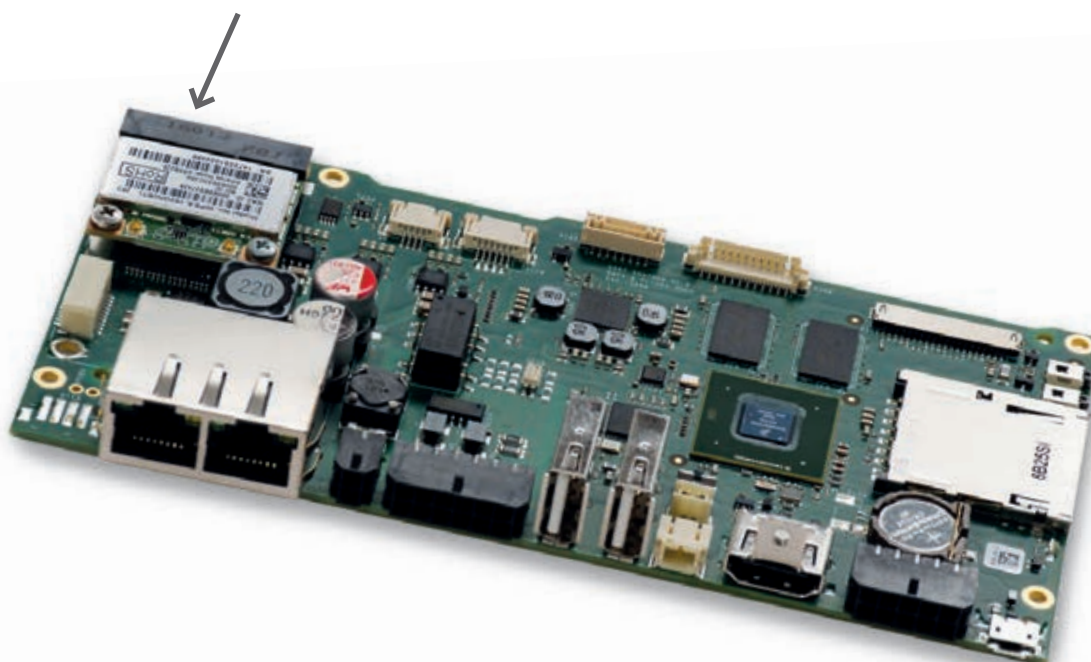
CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker connectors parallel to external output, Line In, Line Out, MIC In	
Display and Touch		
Display Interface	Dual Channel 24bpp LVDS	
Touch Interface	4-wire analogue resistive; PCAP I²C	
Backlight Interface	+12 V, +5V, on/off, PWM	
Device Dimensions		
W x H x D	138.0 x 18.0 x 80.0 mm	
Weight	97g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC, max. 9 to 32 V DC	
Consumption	Typ. 2.6 W; max. 19.6 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	
Expansion Connector		
Interfaces	USB / RS-232 (TTL) Internal	

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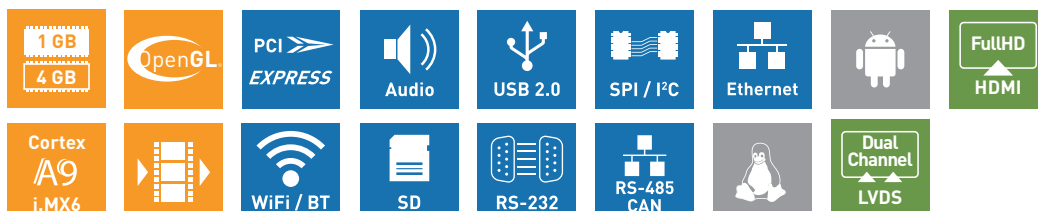
SANTOKA core

ARM Cortex-A9 Single Board Computer

mPCIe Express Modules on Page 129

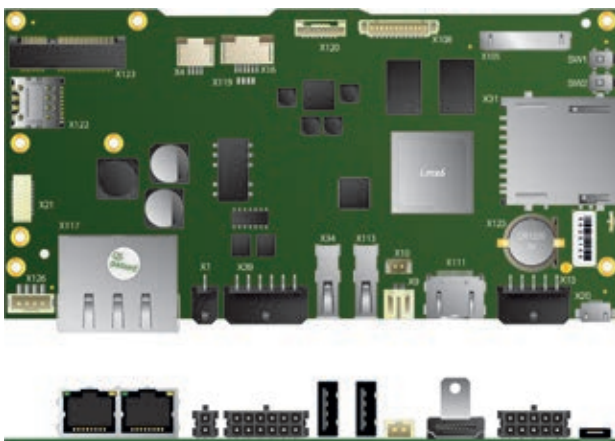
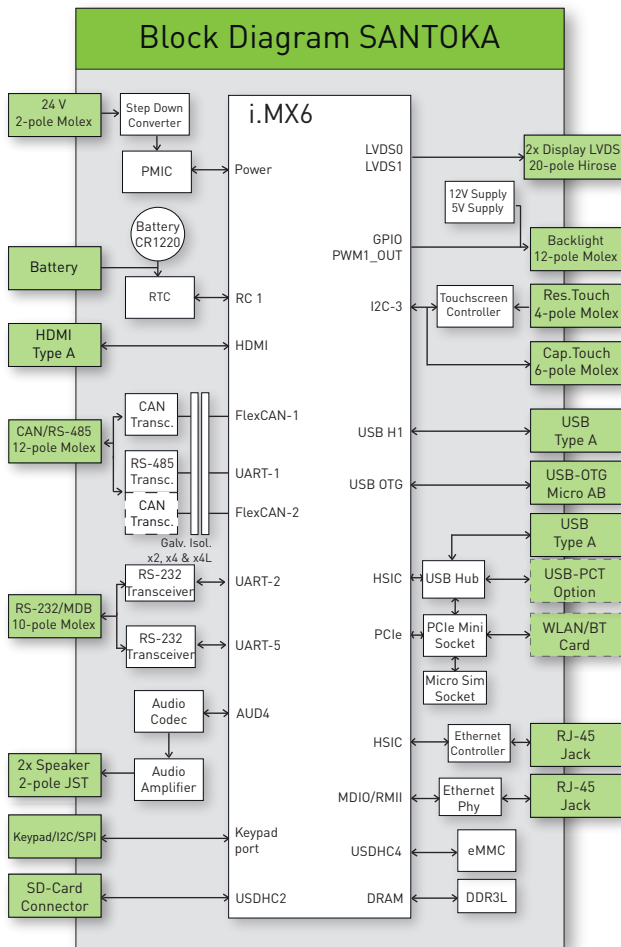


Our IOT solution: PCIe interface for wireless connectivity and two Ethernet ports.



TECHNICAL SPECIFICATION

SANTOKA Single Board Computer

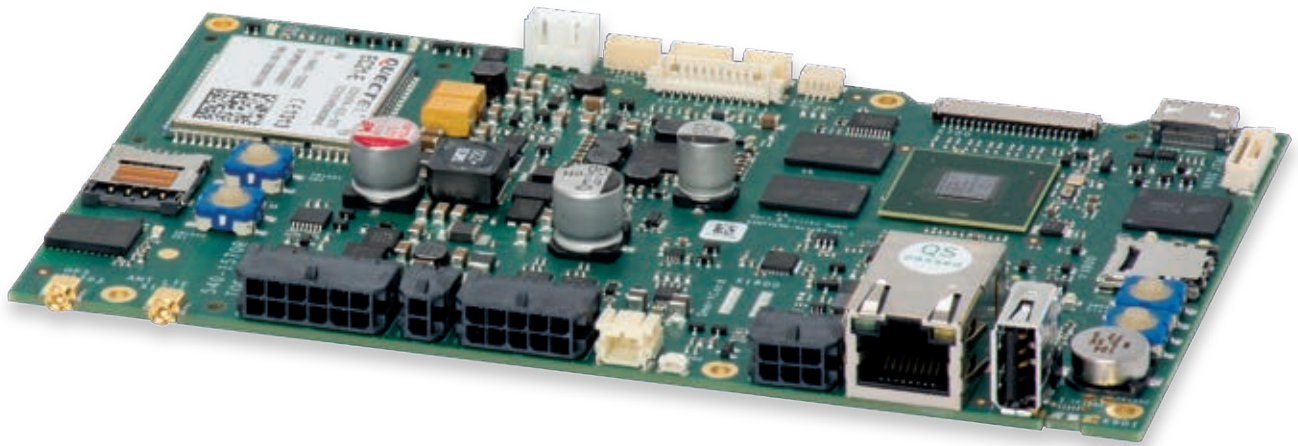


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Linux Yocto, Android	
Communication Interfaces		
Network	2x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	2x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Wireless Communication		
Wireless	WLAN 802.11 b/g/n; Bluetooth 4.0 LE For available mPCIe modules see page 129	
Video		
Video Output		Full HD HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker connector parallel to external output	
Display and Touch		
Display Interface	Dual Channel 24bpp LVDS	
Touch Interface	4-wire analogue resistive; PCAP I²C	
Backlight Interface	+12 V, +5V, on/off, PWM	
Device Dimensions		
W x H x D	159.0 x 18.0 x 80.0 mm	
Weight	102g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC / max. 9 to 32 V DC	
Consumption	Typ. 2.2 W; max. 25.1 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 95 % RH	
Expansion Slot		
mPCIe	mPCIe connector (for half size card)	

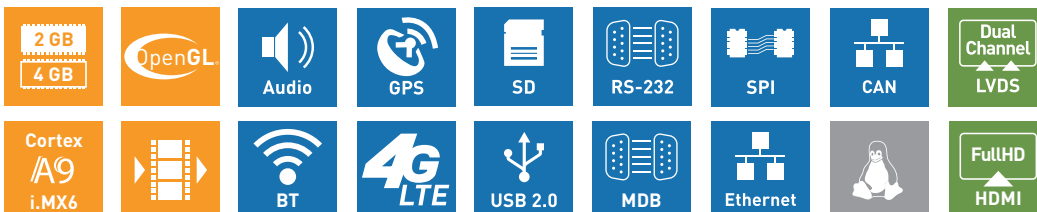
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SANTVEND core

ARM Cortex-A9 IOT Single Board Computer

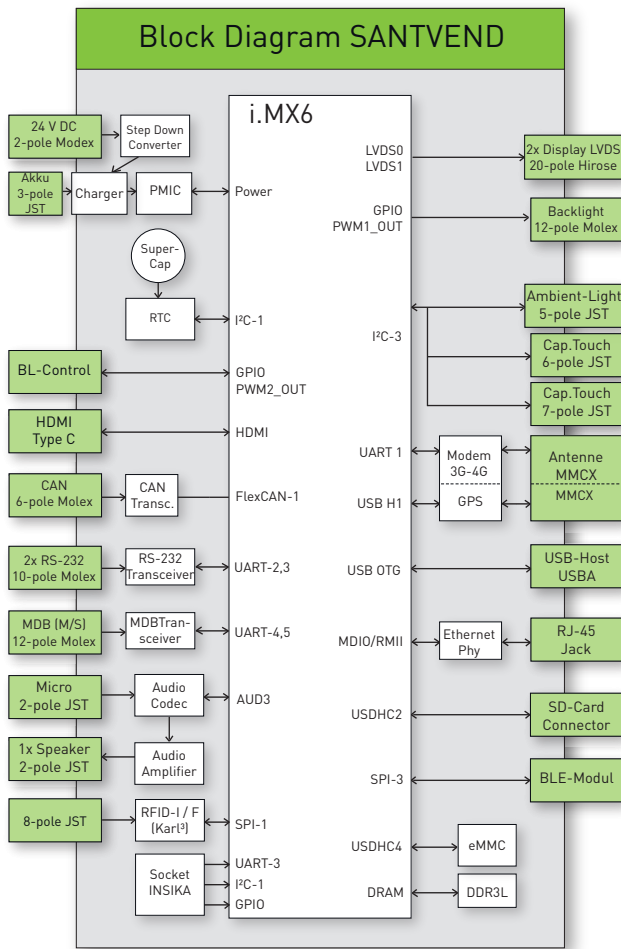


Vending / IOT platform with 3G / 4G modem and MDB interfaces.



TECHNICAL SPECIFICATION

SANTVEND Single Board Computer



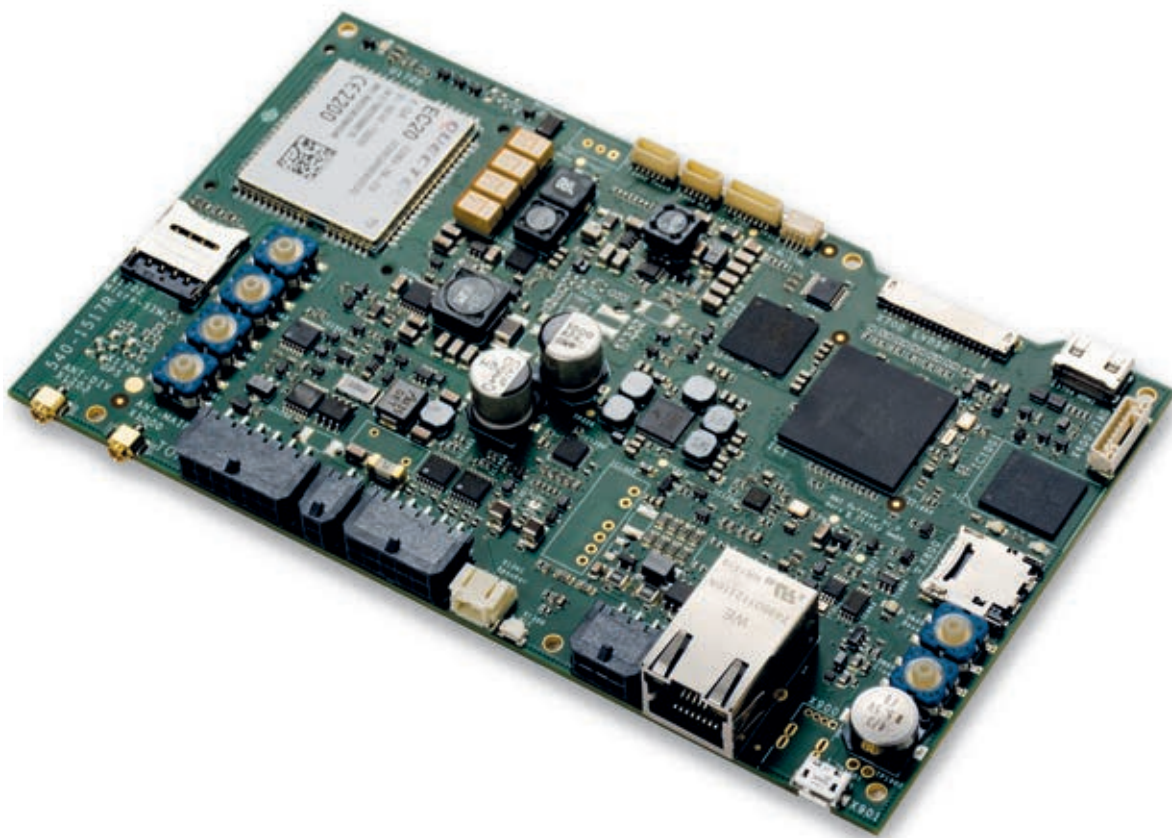
CPU	x2
CPU Type	i.MX6Dual
Core Class	ARM Cortex - A9
Core Clock	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data; 1 MB L2 cache
HW Accelerators	Open VG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C
Super Cap	Buffer for 24h
Memory	
eMMC Flash	4 GB MLC eMMC
RAM Standard	2 GB 32 bit DDR3L
Micro SD Card Slot	4 bit MMC/SDIO/SD/SDHC
Operating Systems	
Supported OS	Linux Yocto
Communication Interfaces	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)
USB 2.0	1x 480 Mbit/s Type A (Host)
CAN Fieldbus	1x CAN (ISO/DIS 11898)
MDB	1x Master, 1x Slave
Modem	3G / 4G, GPS (optional); Micro Sim Socket
RS-232	1x RS-232 (RX/TX/CTS/RTS) and 1x RX, TX
Synchronous Serial Interfaces	SPI up to 2 chip selects; Pinning for RFID-I / F (Karl³)
BLE Module	Single Mode BLE V 4.0 Slave
INSIKA	Socket for optional Smart-Card Interface (Plug In)
Misc.	2x Service Button
Video	
Video Output	HDMI 1.4 Type C Connector; + On / Off, PWM 2nd Backlight control con.
Audio	
Speaker Output	1x speaker (connector), 1 W RMS [8Ω]
Micro IN	1x microphone connector
Display and Touch	
Display Interface	Dual Channel 24bpp LVDS
Sensor	Ambient-Light-Sensor (external via I²C)
Touch Interface	PCAP I²C
Backlight Interface	+12 V, 5 V, on/off, PWM
Device Dimensions	
W x H x D	160 x 18 x 95 mm; PCB 160 x 95 mm
Weight	115 g
Power Supply	
Supply Voltage	Nom. 24 V DC / max. 10 to 42 V DC
Consumption	Typ. 3.0 W; max. tbd.
Li-Ion-Akku	3.7 V / 2.0 to 4.0 Ah for Modem and Backup-Power
Li-Ion-Charger	Internal
Typical Environmental Conditions	
Storage Temp.	-20 to +70 °C without Li-Ion-Akku
Operating Temp.	0 to +40 °C (normal operation) -20 to +60 °C without charge Li-Ion-Akku
Humidity	5 to 90 % RH

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SANTVEND BATTERY core

ARM Cortex-A9 IOT Single Board Computer

coming soon
subject to change

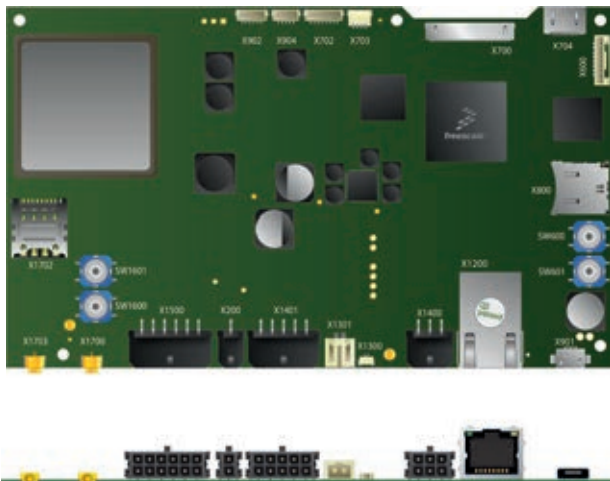
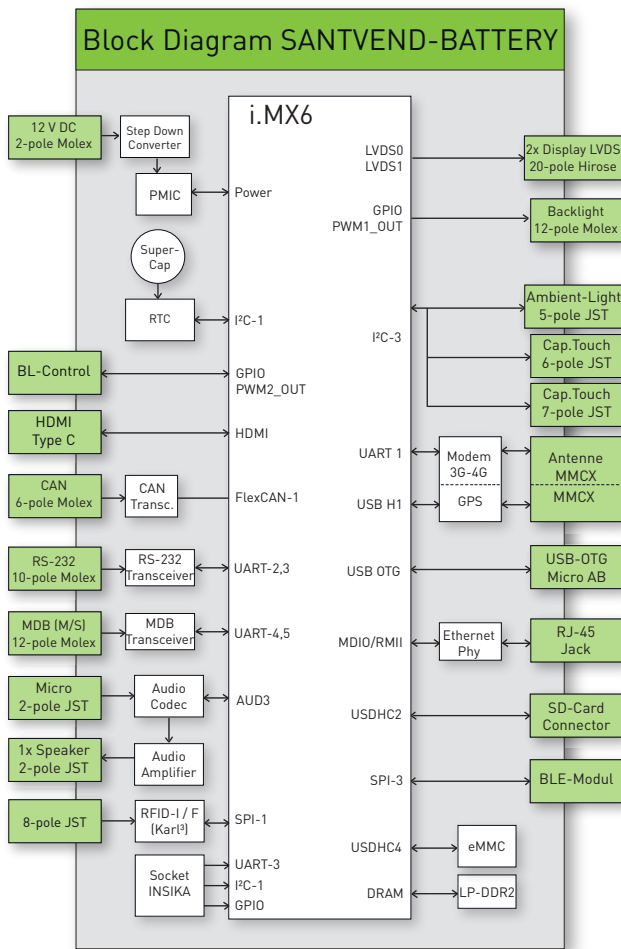


Outdoor Vending / IOT board for 12 V operation with optimized power management.



TECHNICAL SPECIFICATION

SANTVEND BATTERY Single Board Computer

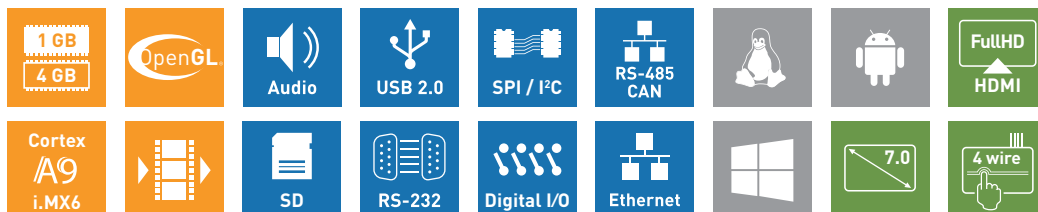
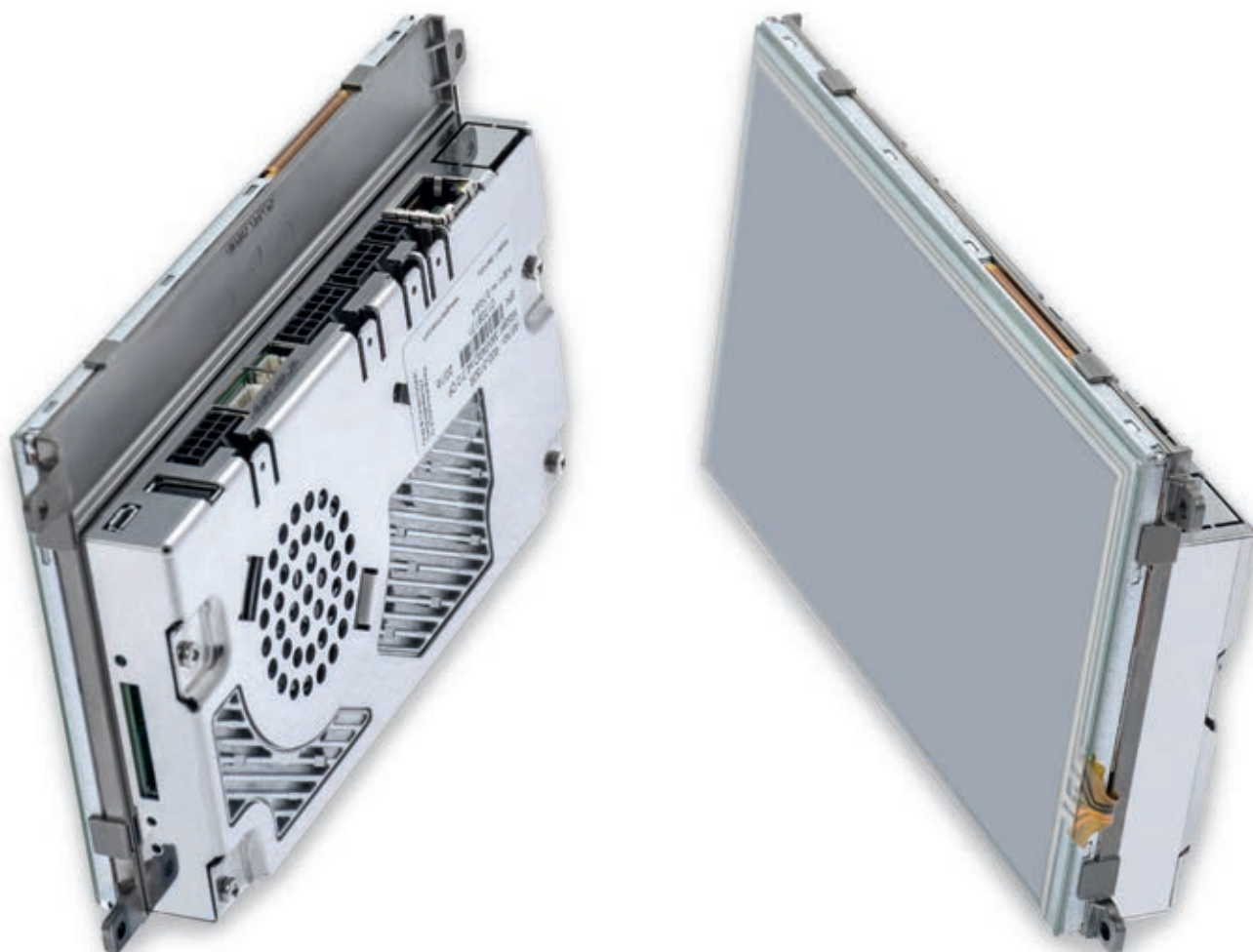


CPU	x1
CPU Type	i.MX6Solo
Core Class	ARM Cortex - A9
Core Clock	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data; 512 KB L2 cache
HW Accelerators	Open VG 1.1 (Emulated on 3D GPU)
RTC	Accuracy: +/- 30 ppm at 25°C
Super Cap	Buffer for 24h
Memory	
eMMC Flash	4 GB MLC eMMC
RAM Standard	1 GB 32 bit LP-DDR2
Micro SD Card Slot	4 bit MMC/SDIO/SD/SDHC
Operating Systems	
Supported OS	Linux Yocto
Communication Interfaces	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)
USB 2.0	1x 480 Mbit/s OTG (Type Micro-AB)
CAN Fieldbus	1x CAN (ISO/DIS 11898); WakeUp IN
MDB	1x Master, 1x Slave
Modem	3G / 4G, GPS (optional); Micro Sim Socket
RS-232	WakeUp IN @ RS-232 Con. 1x RS-232 (RX/TX/CTS/RTS) and 1x RX, TX
Synchronous Serial Interfaces	SPI up to 2 chip selects; Pinning for RFID-I / F (Karl ³)
BLE Module	Single Mode BLE V 4.0 Slave
INSIKA	Socket for optional Smart-Card Interface (Plug In)
Misc.	2x Service Button
Video	
Video Output	HDMI 1.4 Type C Connector; + On / Off, PWM 2nd Backlight control con.
Audio	
Speaker Output	1x speaker (connector), 1 W RMS (8Ω)
Micro IN	1x microphone connector
Display and Touch	
Display Interface	Dual Channel 24bpp LVDS
Sensor	Ambient-Light-Sensor (external via I2C)
Touch Interface	PCAP I2C
Backlight Interface	+12 V, 3.3 V, on/off, PWM
Device Dimensions	
W x H x D	160 x 19 x 95 mm; PCB 160 x 95 mm
Weight	115 g
Power Supply	
Supply Voltage	Nom. 12 V DC / max. 9 to 17 V DC
Consumption	Typ. 3.0 W; max. tbd.
Powermanagement	Sleep Mode; I _{sleep} < 3 mA @ 12 V
Typical Environmental Conditions	
Storage Temp.	-20 to +70 °C
Operating Temp.	-20 to +60 °C
Humidity	5 to 90 % RH

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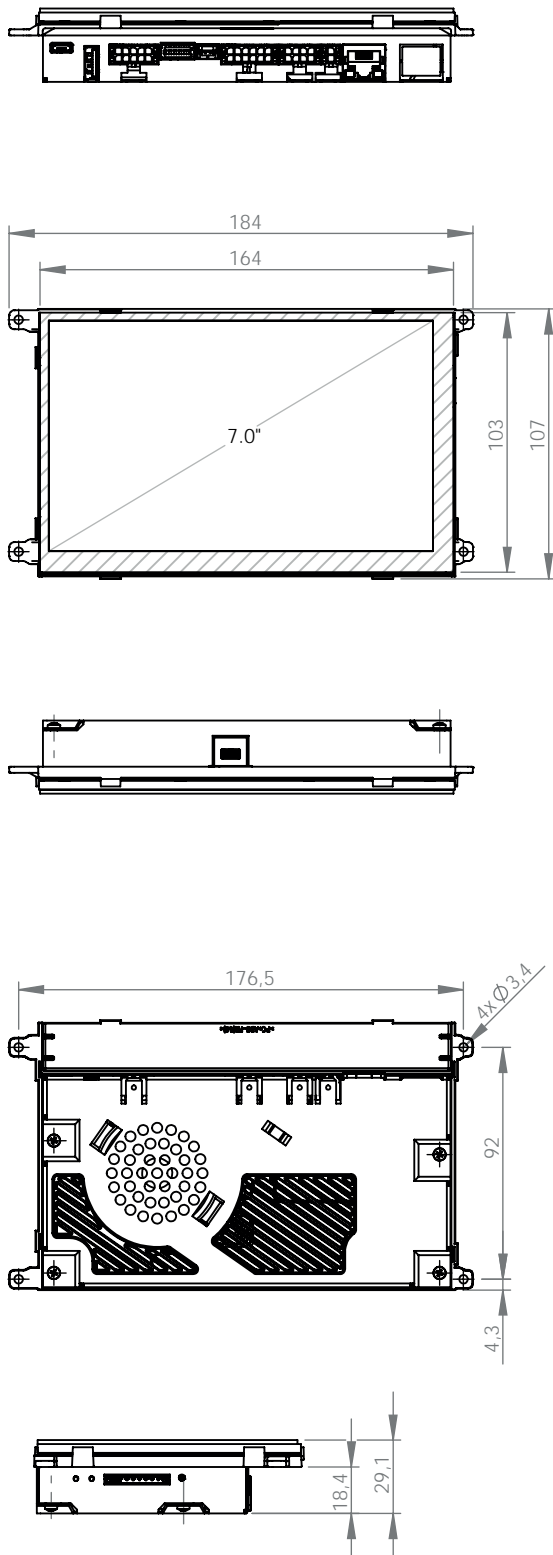
SANTARO 7.0 OF

ARM Cortex-A9 Rear Mount



TECHNICAL SPECIFICATION

SANTARO 7.0 OF

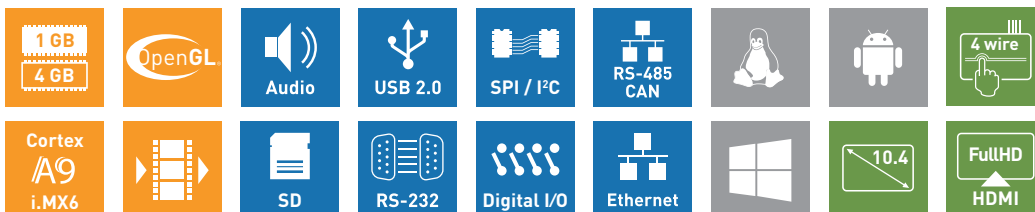
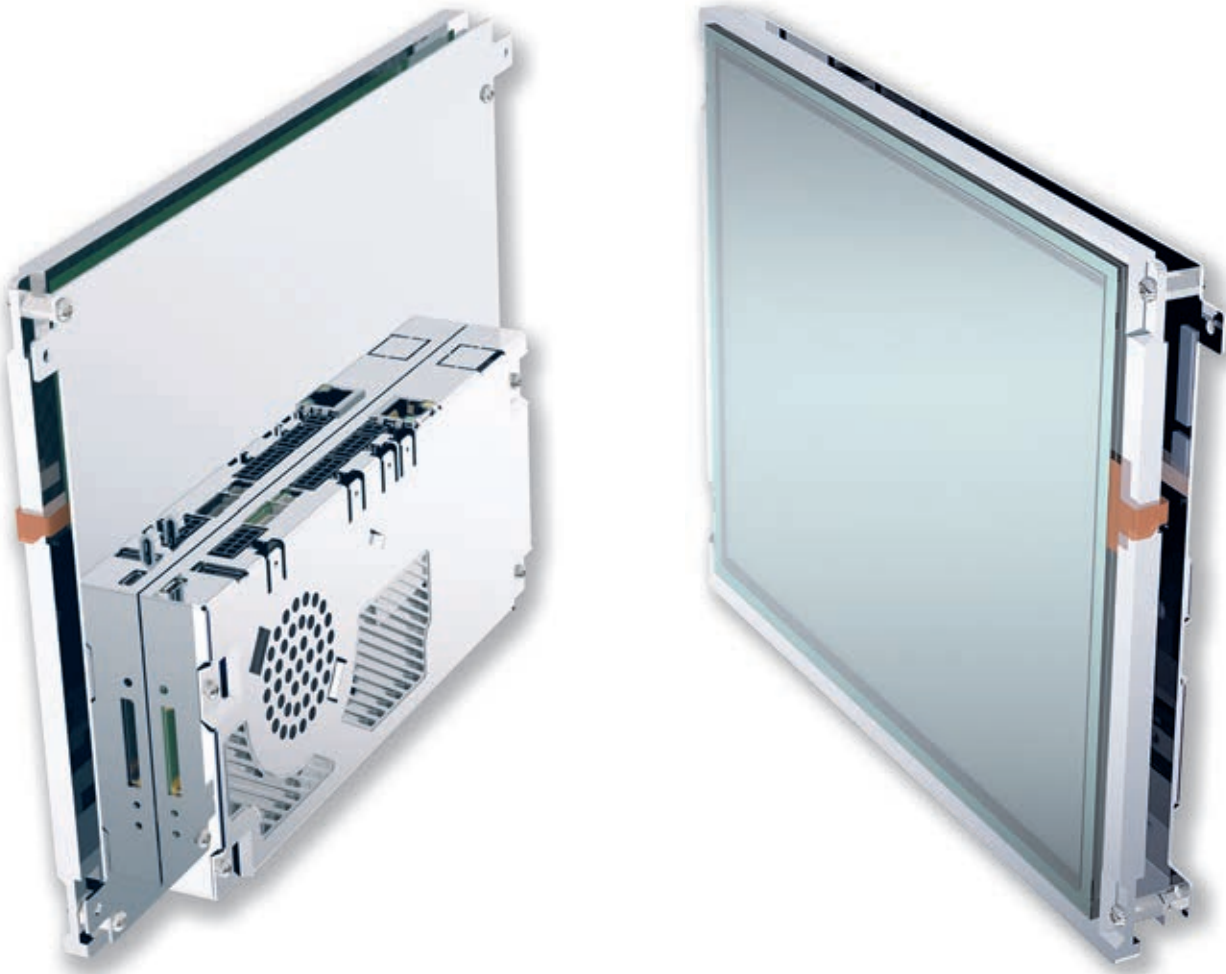


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 [Emulated on 3D GPU]	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I ² C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker [connector], 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	7 inch/177.8 mm	
Resolution	800 x 480 pixel	
Brightness	Typ. 400 cd/m ²	
Backlight Lifetime	Typ. 40 000 h	
Viewing Angle	60°, 70°, 70°, 70° (UDRL)	
Color	18 bit (262 K colors)	
Touch	4 wire resistive	
Housing		
Front	Touch film, surface hardness 3H	
Frame	None	
Rear	ABS-PC/1.4016 stainless steel	
Ingress Protection	Front IP 20/Rear IP20	
Device Dimensions		
W x H x D	184.0 x 107.0 x 29.1 mm	
Weight	549 g	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. 5.7 W; max. 22.8 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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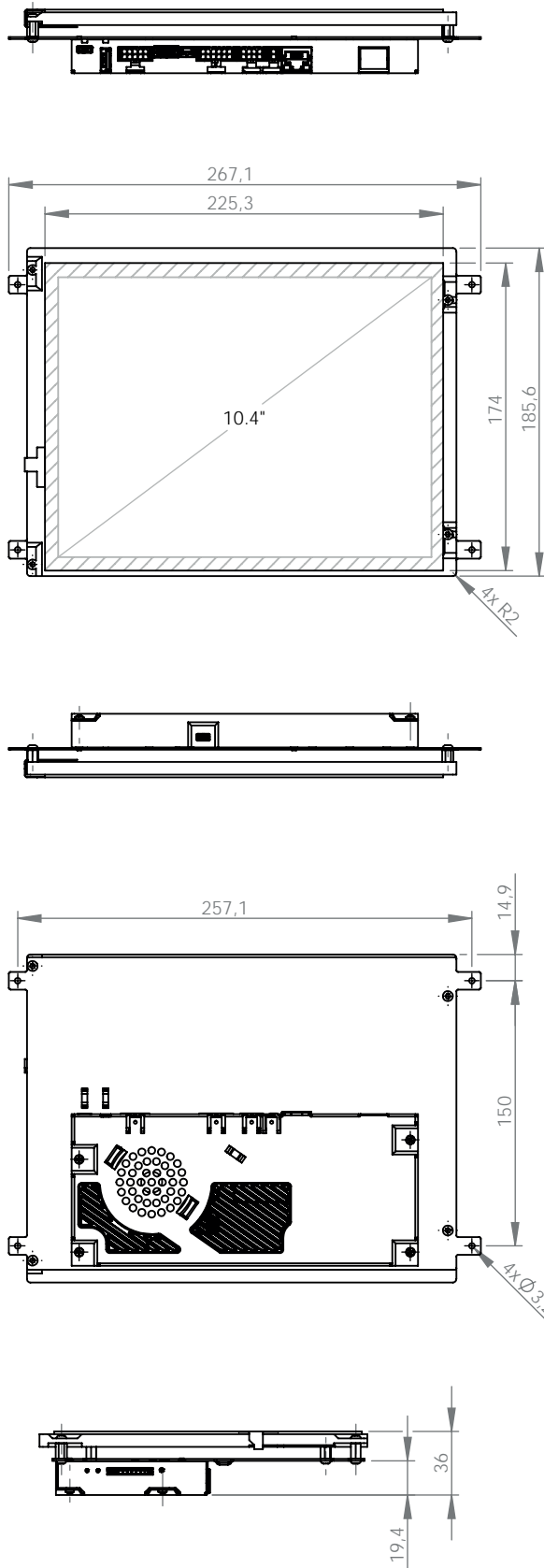
SANTARO 10.4 OF

ARM Cortex-A9 Rear Mount



TECHNICAL SPECIFICATION

SANTARO 10.4 OF

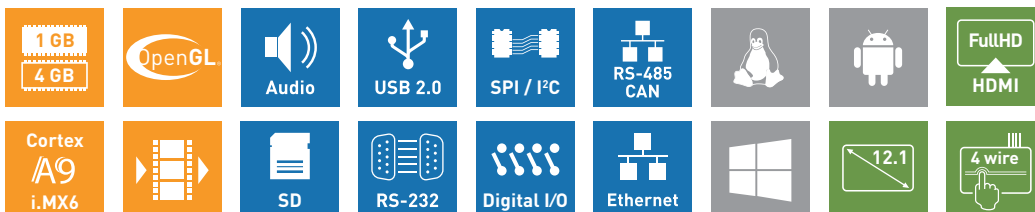
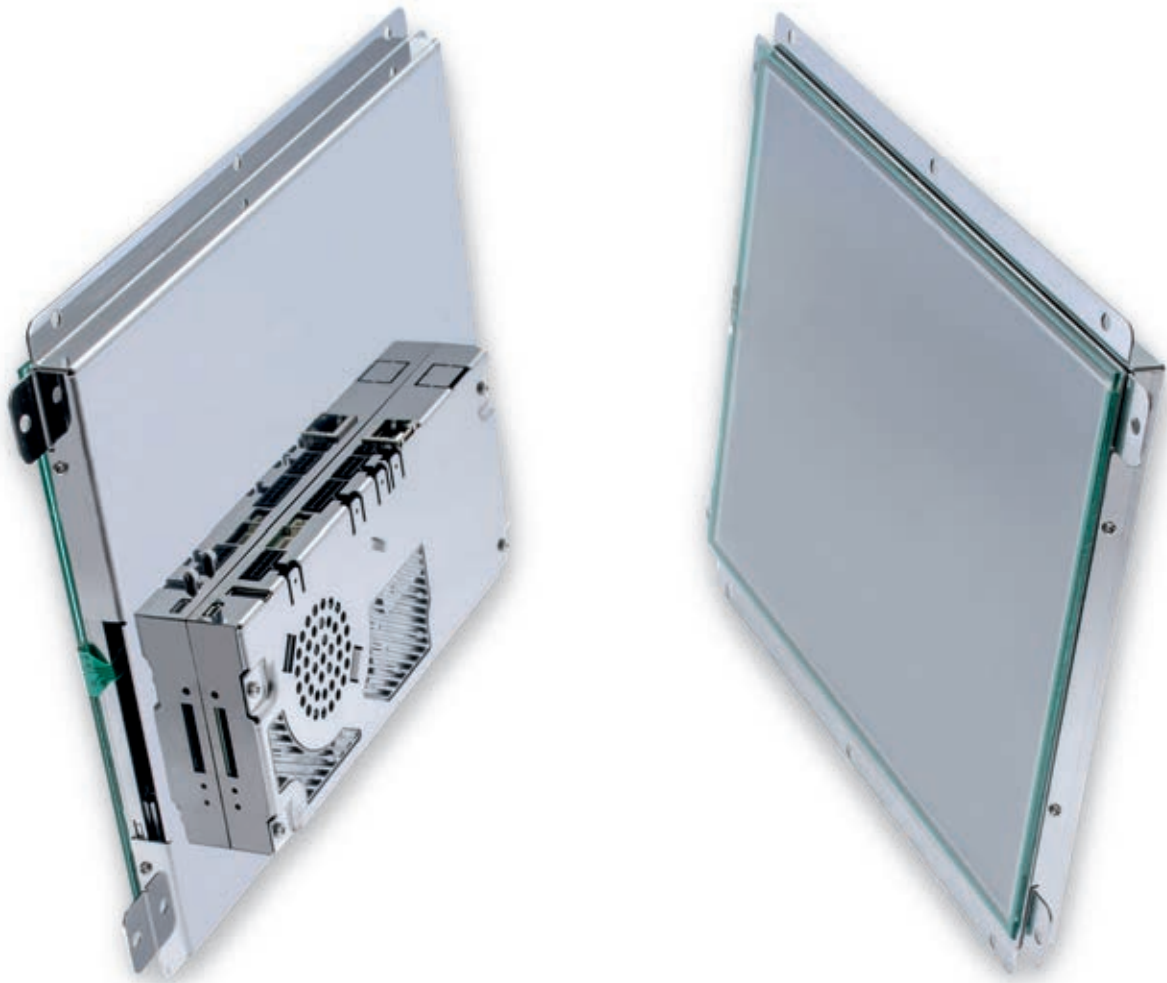


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de-coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.4 inch/264.0 mm	
Resolution	800 x 600 pixel	
Brightness	Typ. 400 cd/m²	
Backlight Lifetime	Typ. 30 000 h	
Viewing Angle	50°, 60°, 70°, 70° (UDRL)	
Color	18 bit (262 K colors)	
Touch	4 wire resistive	
Housing		
Front	Touch film, surface hardness 3H.	
Frame	None	
Rear	1.4016 stainless steel	
Ingress Protection	Front IP 20/Rear IP20	
Device Dimensions		
W x H x D	267.1 x 185.6 x 36.0 mm	
Weight	1186 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 8.5 W; max. 26.4 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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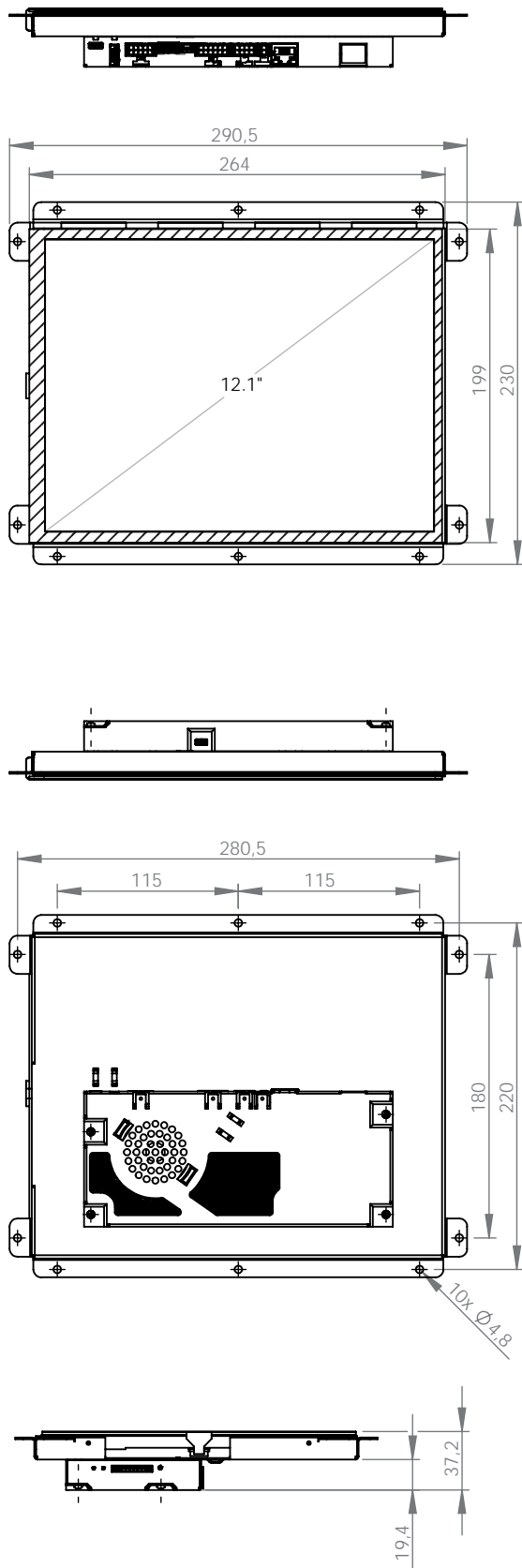
SANTARO 12.1 0F

ARM Cortex-A9 Rear Mount



TECHNICAL SPECIFICATION

SANTARO 12.1 OF



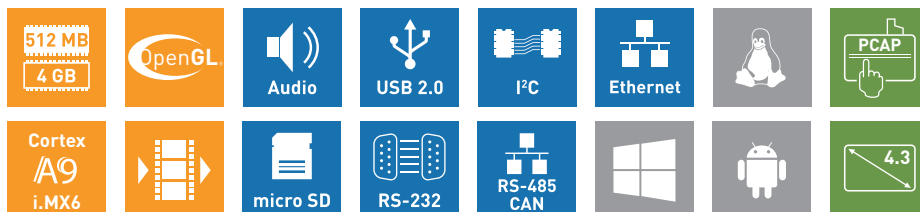
CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	12.1 inch/307.5 mm	
Resolution	800 x 600 pixel	
Brightness	Typ. 360 cd/m²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	89°,89°,89°,89° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	4-wire resistive touch	
Housing		
Front	Touch film, surface hardness 3H.	
Frame	None	
Rear	1.4016 stainless steel	
Ingress Protection	Front IP 20/Rear IP20	
Device Dimensions		
W x H x D	290.5 x 230.0 x 37.2 mm	
Weight	tbd.	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 12.5 W; max. 30.2 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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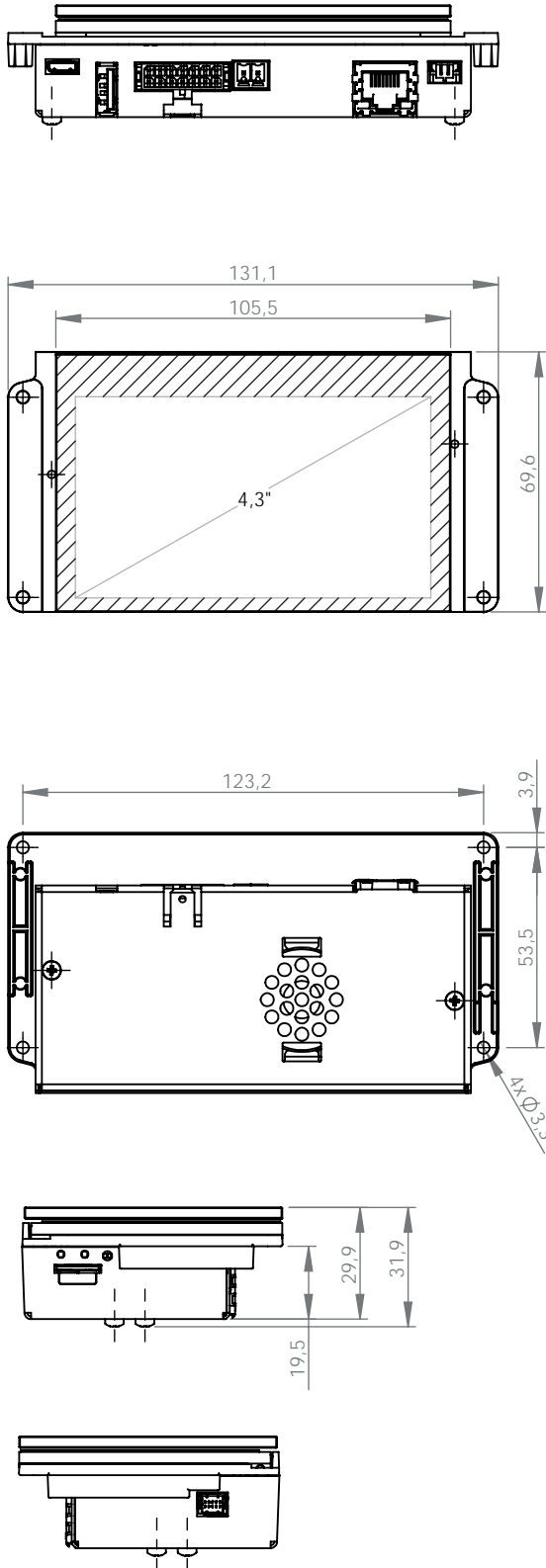
ARM Cortex-A9 Rear Mount

coming soon
subject to change



TECHNICAL SPECIFICATION

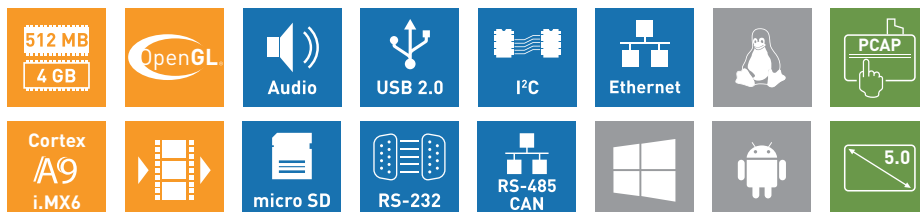
SANTINO LT 4.3 OF PCT



CPU	x1	x2L
CPU Type	i.MX6Solo	i.MX6DualLite
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache,32 KB for instruction and data caches; Unified 512 KB L2 cache	
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC	
RAM Standard	512 MB 32 bit DDR3L	1 GB 32 bit DDR3L
Micro SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
RS-485	1x RS-485 (Half duplex)	
RS-232	1x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	I²C, Matrix keypad up to 4 x 4	
High-Speed USB 2.0	1x 480 Mbit/s Host (Type A), 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus	1x CAN (ISO/DIS 11898)	
Audio		
Speaker Output	1x speaker (connector), 1.5 W RMS (8Ω)	
Audio Internal	1x speaker 1 W RMS (8Ω)	
Display and Touch		
Size	4.3 inch/109.3 mm	
Resolution	480 x 272 pixel	
Brightness	Typ. 576 cd/m²	
Backlight Lifetime	min. 30 000 h	
Viewing Angle	50°, 70°, 70°, 70° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, , RAL 9005	
Frame	None	
Rear	Aluminum/1.4016 stainless steel	
Ingress Protection	Front IP 20/Rear IP20	
Device Dimensions		
W x H x D	130.9 x 69.6 x 32.0 mm	
Weight	tbd.	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. tbd.	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +50 °C	
Humidity	5 to 90 % RH	

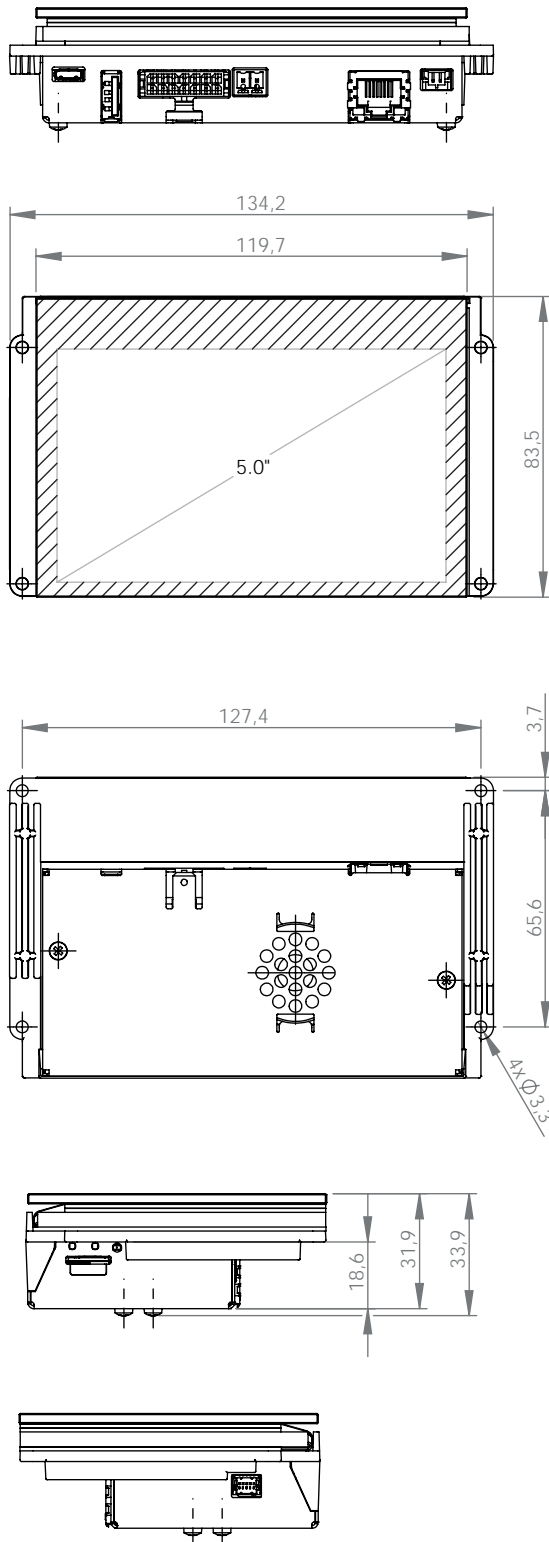
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ARM Cortex-A9 Rear Mount



TECHNICAL SPECIFICATION

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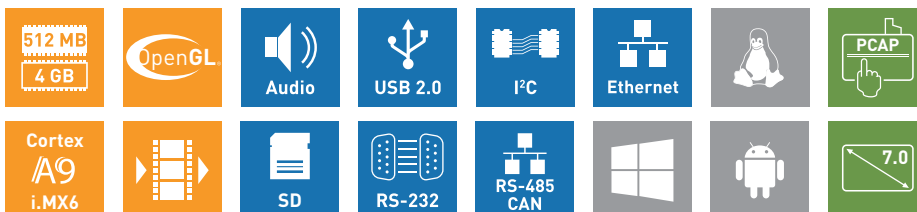


CPU	x1	x2L
CPU Type	i.MX6Solo	i.MX6DualLite
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de-coder and HD 720p video encoder hardware engine; L1 cache,32 KB for instruction and data caches; Unified 512 KB L2 cache	
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC	
RAM Standard	512 MB 32 bit DDR3L	1 GB 32 bit DDR3L
Micro SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
RS-485	1x RS-485 (Half duplex)	
RS-232	1x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	I²C, Matrix keypad up to 4 x 4	
High-Speed USB 2.0	1x 480 Mbit/s Host (Type A), 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus	1x CAN (ISO/DIS 11898)	
Audio		
Speaker Output	1x speaker [connector], 1.5 W RMS (8Ω)	
Audio Internal	1x speaker 1 W RMS (8Ω)	
Display and Touch		
Size	5 inch/125.95 mm	
Resolution	800 x 480 pixel	
Brightness	up to 1120 cd/m²; software default: 400 cd/m²	
Backlight Lifetime	min. 50 000 h	
Viewing Angle	60°,70°,75°,75° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	2.8 mm toughened glass, RAL 9005	
Frame	None	
Rear	Aluminum/1.4016 stainless steel	
Ingress Protection	Front IP 20/Rear IP20	
Device Dimensions		
W x H x D	134,2 x 83.5 x 33.9 mm	
Weight	360 g	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. 7.1 W; max. 20.4 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +50 °C	
Humidity	5 to 90 % RH	

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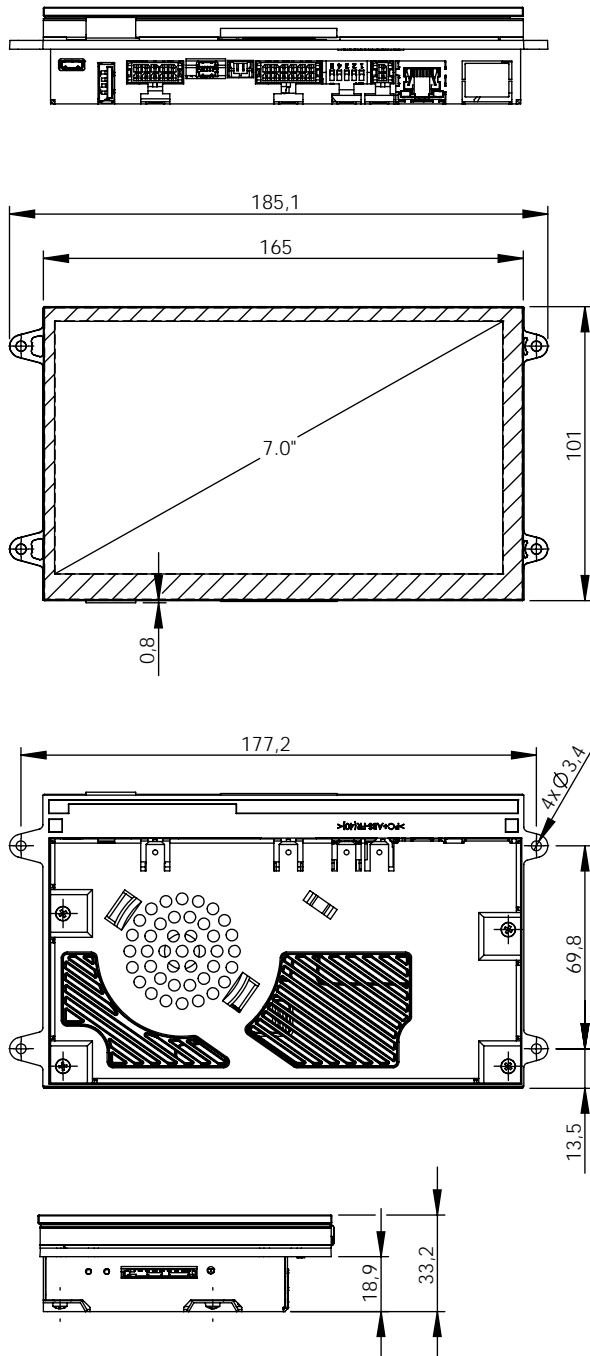
SANTINO 7.0 OF PCT

ARM Cortex-A9 Rear Mount



TECHNICAL SPECIFICATION

SANTINO 7.0 OF PCT

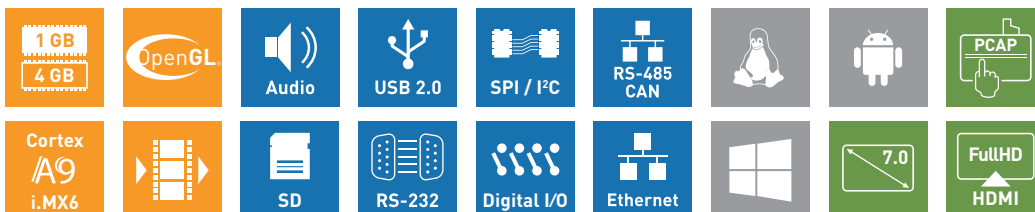
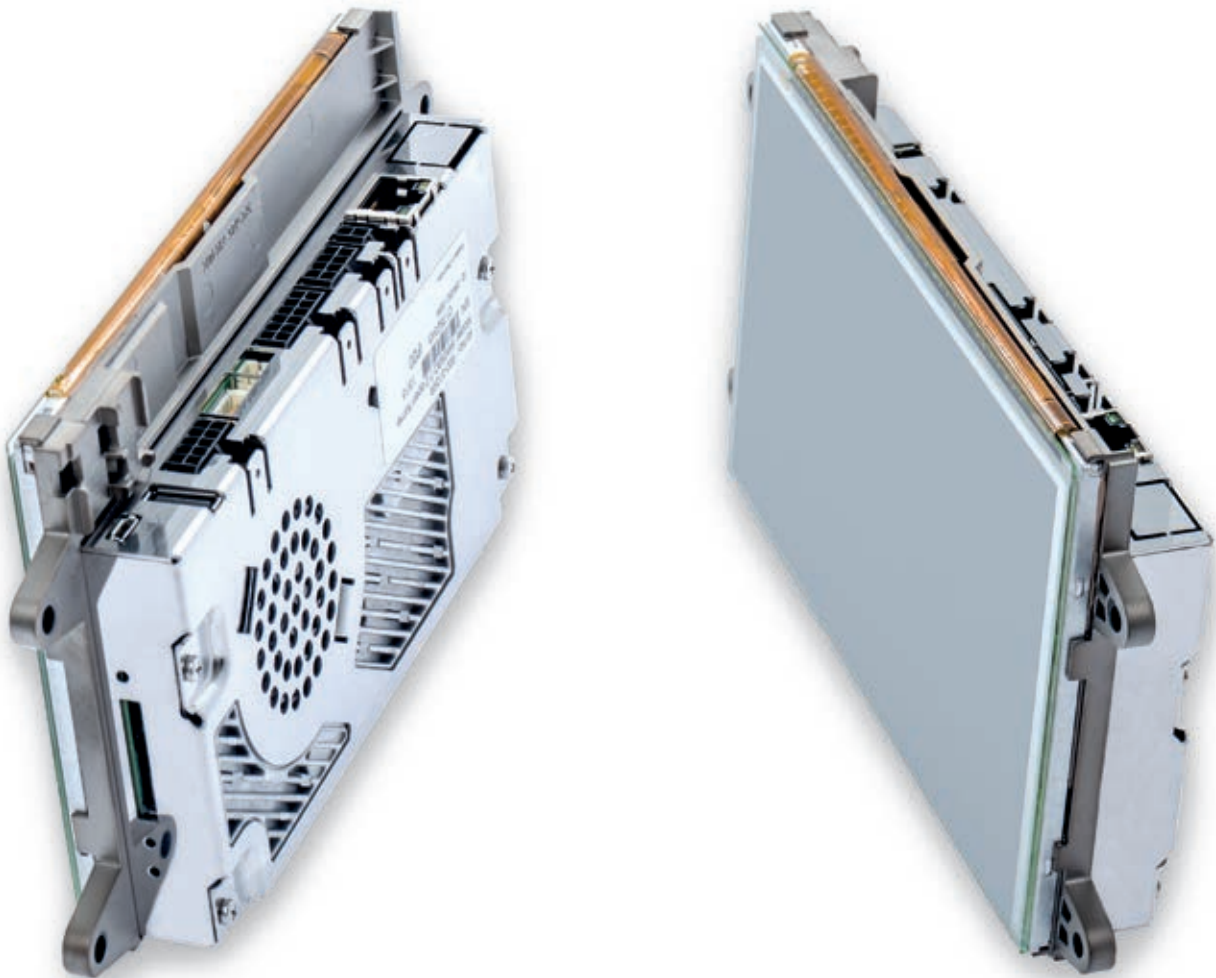


CPU	x1	x2L
CPU Type	i.MX6Solo	i.MX6DualLite
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de-coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data; 512 KB L2 cache	
HW Accelerators	OpenGL ES 2.0, Open VG 1.1 (Emulated on 3D GPU)	
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	512 MB 32 bit DDR3L	1 GB 32 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus/ RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	I²C, Matrix keypad up to 4 x 4	
Audio		
Speaker Output	1x speaker (connector), 1.5 W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	7 inch/177.8 mm	
Resolution	800 x 480 pixel	
Brightness	Typ 400 cd/m²	
Backlight Lifetime	Typ. 50 000 h	
Viewing Angle	50°,70°,70°,70° (UDRL)	
Color	18 bit (262 K colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	None	
Rear	ABS-PC/1.4016 stainless steel	
Ingress Protection	Front IP 20/Rear IP20	
Device Dimensions		
W x H x D	185.1 x 101.6 x 35.2 mm	
Weight	498 g.	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. 5.3 W; max. 22.8 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +50 °C	
Humidity	5 to 90 % RH	

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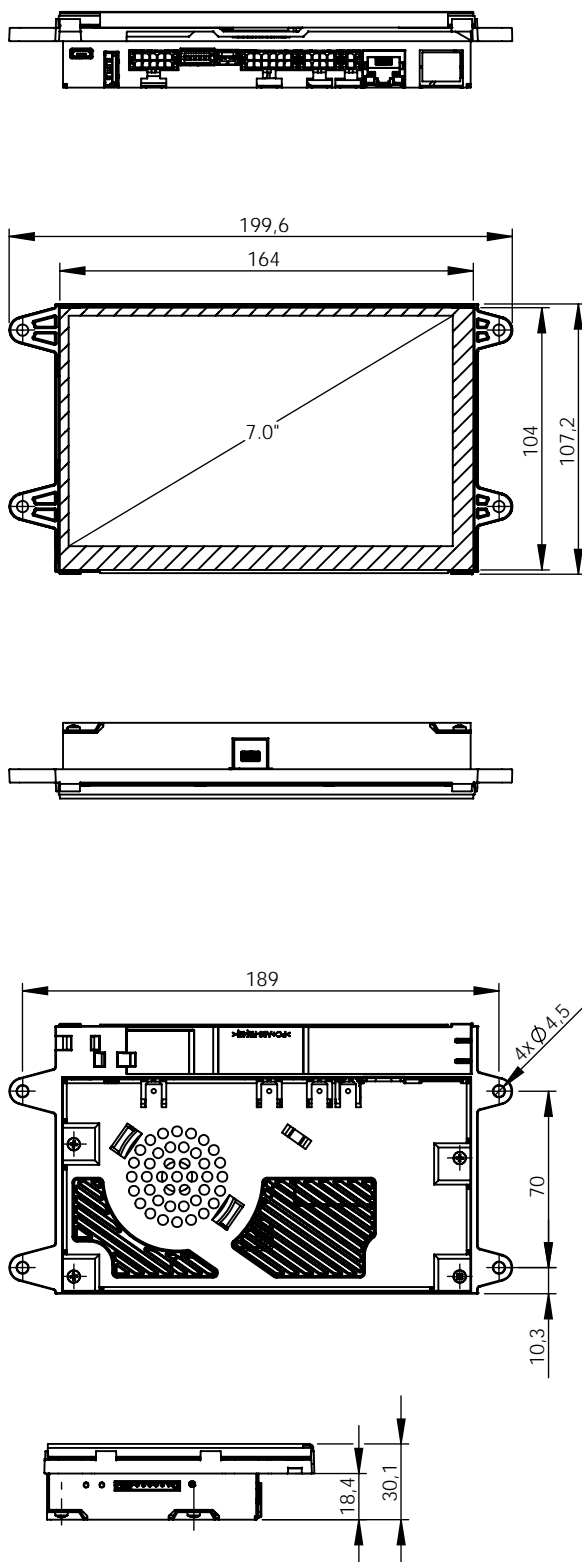
SANTARO 7.0 OF PCT

ARM Cortex-A9 Rear Mount



TECHNICAL SPECIFICATION

SANTARO 7.0 OF PCT

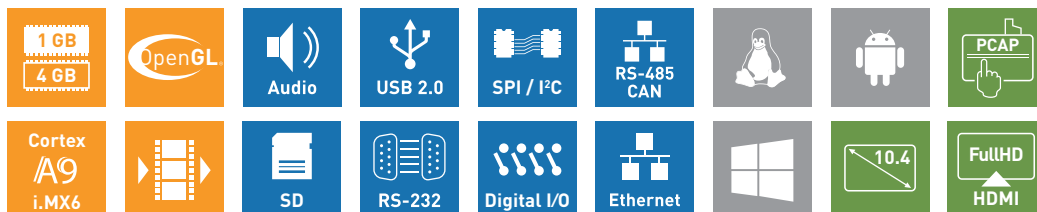
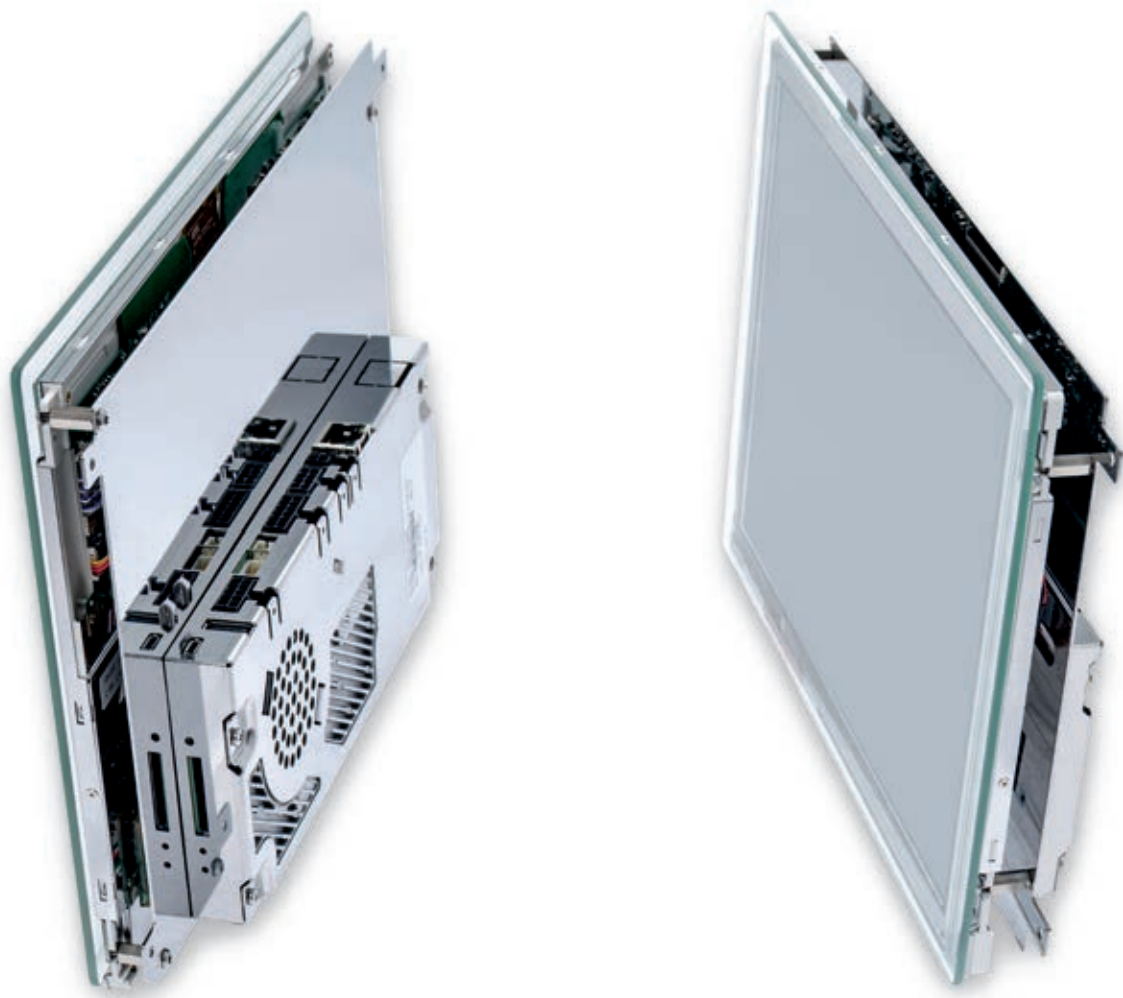


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	7 inch/177.8 mm	
Resolution	800 x 480 pixel	
Brightness	Typ. 400 cd/m²	
Backlight Lifetime	Typ. 40 000 h	
Viewing Angle	60°, 70°, 70°, 70° (UDRL)	
Color	18 bit (262 K colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	Aluminum, colorless anodized	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	199.6 x 107.2 x 30.1 mm	
Weight	563 g	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. 5.7 W; max. 22.8 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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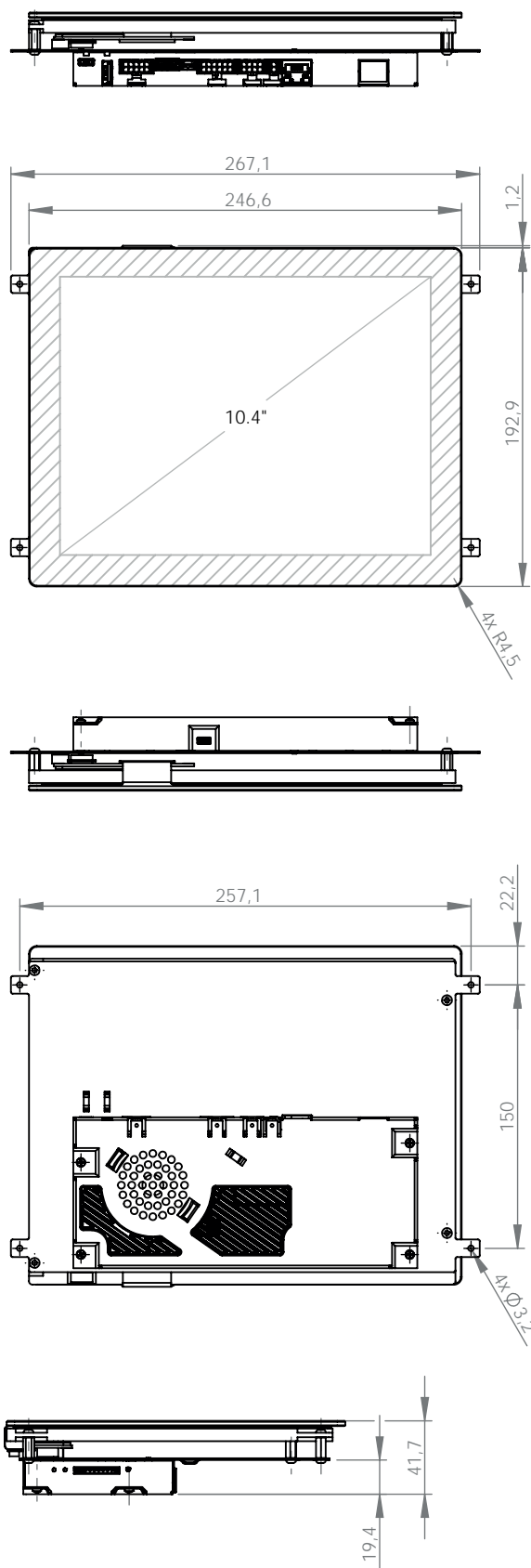
SANTARO 10.4 OF PCT

ARM Cortex-A9 Rear Mount



TECHNICAL SPECIFICATION

SANTARO 10.4 OF PCT

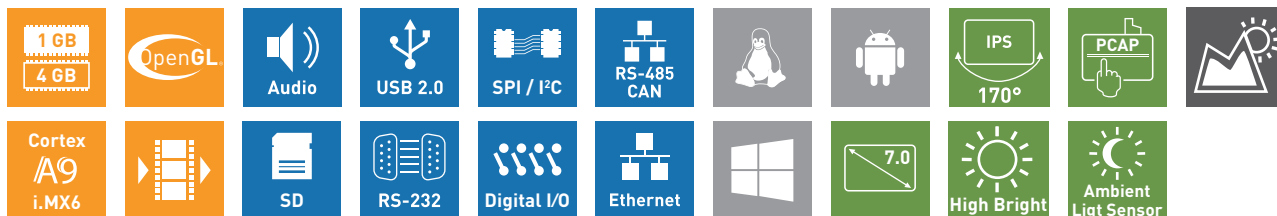


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.4 inch/264.0 mm	
Resolution	800 x 600 pixel	
Brightness	Typ. 400 cd/m²	
Backlight Lifetime	Typ. 30 000 h	
Viewing Angle	50°, 60°, 70°, 70° (UDRL)	
Color	18 bit (262 K colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, colorless	
Frame	None	
Rear	1.4016 stainless steel	
Ingress Protection	Front IP 20/Rear IP20	
Device Dimensions		
W x H x D	267.1 x 194.1 x 41.7 mm	
Weight	1476 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 8.5 W; max. 26.4 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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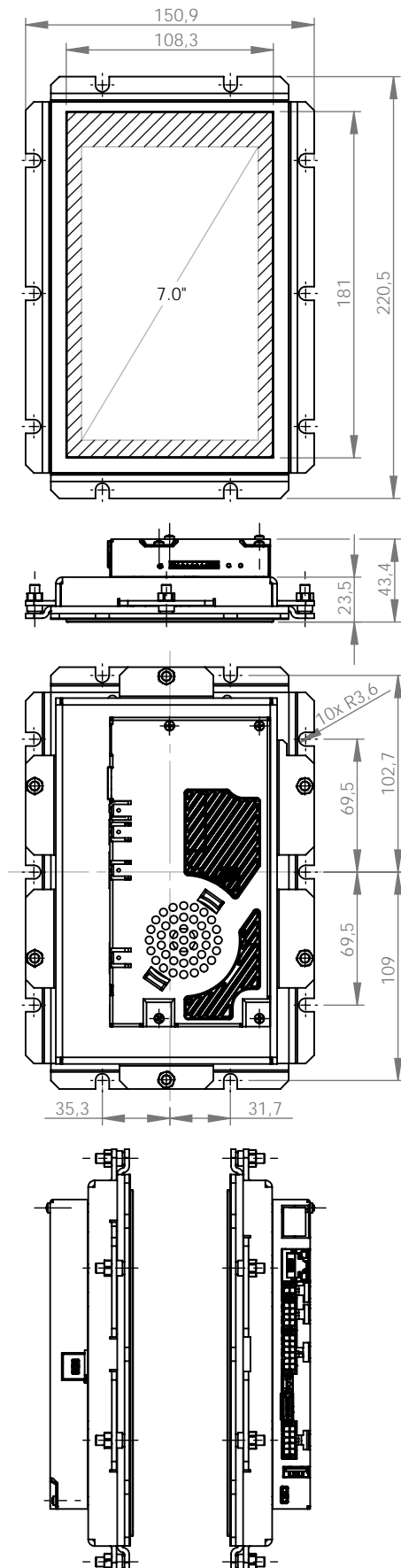
SANTARO 7.0 OF PCT IPS outdoor

ARM Cortex-A9 Rear Mount



TECHNICAL SPECIFICATION

SANTARO 7.0 OF PCT IPS outdoor

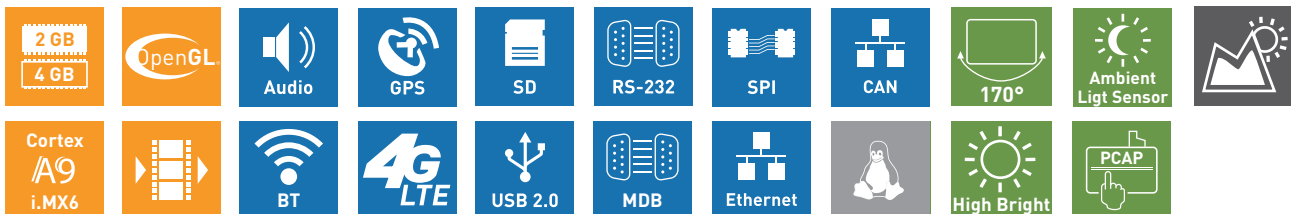


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	7 inch/177.8 mm	
Resolution	800 x 480 pixel	
Brightness	Typ. 1000 cd/m²	
Backlight Control	Ambient Light Sensor	
Backlight Lifetime	Typ. 70 000 h	
Viewing Angle	85°, 85°, 85°, 85° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	5.0 mm toughened glass, Pantone black C	
Frame	None	
Rear	2.5 mm 1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 20/Rear IP20	
Device Dimensions		
W x H x D	220.5 x 150.9 x 43.4 mm	
Weight	tbd.	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 9.1 W; max. 26.8 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	-20 to +60 °C	
Humidity	5 to 90 % RH	

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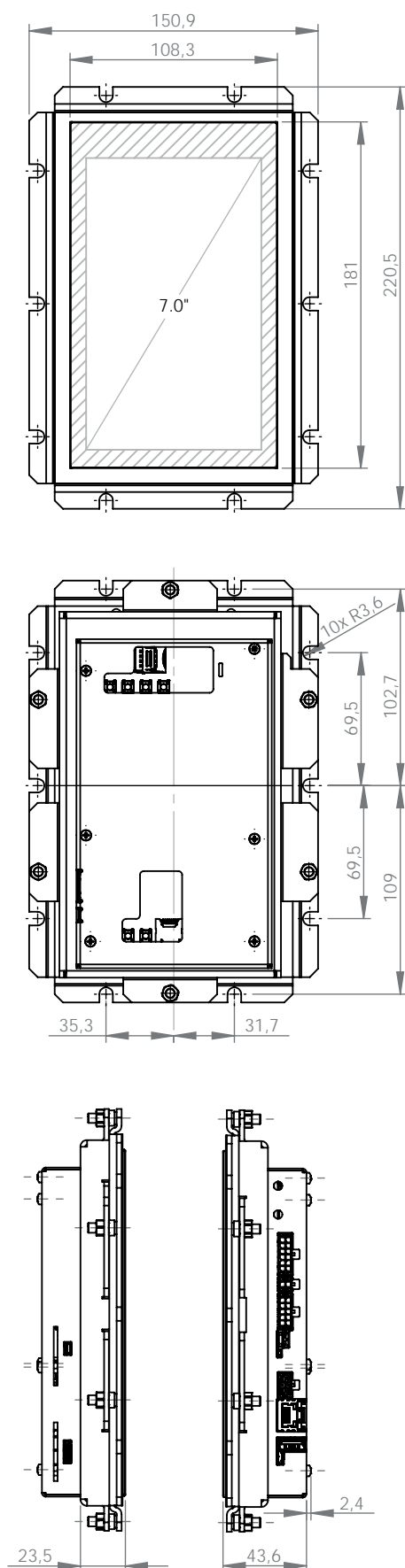
SANTVEND 7.0 OF PCT IPS outdoor

ARM Cortex-A9 IOT Rear Mount



TECHNICAL SPECIFICATION

SANTVEND 7.0 OF PCT IPS outdoor

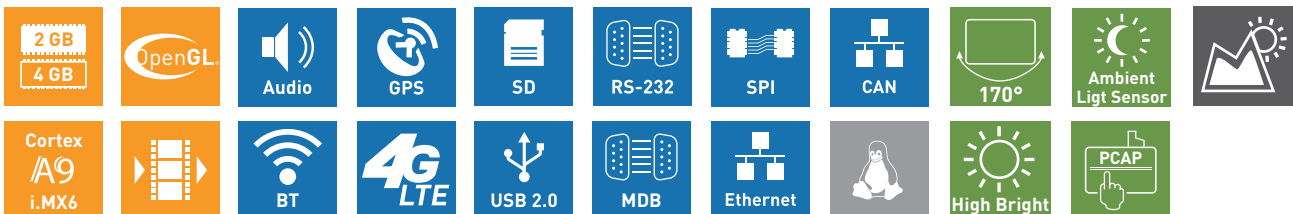


CPU	
CPU Type	i.MX6Solo
Core Class	ARM Cortex - A9
Core Clock	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data; 512 KB L2 cache
HW Accelerators	Open VG 1.1 (Emulated on 3D GPU)
RTC	Accuracy: +/- 30 ppm at 25°C
Super Cap	Buffer for 24h
Memory	
eMMC Flash	4 GB MLC eMMC
RAM Standard	1 GB 32 bit LP-DDR2
Micro SD Card Slot	4 bit MMC/SDIO/SD/SDHC
Operating Systems	
Supported OS	Linux Yocto
Communication Interfaces	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)
USB 2.0	1x 480 Mbit/s OTG (Type Micro-AB)
CAN Fieldbus	1x CAN (ISO/DIS 11898); WakeUp IN
MDB	1x Master, 1x Slave
Modem	3G / 4G, GPS (optional); Micro Sim Socket
RS-232	WakeUp IN @ RS-232 Con. 1x RS-232 (RX/TX/CTS/RTS) and 1x RX, TX
Synchronous Serial Interfaces	SPI up to 2 chip selects; Pinning for RFID-I / F (Karl ³)
BLE Module	Single Mode BLE V 4.0 Slave
INSIKA	Socket for optional Smart-Card Interface (Plug In)
Misc.	2x Service Button
Video	
Video Output	HDMI 1.4 Type C Connector; + On / Off, PWM 2nd Backlight control con.
Audio	
Speaker Output	1x speaker (connector), 1 W RMS (8Ω)
Audio Internal	1x speaker 0.3 W RMS (8Ω)
Display and Touch	
Size	7 inch/177.8 mm
Resolution	800 x 480 pixel
Brightness	Typ. 1000 cd/m ²
Backlight Control	Ambient Light Sensor
Backlight Lifetime	Typ. 70 000 h
Viewing Angle	85°,85°,85°,85° (UDRL)
Color	24 bit (16.7 Mio. colors)
Touch	projected capacitive multi touch
Housing	
Front	5.0 mm toughened glass, Pantone black C
Frame	None
Rear	2.5 mm 1.4016 stainless steel, foam seal
Ingress Protection	Front IP 20/Rear IP20
Device Dimensions	
W x H x D	220.5 x 150.9 x 46.0 mm
Weight	1680 g
Power Supply	
Supply Voltage	Nom. 12 V DC / max. 9 to 17 V DC
Consumption	Typ. 9.5 W; max. 22.8 W
Powermanagement	Sleep Mode; I sleep < 3 mA @ 12 V
Typical Environmental Conditions	
Storage Temp.	-20 to +70 °C
Operating Temp.	-20 to +60 °C
Humidity	5 to 90 % RH

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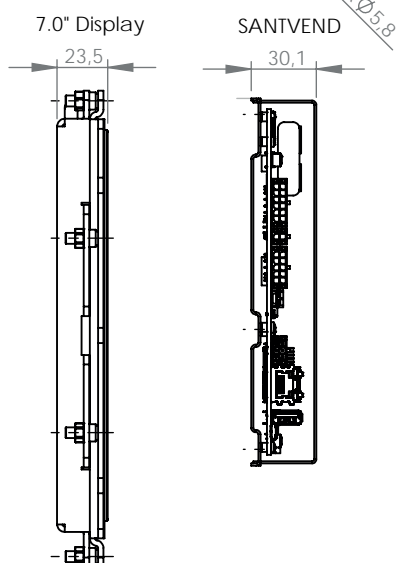
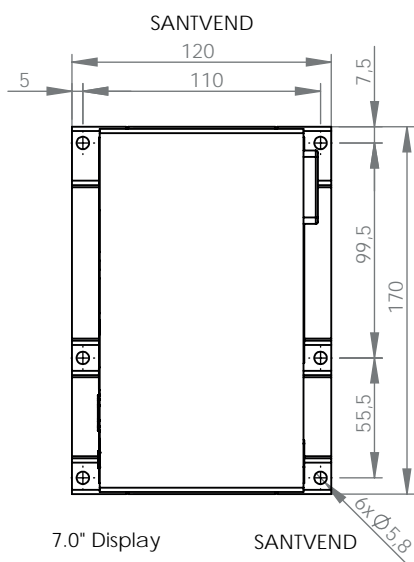
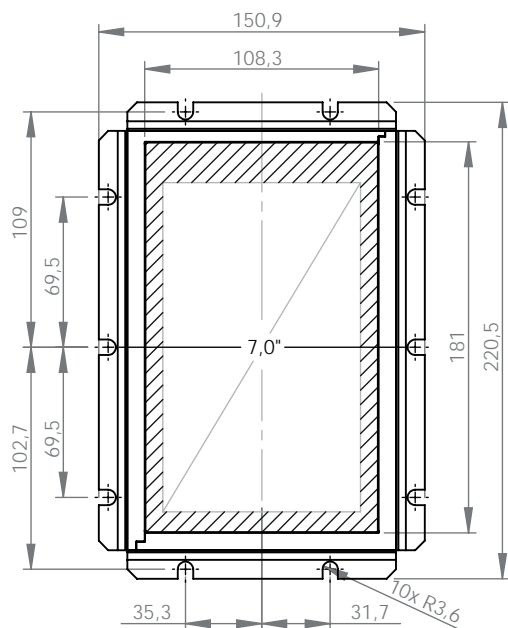
SANTVEND 7.0 OF PCT Touch/Display/Head

ARM Cortex-A9 IOT Rear Mount



TECHNICAL SPECIFICATION

SANTVEND 7.0 OF PCT Touch/Display/Head

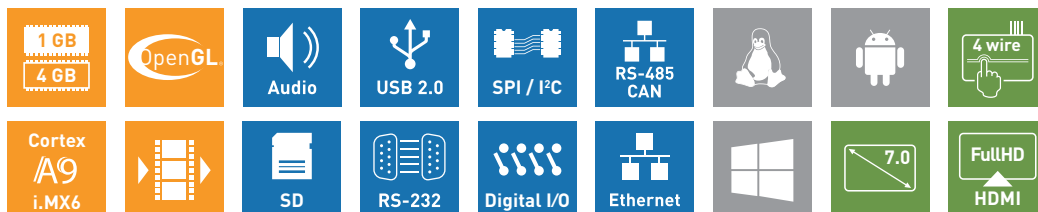
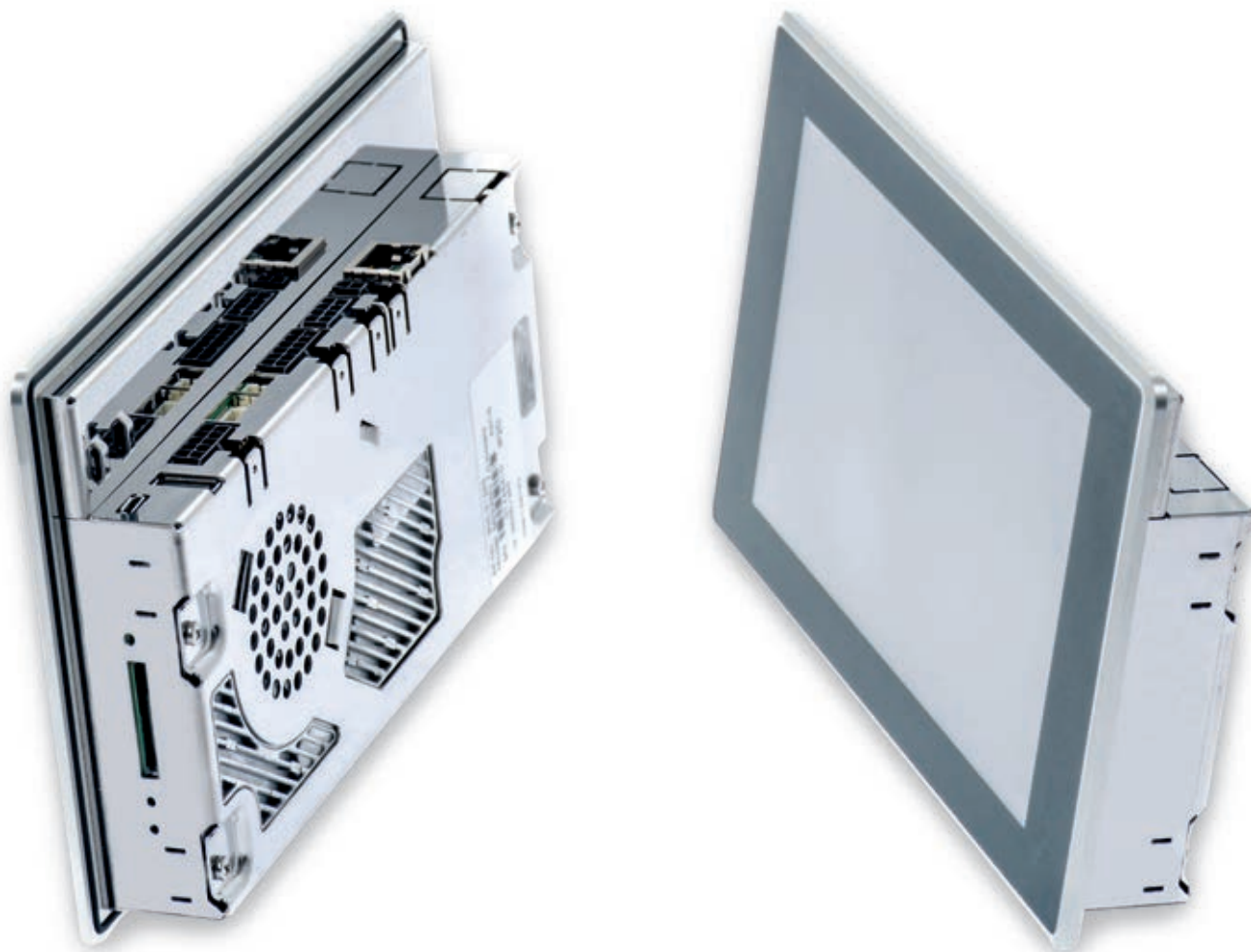


CPU		x2
CPU Type	i.MX6Dual	
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data; 1 MB L2 cache	
HW Accelerators	Open VG 1.1	
RTC	Accuracy: +/- 30 ppm at 25°C	
Super Cap	Buffer for 24h	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	2 GB 32 bit DDR3L	
Micro SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Linux Yocto	
Communication Interfaces		
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Type A (Host)	
CAN Fieldbus	1x CAN (ISO/DIS 11898)	
MDB	1x Master, 1x Slave	
Modem	3G / 4G, GPS (optional); Micro Sim Socket	
RS-232	1x RS-232 (RX/TX/CTS/RTS) and 1x RX, TX	
Synchronous Serial Interfaces	SPI up to 2 chip selects; Pinning for RFID-I / F (Karl³)	
BLE Module	Single Mode BLE V 4.0 Slave	
INSIKA	Socket for optional Smart-Card Interface (Plug In)	
Misc.	2x Service Button	
Video		
Video Output	HDMI 1.4 Type C Connector; + On / Off, PWM 2nd Backlight control con.	
Audio		
Speaker Output	1x speaker (connector), 1 W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	7 inch/177.8 mm	
Resolution	800 x 480 pixel	
Brightness	Typ. 1000 cd/m²	
Backlight Control	Ambient Light Sensor	
Backlight Lifetime	Typ. 70 000 h	
Viewing Angle	85°,85°,85°,85° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	5.0 mm toughened glass, Pantone black C	
Frame	None	
Rear	2.5 mm 1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 65/Rear IP 20	
Device Dimensions		
W x H x D	see Drawing	
Weight	1920 g.	
Power Supply		
Supply Voltage	Nom. 24 V DC / max. 10 to 42 V DC	
Consumption	Typ. 3.0 W; max. tbd.	
Li-Ion-Battery	3.7 V / 2.0 to 4.0 Ah for Modem and Backup-Power	
Li-Ion-Charger	Internal	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C without Li-Ion-Akku	
Operating Temp.	0 to +40 °C (normal operation) -20 to +60 °C without charge Li-Ion-Akku	
Humidity	5 to 90 % RH	

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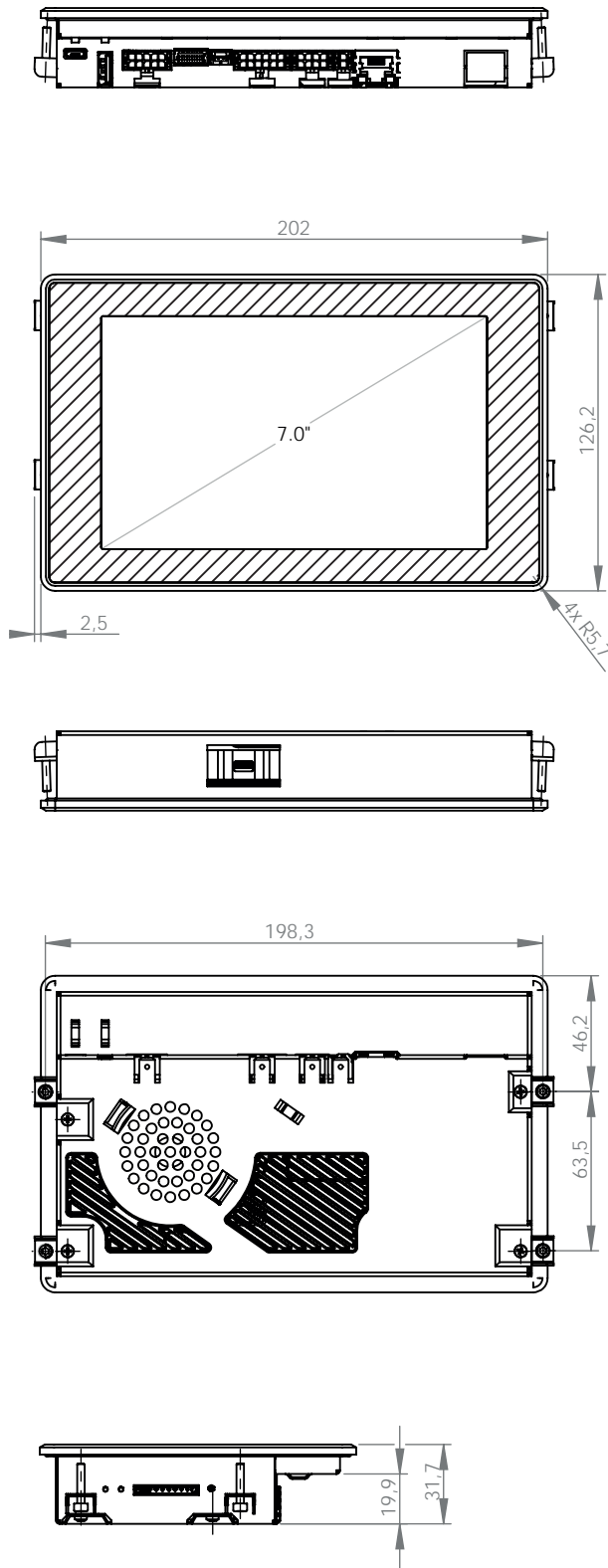
SANTARO 7.0 BX

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTARO 7.0 BX

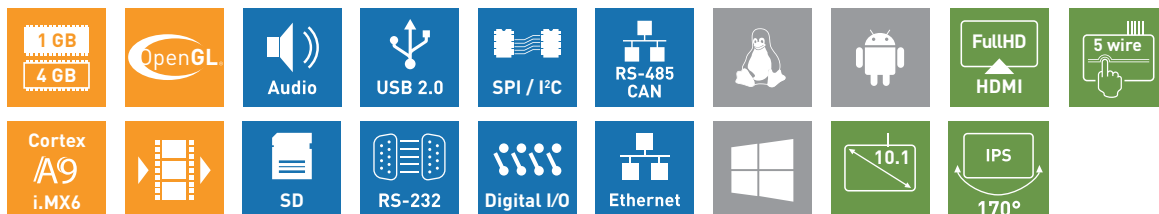
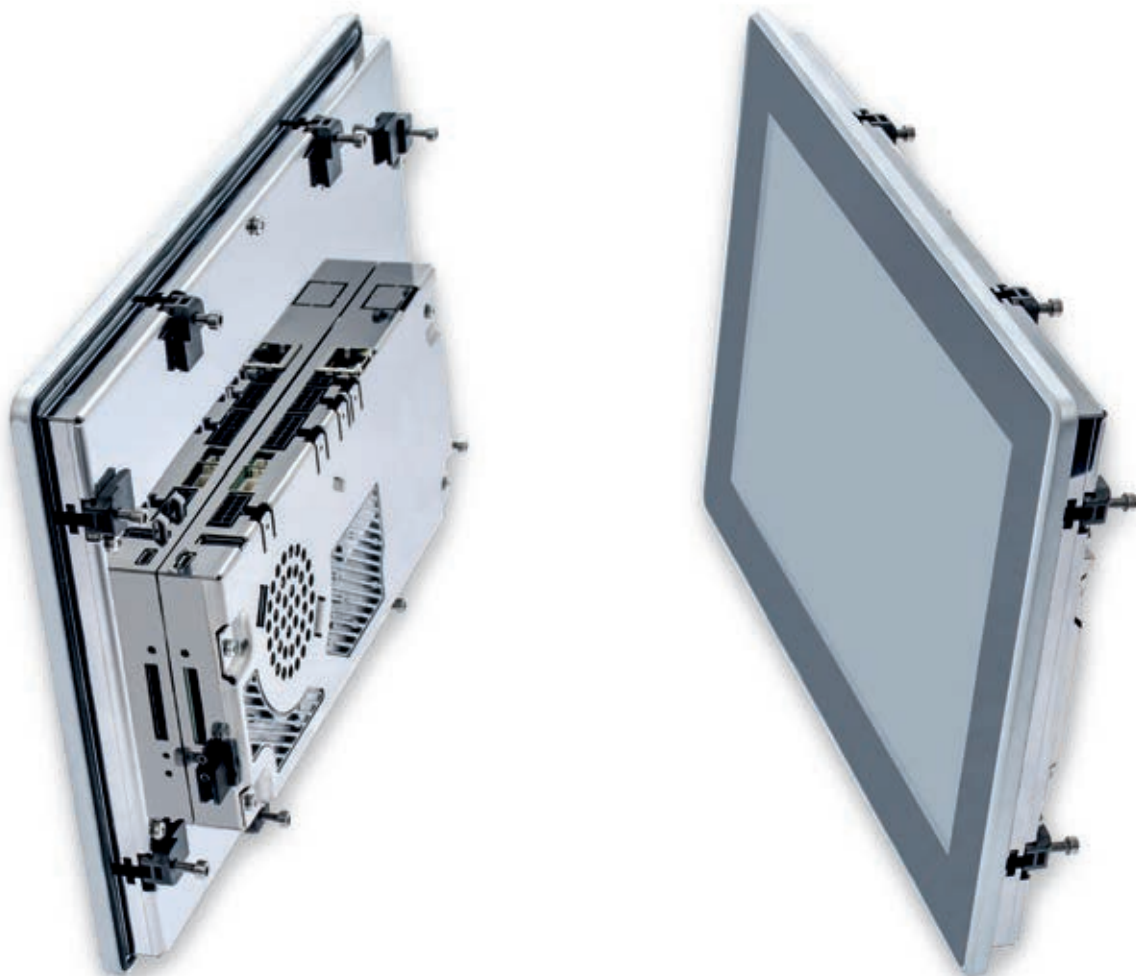


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 [Emulated on 3D GPU]	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker [connector], 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	7 inch/177.8 mm	
Resolution	800 x 480 pixel	
Brightness	Typ. 400 cd/m²	
Backlight Lifetime	Typ. 40 000 h	
Viewing Angle	60°, 70°, 70°, 70° (UDRL)	
Color	18 bit (262 K colors)	
Touch	4 wire resistive	
Housing		
Front	180 µm foil, RAL 9005, antiglare	
Frame	Aluminum, colorless anodized	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	207.0 x 126.2 x 31.7 mm	
Weight	730 g	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. 5.7 W; max. 22.8 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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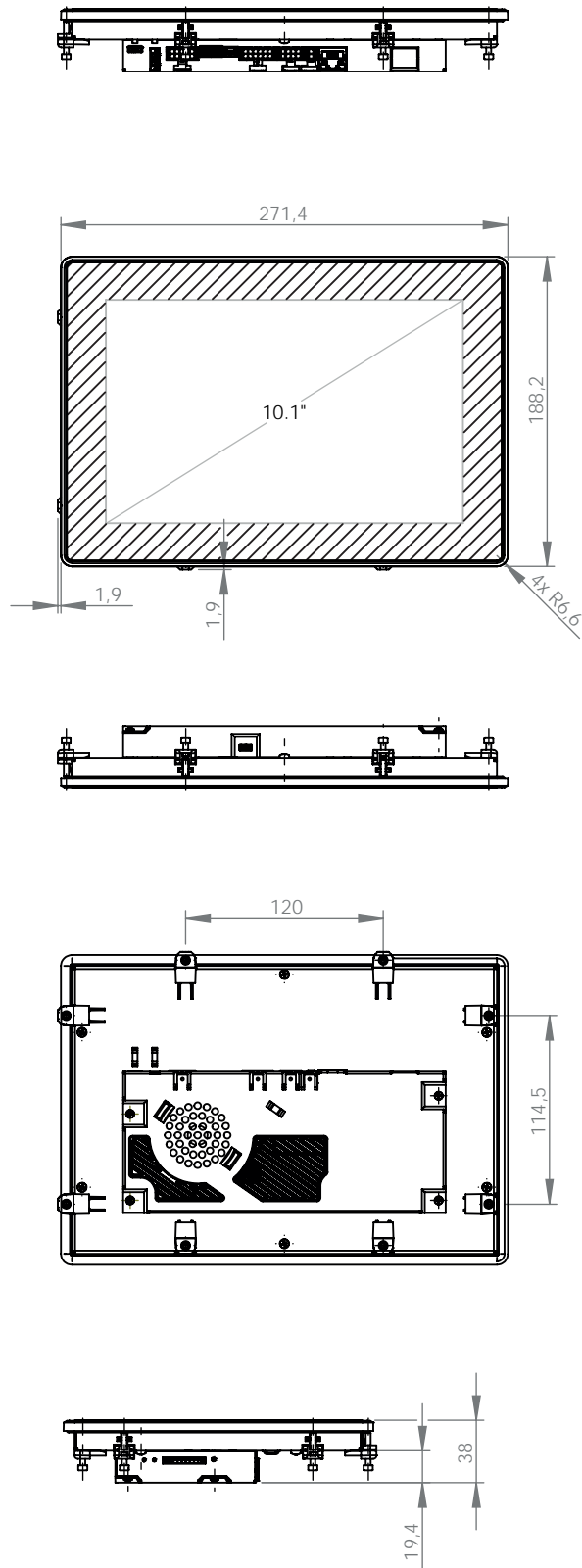
SANTARO 10.1 BX IPS

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTARO 10.1 BX IPS

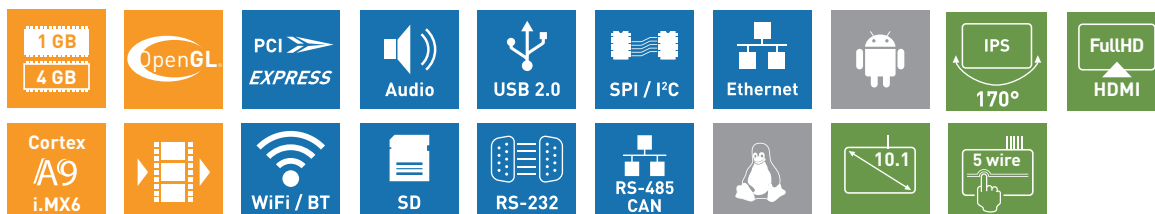


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 [Emulated on 3D GPU]	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker [connector], 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.1 inch/255.85 mm	
Resolution	1280 x 800 pixel	
Brightness	Typ. 400 cd/m²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	85°,85°,85°,85° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	5 wire resistive	
Housing		
Front	Film/Glass 3.2 mm, surface hardness 3H	
Frame	Fine zinc alloy, matt chrome	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	275.2 x 192.0 x 38.0 mm	
Weight	1749 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 10.2 W; max. 26.4 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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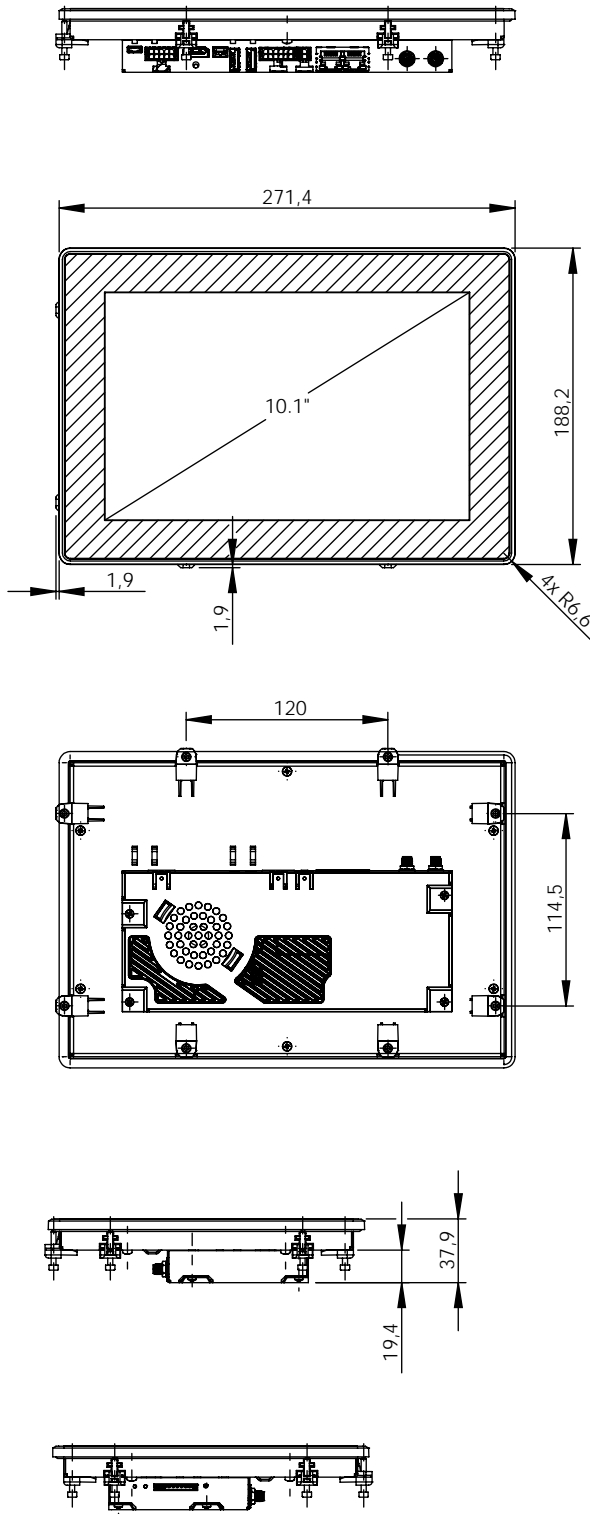
SANTOKA 10.1 BX IPS

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTOKA 10.1 BX IPS

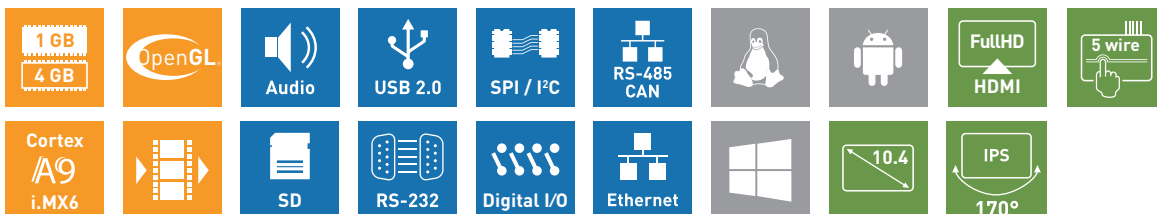
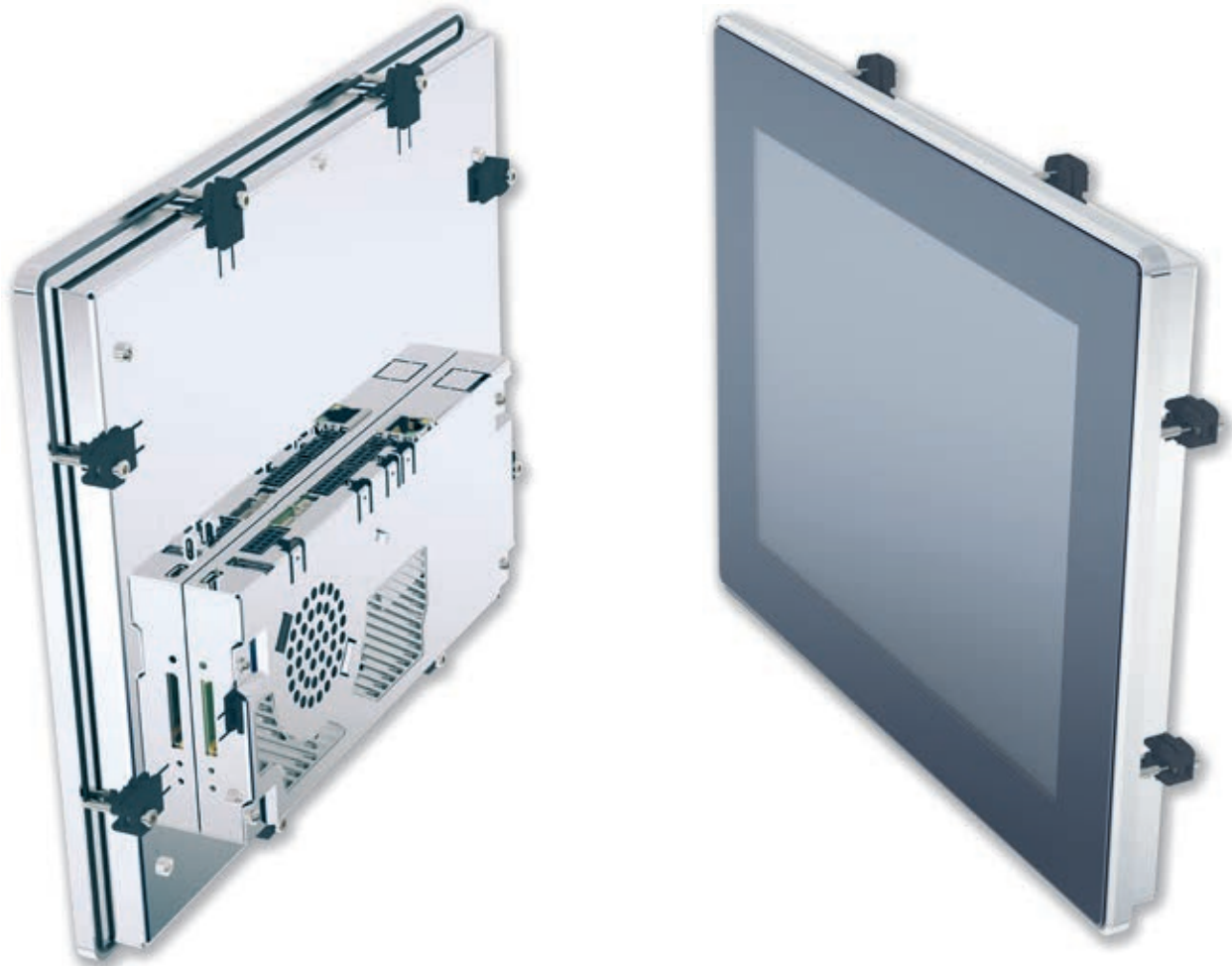


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Linux Yocto, Android	
Communication Interfaces		
Network	2x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	2x 480 Mbit/s Host (Type A)	
	1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Wireless Communication		
Wireless	WLAN 802.11 b/g/n; Bluetooth 4.0 LE For available mPCIe modules see page 129	
Video		
Video Output		Full HD HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.1 inch/255.85 mm	
Resolution	1280 x 800 pixel	
Brightness	Typ. 400 cd/m²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	85°,85°,85°,85° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	5-wire resistive touch	
Housing		
Front	Film/Glass 3.2 mm, surface hardness 3H	
Frame	Fine zinc alloy, matt chrome	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	275.2 x 192.0 x 37.9 mm	
Weight	1749 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 9.8 W; max. 32.6 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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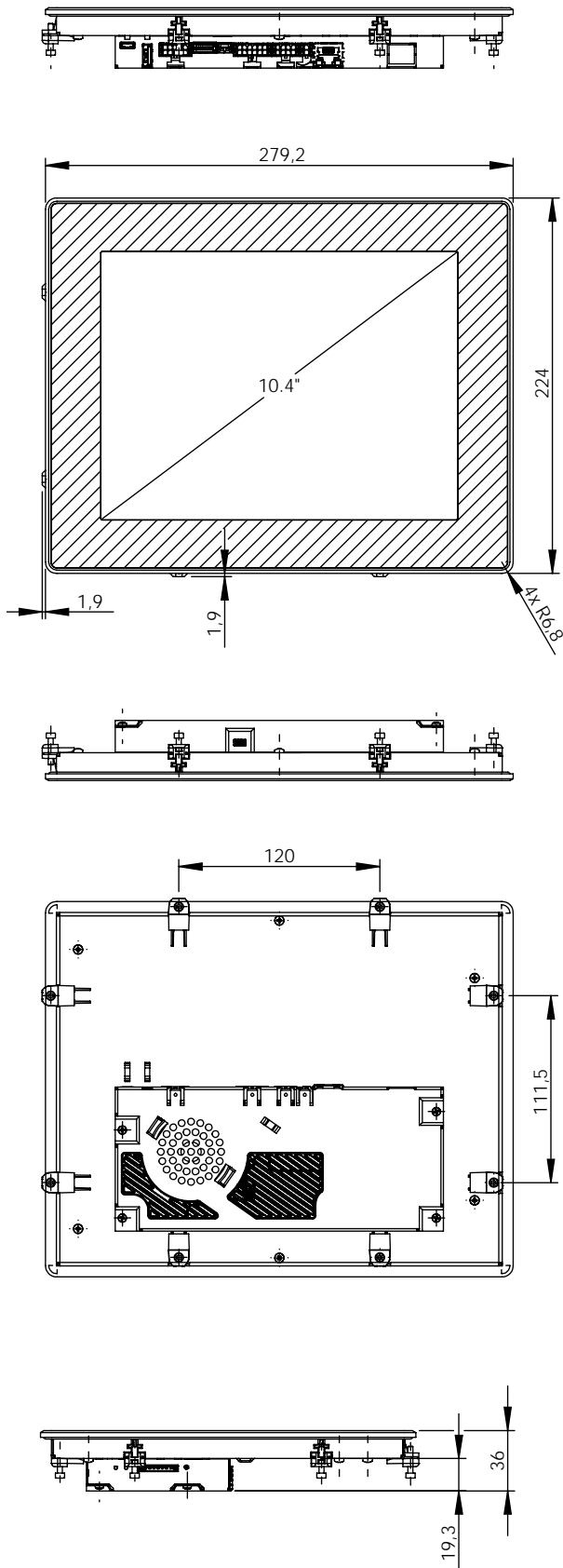
SANTARO 10.4 BX

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTARO 10.4 BX



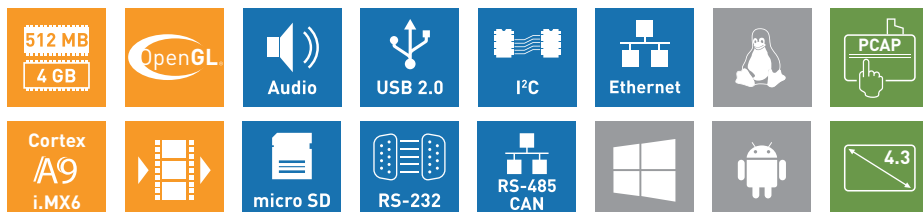
CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 [Emulated on 3D GPU]	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker [connector], 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.4 inch/264.0 mm	
Resolution	800 x 600 pixel	
Brightness	Typ. 400 cd/m²	
Backlight Lifetime	Typ. 30 000 h	
Viewing Angle	50°, 60°, 70°, 70° (UDRL)	
Color	18 bit (262 k. colors)	
Touch	4-wire resistive touch	
Housing		
Front	Film surface hardness 3H	
Frame	Aluminum, colorless anodized	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	279.2 x 224.0 x 36.1 mm	
Weight	1500 g.	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 8.5 W; max. 26.4 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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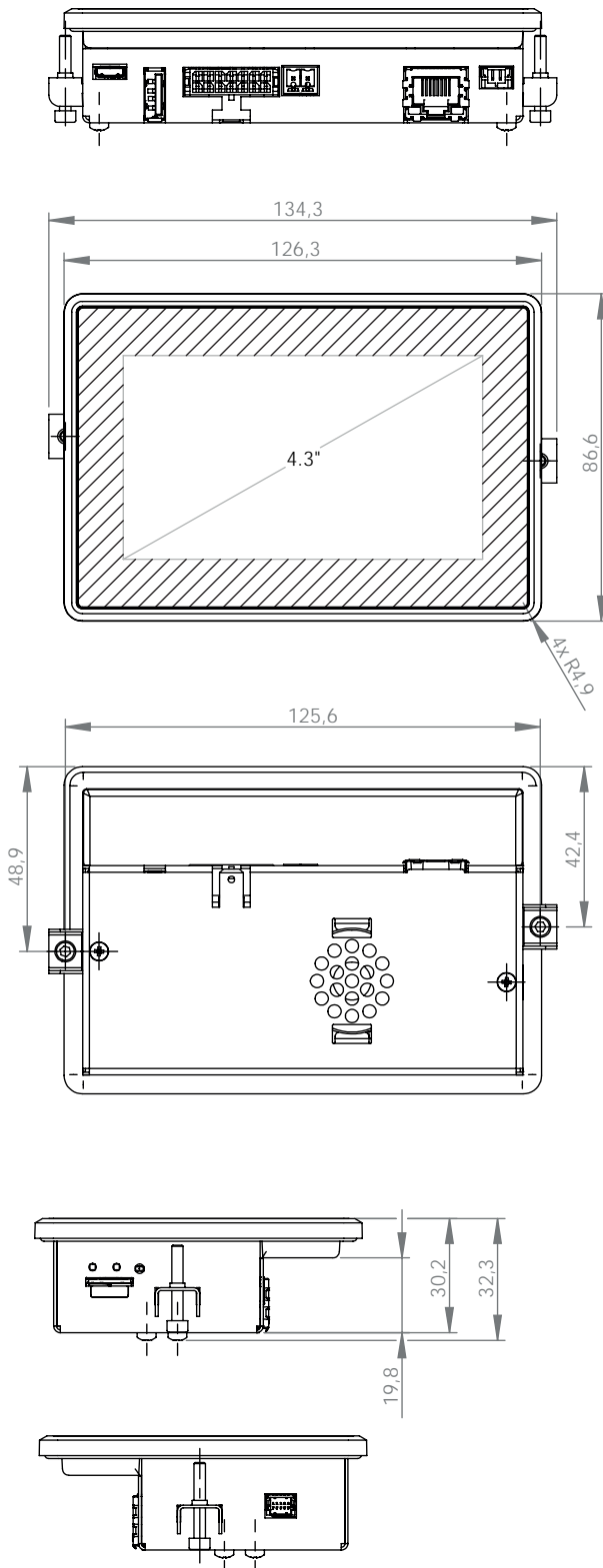
ARM Cortex-A9 Panel Mount

coming soon
subject to change



TECHNICAL SPECIFICATION

SANTINO LT 4.3 BX PCT

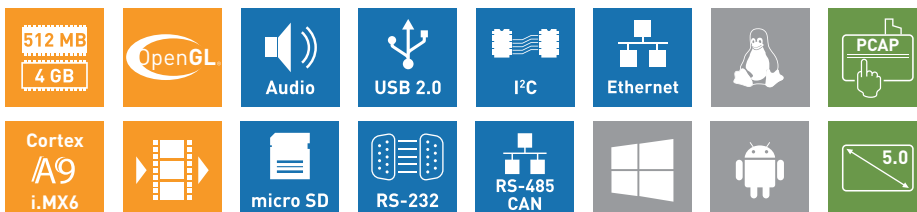
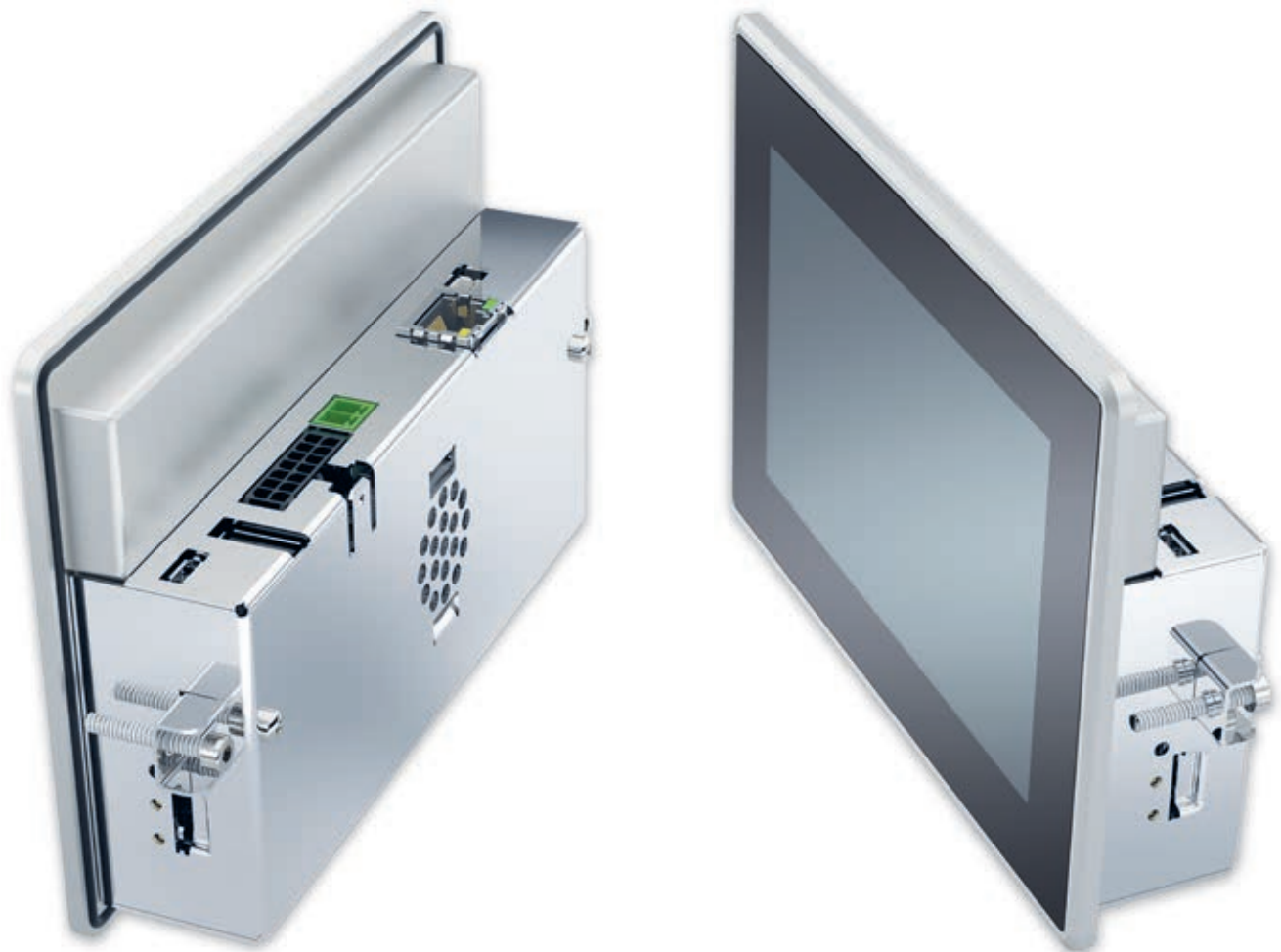


CPU	x1	x2L
CPU Type	i.MX6Solo	i.MX6DualLite
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de-coder and HD 720p video encoder hardware engine; L1 cache,32 KB for instruction and data caches; Unified 512 KB L2 cache	
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC	
RAM Standard	512 MB 32 bit DDR3L	1 GB 32 bit DDR3L
Micro SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
RS-485	1x RS-485 (Half duplex)	
RS-232	1x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	I²C, Matrix keypad up to 4 x 4	
High-Speed USB 2.0	1x 480 Mbit/s Host (Type A), 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus	1x CAN (ISO/DIS 11898)	
Audio		
Speaker Output	1x speaker [connector], 1.5 W RMS (8Ω)	
Audio Internal	1x speaker 1 W RMS (8Ω)	
Display and Touch		
Size	4.3 inch/ 109.3 mm	
Resolution	480 x 272 pixel	
Brightness	Typ. 576 cd/m²	
Backlight Lifetime	min. 30 000 h	
Viewing Angle	50°,70°,70°,70° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	Fine zinc alloy, matt chrome	
Rear	Zinc die-cast/ 1.4016 stainless steel, seal	
Ingress Protection	Front IP 66/ Rear IP20	
Device Dimensions		
W x H x D	134.4 x 86.6 x 32.3 mm	
Weight	tbd.	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. tbd.	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +50 °C	
Humidity	5 to 90 % RH	

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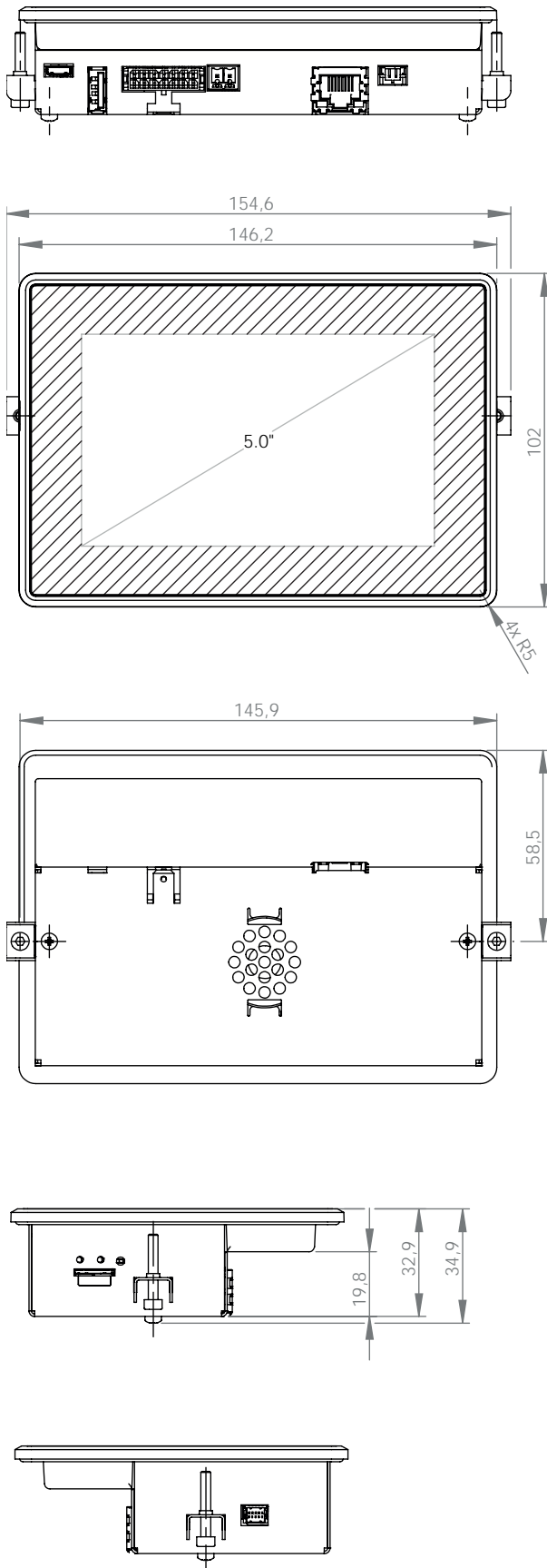
SANTINO LT 5.0 BX PCT

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTINO LT 5.0 BX PCT

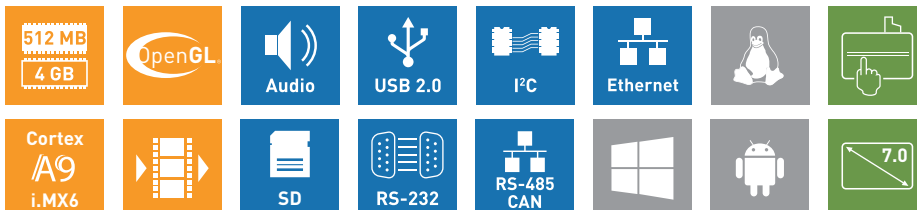
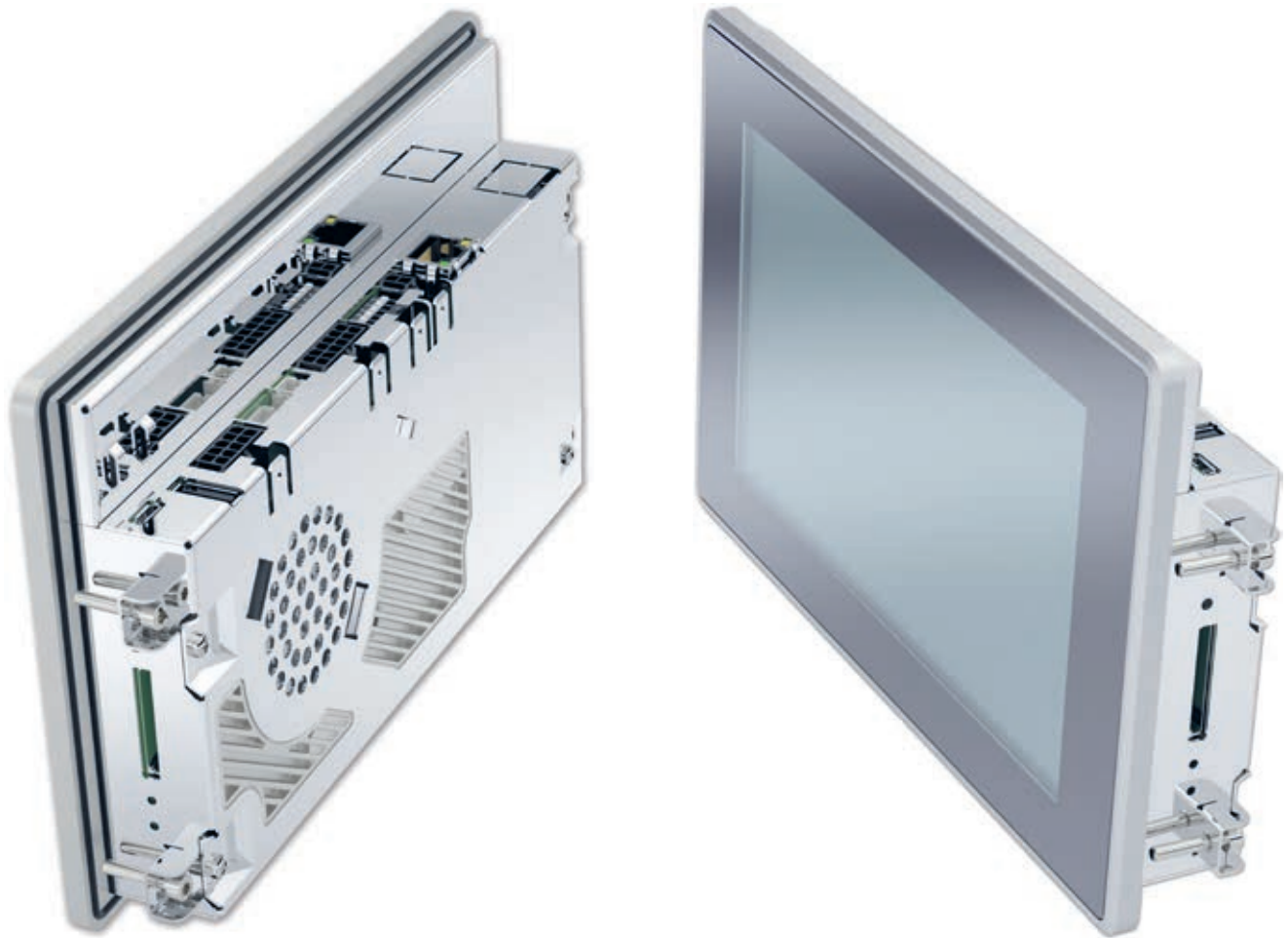


CPU	x1	x2L
CPU Type	i.MX6Solo	i.MX6DualLite
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction and data caches; Unified 512 KB L2 cache	
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC	
RAM Standard	512 MB 32 bit DDR3L	1 GB 32 bit DDR3L
Micro SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
RS-485	1x RS-485 (Half duplex)	
RS-232	1x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	I ² C, Matrix keypad up to 4 x 4	
High-Speed USB 2.0	1x 480 Mbit/s Host (Type A), 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus	1x CAN (ISO/DIS 11898)	
Audio		
Speaker Output	1x speaker (connector), 1.5 W RMS (8Ω)	
Audio Internal	1x speaker 1 W RMS (8Ω)	
Display and Touch		
Size	5 inch/125.95 mm	
Resolution	800 x 480 pixel	
Brightness	up to 1120 cd/m ² ; software default: 400 cd/m ²	
Backlight Lifetime	min. 50 000 h	
Viewing Angle	60°, 70°, 75°, 75° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	1.8 mm toughened glass, RAL 9005	
Frame	Fine zinc alloy, matt chrome	
Rear	Zinc die-cast/1.4016 stainless steel, seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	154.6 x 102.0 x 34.9 mm	
Weight	388 g.	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. 7.1 W; max. 20.4 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +50 °C	
Humidity	5 to 90 % RH	

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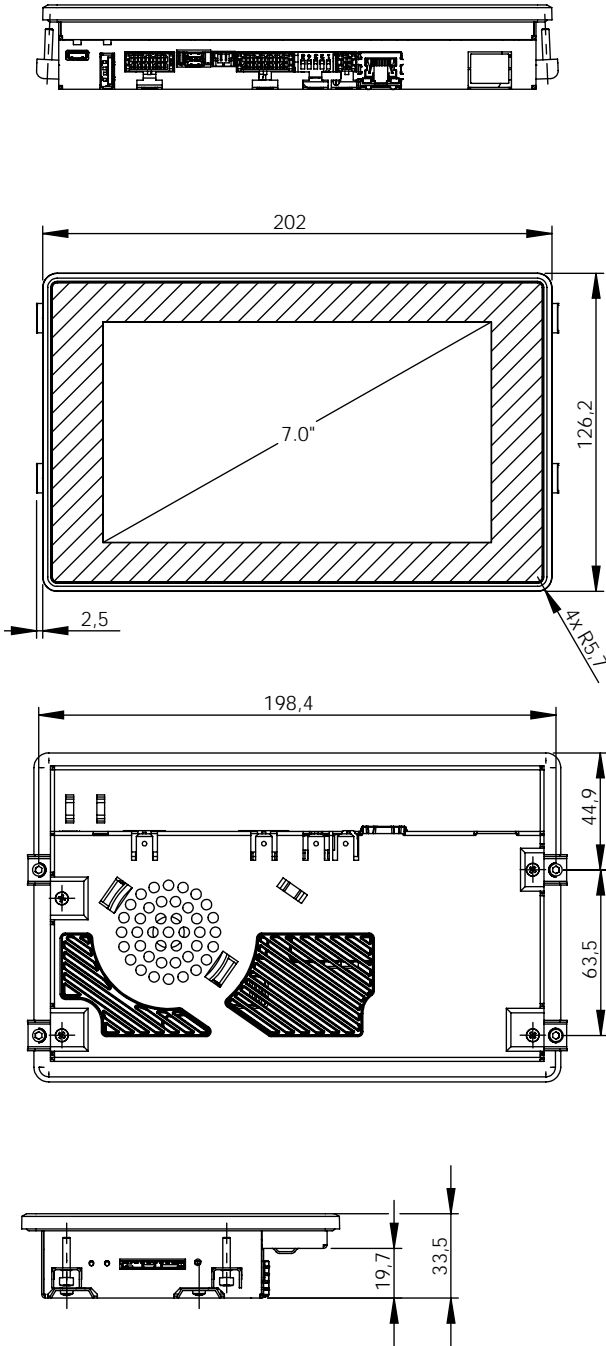
SANTINO 7.0 BX PCT

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTINO 7.0 BX PCT

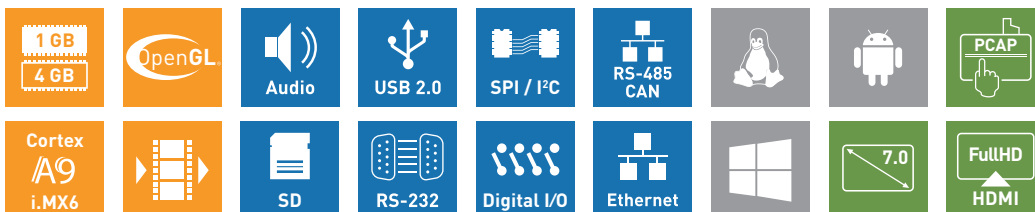
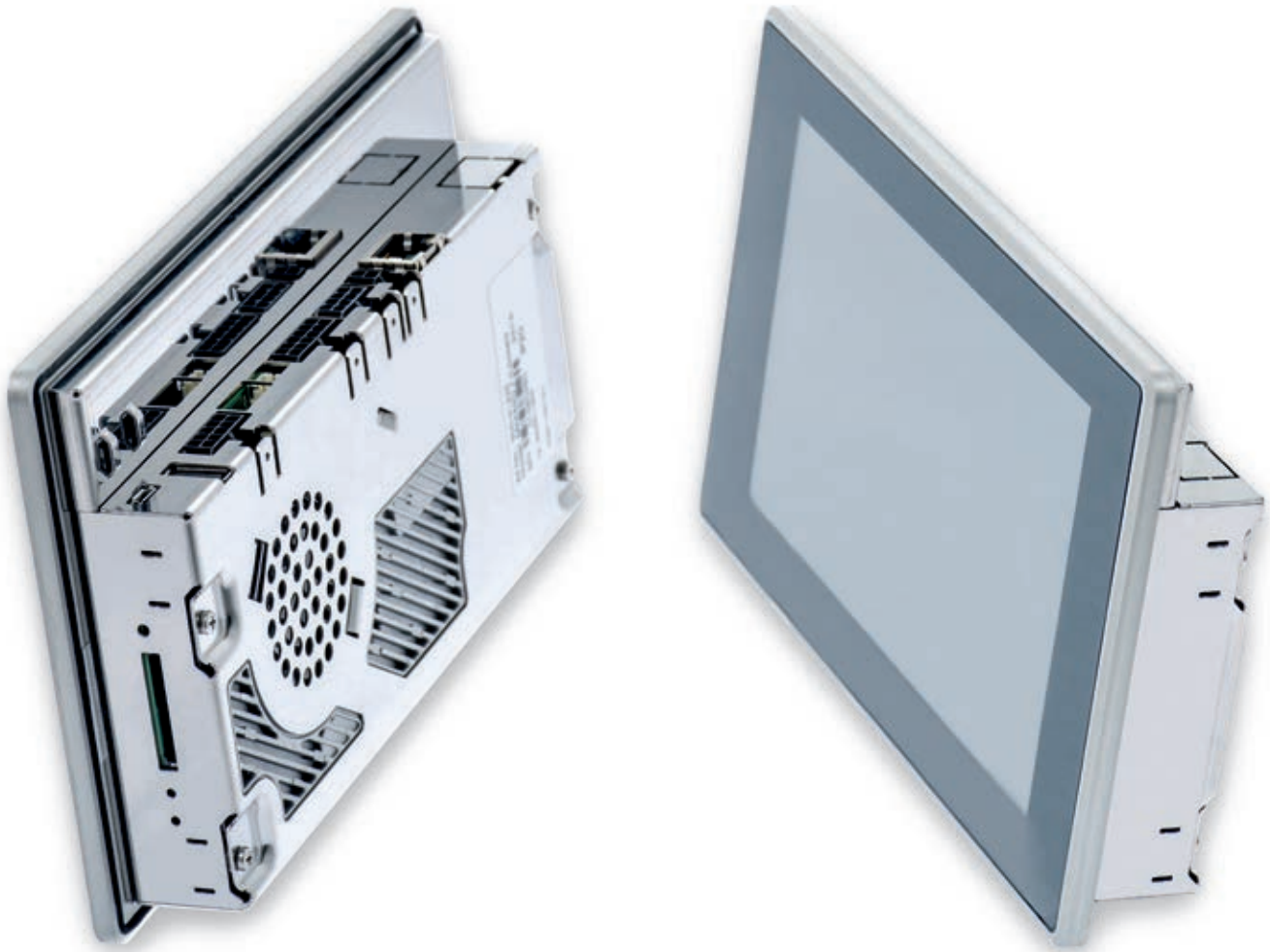


CPU	x1	x2L
CPU Type	i.MX6Solo	i.MX6DualLite
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data; 512 KB L2 cache	
HW Accelerators	OpenGL ES 2.0, Open VG 1.1 (Emulated on 3D GPU)	
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	512 MB 32 bit DDR3L	1 GB 32 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus/ RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	I ² C, Matrix keypad up to 4 x 4	
Audio		
Speaker Output	1x speaker (connector), 1.5 W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	7 inch/177.8 mm	
Resolution	800 x 480 pixel	
Brightness	Typ. 400 cd/m ²	
Backlight Lifetime	Typ. 50 000 h	
Viewing Angle	50°, 70°, 70°, 70° (UDRL)	
Color	18 bit (262 K colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	Fine zinc alloy, matt chrome	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	206.9 x 126.2 x 35.6 mm	
Weight	861 g	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. 5.3 W; max. 22.8 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +50 °C	
Humidity	5 to 90 % RH	

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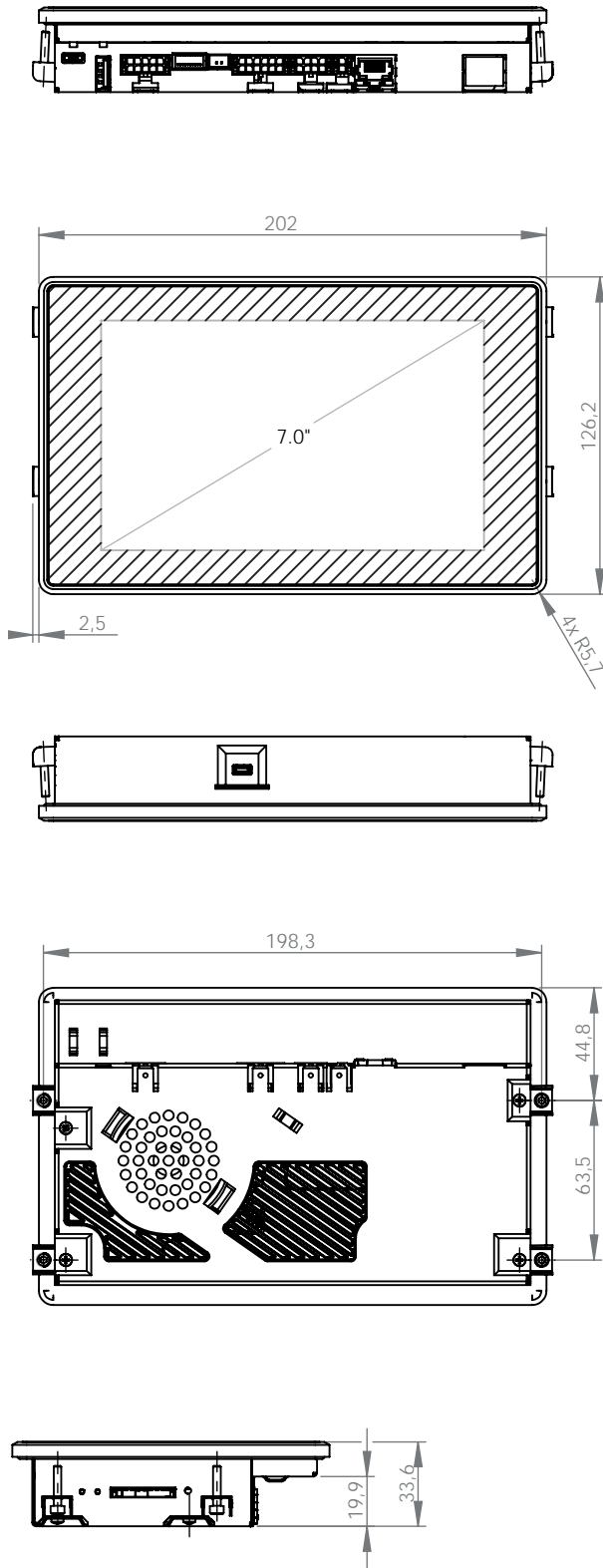
SANTARO 7.0 BX PCT

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTARO 7.0 BX PCT



CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de-coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I ² C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	7 inch/177.8 mm	
Resolution	800 x 480 pixel	
Brightness	Typ. 500 cd/m ²	
Backlight Lifetime	Typ. 40 000 h	
Viewing Angle	60°, 70°, 70°, 70° (UDRL)	
Color	18 bit (262 K colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	Fine zinc alloy, matt chrome	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	206.9 x 126.2 x 33.6 mm	
Weight	861 g	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. 5.7 W; max. 22.8 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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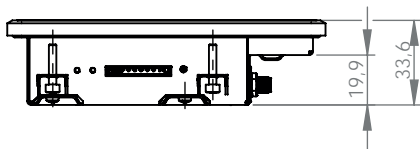
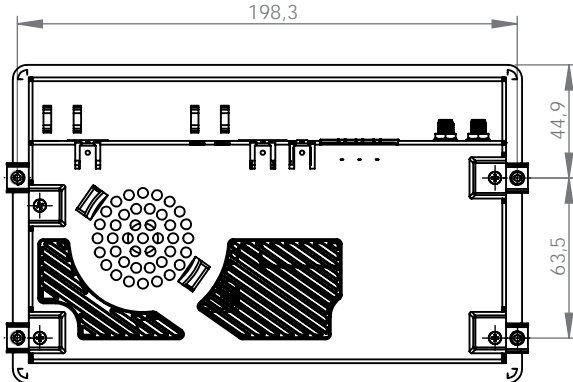
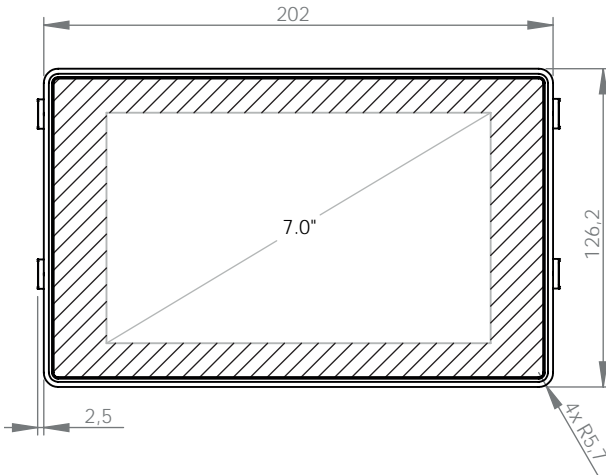
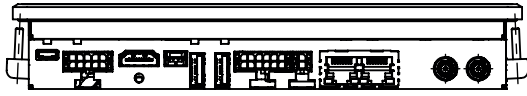
SANTOKA 7.0 BX PCT

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTOKA 7.0 BX PCT

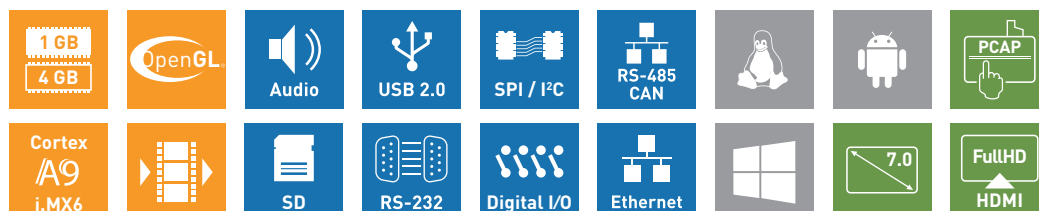
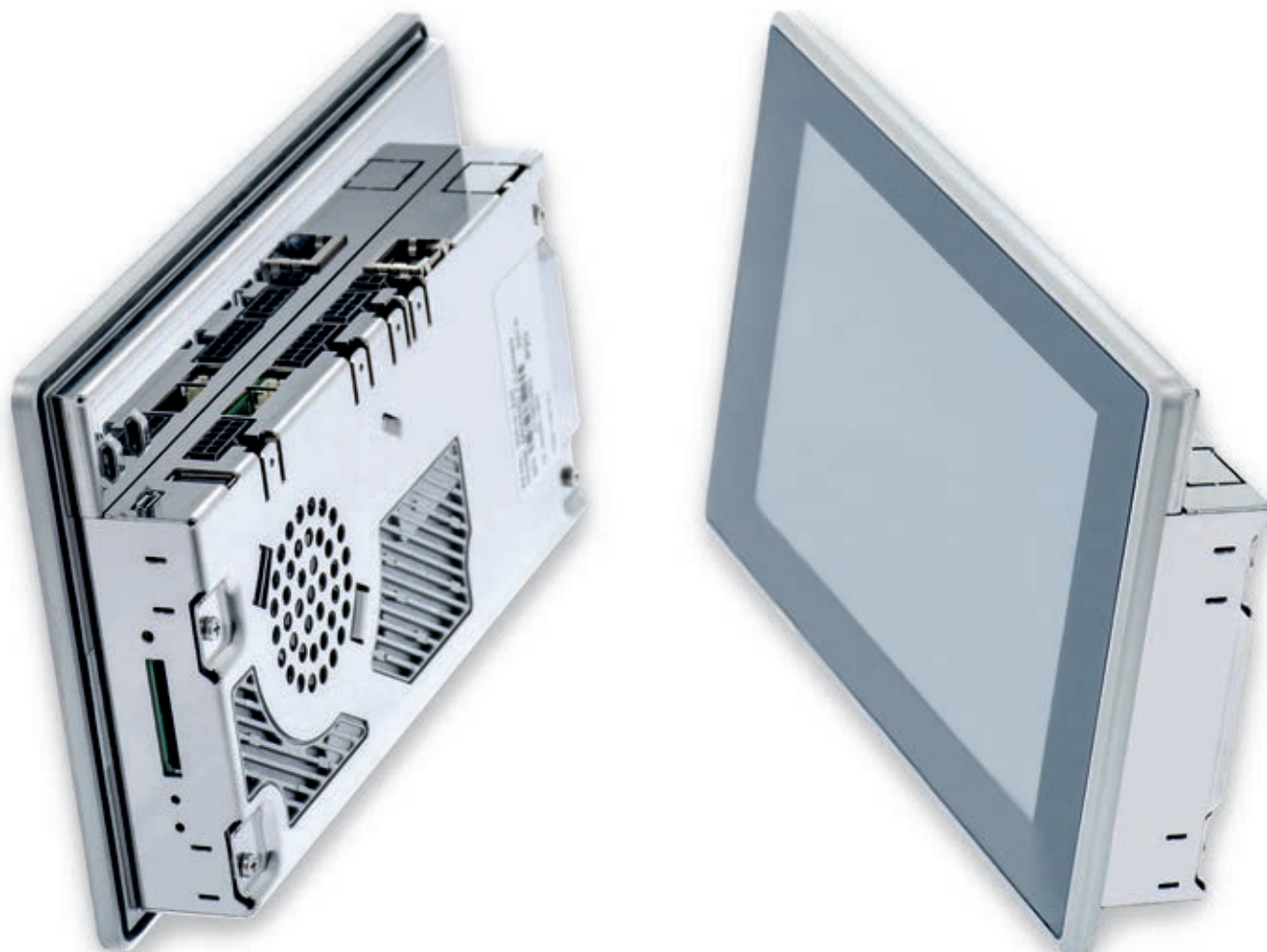


CPU		x1	x2
CPU Type	i.MX6Solo		i.MX6Dual
Core Class	ARM Cortex - A9		
Core Clock	1 GHz		
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data		
	512 KB L2 cache	1 MB L2 cache	
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1	
RTC	Accuracy: +/- 30 ppm at 25°C		
Memory			
eMMC Flash	4 GB MLC eMMC		
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L	
SD Card Slot	4 bit MMC/SDIO/SD/SDHC		
Operating Systems			
Supported OS	Linux Yocto, Android		
Communication Interfaces			
Network	2x 10/100 Mbit/s Ethernet (RJ-45)		
USB 2.0	2x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)		
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated	
RS-232	2x RS-232 (RX/TX/CTS/RTS)		
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8		
Wireless Communication			
Wireless	WLAN 802.11 b/g/n; Bluetooth 4.0 LE For available mPCIe modules see page 129		
Video			
Video Output		Full HD HDMI	
Audio			
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)		
Audio Internal	1x speaker 0.3 W RMS (8Ω)		
Display and Touch			
Size	7 inch/177.8 mm		
Resolution	800 x 480 pixel		
Brightness	Typ. 400 cd/m²		
Backlight Lifetime	Typ. 40 000 h		
Viewing Angle	60°, 70°, 70°, 70° (UDRL)		
Color	18 bit (262 K colors)		
Touch	projected capacitive multi touch		
Housing			
Front	3.0 mm toughened glass, RAL 9005		
Frame	Aluminum, colorless anodized		
Rear	1.4016 stainless steel, foam seal		
Ingress Protection	Front IP 66/Rear IP20		
Device Dimensions			
W x H x D	206.9 x 126.2 x 33.6 mm		
Weight	861 g		
Power Supply			
Supply Voltage	Nom. 9 to 32 V DC		
Consumption	Typ. 5.3 W; max. 28.2 W		
Typical Environmental Conditions			
Storage Temp.	-20 to +70 °C		
Operating Temp.	0 to +60 °C		
Humidity	5 to 90 % RH		

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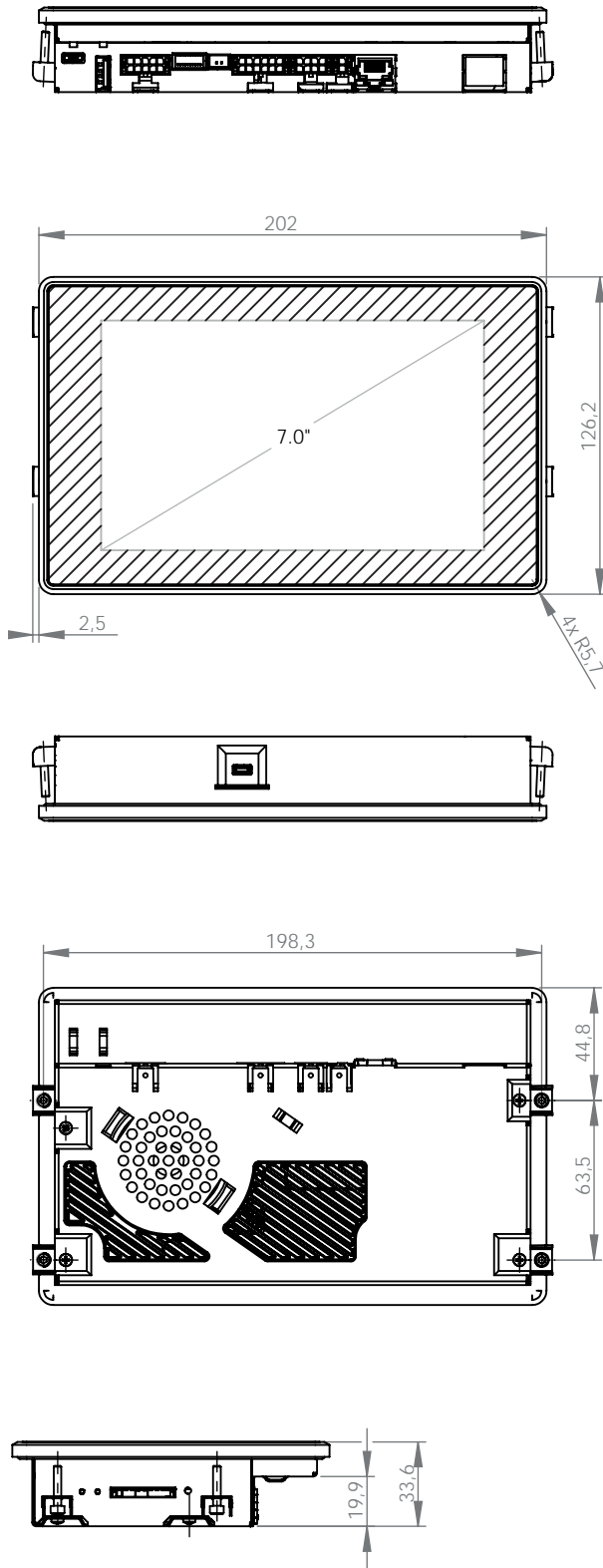
SANTARO 7.0 BX PCT 1K

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTARO 7.0 BX PCT 1K

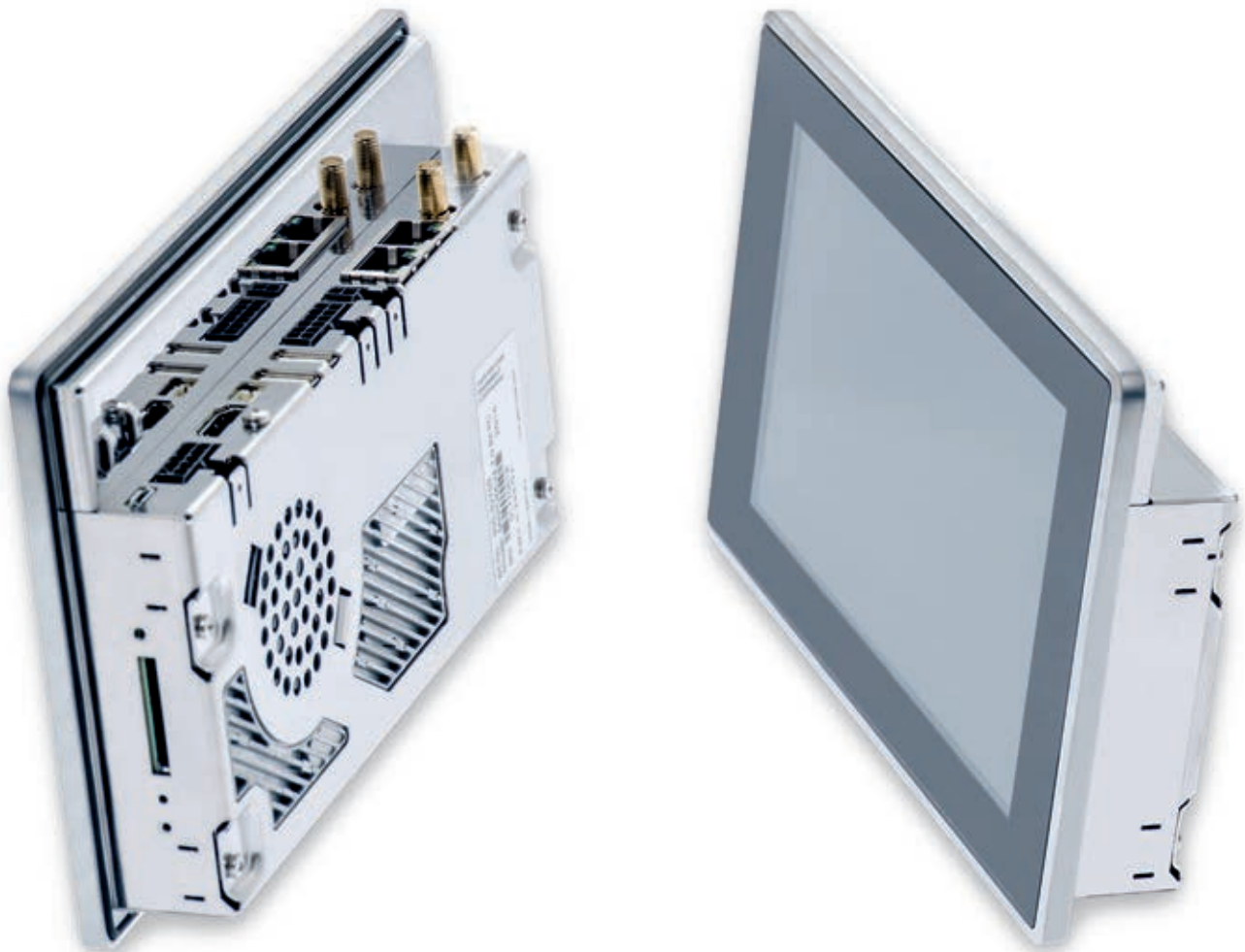


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de-coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	7 inch/178.0 mm	
Resolution	1024 x 600 pixel	
Brightness	Typ. 420 cd/m²	
Backlight Lifetime	Typ. 20000 h	
Viewing Angle	70°,75°,75°,75° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	Fine zinc alloy, matt chrome	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	206.9 x 126.2 x 33.6 mm	
Weight	936 g	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. 5.1 W; max. 22.8 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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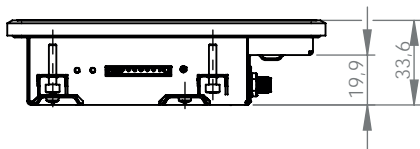
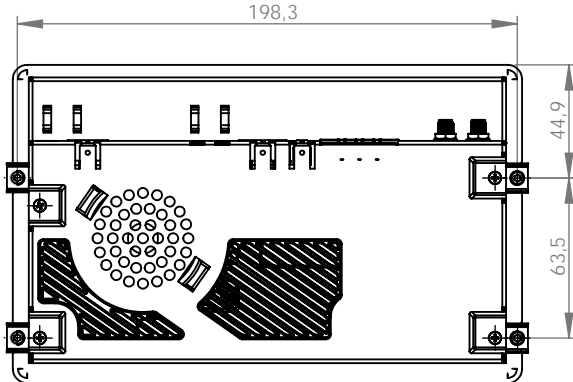
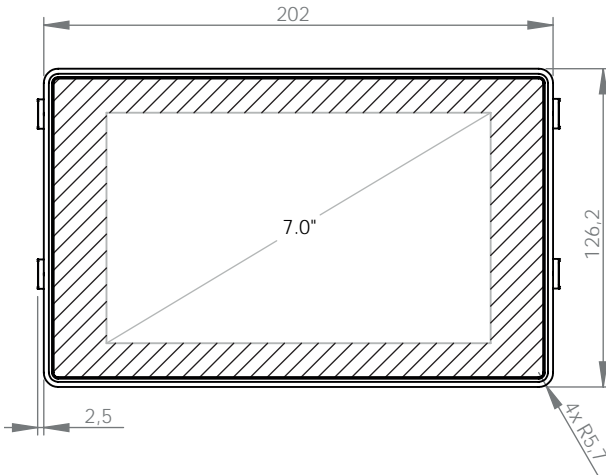
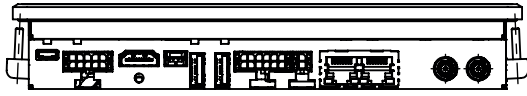
SANTOKA 7.0 BX PCT 1K

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTOKA 7.0 BX PCT 1K

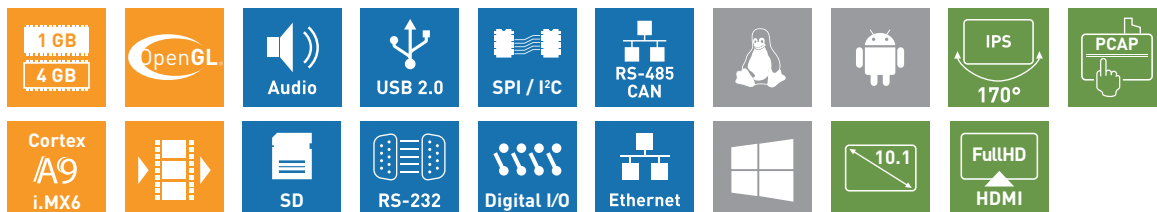
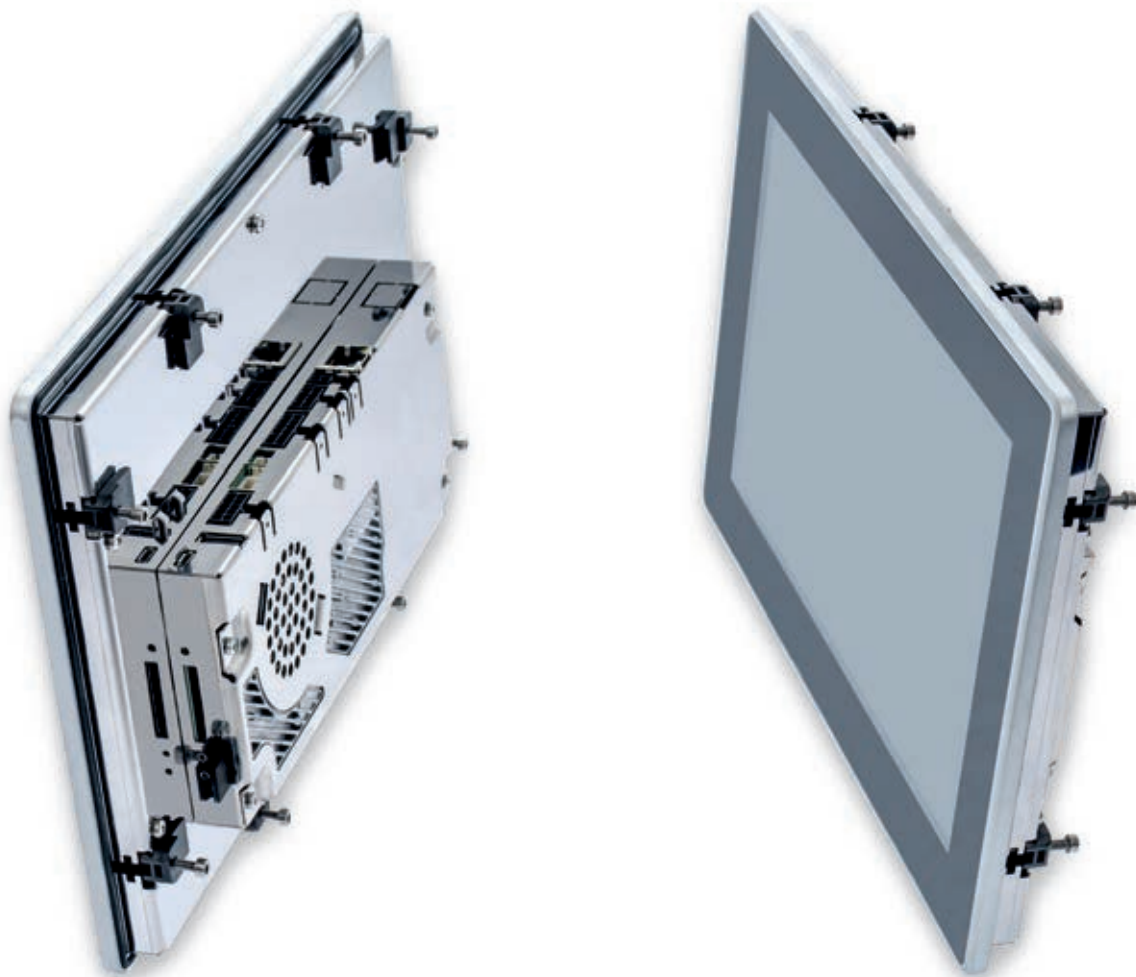


CPU		x1	x2
CPU Type	i.MX6Solo		i.MX6Dual
Core Class	ARM Cortex - A9		
Core Clock	1 GHz		
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de-coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data		
	512 KB L2 cache	1 MB L2 cache	
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1	
RTC	Accuracy: +/- 30 ppm at 25°C		
Memory			
eMMC Flash	4 GB MLC eMMC		
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L	
SD Card Slot	4 bit MMC/SDIO/SD/SDHC		
Operating Systems			
Supported OS	Linux Yocto, Android		
Communication Interfaces			
Network	2x 10/100 Mbit/s Ethernet (RJ-45)		
USB 2.0	2x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)		
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated	
RS-232	2x RS-232 (RX/TX/CTS/RTS)		
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8		
Wireless Communication			
Wireless	WLAN 802.11 b/g/n; Bluetooth 4.0 LE For available mPCIe modules see page 129		
Video			
Video Output		Full HD HDMI	
Audio			
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)		
Audio Internal	1x speaker 0.3 W RMS (8Ω)		
Display and Touch			
Size	7 inch/178.0 mm		
Resolution	1024 x 600 pixel		
Brightness	Typ. 420 cd/m²		
Backlight Lifetime	Typ. 20 000 h		
Viewing Angle	70°, 75°, 75°, 75° (UDRL)		
Color	24 bit (16.7 Mio. colors)		
Touch	projected capacitive multi touch		
Housing			
Front	3.0 mm toughened glass, RAL 9005		
Frame	Fine zinc alloy, matt chrome		
Rear	1.4016 stainless steel, foam seal		
Ingress Protection	Front IP 66/Rear IP20		
Device Dimensions			
W x H x D	206.9 x 126.2 x 33.6 mm		
Weight	936 g		
Power Supply			
Supply Voltage	Nom. 9 to 32 V DC		
Consumption	Typ. 4.7 W; max. 27.6 W		
Typical Environmental Conditions			
Storage Temp.	-20 to +70 °C		
Operating Temp.	0 to +60 °C		
Humidity	5 to 90 % RH		

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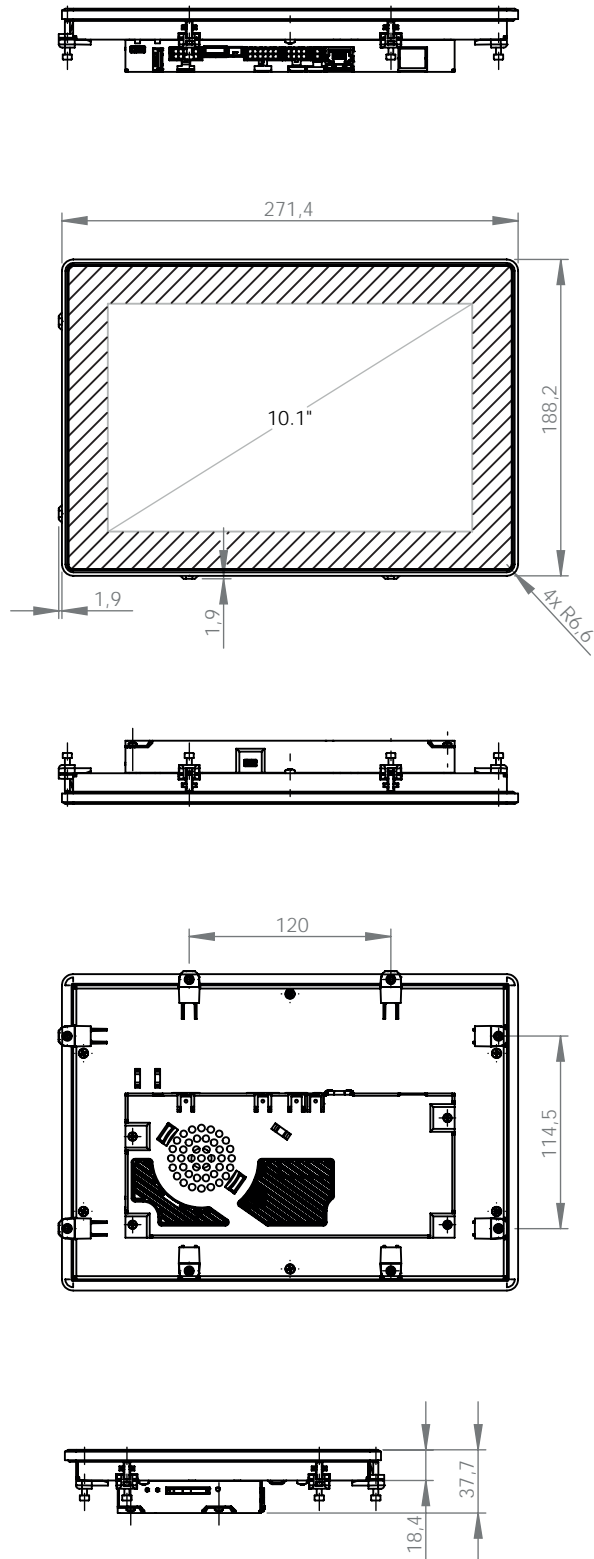
SANTARO 10.1 BX PCT IPS

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTARO 10.1 BX PCT IPS

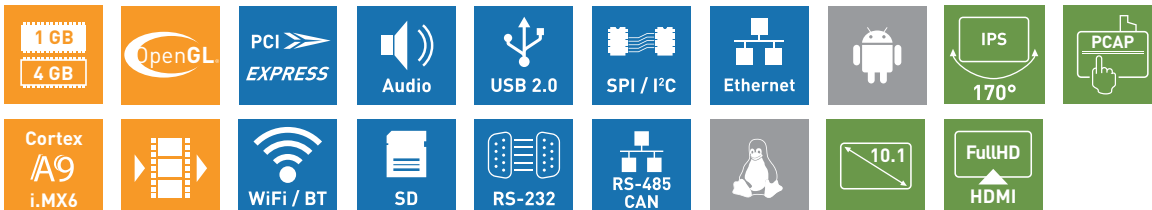


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de-coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.1 inch/255.85mm	
Resolution	1280 x 800 pixel	
Brightness	Typ. 420 cd/m²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	85°,85°,85°,85° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	Fine zinc alloy, matt chrome	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	275.2 x 192.0 x 37.7 mm	
Weight	1749 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 10.2 W; max. 26.4 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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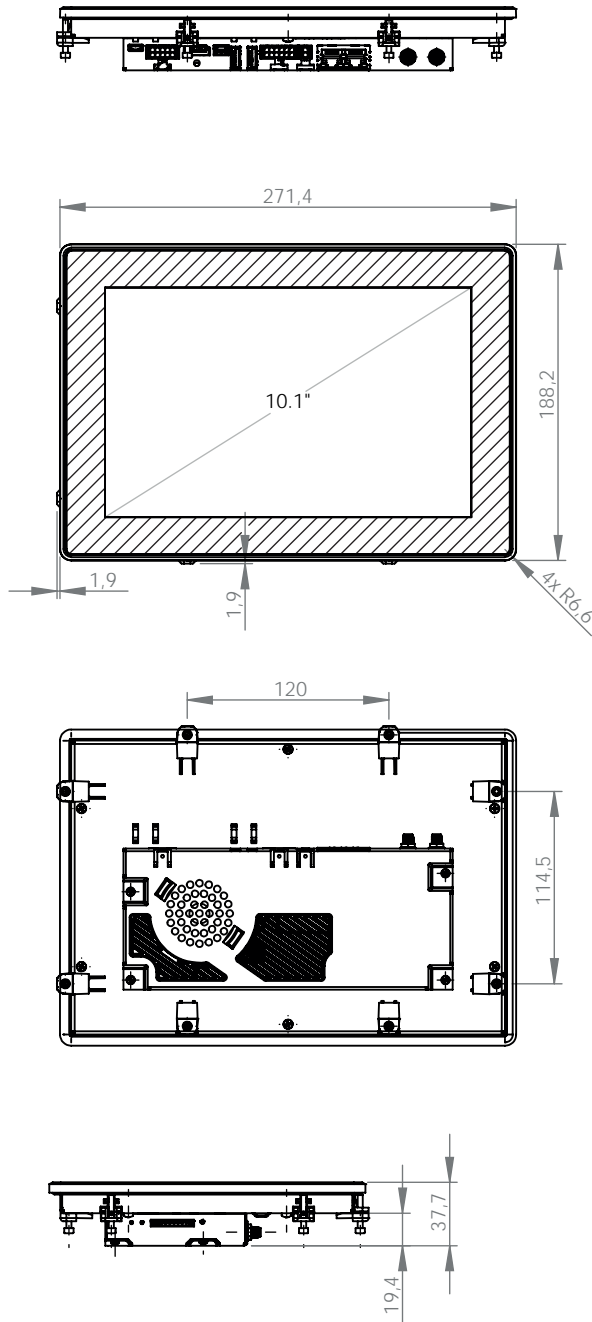
SANTOKA 10.1 BX PCT IPS

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTOKA 10.1 BX PCT IPS

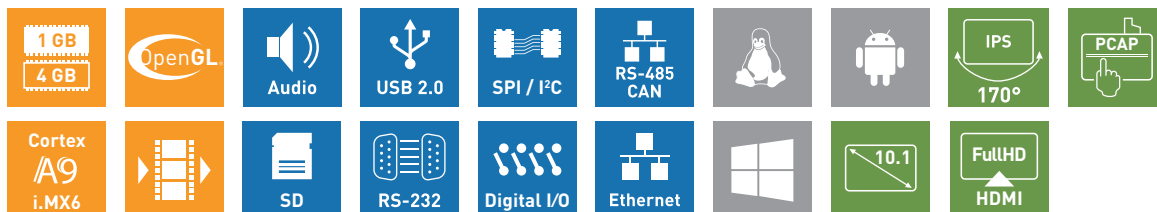
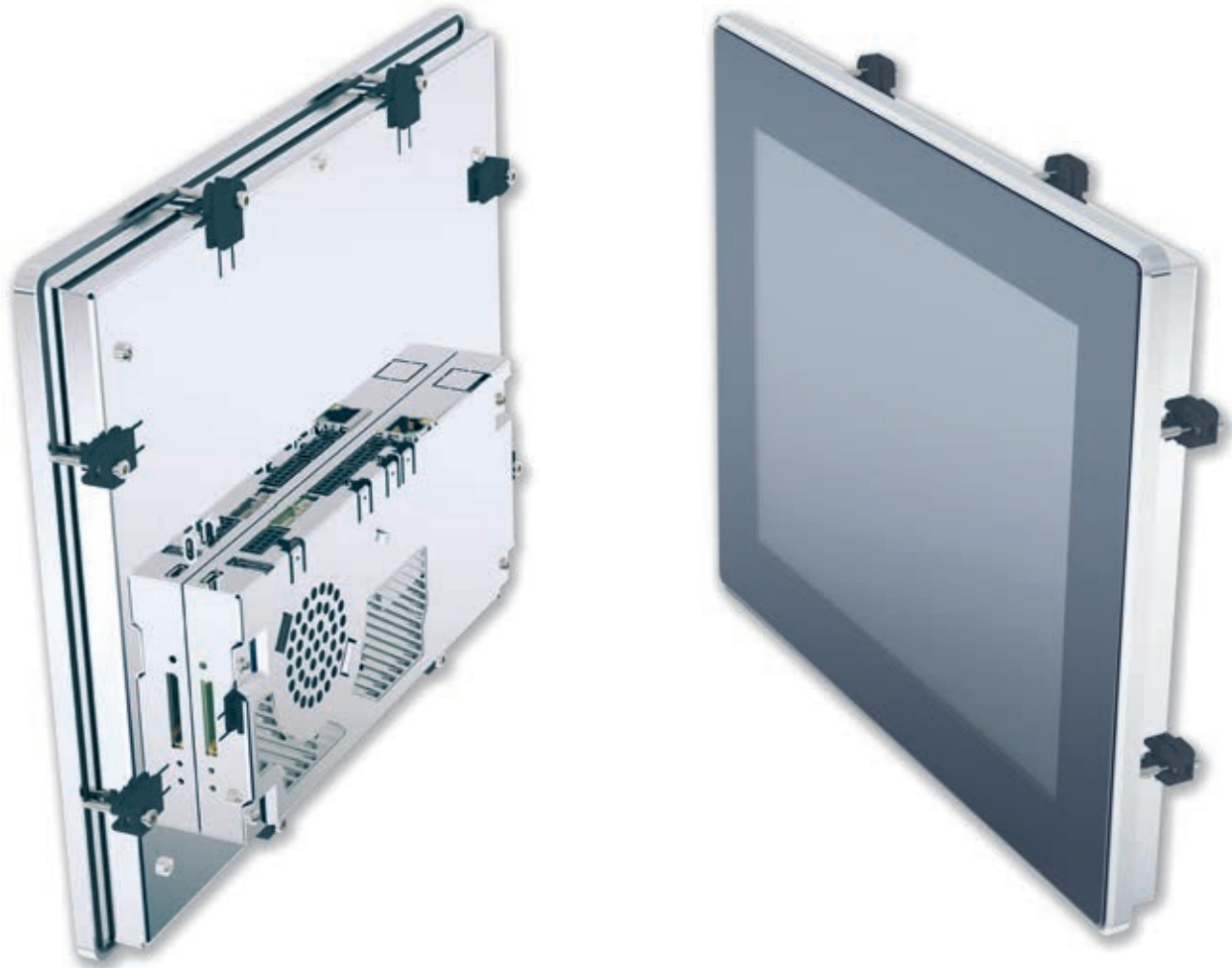


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Linux Yocto, Android	
Communication Interfaces		
Network	2x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	2x 480 Mbit/s Host (Type A)	
	1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Wireless Communication		
Wireless	WLAN 802.11 b/g/n; Bluetooth 4.0 LE For available mPCIe modules see page 129	
Video		
Video Output		Full HD HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.1 inch/ 256.54 mm	
Resolution	1280 x 800 pixel	
Brightness	Typ. 420 cd/m²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	85°,85°,85°,85° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multitouch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	Fine zinc alloy, matt chrome	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	275.2 x 192.0 x 37.9 mm	
Weight	1749 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 9.8 W; max. 32.6 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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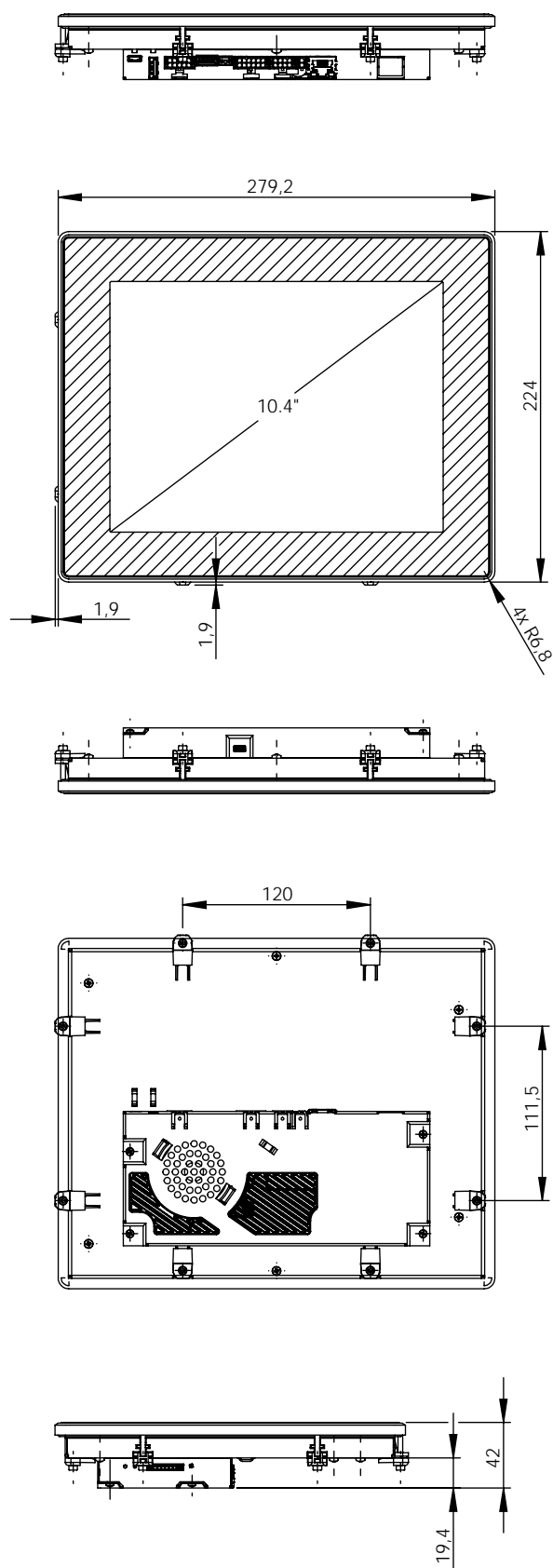
SANTARO 10.4 BX PCT

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTARO 10.4 BX PCT

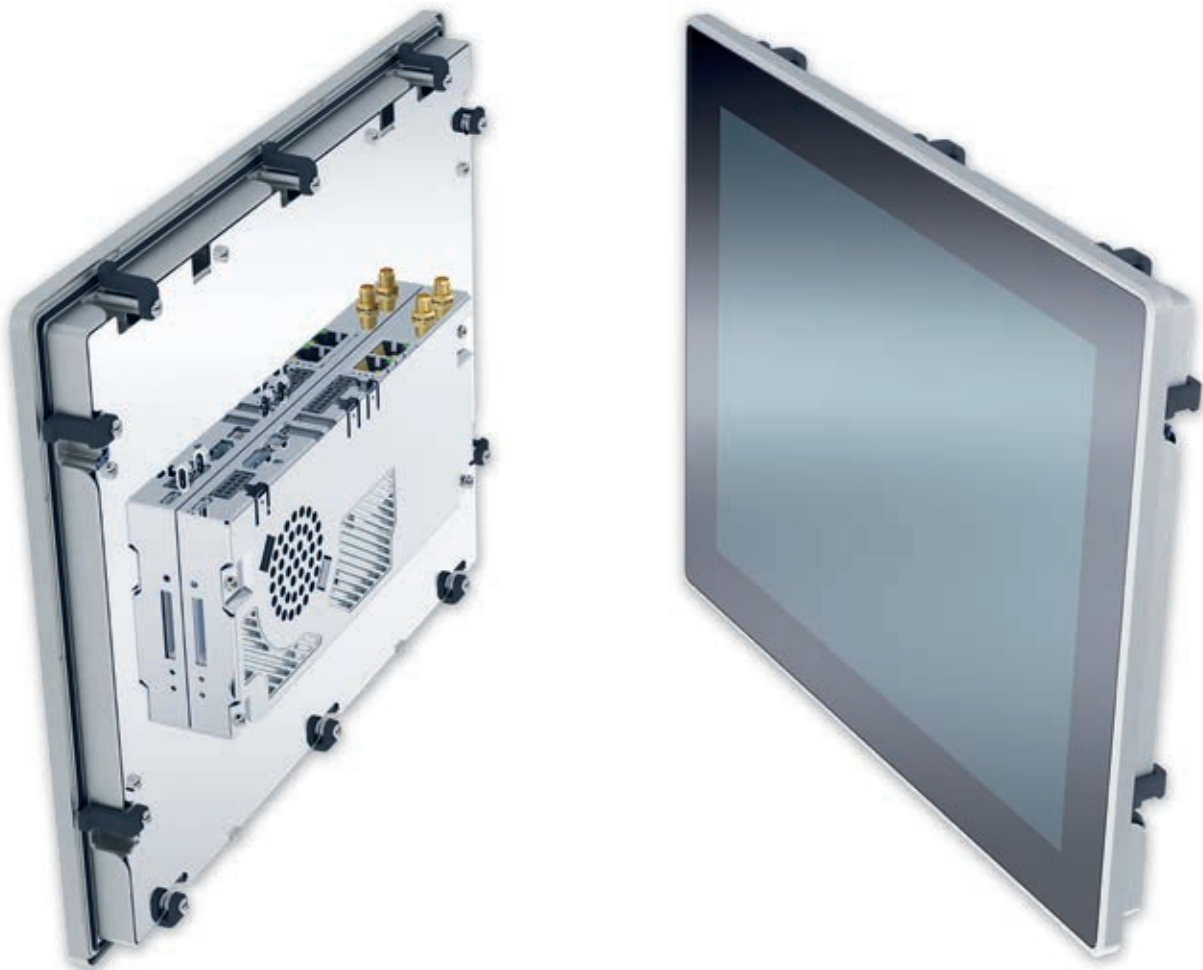


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A)	
	1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C;	
	Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.4 inch/264.0mm	
Resolution	800 x 600 pixel	
Brightness	Typ. 400 cd/m²	
Backlight Lifetime	Typ. 30 000 h	
Viewing Angle	50°,60°,70°,70° (UDRL)	
Color	18 bit (262 k. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	Aluminum, colorless anodized	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	279.2 x 224.0 x 42.0 mm	
Weight	2173 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 8.5 W; max. 26.4 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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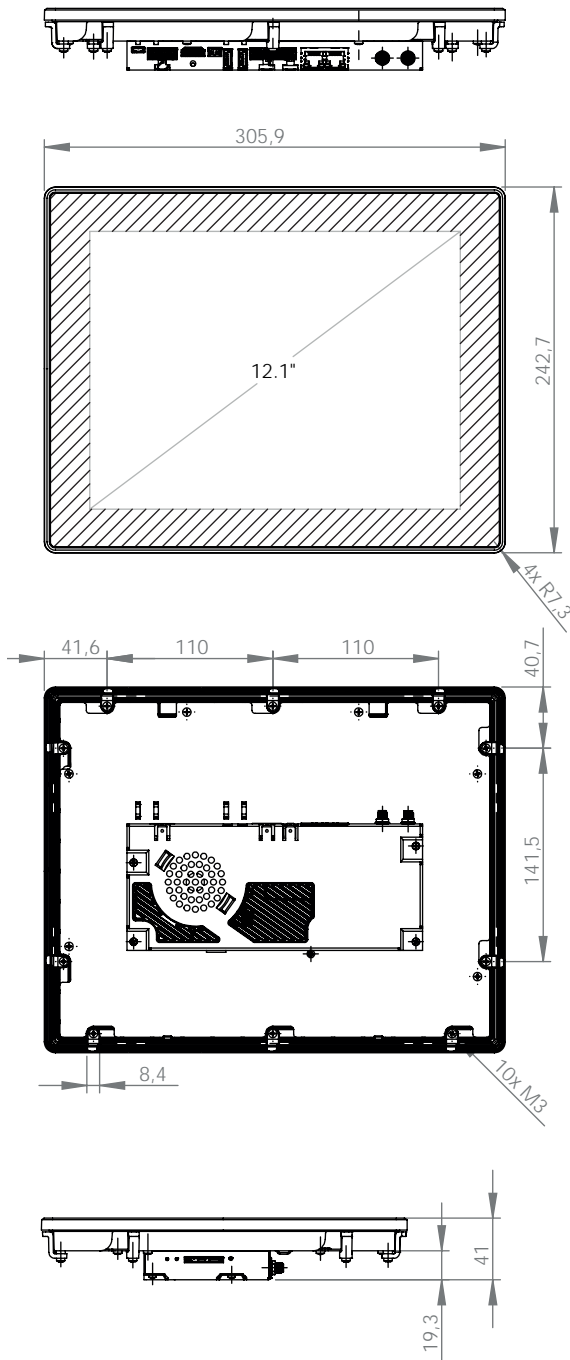
SANTOKA 12.1 BX PCT

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTOKA 12.1 BX PCT

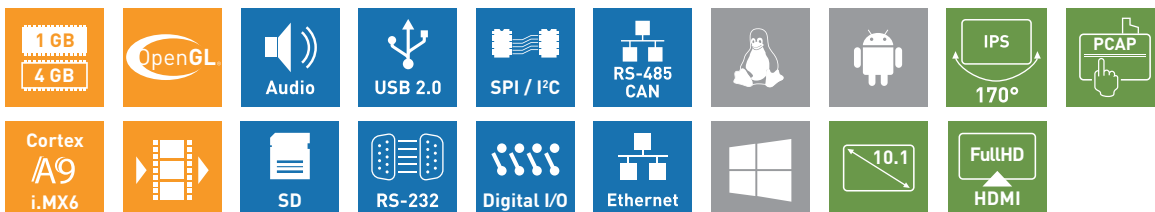
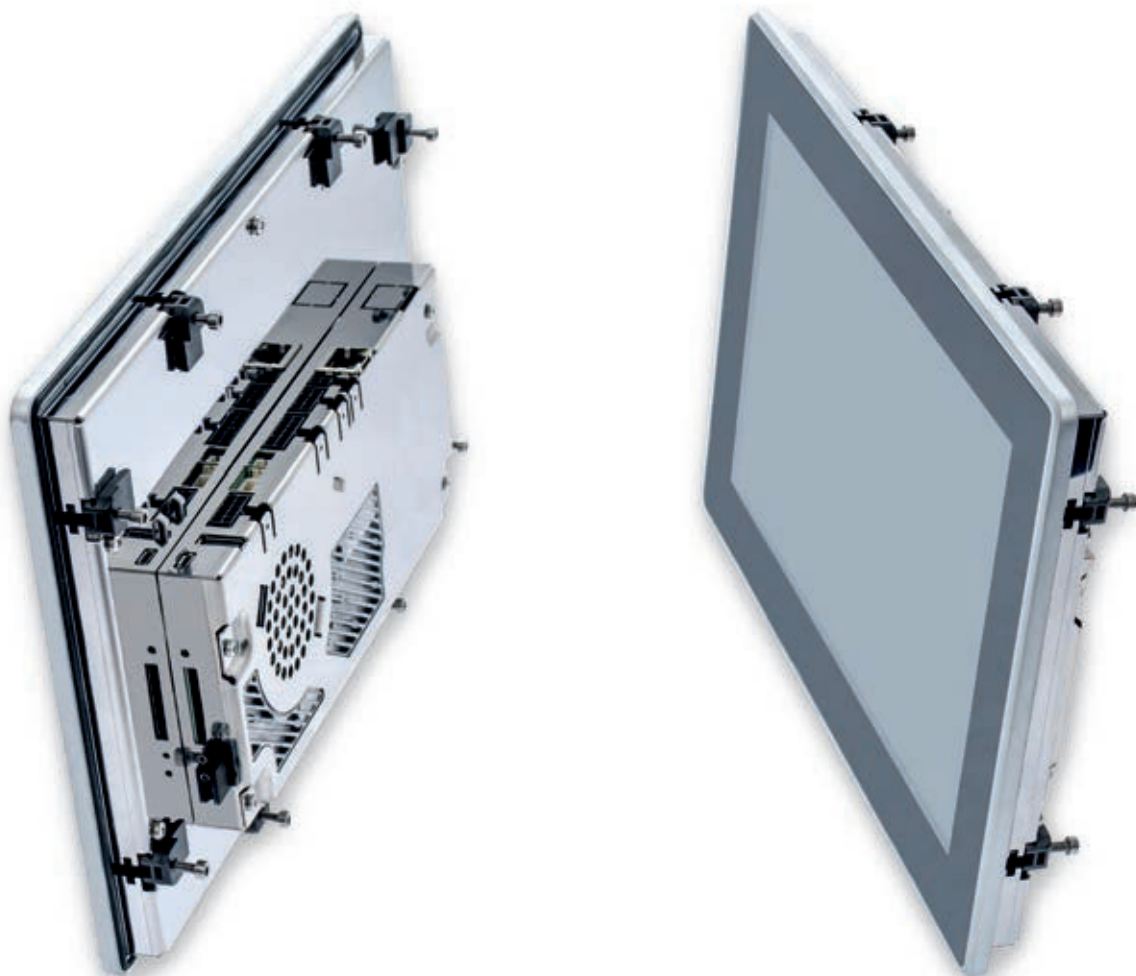


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Linux Yocto, Android	
Communication Interfaces		
Network	2x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	2x 480 Mbit/s Host (Type A)	
	1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Wireless Communication		
Wireless	WLAN 802.11 b/g/n; Bluetooth 4.0 LE For available mPCIe modules see page 129	
Video		
Video Output		Full HD HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	12.1 inch/307.5 mm	
Resolution	1024 x 768 pixel	
Brightness	Typ. 480 cd/m²	
Backlight Lifetime	Min. 70 000 h	
Viewing Angle	70°, 70°, 80°, 80° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	4.0 mm toughened glass, RAL 9005	
Frame	Fine zinc alloy, matt chrome	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	305.9 x 242.7 x 41.0 mm	
Weight	2700 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 9.8 W; max. 32.6 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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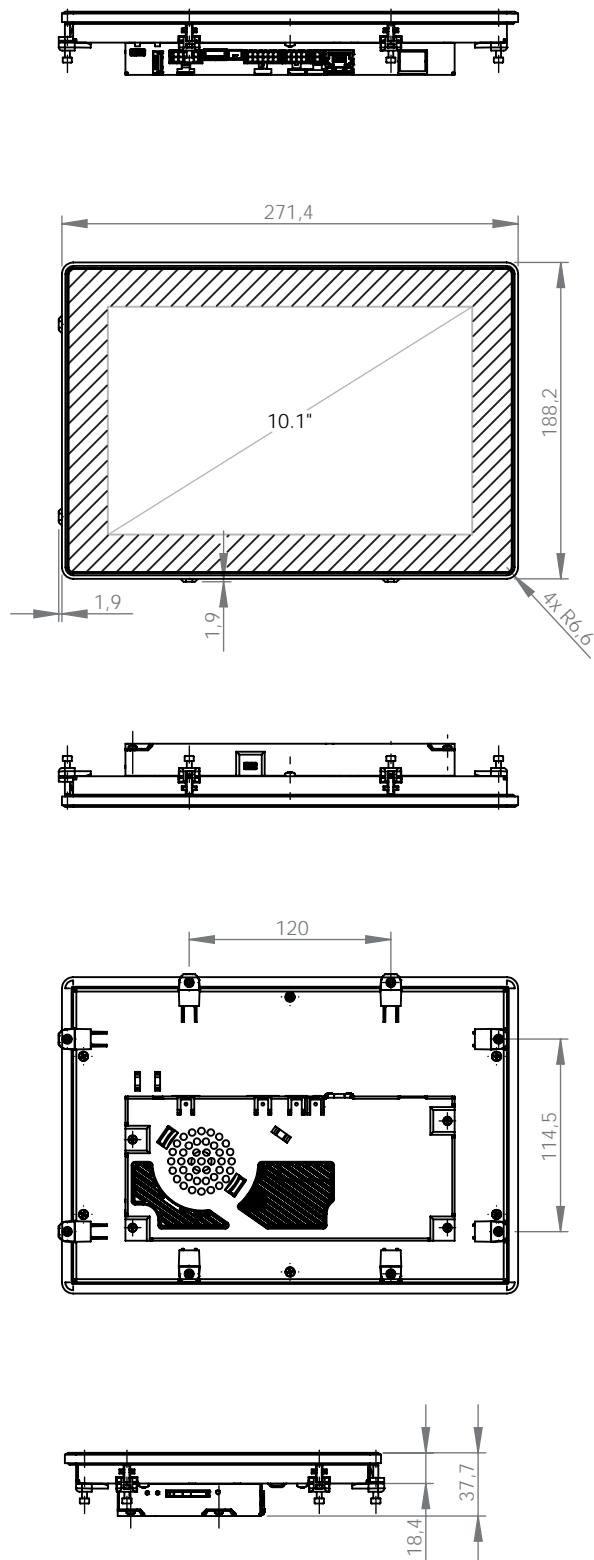
SANTARO 10.1 BX PCT IPS outdoor

ARM Cortex-A9 Panel Mount



TECHNICAL SPECIFICATION

SANTARO 10.1 BX PCT IPS outdoor



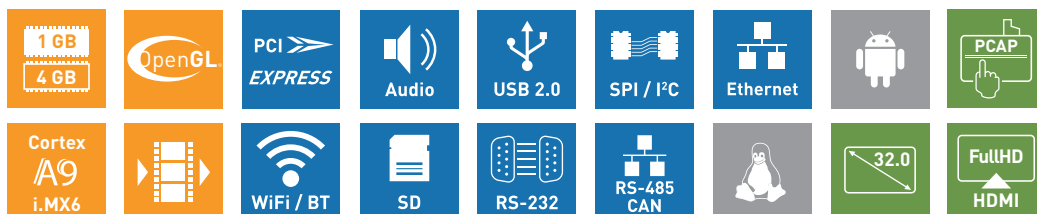
CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.1 inch/255.85mm	
Resolution	1280 x 800 pixel	
Brightness	Typ. 850 cd/m²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	85°,85°,85°,85° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Special Features	optical bonded	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	Fine zinc alloy, matt chrome	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	275.2 x 192.0 x 37.7 mm	
Weight	1749 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 10.2 W; max. 26.4 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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SANTOKA 32.0 BX PCT

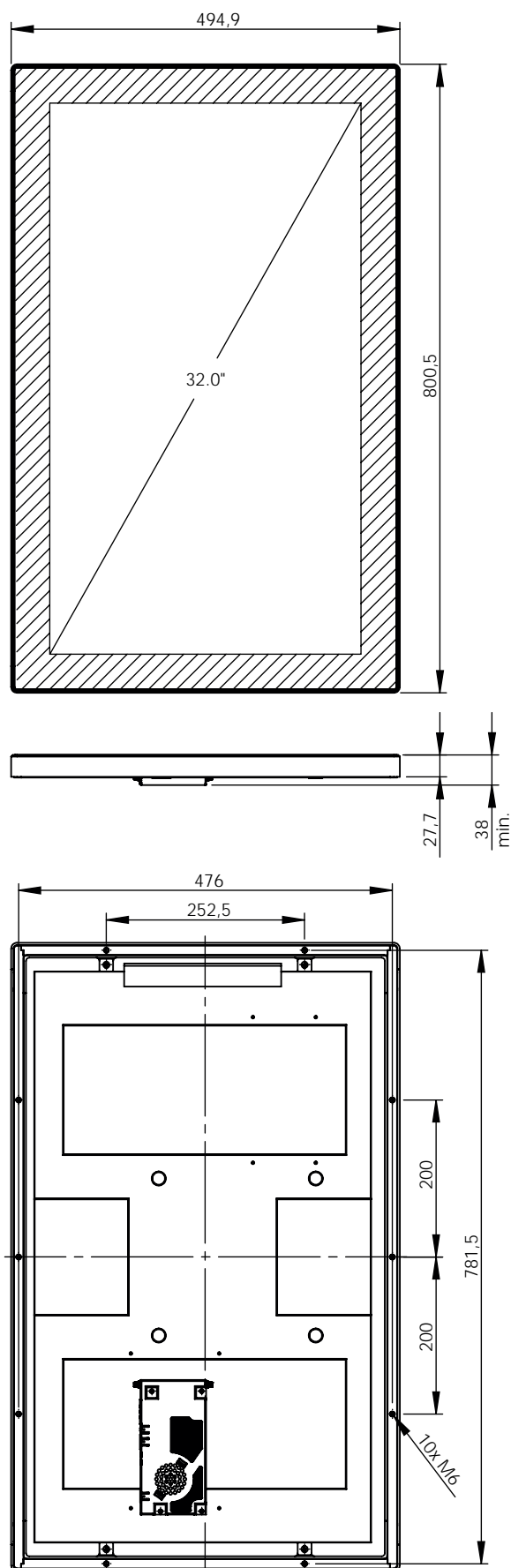
ARM Cortex-A9 Panel Mount

coming soon
subject to change



TECHNICAL SPECIFICATION

SANTOKA 32.0 BX PCT



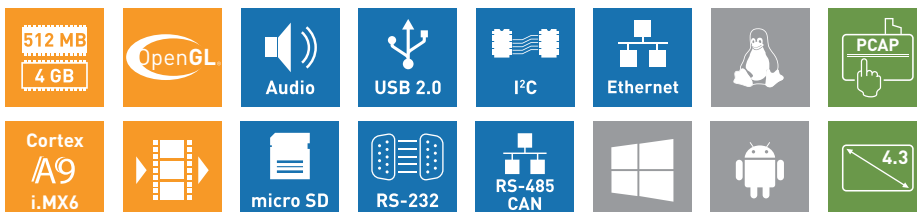
CPU	x2	x4
CPU Type	i.MX6Dual	i.MX6Quad
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	1 MB L2 cache	
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1	
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	1 GB 64 bit DDR3L	
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Linux Yocto, Android	
Communication Interfaces		
Network	2x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	2x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated	
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I ² C; Matrix keypad up to 8 x 8	
Wireless Communication		
Wireless	WLAN 802.11 b/g/n; Bluetooth 4.0 LE For available mPCIe modules see page 129	
Video		
Video Output	Full HD HDMI	
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	32.0 inch/812.8 mm	
Resolution	1920 x 1080 pixel	
Brightness	Typ. 400 cd/m ²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	89°, 89°, 89°, 89° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	4.0 mm toughened glass, RAL 9005	
Frame	Aluminum, colorless anodized	
Rear	1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	800.5 x 494.9 x 27.7 mm	
Weight	tbd.	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC/24 V Backlight	
Consumption	Typ. tbd; max. 40.6 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +50 °C	
Humidity	5 to 90 % RH	

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SANTINO LT 4.3 SG

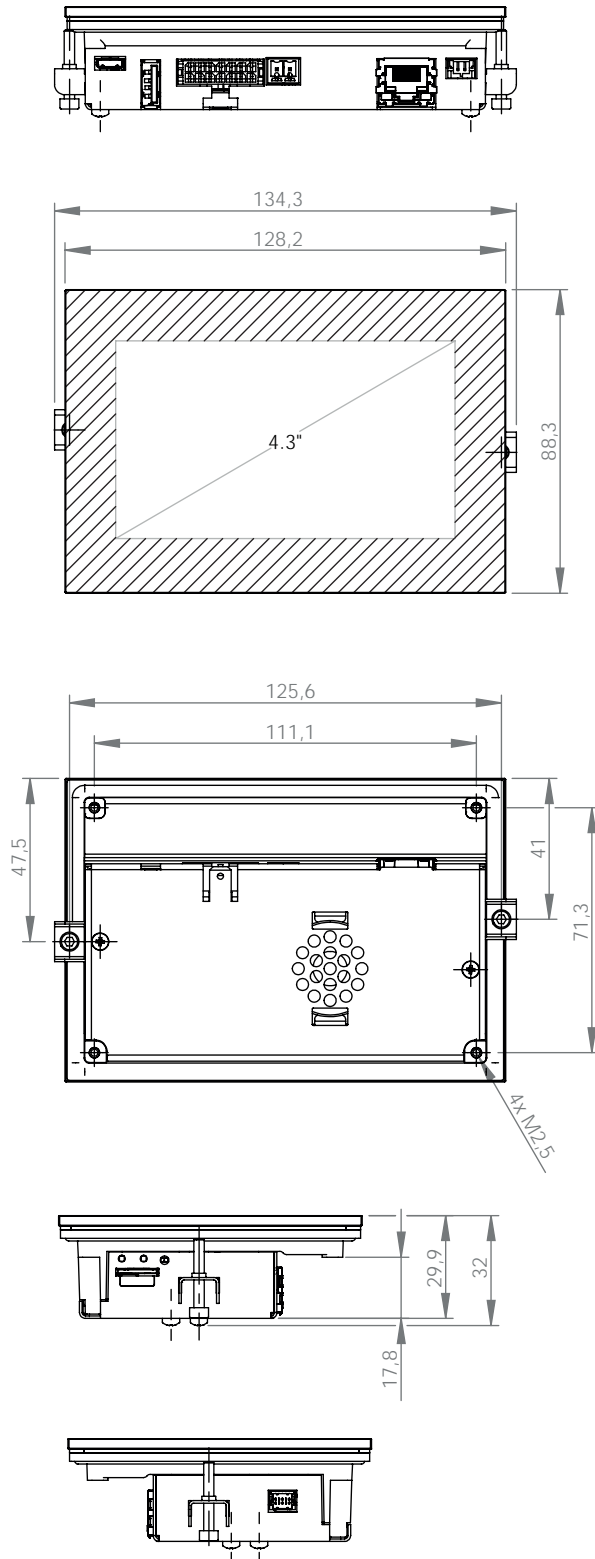
ARM Cortex-A9 Flush Mount

coming soon
subject to change



TECHNICAL SPECIFICATION

SANTINO LT 4.3 SG

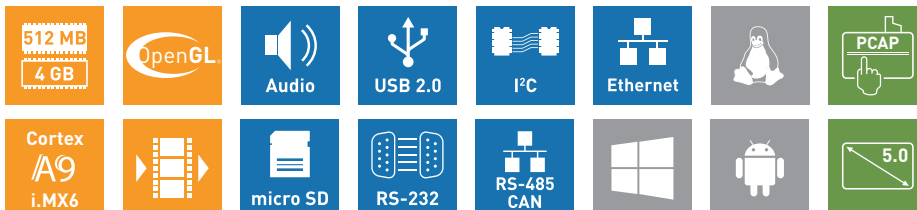


CPU	x1	x2L
CPU Type	i.MX6Solo	i.MX6DualLite
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache,32 KB for instruction and data caches; Unified 512 KB L2 cache	
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC	
RAM Standard	512 MB 32 bit DDR3L	1 GB 32 bit DDR3L
Micro SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
RS-485	1x RS-485 (Half duplex)	
RS-232	1x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	I²C, Matrix keypad up to 4 x 4	
High-Speed USB 2.0	1x 480 Mbit/s Host (Type A), 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus	1x CAN (ISO/DIS 11898)	
Audio		
Speaker Output	1x speaker (connector), 1.5 W RMS (8Ω)	
Audio Internal	1x speaker 1 W RMS (8Ω)	
Display and Touch		
Size	4.3 inch/109.3 mm	
Resolution	480 x 272 pixel	
Brightness	typ 576 cd/m²	
Backlight Lifetime	min. 30 000 h	
Viewing Angle	50°,70°,70°,70° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	None	
Rear	Aluminum/1.4016 stainless steel, seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	128.2 x 88.3 x 32.0 mm	
Weight	tbd.	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. tbd.	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +50 °C	
Humidity	5 to 90 % RH	

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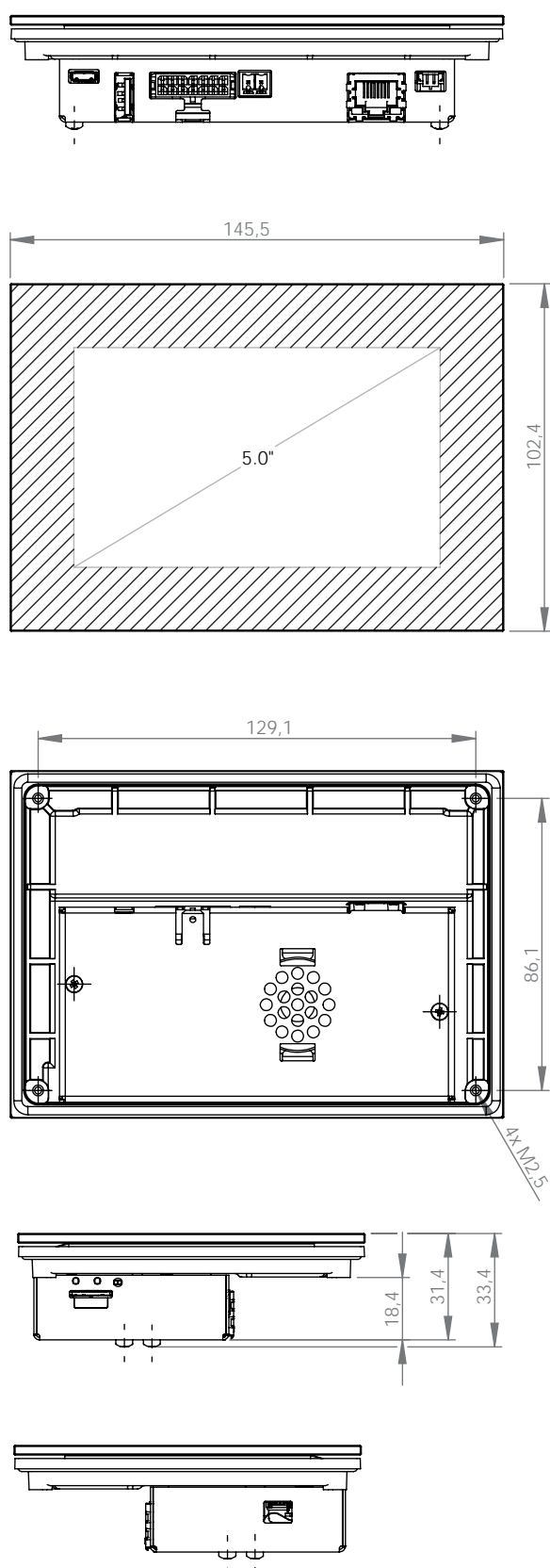
SANTINO LT 5.0 SG

ARM Cortex-A9 Flush Mount



TECHNICAL SPECIFICATION

SANTINO LT 5.0 SG

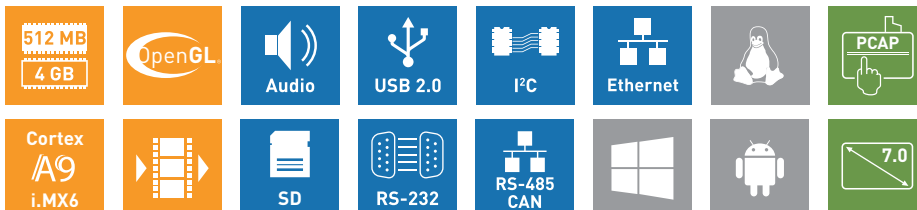


CPU	x1	x2L
CPU Type	i.MX6Solo	
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de-coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction and data caches; Unified 512 KB L2 cache	
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC	
RAM Standard	512 MB 32 bit DDR3L	1 GB 32 bit DDR3L
Micro SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
RS-485	1x RS-485 (Half duplex)	
RS-232	1x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	I ² C, Matrix keypad up to 4 x 4	
High-Speed USB 2.0	1x 480 Mbit/s Host (Type A), 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus	1x CAN (ISO/DIS 11898)	
Audio		
Speaker Output	1x speaker (connector), 1.5 W RMS (8Ω)	
Audio Internal	1x speaker 1 W RMS (8Ω)	
Display and Touch		
Size	5 inch/125.95 mm	
Resolution	800 x 480 pixel	
Brightness	up to 1120 cd/m ² ; software default: 400 cd/m ²	
Backlight Lifetime	min. 50 000 h	
Viewing Angle	60°, 70°, 75°, 75° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	2.8 mm toughened glass, RAL 9005	
Frame	None	
Rear		
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	145.5 x 102.4 x 33.4 mm	
Weight	429 g	
Power Supply		
Supply Voltage	Nom. 9 to 32 V DC	
Consumption	Typ. 7.1 W; max. 20.4 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +50 °C	
Humidity	5 to 90 % RH	

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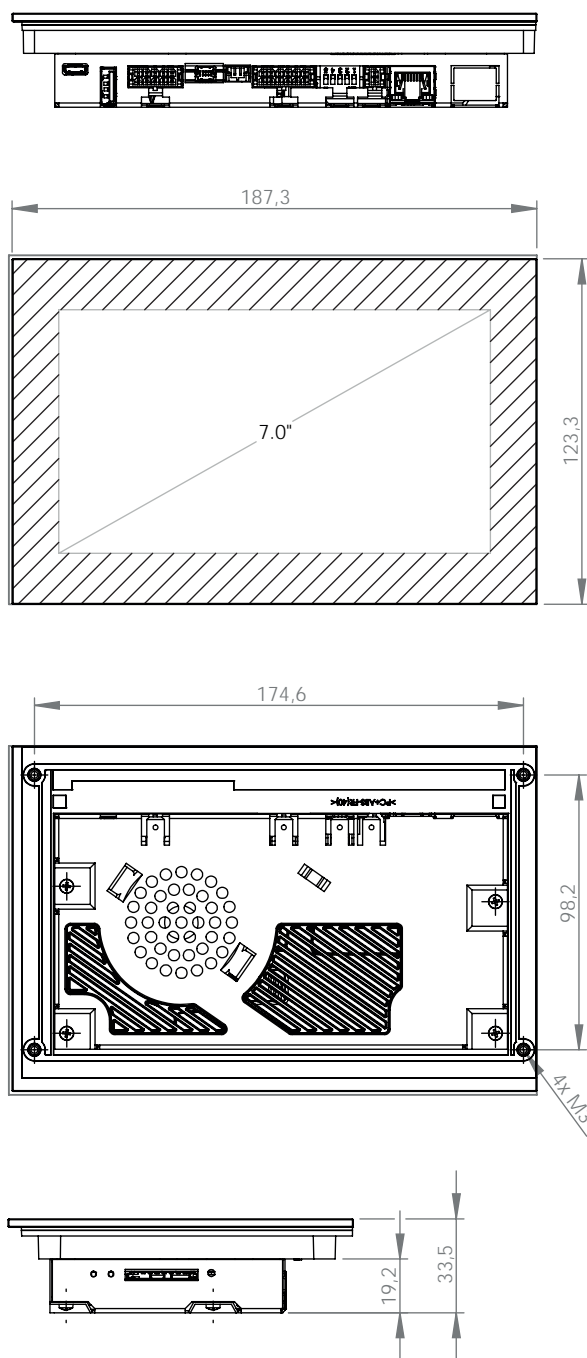
SANTINO 7.0 SG

ARM Cortex-A9 Flush Mount



TECHNICAL SPECIFICATION

SANTINO 7.0 SG

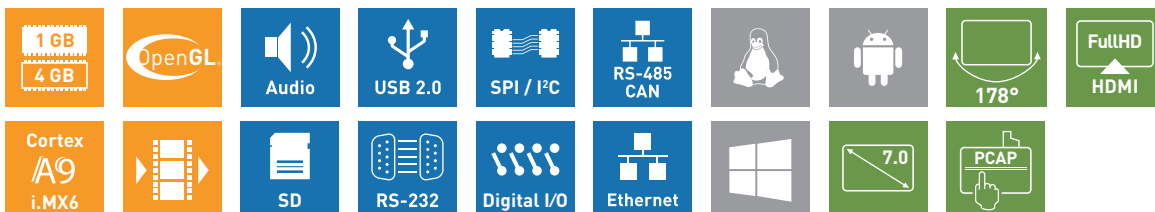


CPU	x1		x2L	
CPU Type	i.MX6Solo		i.MX6DualLite	
Core Class	ARM Cortex - A9			
Core Clock	1 GHz			
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data; 512 KB L2 cache			
HW Accelerators	OpenGL ES 2.0, Open VG 1.1 [Emulated on 3D GPU]			
RTC	Accuracy: +/- 30 ppm at 25°C			
Memory				
eMMC Flash	4 GB MLC eMMC			
RAM Standard	512 MB 32 bit DDR3L		1 GB 32 bit DDR3L	
SD Card Slot	4 bit MMC/SDIO/SD/SDHC			
Operating Systems				
Supported OS	Windows EC on request, Linux Yocto, Android			
Communication Interfaces				
Network	1x 10/100 Mbit/s Ethernet (RJ-45)			
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)			
CAN Fieldbus/ RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485		1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated	
RS-232	2x RS-232 (RX/TX/CTS/RTS)			
Synchronous Serial Interfaces	I²C, Matrix keypad up to 4 x 4			
Audio				
Speaker Output	1x speaker [connector], 1.5 W RMS (8Ω)			
Audio Internal	1x speaker 0.3 W RMS (8Ω)			
Display and Touch				
Size	7 inch/177.8 mm			
Resolution	800 x 480 pixel			
Brightness	Typ. 400 cd/m²			
Backlight Lifetime	Typ. 50000 h			
Viewing Angle	50°, 70°, 70°, 70° [UDRL]			
Color	18 bit [262 K colors]			
Touch	projected capacitive multi touch			
Housing				
Front	1.8 mm toughened glass, RAL 9005			
Frame	None			
Rear	ABS-PC/1.4016 stainless steel, foam seal			
Ingress Protection	Front IP 66/Rear IP20			
Device Dimensions				
W x H x D	184.24 x 118.86 x 33.99 mm			
Weight	tbd.			
Power Supply				
Supply Voltage	Nom. 9 to 32 V DC			
Consumption	Typ. 5.3 W; max. 22.8 W			
Typical Environmental Conditions				
Storage Temp.	-20 to +70 °C			
Operating Temp.	0 to +50 °C			
Humidity	5 to 90 % RH			

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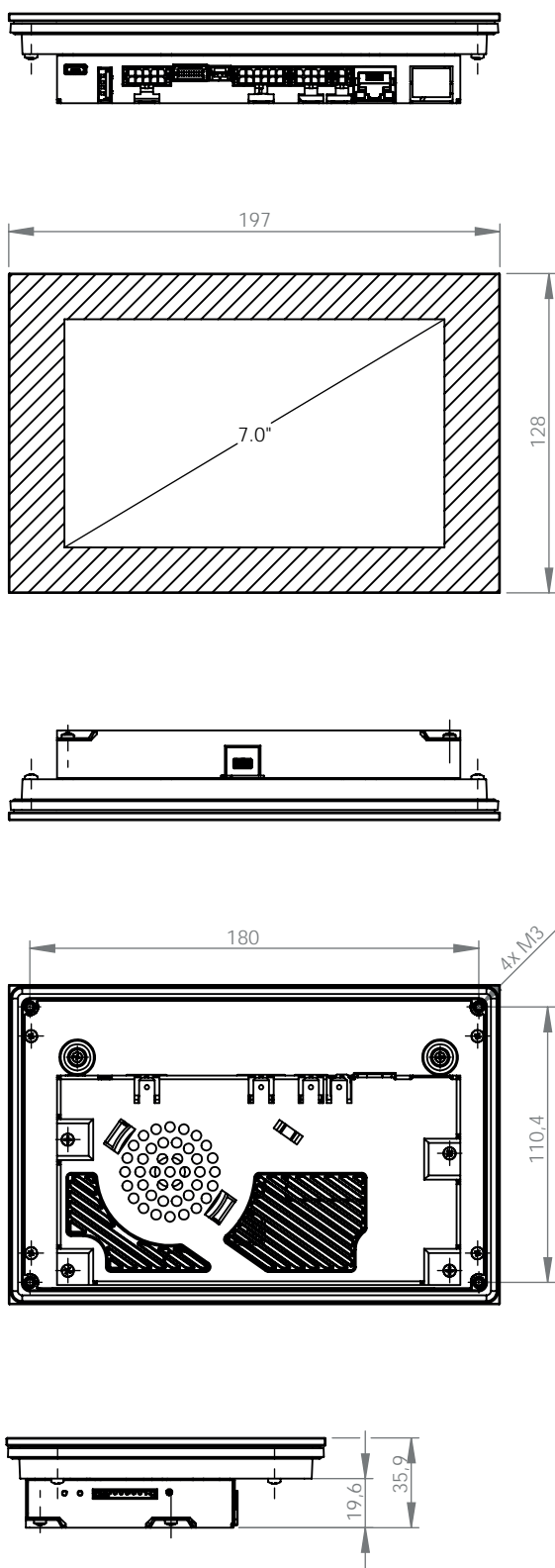
SANTARO 7.0 SG IPS

ARM Cortex-A9 Flush Mount



TECHNICAL SPECIFICATION

SANTARO 7.0 SG IPS

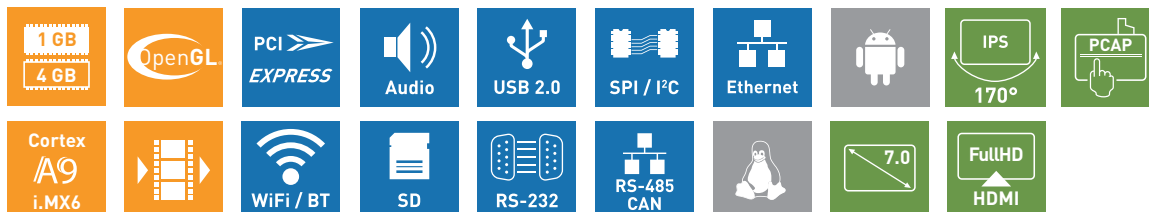


CPU	x1		x2	
CPU Type	i.MX6Solo		i.MX6Dual	
Core Class	ARM Cortex - A9			
Core Clock	800 MHz		1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data			
	512 KB L2 cache		1 MB L2 cache	
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)		OpenGL ES 2.0, OpenVG 1.1	
RTC	Accuracy: +/- 30 ppm at 25°C			
Memory				
eMMC Flash	4 GB eMMC Flash			
RAM Standard	1 GB 32 bit DDR3L		1 GB 64 bit DDR3L	
SD Card Slot	4 bit MMC/SDIO/SD/SDHC			
Operating Systems				
Supported OS	Windows EC on request, Linux Yocto, Android			
Communication Interfaces				
Digital I/O	2x In, 2x Out (0.7 A)			
Network	1x 10/100 Mbit/s Ethernet (RJ-45)			
USB 2.0	1x 480 Mbit/s Host (Type A)			
	1x 480 Mbit/s OTG (Type Micro-AB)			
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485		1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated	
RS-232	2x RS-232 (RX/TX/CTS/RTS)			
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8			
Video				
Video Output			Full HD micro HDMI	
Audio				
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)			
Audio Internal	1x speaker 0.3 W RMS (8Ω)			
Display and Touch				
Size	7 inch/177.8 mm			
Resolution	800 x 480 pixel			
Brightness	Typ. 400 cd/m²			
Backlight Lifetime	Typ. 30000 h			
Viewing Angle	89°,89°,89°,89° (UDRL)			
Color	24 bit (16.7 Mio. colors)			
Touch	projected capacitive multi touch			
Housing				
Front	3.0 mm toughened glass, RAL 9005			
Frame	None			
Rear	ABS-PC/ 1.4016 stainless steel, foam seal			
Ingress Protection	Front IP 66/Rear IP20			
Device Dimensions				
W x H x D	197.0 x 128.0 x 35.9 mm			
Weight	832 g			
Power Supply				
Supply Voltage	Nom. 13 to 32 V DC			
Consumption	Typ. 6.9 W; max. 25 W			
Typical Environmental Conditions				
Storage Temp.	-20 to +70 °C			
Operating Temp.	0 to +60 °C			
Humidity	5 to 90 % RH			

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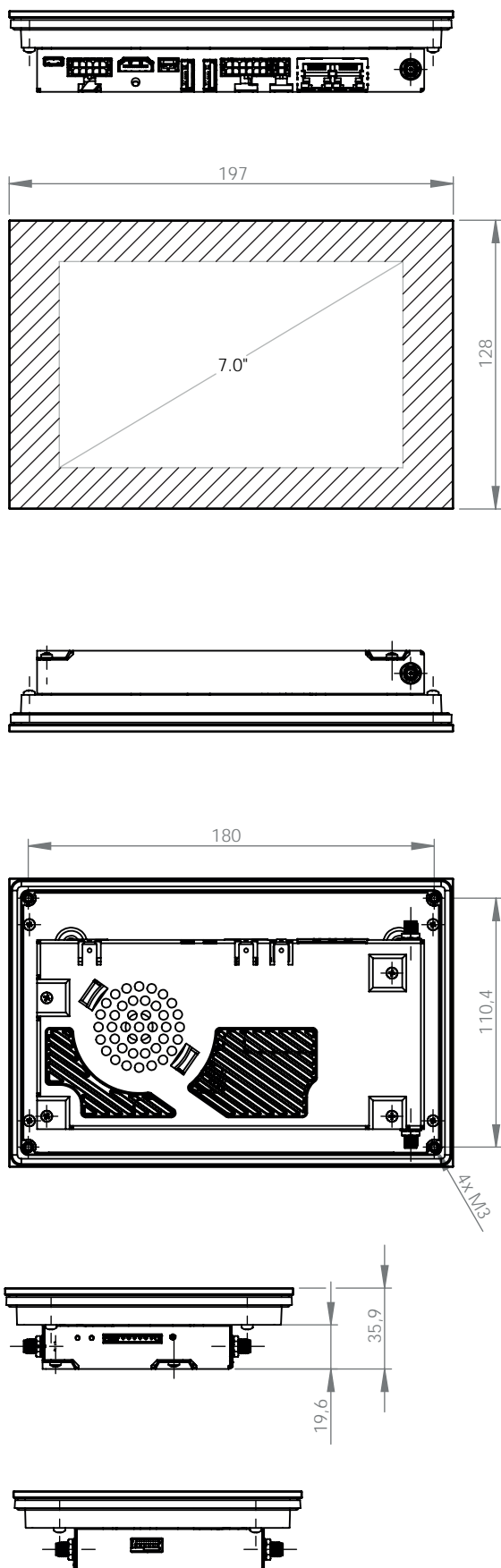
SANTOKA 7.0 SG IPS

ARM Cortex-A9 Flush Mount



TECHNICAL SPECIFICATION

SANTOKA 7.0 SG IPS

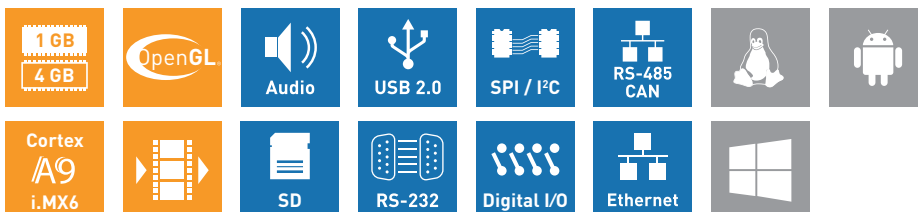


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Linux Yocto, Android	
Communication Interfaces		
Network	2x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	2x 480 Mbit/s Host (Type A)	
	1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I ² C; Matrix keypad up to 8 x 8	
Wireless Communication		
Wireless	WLAN 802.11 b/g/n; Bluetooth 4.0 LE For available mPCIe modules see page 129	
Video		
Video Output		Full HD HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	7.0 inch/177.8 mm	
Resolution	800 x 480 pixel	
Brightness	Typ. 400 cd/m ²	
Backlight Lifetime	Min. 30 000 h	
Viewing Angle	70°, 70°, 80°, 80° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	None	
Rear	ABS - PC/ 1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/ Rear IP20	
Device Dimensions		
W x H x D	197.0 x 128.0 x 35.9 mm	
Weight	837 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 6.9 W; max. 31.1 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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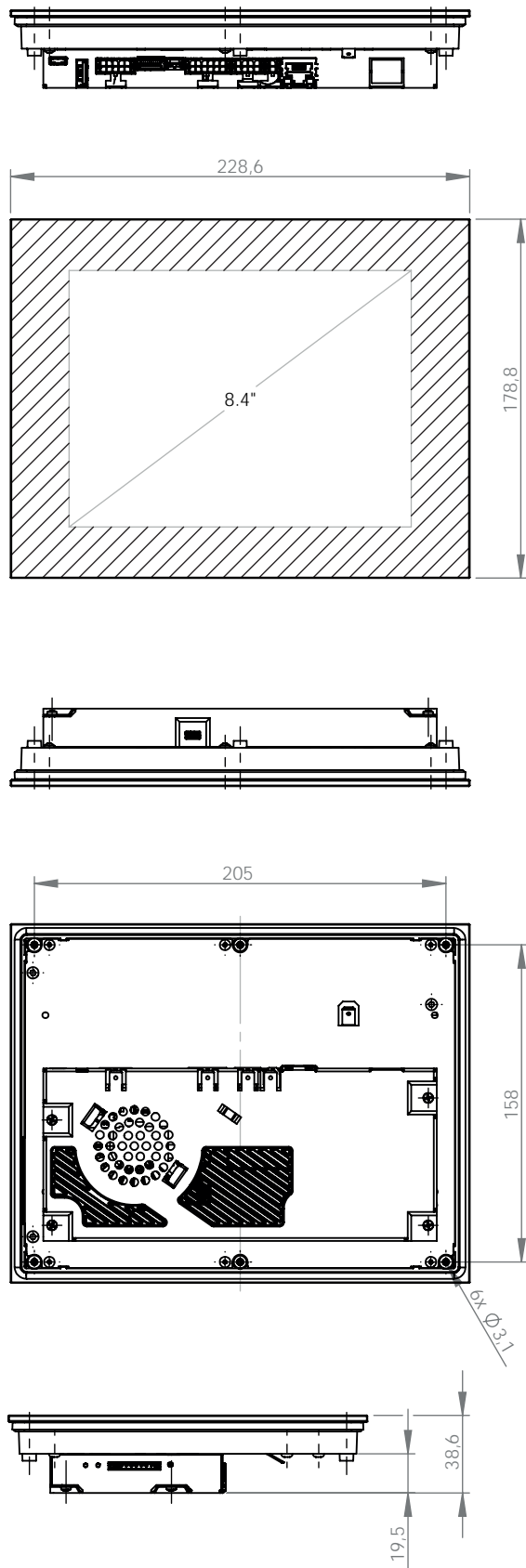
SANTARO 8.4 SG

ARM Cortex-A9 Flush Mount



TECHNICAL SPECIFICATION

SANTARO 8.4 SG

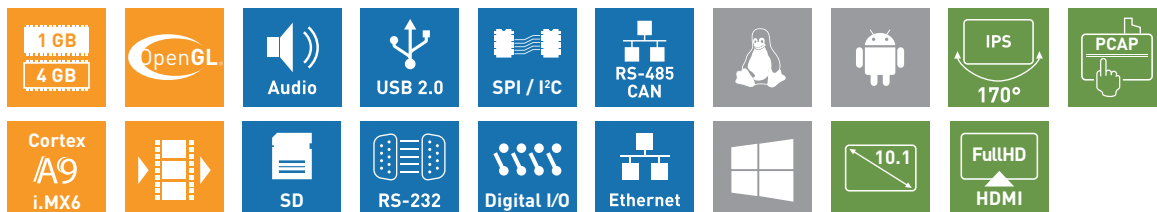


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I ² C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	8.4 inch/213.4 mm	
Resolution	800 x 600 pixel	
Brightness	Typ. 360 cd/m ²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	80°,60°,80°,80° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	None	
Rear	ABS-PC/1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/ Rear IP 20	
Device Dimensions		
W x H x D	228.6 x 178.8 x 38.6 mm	
Weight	tbd.	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 10.2 W; max. 24 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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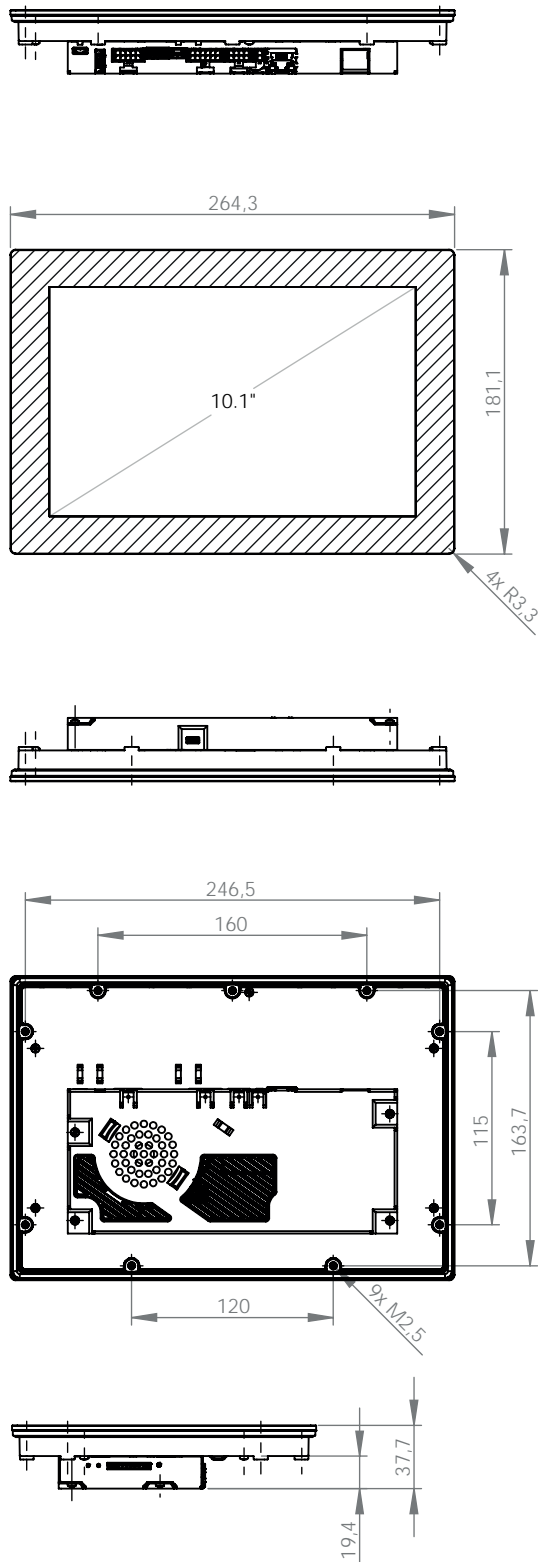
SANTARO 10.1 SG IPS

ARM Cortex-A9 Flush Mount



TECHNICAL SPECIFICATION

SANTARO 10.1 SG IPS

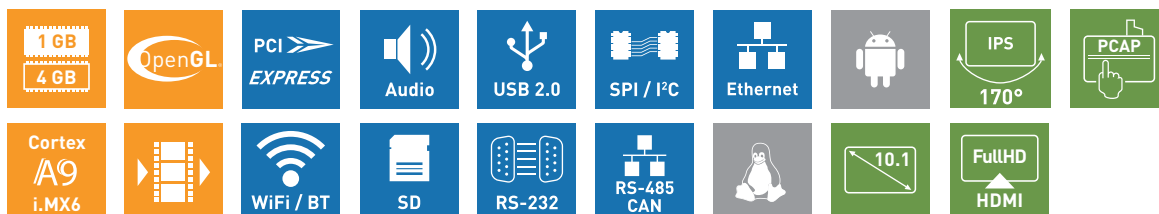
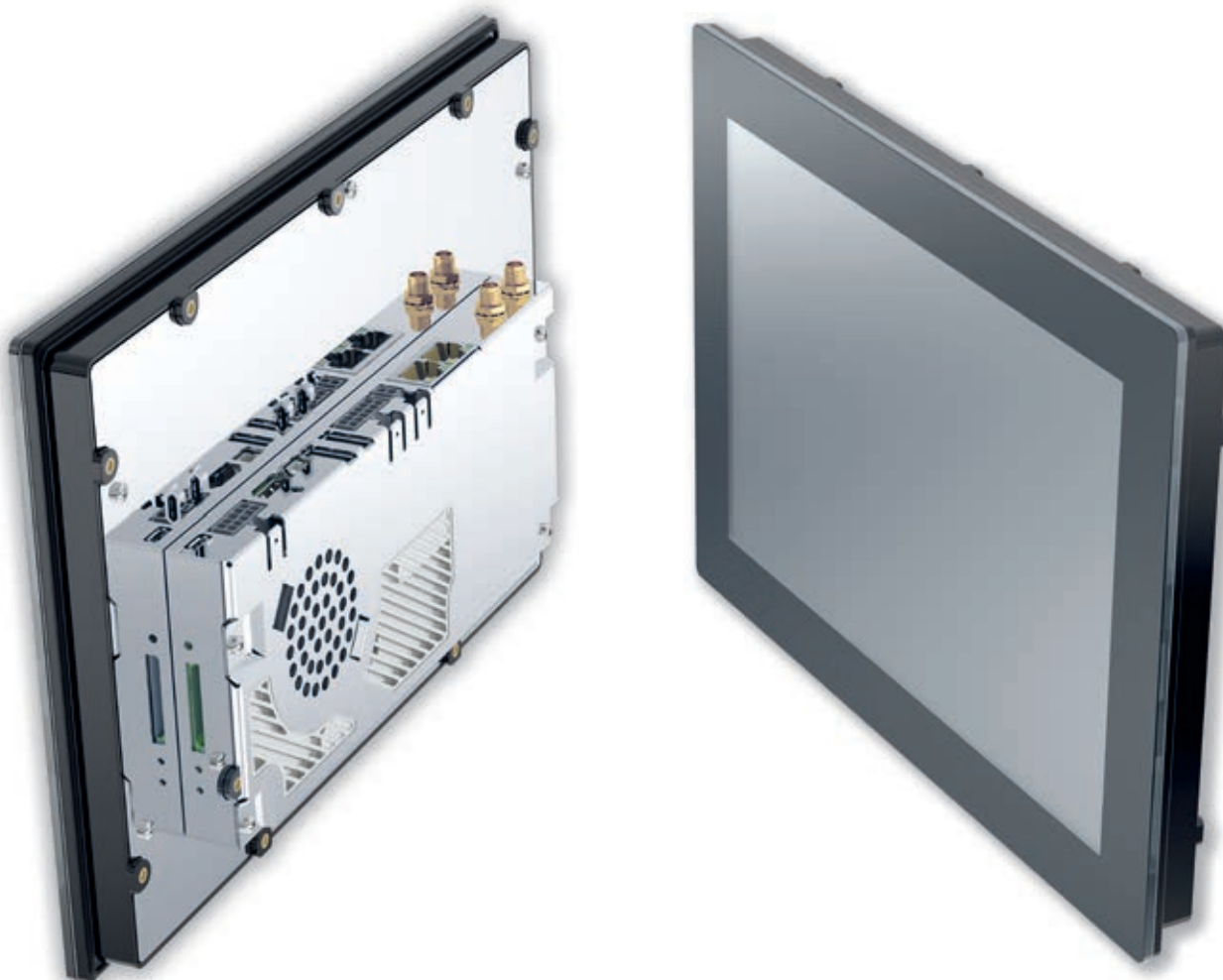


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I ² C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.1 inch/255.85 mm	
Resolution	1280 x 800 pixel	
Brightness	Typ. 400 cd/m ²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	85°,85°,85°,85° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	5-wire resistive touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	None	
Rear	ABS-PC/1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/ Rear IP 20	
Device Dimensions		
W x H x D	264.3 x 181.1 x 37.7 mm	
Weight	1420 g.	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 28.3 W; max. 42.1 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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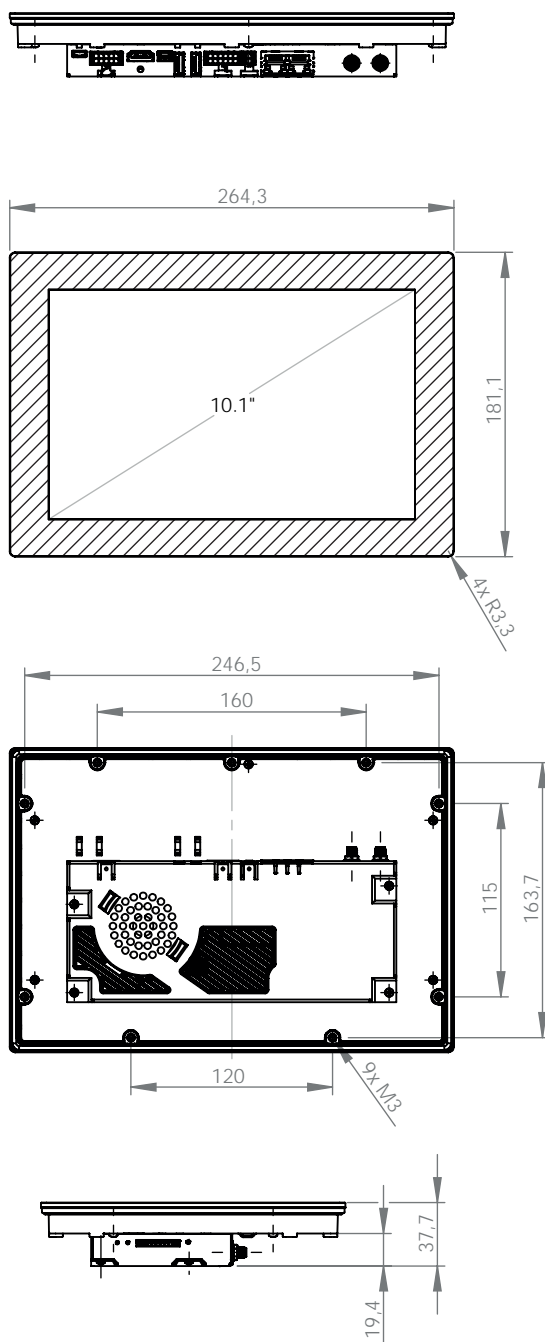
SANTOKA 10.1 SG IPS

ARM Cortex-A9 Flush Mount



TECHNICAL SPECIFICATION

SANTOKA 10.1 SG IPS

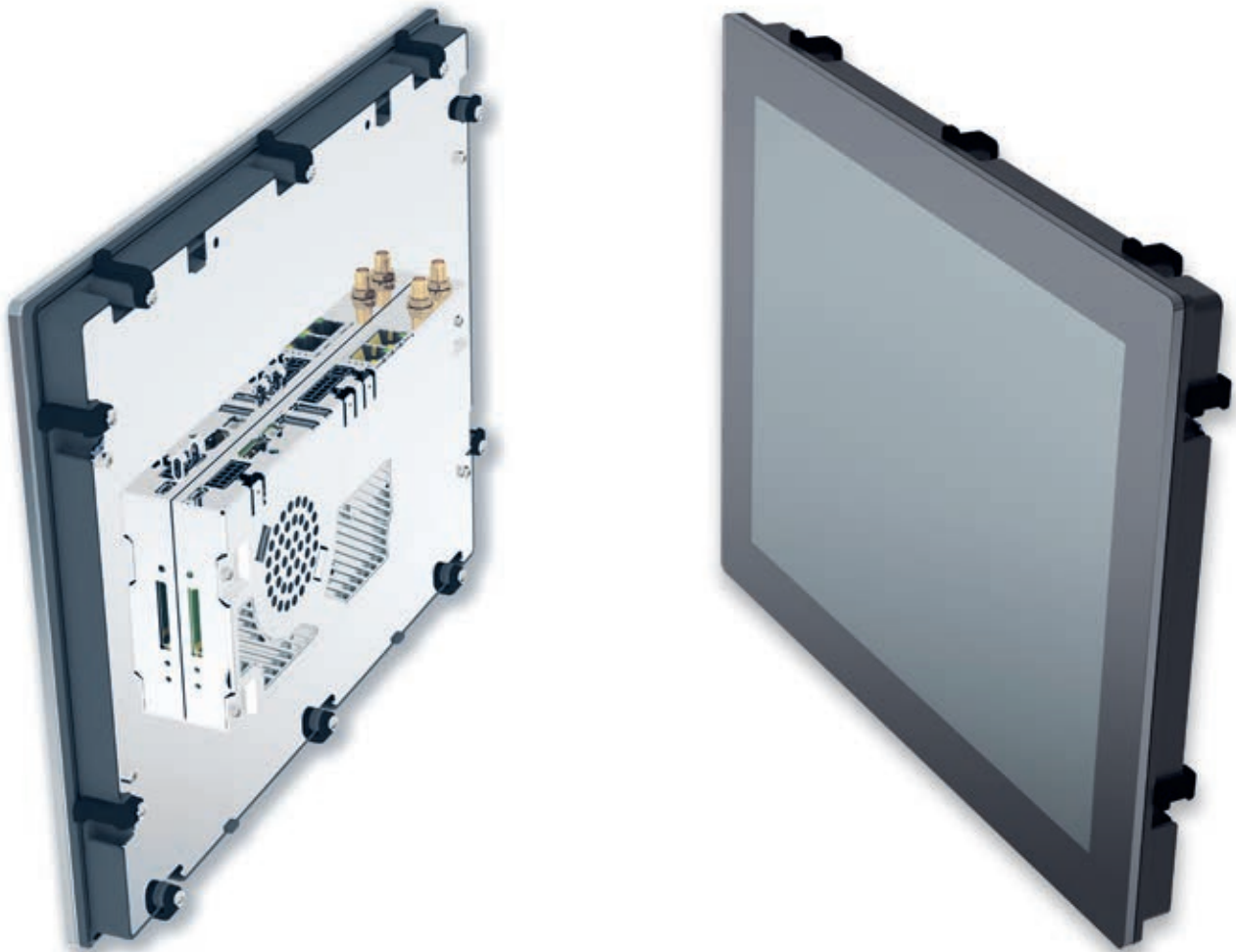


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Linux Yocto, Android	
Communication Interfaces		
Network	2x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	2x 480 Mbit/s Host (Type A)	
	1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Wireless Communication		
Wireless	WLAN 802.11 b/g/n; Bluetooth 4.0 LE For available mPCIe modules see page 129	
Video		
Video Output		Full HD HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.1 inch/255.85mm	
Resolution	1280 x 800 pixel	
Brightness	Typ. 420 cd/m²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	85°, 85°, 85°, 85° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, RAL 9005	
Frame	None	
Rear	ABS-PC/1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	264.3 x 181.1 x 37.7 mm	
Weight	1420 g.	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 9.8 W; max. 32.6 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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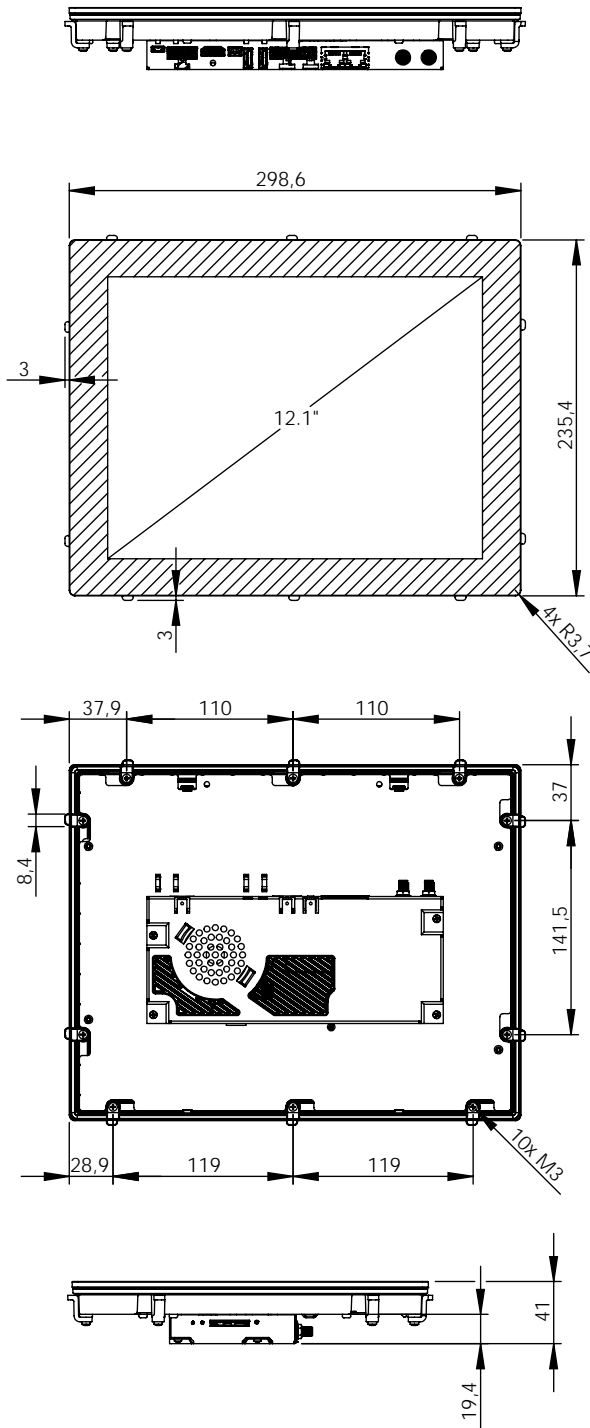
SANTOKA 12.1 SG

ARM Cortex-A9 Flush Mount



TECHNICAL SPECIFICATION

SANTOKA 12.1 SG

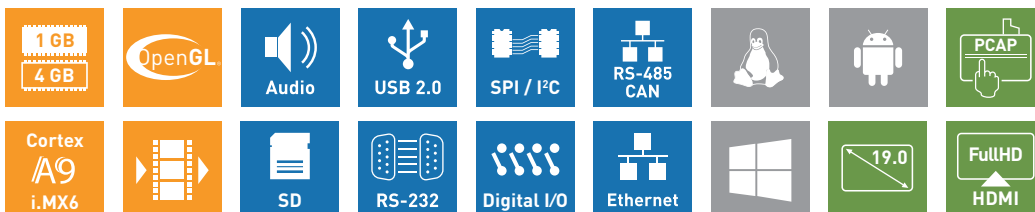
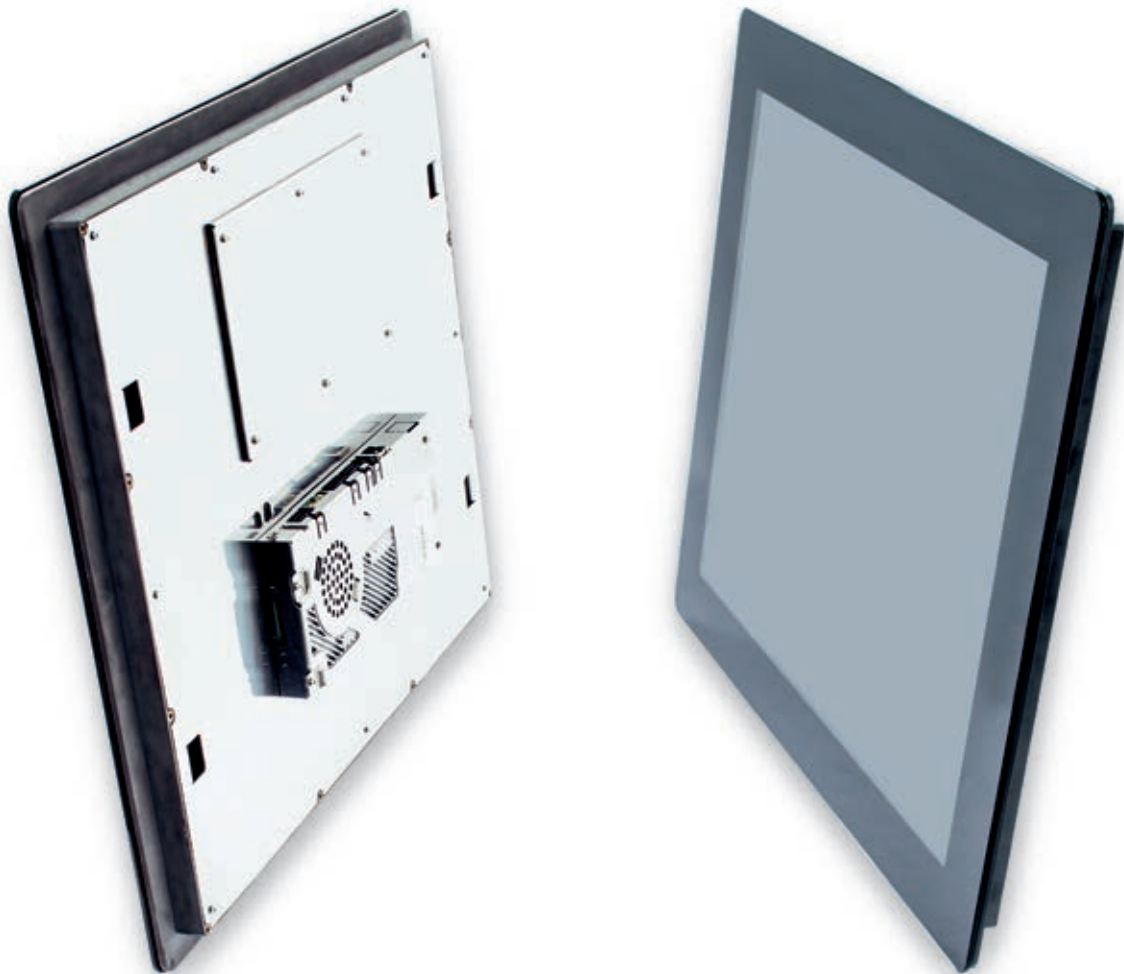


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	1 GHz	
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB MLC eMMC	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Linux Yocto, Android	
Communication Interfaces		
Network	2x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	2x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Wireless Communication		
Wireless	WLAN 802.11 b/g/n; Bluetooth 4.0 LE For available mPCIe modules see page 129	
Video		
Video Output		Full HD HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	12.1 inch/307.3 mm	
Resolution	1024 x 768 pixel	
Brightness	Typ. 600 cd/m²	
Backlight Lifetime	Typ. 70000 h	
Viewing Angle	70°, 70°, 80°, 80° (UDRL), LD/UD 160/140	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	4.0 mm toughened glass, RAL 9005	
Frame	None	
Rear	ABS-PC/1.4016 stainless steel, foam seal	
Ingress Protection	Front IP 66/Rear IP20	
Device Dimensions		
W x H x D	298.6 x 235.4 x 41.1 mm	
Weight	2140 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 10.3 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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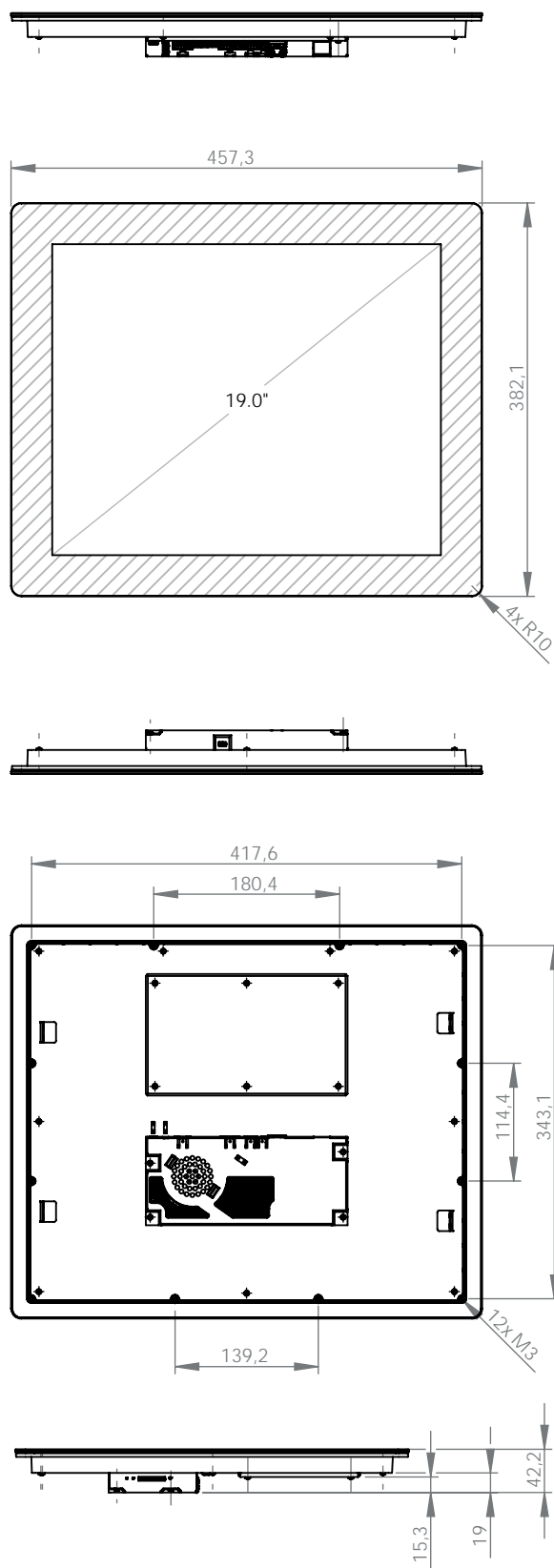
SANTARO 19.0 SG

ARM Cortex-A9 Flush Mount



TECHNICAL SPECIFICATION

SANTARO 19.0 SG

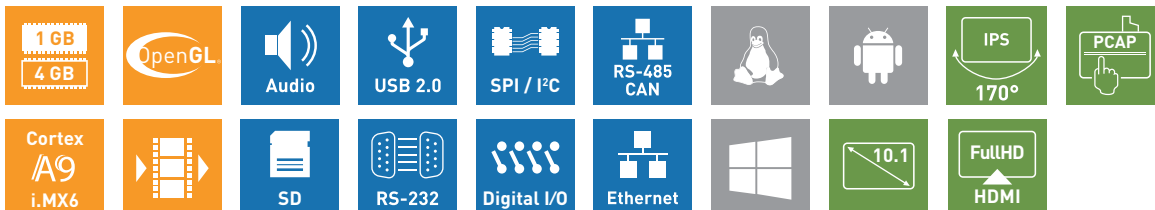


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	19.0 inch/481.93 mm	
Resolution	1280 x 1024 pixel	
Brightness	Typ. 280 cd/m²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	80°,80°,85°,85° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Housing		
Front	3.0 mm toughened glass, PMS Black C	
Frame	None	
Rear	ABS-PC/1.4016 stainless steel	
Ingress Protection	Front IP 20/Rear IP20	
Device Dimensions		
W x H x D	457.3 x 382.1 x 42.2 mm	
Weight	4820 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 28.3 W; max. 42.1 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +50 °C	
Humidity	5 to 90 % RH	

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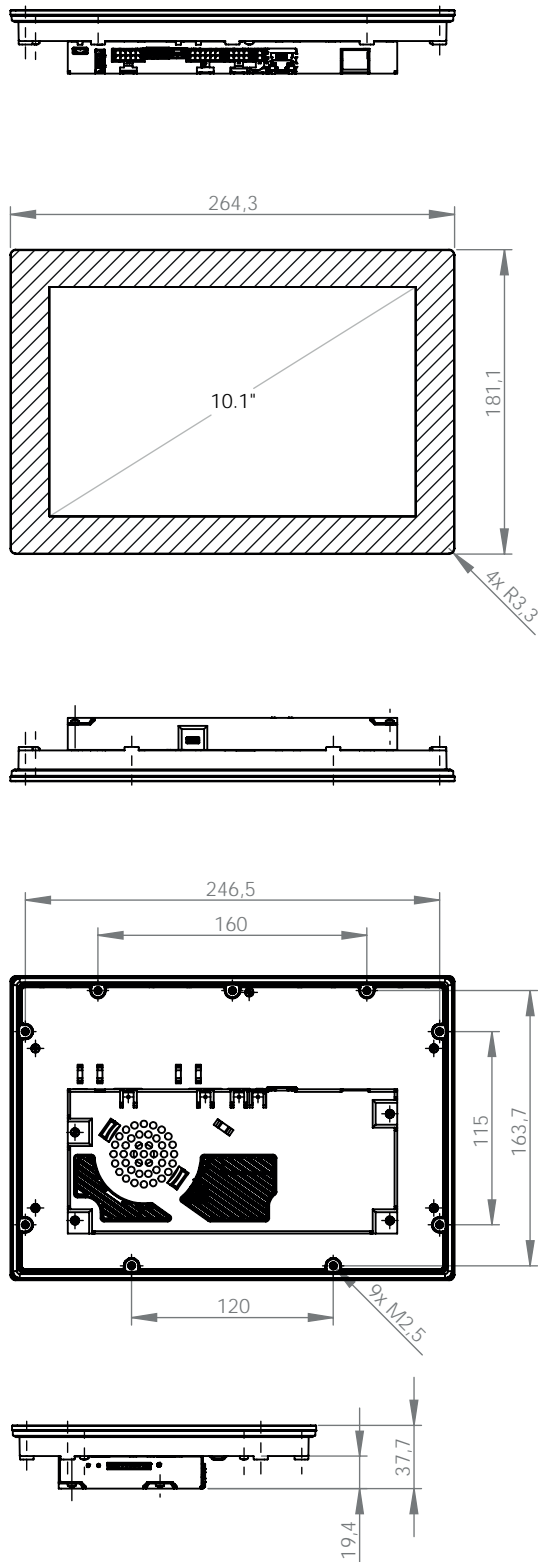
SANTARO 10.1 SG IPS outdoor

ARM Cortex-A9 Flush Mount



TECHNICAL SPECIFICATION

SANTARO 10.1 SG IPS outdoor

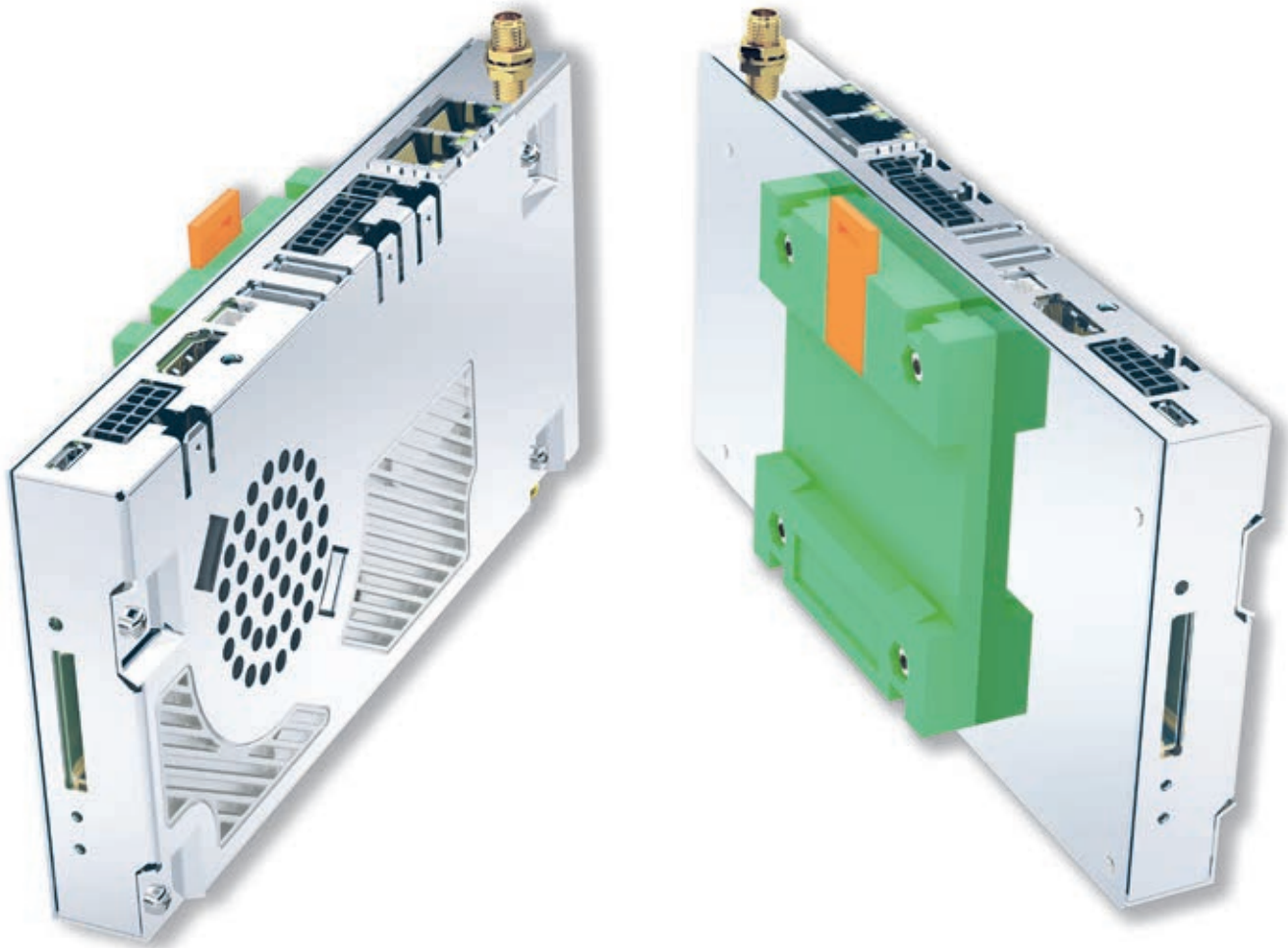


CPU	x1	x2
CPU Type	i.MX6Solo	i.MX6Dual
Core Class	ARM Cortex - A9	
Core Clock	800 MHz	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data	
	512 KB L2 cache	1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C	
Memory		
eMMC Flash	4 GB eMMC Flash	
RAM Standard	1 GB 32 bit DDR3L	1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC	
Operating Systems		
Supported OS	Windows EC on request, Linux Yocto, Android	
Communication Interfaces		
Digital I/O	2x In, 2x Out (0.7 A)	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)	
USB 2.0	1x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)	
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)	
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8	
Video		
Video Output		Full HD micro HDMI
Audio		
Speaker Output	1x speaker (connector), 1.5W RMS (8Ω)	
Audio Internal	1x speaker 0.3 W RMS (8Ω)	
Display and Touch		
Size	10.1 inch/255.85 mm	
Resolution	1280 x 800 pixel	
Brightness	Typ. 850 cd/m²	
Backlight Lifetime	Min. 50 000 h	
Viewing Angle	85°, 85°, 85°, 85° (UDRL)	
Color	24 bit (16.7 Mio. colors)	
Touch	projected capacitive multi touch	
Special Feature	optical bonded	
Housing		
Metal Parts	1.4016 high quality steel 0.8 mm	
Front glass	3 mm chemically strengthened	
Device Dimensions		
W x H x D	264.3 x 181.1 x 37.7 mm	
Weight	1420 g	
Power Supply		
Supply Voltage	Nom. 13 to 32 V DC	
Consumption	Typ. 28.3 W; max. 42.1 W	
Typical Environmental Conditions		
Storage Temp.	-20 to +70 °C	
Operating Temp.	0 to +60 °C	
Humidity	5 to 90 % RH	

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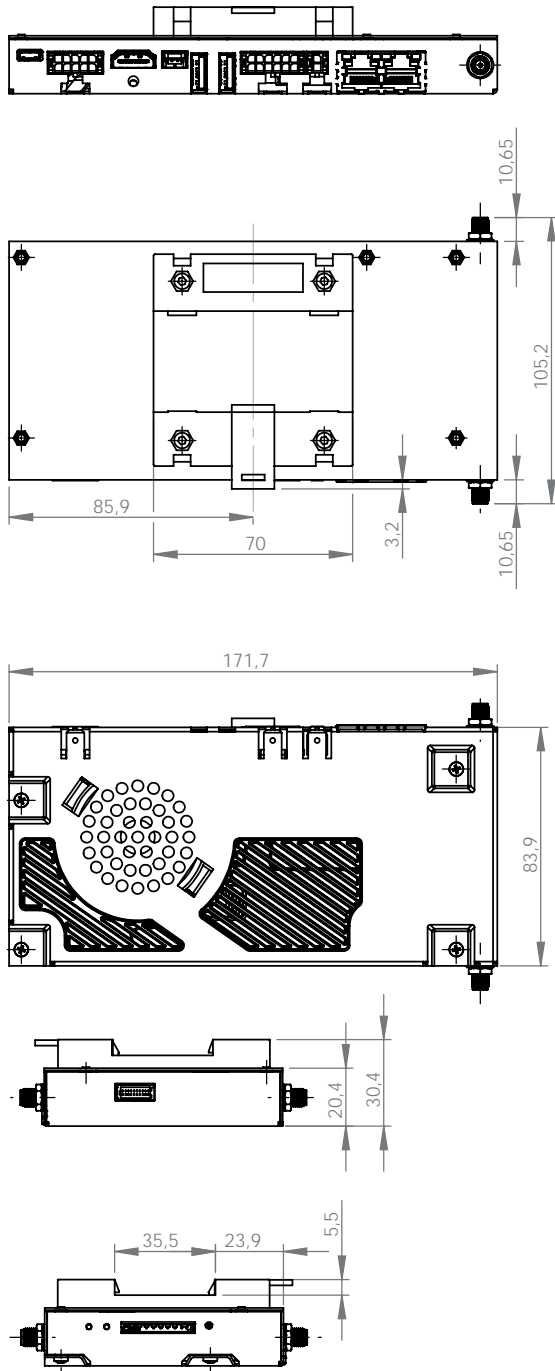
SANTOKA DIN RAIL

M2M DIN Rail Computer



TECHNICAL SPECIFICATION

SANTOKA DIN Rail Series

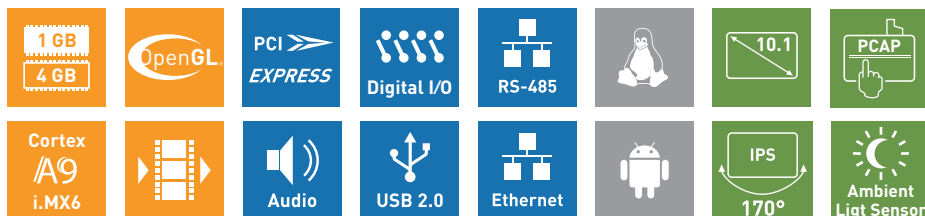


CPU		x1	x2
CPU Type	i.MX6Solo		i.MX6Dual
Core Class	ARM Cortex - A9		
Core Clock	1 GHz		
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video de- coder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data		
	512 KB L2 cache		1 MB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1 (Emulated on 3D GPU)		OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C		
Memory			
eMMC Flash	4 GB MLC eMMC		
RAM Standard	1 GB 32 bit DDR3L		1 GB 64 bit DDR3L
SD Card Slot	4 bit MMC/SDIO/SD/SDHC		
Operating Systems			
Supported OS	Linux Yocto		
Communication Interfaces			
Network	2x 10/100 Mbit/s Ethernet (RJ-45)		
USB 2.0	2x 480 Mbit/s Host (Type A) 1x 480 Mbit/s OTG (Type Micro-AB)		
CAN Fieldbus / RS-485	1x CAN (ISO/DIS 11898) + 1x RS-485		1x CAN (ISO/DIS 11898) + 1x RS-485 galvanic isolated
RS-232	2x RS-232 (RX/TX/CTS/RTS)		
Synchronous Serial Interfaces	SPI up to 12 chip selects; I²C; Matrix keypad up to 8 x 8		
Wireless Communication			
Wireless	Wifi 802.11 b/g/n; Bluetooth 4.0 LE For available mPCIe modules see page 129		
Video			
Video output			Full HD HDMI
Audio			
Speaker output	1x speaker (connector), 1.5W RMS (8Ω)		
Audio Internal	1x speaker connector parallel to external output		
Device Dimensions			
W x H x D	171.7 x 105.2 x 30.4 mm		
Weight	354 g		
Power Supply			
Supply	Nom. 9 to 32 V DC		
Consumption	Typ. 3.3 W; max. 21.2 W		
Typical Environmental Conditions			
Storage Temp.	-20 to +70 °C		
Operating Temp.	0 to +60 °C		
Humidity	5 to 90 % RH		
Expansion Slot			
mPCIe	mPCIe connector (for half size card)		
Housing			
Front	1.4016 stainless steel		
Frame	None		
Rear	1.4016 stainless steel, DIN Rail (TS 35)		
Ingress Protection	Front IP 20/Rear IP20		

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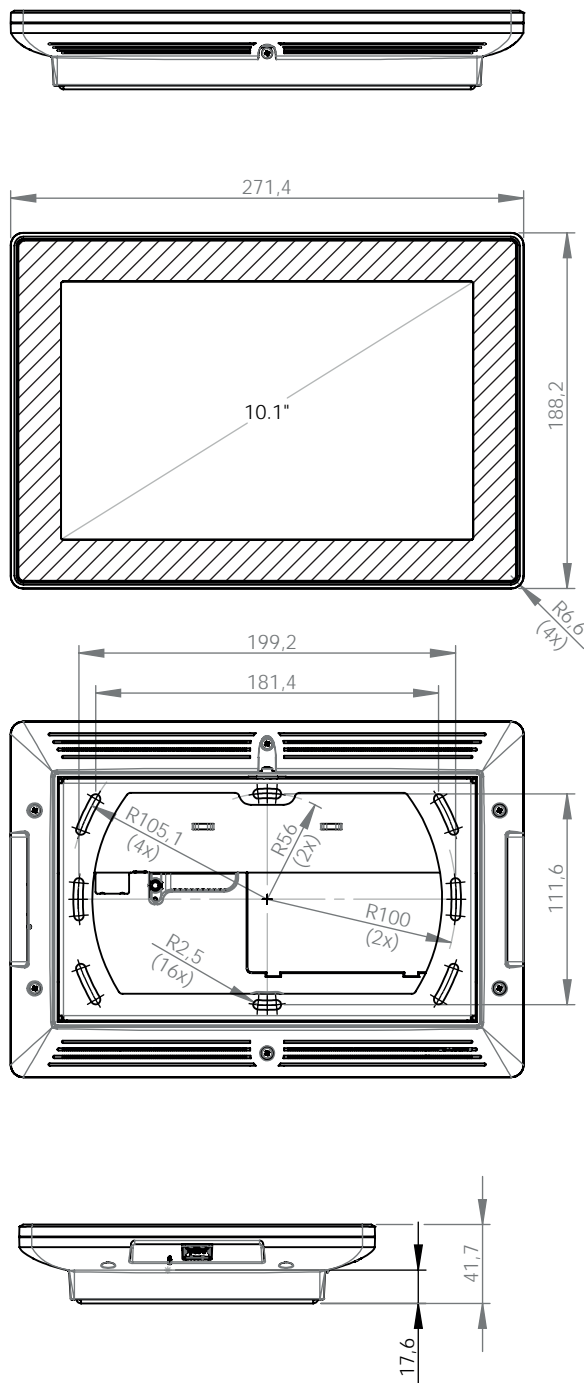
SANVITO 10.1 IPS

ARM Cortex-A9 Wall Mount



TECHNICAL SPECIFICATION

SANVITO 10.1 IPS



CPU	x2L
CPU Type	i.MX6 DualLite
Core Class	ARM Cortex - A9
Core Clock	1 GHz
Features	NEON for SIMD media acceleration and VFP operations; Multi-format HD 1080p video decoder and HD 720p video encoder hardware engine; L1 cache, 32 KB for instruction, 32 KB for data
	512 KB L2 cache
HW Accelerators	OpenGL ES 2.0, OpenVG 1.1
RTC	Accuracy: +/- 30 ppm at 25°C
Memory	
eMMC Flash	4 GB eMMC Flash
RAM Standard	1 GB 32 bit DDR3L
Operating Systems	
Supported OS	Linux Yocto, Android
Communication Interfaces	
Network	1x 10/100 Mbit/s Ethernet (RJ-45)
USB	1x 480 Mbit/s Host (Type A)
RS-485	1x RS-485 galvanic isolated
Miscellaneous	
Sensors	Ambient Light Sensor Proximity Sensor
LED	2 colour status LEDs
Audio	
Audio Internal	1x speaker 0.3 W RMS (8Ω) (optional) 1x microphone (optional)
Display and Touch	
Size	10.1 inch/255.85mm
Resolution	1280 x 800 pixel
Brightness	Typ. 420 cd/m ²
Backlight Lifetime	Min. 50 000 h
Viewing Angle	85°, 85°, 85°, 85° (UDRL)
Color	24 bit [16.7 Mio. colors]
Touch	projected capacitive multi touch
Housing	
Front	3.0 mm toughened glass "anti-glare", RAL 9005, optical bonded with touch and display
Frame	Fine zinc alloy, matt chrome
Rear	ABS-PC black
Ingress Protection	IP30
Device Dimensions	
W x H x D	271.4 x 188.2 x 41.7 mm
Weight	1820g
Power Supply	
Supply Voltage	Nom. 24 V DC or PoE+ [802.3at]
Consumption	Typ. 10.2 W; max. 26.4 W
Typical Environmental Conditions	
Storage Temp.	-20 to +70 °C
Operating Temp.	0 to +40 °C
Humidity	5 to 90 % RH

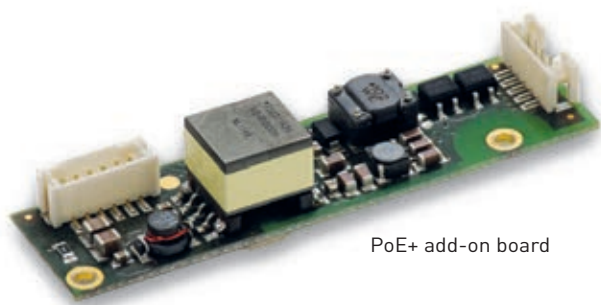
Expansion Card	
Network	1x additional 10/100 Mbit/s Ethernet (RJ-45) 1x KNX [on request]
Wireless	1x WLAN 1x Bluetooth 5 (PCIe module)

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SBC and HMI Accessories

For extended functionality

Internal Add-On Boards



PoE+ add-on board

On SANTARO, Power-over-Ethernet (PoE+) is available as an option. The add-on module can be installed under the hood beside the single board computer

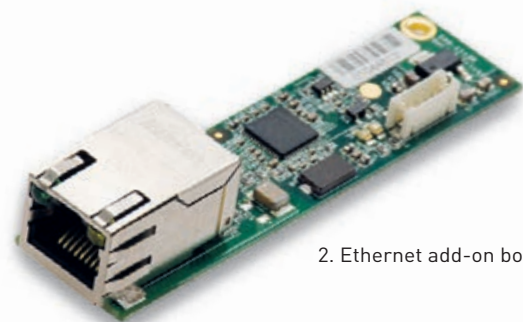
PoE Power over Ethernet	
Standard	802.3at
Outputpower [W]	max. 25
W x H x D [mm]	20.0 x 80.0 x 16.0
Weight [g]	15
Available for	VINCELL, SANTARO



50-Watt-supply

50-Watt-supply	
Power-In	Norm. 12/24 V DC +-15% max. 8...36 V DC
Power-Out	12 V DC / 50 W
Topology	Step-down (no galvanic isolation) Overvoltage Protection (Surge/Burst) Reverse Polarity Protection

The on-board power supply is limited to 24 watts for single board computers and display. For applications that require more than that, the optional power adaptor provides up to 50 watts .



2. Ethernet add-on board

Some applications require a second Ethernet interface for security or just for service reasons. Besides the main Ethernet connection, the additional port is available through a USB-to-Ethernet adaptor. The small adaptor PCB fits into the housing besides the main board.

Second Ethernet	
Standard	802.3/802.3u (10/100 Mbit)
W x H x D [mm]	20.0 x 80.0 x 16.0
Weight [g]	12
Connection	internal USB Connector
Available for	CUPID, VINCELL, SANTARO

USB Adapter

Some appliances require a wireless network connection. An external USB dongle is recommended for greater flexibility with different industrial standards and to achieve the optional wireless solution. Our USB dongles provide certified modules for WiFi only, WiFi & Bluetooth and cellular. Drivers are included in the related operating systems.



	WiFi only	WiFi only	WiFi only	WiFi & Bluetooth	Cellular
Manufacturer	LM Technologies	LM Technologies	LM Technologies	LM Technologies	Huawei
Typ	LM808	LM007	LM816	LM817	MS2131i-8
Standards	IEEE 802.11ac/a/b/g/n/d/e/h/i	802.11 b/g/n	802.11 b/g/n	IEEE 802.11 b/g/n/d/e/h/Bluetooth v2.1+EDR/v3.0+HS/v4.0	HSPA+, HSUPA, HSDPA, WCDMA, EDGE, GPRS, GSM
Data rate	Up to 433.3 Mbps	Up to 150 Mbps	Up to 150 Mbps	Up to 54 Mbps	Up to 21.6 Mbits (HSPA+)
Frequency band	2.4 GHz and 5 GHz	2.4 GHz	2.4 GHz	2.4 GHz	EDGE: 850/900/1800/1900 MHz GSM/GPRS: 850/900/1800/1900 MHz
Operating temperature	-10 °C to +70 °C	-20 °C to +85 °C	-10 °C to +60 °C	0 °C to +50 °C	-20 °C to +55 °C
Supported OS	Linux Yocto, Android	Linux Yocto, Android	Linux Yocto, Android	Linux Yocto, Android	on request

Please contact you sales partner for detailed information, availability and driver support



mPCIe Modules

Our new SANTOKA offers a high flexibility with its mPCIe slot. The extension module fits into the housing which offers up to three SMA jacks for the antenna. To achieve the optimal wireless solution, Garz & Fricke offer pre-certified modules for cellular, Bluetooth and/or WiFi. Drivers are included for the respective operating systems.

	WiFi only	WiFi & Bluetooth	Cellular
Manufacturer	Silex	Sparklan	Quectel
Typ	SX-PCEAN2i	WPEA-152GN(BT)	EC21-E
Standards	IEEE 802.11a/b/g/n	IEEE 802.11 b/g/n Bluetooth V4.0 LE; V3.0+HS; V2.1+EDR	LTE category 1
Data rate	Up to 300 Mbps	Up to 54 Mbps (Wifi) Up to 3 Mbps (BT EDR)	10Mbit/s downlink and 5Mbit/s uplink
Frequency band	2.4 GHz and 5 GHz	2.4 GHz	LTE FDD: B1/B3/B5/B7/B8/B20 WCDMA: B1/B5/B8 GSM: B3/B8
Operating temperature	-40 °C to +85 °C	0 °C to +75 °C	-40 °C to +85 °C
Supported OS	Linux Yocto, Android	Linux Yocto, Android	Linux Yocto, Android

Please contact you sales partner for detailed information, availability and driver support

Wireless Adapter Compatibility

	SANTINO LT	SANTINO	SANTARO	SANTOKA	SANTVEND
WiFi	USB	USB	USB	USB, mPCIe	USB
WiFi & BT	USB	USB	USB	USB, mPCIe	not required
BT	USB	USB, onboard on request	USB	USB, mPCIe	onboard
Cellular	USB	USB	USB	USB, mPCIe	onboard



GARZ & FRICKE GMBH | TEMPOWERKRING 2 | 21079 HAMBURG | +49 (0)40 79 18 99 30
SALES@GARZ-FRICKE.COM | WWW.GARZ-FRICKE.COM

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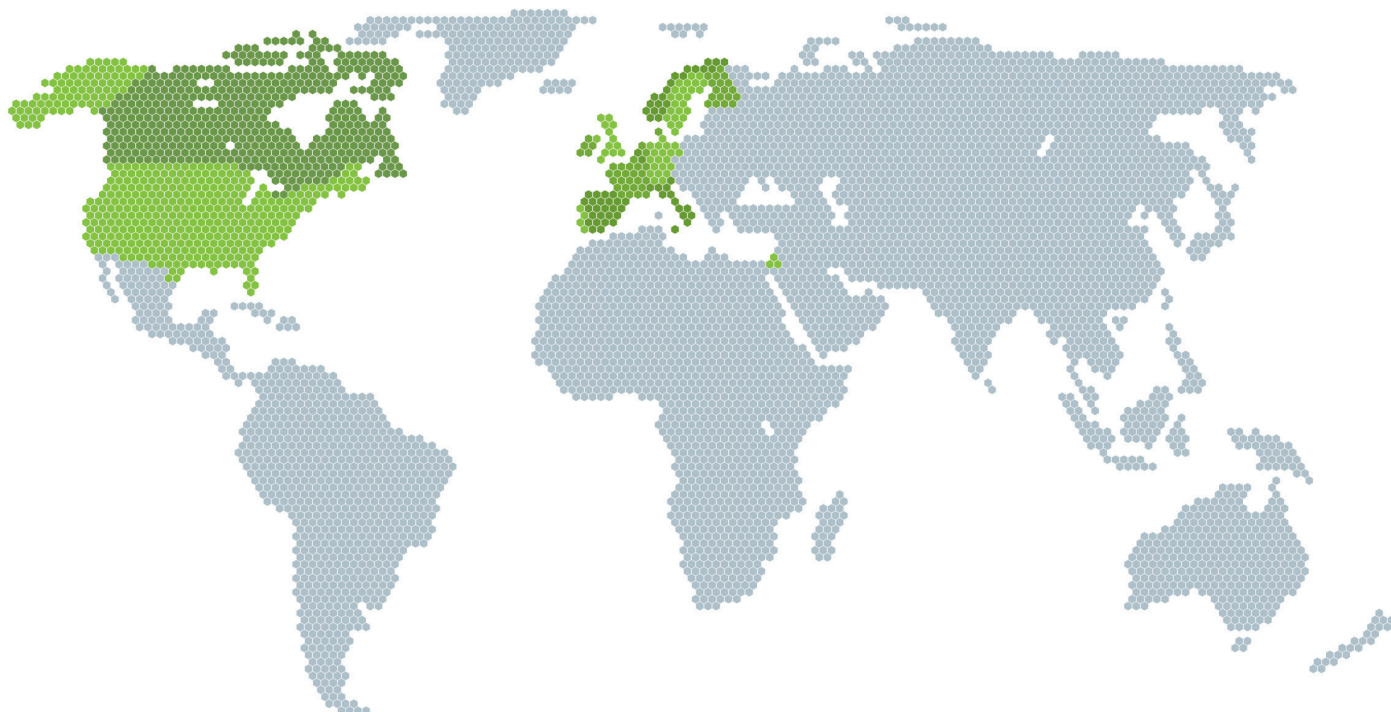
Drawings

All drawings shown in this catalogue are schematic drawings.
For exact technical drawings please contact our sales team or product manager.

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Territories as per end of 2017




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GARZ  **FRICKE**

Cynetis Embedded

76 rue des Grands Champs
75020 Paris, France

 +33 18508 7069

Email info@cynetis-embedded.com

URL www.cynetis-embedded.com

