Embedded Solutions

The Basic Components of Industrial IoT

EXOR
EMBEDDED

...Our Word Counts

Benefits

IIoT Ready - Now

Reduced Time to Market

Exor Embedded can streamline the design, devlopment and manufacturing of your new product. The microSOM is ready today and with Exor's stated open stance regarding protocols. You are able to reduce your time to market by up to 2 years. That is a lot of competitive advantage.

Practical Experience

Reduced Risk

New product design is a complex and expensive undertaking for any company. Not only can Exor's multi year experience help to reduce the risk associated with this but the flexibility and power of the microSOM allow (mid-project) pivoting which is crucial to final commercial success.

Extensive Choice

Easy Upgrade or Downgrade Decisions

Use Exor Embedded microSOM and display options to design your IIoT product yourselves, have Exor design, develop and test your product or simply choose to customise an already existing standard Exor product. The point is, with Exor Embedded you do actually have this level of choice, which we will help you make. Nothing is standing in your way to come to market with your IIoT product.

Sophisticted Technology

Being Simple Is Not Easy

Simplicity in technology use cannot exist without having a tremendous level of sophistication in hardware and software. Exor microSOM allows product design across the entire enterprise architecture: Product, Field Device, Control Device, Station, Work Centres and also connection to Enterprise level data analytics. Being simple to Exor means you not worrying about compatibilty.

Lifetime

Minimum 10 Year Product Life Cycle

We have been around for nearly 50 years and we are not going anywhere. Exor is small but fiscally strong, well positioned in the marketplace and managed in a prudent manner. The Exor microSOM therefore will be guaranteed for at least 10 years from the moment of design sign off.

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USP Exor Embedded

No other microSOM manufacturer has 50 years' experience in the Industrial Automation sector.

No other Industrial Automation manufacturer produces microSOM technology

Exor Embedded bridges that gap.

Embedded

Key Features

- Basic Component of the X Platform
- Guaranteed Minimum 10 year Product Life Cycle
- Reduced Time to Market for Customised Products
- Backed by a partner that can cover the design and supply chain
- Essential Basic Component of IIoT Implementation
- Powerful IIoT engine across all "Industrie 4.0" levels
- OPC UA pub/sub over TSN, MQTT and AMQT
- IIoT Gateway and Logic control
- Vast Protocol Library
- At the Edge Analytics
- Fog Node Compatibility
- Optional CODESYS v3
- Distributed micro-Server
- Quad Core ARM
- Linux BSP rt (OSADL) or Android BSP

Powering some of the most innovative and robust products and ecosystems in the Industrial, Marine and Building IoT sector, the Exor nanoSOM and microSOM are the basic components of the IIoT Industry 4.0 ready, X Platform.
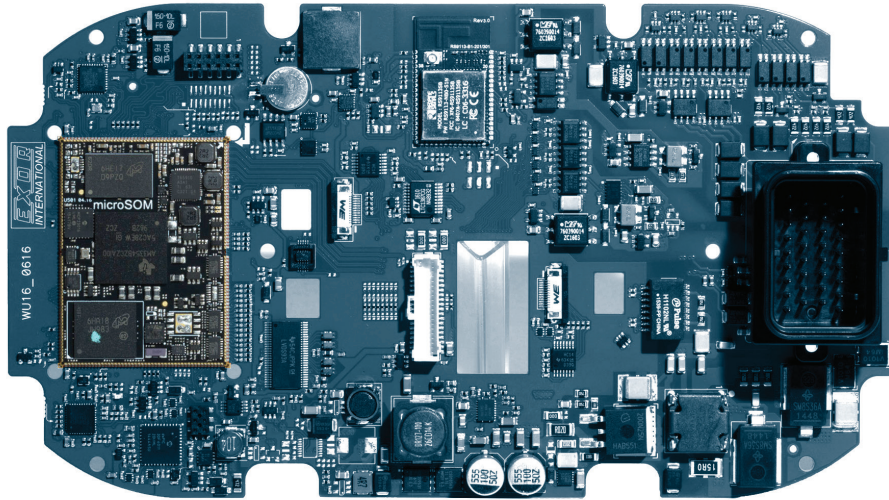
The systems on mobile are highly miniaturised, flexible and fully customizable. Most importantly they come with guarantee of a minimum 10 year product life cycle therefore allowing the execution of a viable business case.

When coupled with **JMobile** – the software inside X Platform, they become powerful IoT Engines able to empower complete connectivity from the machine up to enterprise level control and analytical systems. The linux OS, chosen in 2010 by Exor is ideal for secure operations and hence reduced penetration risks.
Covering all the major protocols; PorfitNet, EtherCat, POWERLINK, EtherNet/IP, etc. and then securely pushing this data to the cloud, edge or Fog node using OPC UA standard and pub/sub over TSN or where appropriate MQTT / AMQP all configured with Node-red interface.
With CODESYS PLC it is possible to create customised control logic and visualization. This combination allows solutions with the Exor Embedded SOM to cross the entire Reference Architectural Model Industrie 4.0 - Product, Field Device, Control Device, Station, Work Centres and then connected to Enterprise higher levels.

This unique flexibility allows various product / ecosystem creations all brought to market in dramatically reduced time by Exor which can cover the complete design and supply chain.

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Display and Touch

Projected Capacitive Technology has evolved since its introduction in 2007 and continues to improve its performance to provide an ideal evolution to your application.

Key Features

Extremely High Quality Solution

Provide different display solution, with same thickness and concept design

Stable G/F/F Touch Sensor technology

Touch With Chip On Flat Design

FW customization and High Immunity Touch Solution available

Product can be customized to support the following Certifications:
• Automotive
• Medical
• Avionics

The extremely high quality that Exor Embedded offers, ensures that the display solution is incredibly stable. Exor embedded already quite uniquely takes responsibility for the microSOM and the BSP onboard and this responsibility extends out to the display.

The touch screens are based on Film Film Glass Structure giving both flexibility to design and due to lower tooling costs, a better price / performance ratio.
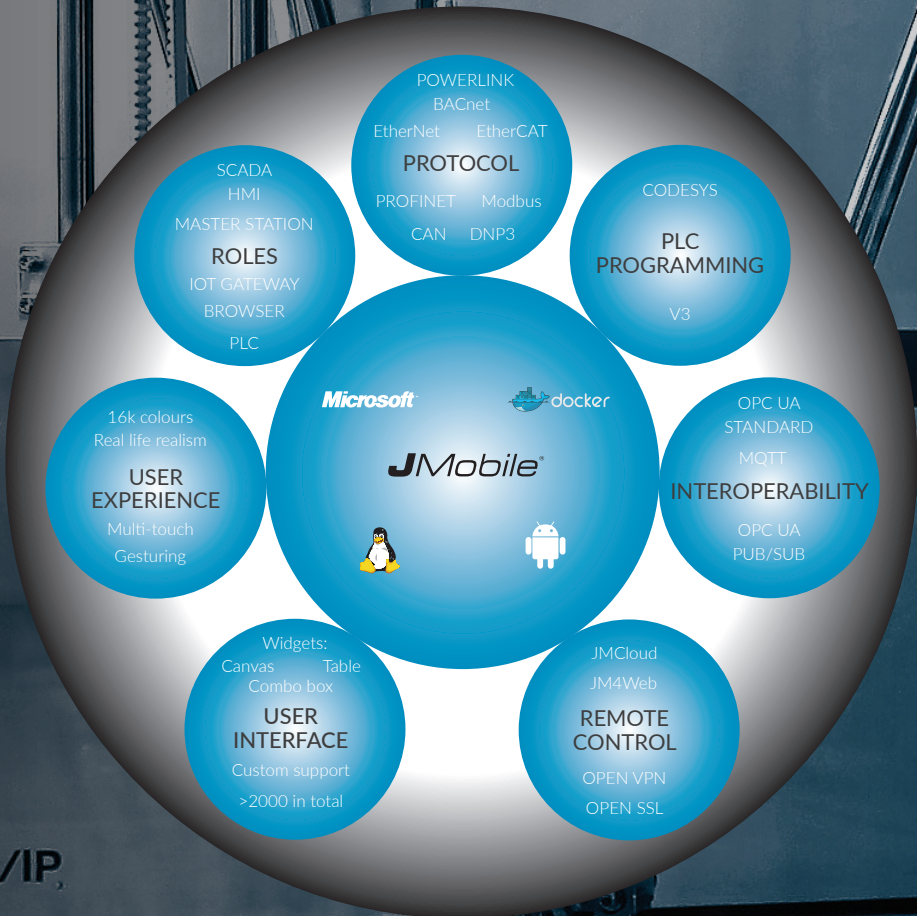
All displays are connected to the carrier board using a Chip On Flat Design controller rather than external design so as to reduce dramatically the foot print which is crucial for certain applications. The bonding process is taken to extreme levels using soldering, UV glue and special advanced SUS material.

The displays and touch from Exor Embedded are developed in collaboration with top tier glass and PC/PMMA manufacturers, allowing vast design options.

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JMobile —
The software
inside X Platform

PROTOCOL
POWERLINK
BACnet
EtherNet
EtherCAT
PROFINET
Modbus
CAN
DNP3

ROLES
SCADA
HMI
MASTER STATION
IOT GATEWAY
BROWSER
PLC

PLC PROGRAMMING
CODESYS
V3

Microsoft
docker
JMobile

USER EXPERIENCE
16k colours
Real life realism
Multi-touch
Gesturing

INTEROPERABILITY
OPC UA STANDARD
MQTT
OPC UA PUB/SUB

USER INTERFACE
Widgets:
Canvas   Table
Combo box
Custom support
>2000 in total

REMOTE CONTROL
JMCloud
JM4Web
OPEN VPN
OPEN SSL

EtherNet/IP

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What is the
X Platform?

The vast majority of IoT platforms offer only the first component on this list: connectivity.

To develop a platform that crosses over all of the IoT components listed above would take many years to bring to market and at a significant cost

The X Platform by Exor exists and touches not only across the entire IIoT infrastructure but also offers the concept, design, mechanical, electrical and software assistance needed to realise a new product

DATABASE

External Interfaces
Interfaces up to higher
organizational systems
(CRM, ERP etc)

Analytics
Calculations and Machine
Learning

Development Tools
Reporting, access
mgt etc

Visualisation
Simple graphic representation of real time data

Rule Management
Rule engine that allows for real time action based on sensor data IFTTT

Device Management
Tool for management of device status, remote software updates

Connectivity
Libraries of protocols that ensure constant interoperability

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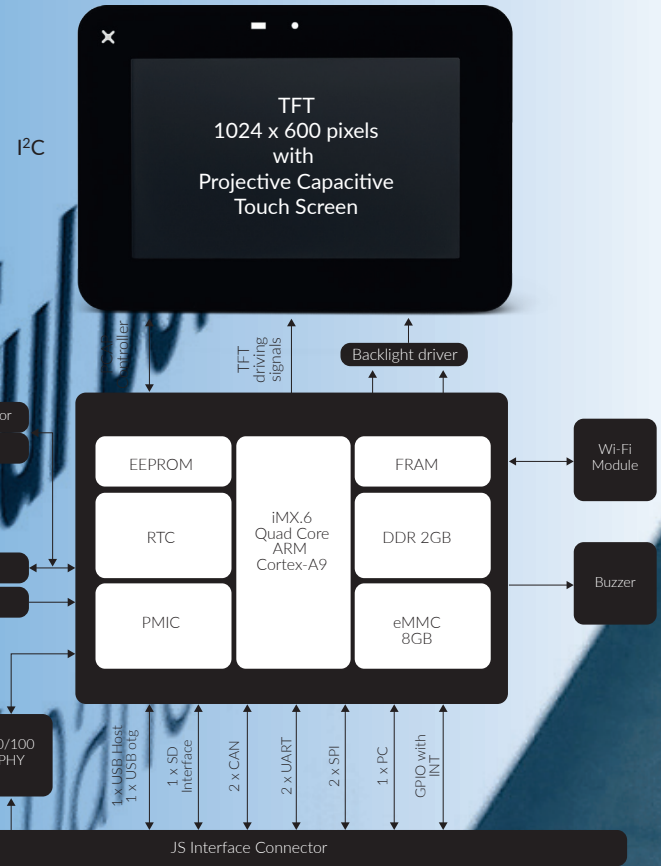# The JS Family
of smart HMI

An ideal embedded display solution to allow your organization to design and build modern IIoT Industry 4.0 ready Human Interface products across many industries. Usable in applications for factory automation HMI, building and home automation, Vending systems and energy meters and in particular certified for:

1. Automotive with TS 16949
2. Medical with ISO13458
3. Avionics with AS9100

In addition the display can be fully water resistant, easy to read in high sunlight conditions and be used by medical or industrial gloves to offer a highly reliable Projective Capacitive Touch screen.

The JS family is available with either a 5", 7" or 10.1" display and with any of three different microSOMs used currently by Exor Embedded depending upon the needs of the application upto the iMX6 QuadCore ARM Cortex-A9 CPU.

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TFT
1024 x 600 pixels
with
Projective Capacitive
Touch Screen

I²C

Controller

TFT driving signals

Backlight driver

CPU

CPU Type:	iMX.6 Quadcore
Core Class:	Dual Core Cortex–A9–800Mhz
HW accelerator:	Open Gç ES 2.0 / Open VG 1.1
RTC:	30 ppm @25⁰–Battery backup

DISPLAY AND TOUCH

Size:	7"W
Resolution:	1024 x 600
Brightness:	350 to 550 Cd/m²
Backlite Lifetime:	Typ. 30.000h
Viewing angle:	70⁰ to 80⁰ (UDRL)
Colour:	24 bit
Touch:	PCAP – Multitouch 5 fingers

Temperature Monitor

Accelerrometer

EEPROM

Battery Backup

3.3 Volt

EEPROM

RTC

PMIC

iMX.6
Quad Core
ARM
Cortex-A9

FRAM

DDR 2GB

eMMC
8GB

Wi-Fi Module

Buzzer

DC/DC
Switching
over
Supply

10/100
PHY

1 x USB Host
1 x USB otg

1 x SD
Interface

2 x CAN

2 x UART

2 x SPI

1 x PC

GPIO with
INT

JS Interface Connector

Data Sheets
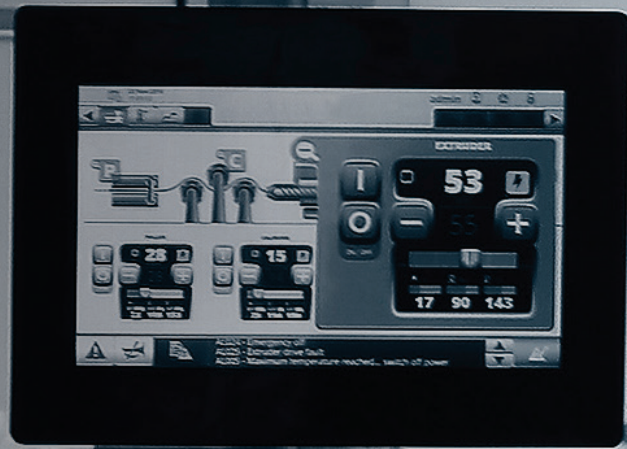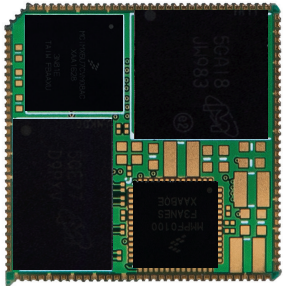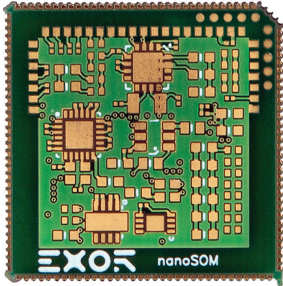
Dimensions	25,4x25,4 mm
Temperature Range	-40°C to +85°C
CPU	ARM Cortex-A7 - i.MX6UL up to 528 MHz
DDR	512 MByte (up to 1 GByte) DDR3L
Flash Disk	4 GBytes (up to 64 GBytes)
EEPROM	512 Bytes
FRAM	Optional external
Watchdog/RTC/Voltage monitor/JTAG	Yes
USB	3 (port 0 - OTG, port 1 - 2.0 Host, port 2 - 2.0 Host)
Ethernet	2 (port 0 - 10/100, port 1 - 10/100)
SD	1
Serial Port	3
SPI	4
I2C	1
CAN	2
Audio	1 (I2S Channel) shared with JTAG
Video	1 (Video Out Controller 16 Bit)
Analog Input	5
GPIO	4

Software configurable. Not all selections can be combined

microSOM us01 - Technical Data
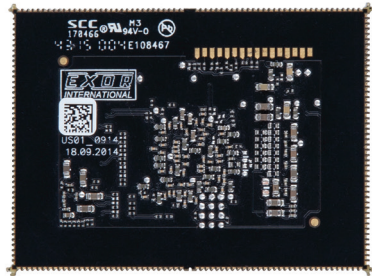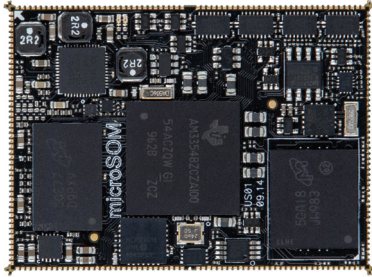
Dimensions	46x35 mm
Temperature Range	-40°C to +85°C
CPU	TI Sitara AM3352/AM3354 up 1 GHz
DDR	Up 512 Mbytes DDR3
Flash Disk	Up to 4 Gbytes eMMC
EEPROM	4 Kbits
FRAM	64-Kbytes (optional)
Watchdog/RTC/Voltage monitor/JTAG	Yes
USB	2 (Host V2.0)
Ethernet	2 (port 0 - 10/100, port 1 - 10/100)
SD	1
Serial Port	3
SPI	2
I2C	1
CAN	2*
Audio	1 (I2S Channel)
Video	1 (Video Out Controller 16 Bit)
Analog Input	5
GPIO	19

Software configurable. Not all selections can be combined

microSOM us02 - Technical Data
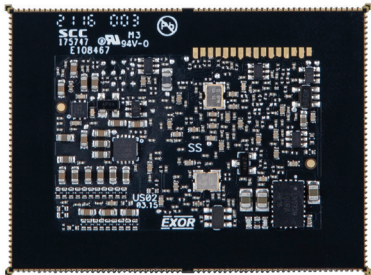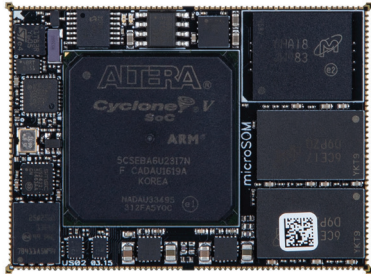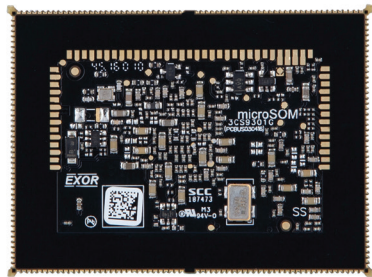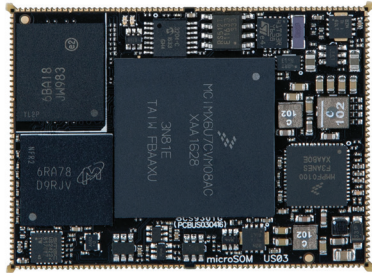

Dimensions	46x35 mm
Temperature Range	-40°C to +85°C
CPU	Altera 5CSEBA2 (A6) Dual ARM Cortex - A9 925 MHz Integrated with FPGA up to 110K LEs
DDR	1 Gbyte DDR3
Flash Disk / QSPI	Up to 4 Gbytes eMMC / Up to 256 Mbits
EEPROM	4 Kbits
FRAM	64-Kbytes
Watchdog/RTC/Voltage monitor/JTAG	Yes
USB	2 (Host V2.0), 1 (OTG (selectable))
Ethernet	2 (port 0 - 10/100, port 1 - 10/100)
SD	1
Serial Port	3
SPI	2
I2C	1
CAN	2
Audio	1 (I2S Channel)
Video	(1) Video Out Controller 16 Bit Video Input: Digital Interface ITU656
Analog Input	5
GPIO	19 (GPIO), 2 (LVDS Link)

Software configurable. Not all selections can be combined

Specifications subject to change without notice.

microSOM us03 - Technical Data

Dimensions	46x35 mm
Temperature Range	-40°C to +85°C
CPU	i.MX6S Solo up to 800 MHz, i.MX6DL DualLite up to 800 MHz, iMXD Dual up to 800 MHz, i.MX6Q Quad up to 800 MHz
DDR	Up to 2 GBytes high performance LVDDRAM2 Dual Channel mode (2x32 bit)
Flash Disk	Up to 8 Gbytes eMMC
EEPROM	4 Kbits
FRAM	64-Kbytes (optional)
Watchdog/RTC/Voltage monitor/JTAG	Yes
USB	2 (Host V2.0), 1 (OTG)
Ethernet	1 (10/100 or 10/100/1000) port
SD	2
Serial Port	3
SPI	2
I2C	1
CAN	2
Audio	1 (I2S Channel)
Video	1 (Video Out Controller 24 Bit) Video Out LVDS Dual Ch. or 2 Single Channel HDMI Interface 1.4 / Video Input Port / Camera int. MIPI CSI and MIPI DSI
Analog Input	5
GPIO	27
PCIe	GEN1 (2,5 Gbps)

Software configurable. Not all selections can be combined

Specifications subject to change without notice.

JS05 - Technical Data
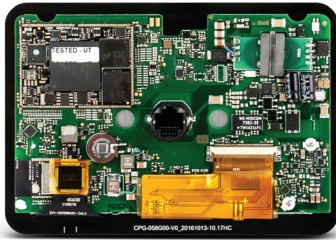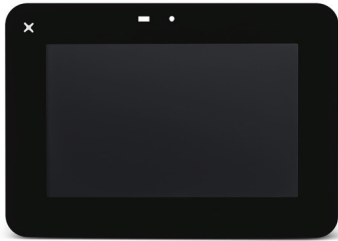
CPU	iMX6 DualLite (optional Quad Core)	
Sizes	5"W	
Resolution	800 x 480	
Version	Standard Brightness	High Brightness
Brightness	420 Cd/m2	820 Cd/m2
Technology	TN TFT	MVA Film
Viewing Angle	70⁰	80⁰
Outside Dimension (mm)	120.7 (H) x 75.8(V)	120.7 (H) x 75.8(V)
Thickness (mm)	2.7(T)	2.7(T)
Touch Screen Technology	Advanced Projected Capacitive Touch	
Glass thickness	From 0.7 up to 6 mm glass	
Glass Type	Chemically Strengthened, Semi Tempered, Fully Tempered, Gorilla Glass	
Glass treatment options	Anti Reflective, Anti Glare, Anti Bacterial, UV and IR	
Firmware Features	Multifinger, Water Rejection, Full Water, Gloves	
CS compatibility	3V and 10V	
Lamination between Touch and Display	Air Lamination or Full Lamination	

The Core of the microSOM power may be supported by an advanced and strong display and touch solution to provide the best benefit to the final user interaction.
Exor Embedded has 3 sizes of standard display solution to fulfill customer requests (full custom can be developed too)

The JS05 5"W Solution 800x480 resolution is available with two different brightness (420 and 820 nits) for indoor and outdoor application, yet the displays have the same extremely thin design of 2.7mm.

This solution is combined with a advanced Projected Capacitive touch based on COF controller design with the availability of different possible customization of the front glass based on the customer design.

The display and touch can be assembled with different methods, including AIR bonding and also Liquid Bonding to improve the front impact resistance and the outdoor visibility.

JS07 - Technical Data
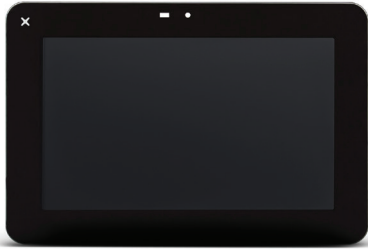
CPU	iMX6 DualLite (optional Quad Core)	
Sizes	7"W	
Resolution	1024 x 600	
Version	Standard Brightness	High Brightness
Brightness	350 Cd/m2	550 Cd/m2
Technology	TN TFT	MVA Film
Viewing Angle	70°	80°
Outside Dimension (mm)	165.75(H) x 105.14(V)	165.75(H) x 105.14(V)
Thickness (mm)	2.7(T)	2.7(T)
Touch Screen Technology	Advanced Projected Capacitive Touch	
Glass thickness	From 0.7 up to 6 mm glass	
Glass Type	Chemically Strengthened, Semi Tempered, Fully Tempered, Gorilla Glass	
Glass treatment options	Anti Reflective, Anti Glare, Anti Bacterial, UV and IR	
Firmware Features	Multifinger, Water Rejection, Full Water, Gloves	
CS compatibility	3V and 10V	
Lamination between Touch and Display	Air Lamination or Full Lamination	

The Core of the microSOM power may be supported by an advanced and strong display and touch solution to provide the best benefit to the final user interaction.
Exor Embedded has 3 sizes of standard display solution to fulfill customer requests (full custom can be developed too)

The JS07 7"W Solution 1024x600 resolution is available with two different brightness (350 and 550 nits) for indoor and outdoor application, yet the displays have the same extremely thin design of 2.7mm.

This solution is combined with a advanced Projected Capacitive touch based on COF controller design with the availability of different possible customization of the front glass based on the customer design.

The display and touch can be assembled with different methods, including AIR bonding and also Liquid Bonding to improve the front impact resistance and the outdoor visibility.

JS10 - Technical Data
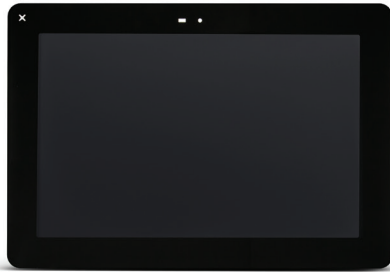
CPU	iMX6 DualLite (optional Quad Core)	
Sizes	10.1"W	
Resolution	1280 x 800	
Version	Standard Brightness	High Brightness
Brightness	500 Cd/m2	700 Cd/m2
Technology	IPS TFT	IPS TFT
Viewing Angle	85º	85º
Outside Dimension (mm)	231.1 (H) x149.3(V)	231.1 (H) x149.3(V)
Thickness (mm)	2.7(T)	2.7(T)
Touch Screen Technology	Advanced Projected Capacitive Touch	
Glass thickness	From 0.7 up to 6 mm glass	
Glass Type	Chemically Strengthened, Semi Tempered, Fully Tempered, Gorilla Glass	
Glass treatment options	Anti Reflective, Anti Glare, Anti Bacterial, UV and IR	
Firmware Features	Multifinger, Water Rejection, Full Water, Gloves	
CS compatibility	3V and 10V	
Lamination between Touch and Display	Air Lamination or Full Lamination	

The Core of the microSOM power may be supported by an advanced and strong display and touch solution to provide the best benefit to the final user interaction.
Exor Embedded has 3 sizes of standard display solution to fulfill customer requests (full custom can be developed too)

The JS10 10.1"W Solution 1280x800 resolution is available with two different brightness (500 and 700 nits) for indoor and outdoor application, yet the displays have the same extremely thin design of 2.7mm.

This solution is combined with a advanced Projected Capacitive touch based on COF controller design with the availability of different possible customization of the front glass based on the customer design.

The display and touch can be assembled with different methods, including AIR bonding and also Liquid Bonding to improve the front impact resistance and the outdoor visibility.

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IIoT industry 4.0 ready

PLATFORM