



# CCpilot V1000 I.MX 8 BASED DISPLAY COMPUTER FOR INDUSTRIAL VEHICLES

The **CCpilot V1000** is a 10.1" display computer featuring an i.MX 8QuadXPlus application processor. It comes with a very powerful GPU with much higher graphics performance than earlier generations of ARM processors. Compared to iMX6-based displays it offers 3 times higher frame rate. The high brightness and contrast screen has Wide XGA resolution and uses IPS technology for wide viewing angles and color accuracy. It comes with a multi-touch PCAP touch screen for intuitive user interaction also with gloves. The screen assembly is optically bonded, reducing reflections and making the display easy to read also in direct sunlight.

Wired interfaces include up to 4 CAN ports, Gigabit Ethernet & USB 2.0. It also features a USB-C connector with USB 3.0 for memory sticks and peripherals. Built-in Wifi & Bluetooth are optional, enabling software updates over the air, smartphone integration and other wireless features.

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The CCpilot V1000 comes with a Yocto-based Linux OS which leverages the next generation of graphics APIs and frameworks, making it possible to realize advanced and super responsive GUIs. Cold boot time of less than 5 seconds can be achieved.

Our open modular platform offers many options for application development, including Qt, HTML5 & CODESYS. And like all CrossControl display products, it comes with LinX Software Suite - a set of libraries and software components that help speed up application development.

The V1000 product platform has inherent support for a number of optional features. For example it features a mini-PCIe module slot which can be used for integrating an AI/ML accelerator module or an extra storage card to boost performance and extend capabilities. With its vast software capabilities and state-of-the-art hardware, the CCpilot V1000 is a future ready platform for machine intelligence. **Turn for technical specifications »**

The content herein is preliminary and may be subject to change without further notice.

# CCpilot V1000 PRODUCT SPECIFICATIONS

COMPUTING CORE	
<b>OVERVIEW</b>	i.MX 8QuadXPlus, quad core CPU, integrated GPU & M4 Co-processor.
<b>CPU</b>	4 x Cortex A35 @ 1GHz
<b>GPU</b>	Vivante GC7000lite high performance graphics processing unit.
<b>STORAGE</b>	8 GB, enhanced mode eMMC pseudoSLC.
<b>RAM</b>	2 GB 32 bit LPDDR4 @ 1200MHz

DISPLAY	
<b>TYPE</b>	IPS with >88° viewing angles in all directions
<b>COVER LENS</b>	Tempered glass with AG coating
<b>OPTICAL BONDING</b>	Display, touch screen and cover lens optically bonded to achieve sunlight readability.
<b>SIZE AND RESOLUTION</b>	10.1" WXGA, 1280x800 pixels
<b>COLOR DEPTH</b>	24 bit, 16 million
<b>CONTRAST RATIO*</b>	800:1
<b>BRIGHTNESS*</b>	800 cd/m <sup>2</sup>
<b>DIMMING</b>	Yes, in steps, 1-100%
<b>AMBIENT LIGHT SENSOR</b>	Yes, enabling automatic dimming

HMI	
<b>TOUCH SCREEN</b>	Projective Capacitive with up to 10-point multi-touch. Calibrated to support interaction with gloves or be in-sensitive to water drops.
<b>STATUS LED</b>	RGB LED
<b>BUZZER</b>	Yes, with configurable volume and frequency.

INTERFACES	
<b>CAN</b>	2 ports, physical layer ISO 11898 2:2016. Configurable bit rate. CAN FD compliant. 2 additional ports optional.
<b>USB</b>	USB 1 x USB 2.0 high speed, 1 x USB 3.0 super speed
<b>ETHERNET</b>	1 x 1GB Ethernet
<b>WIFI</b>	Optional. 802.11ac/a/b/g/n, dual-band 2.4/5 GHz
<b>BLUETOOTH</b>	Optional. Bluetooth 5.0.
<b>POWER SUPPLY</b>	12/24 VDC nominal, range 9-36 VDC. Power on from 4.5 Volt over DC.
<b>KEY SWITCH</b>	1 Key switch input, for start-up/suspend/resume/shutdown.

MECHANICAL	
<b>HOUSING MATERIAL</b>	Nylon, Valox 357x
<b>INSTALLATION</b>	Panel mounted or 4 point VESA 75 mount
<b>CONNECTORS</b>	3 x DIN M12 for Power & CAN, Ethernet and USB 2.0 1 x USB-C for USB 3.0 interface. Optional: 1 x DIN M12 for 2 additional CAN
<b>DIMENSIONS (mm)</b>	265 x 184 x 41
<b>WEIGHT (g)</b>	< 1050 g

ENVIRONMENTAL SPECIFICATIONS	
<b>IP CLASS</b>	IP65, IP66, and IP67
<b>EMC CONFORMITY</b>	2014/30/EU, ISO 14982:2009, ISO 13766-1:2018, ISO 13766-2:2018, ISO 11783-5:2019 (2ms interrupts with a capacitor)
<b>VIBRATIONS</b>	IEC 60068-2-64. Random, 0.02g <sup>2</sup> /Hz 5-2000Hz 3x3h
<b>SHOCK</b>	IEC 60068-2-27. ±25g /6ms±3 x3, 15000 total shocks
<b>TEMPERATURE RANGE (°C)</b>	Operating: -30 to +70, Storage: -40 to +80

OPERATING SYSTEM	
<b>SYSTEM</b>	Custom Linux system based on Yocto 3.0+
<b>KERNEL</b>	5.4+ (Long Term Support)
<b>BSP</b>	Available to create a custom Linux image
<b>COMPUTING AND GRAPHICS APIs</b>	Support for advanced UX and computing tasks: OpenGL ES, Vulkan, OpenCL, OpenVG
<b>BOOTUP TIME</b>	Configurable. Cold boot 4-7 sec

SOFTWARE FRAMEWORKS & TOOLS	
<b>DEVELOPMENT ENVIRONMENT</b>	Virtual machine or Native Linux.
<b>PROGRAMMING</b>	Supported languages include C++, C, QML, JavaScript, Python, HTML5, IEC61131-3.
<b>GCC COMPILER</b>	GCC C++17 or newer
<b>UI FRAMEWORKS</b>	Qt 5.15+ Open Source. Will support Qt 6. Qt Commercial is optional, enables closing access to the system. Support for Web frameworks.
<b>WINDOWING</b>	Weston, Qt Wayland, X Wayland. Direct EGLFS is available if windowing is not required.

**APPLICATION PLATFORM**  
LinX Software Suite, open and modular platform based on Qt, common for all CCpilot products. Examples of modules and components listed below.

<b>GUI DESIGN</b>	UX Designer, a pre-built virtual machine with Qt Creator, compilers, libraries, graphical components and templates.
<b>CAN NETWORKING</b>	Fieldbus Access, easy configuration of J1939 and CANopen networks.
<b>ISOBUS</b>	Universal Terminal, Task Controller.
<b>SMART DEVICE INTEGRATION</b>	Smart Connect, framework for building apps and integrating smart phones and tablets (Service tool, secondary HMI).
<b>REMOTE APPLICATION ACCESS</b>	VNC server and client, web browser and server.
<b>SOFT PLC</b>	CODESYS 3.5
<b>DIGITAL VIDEO</b>	Ready-made solution for displaying multiple digital camera streams over Ethernet. RTP, MPEG4, MJPEG, H.264 (4Kp30) and H.265. Support for controlling camera settings like resolution and frame rate.

**PLATFORM SUPPORT**  
Below you find specifications of features for which the product platform has inherent hardware support. These are not currently available in the standard product specified above but may be added over time in the generic evolution of the product, or added for a specific, larger customer program.

<b>CAN FD</b>	BSP/SDK can be developed on request.
<b>LARGER STORAGE</b>	Expandable up to 32 GB enhanced mode eMMC pseudoSLC. Possible to increase storage even more through Mini-PCIe card (see below).
<b>TOUCH SCREEN SENSITIVITY</b>	Option to have touch controller calibrated for special use cases.
<b>SECURITY</b>	RSA/AES, elliptic-curve cryptography, key storage, secure boot-up, signed applications, docker.
<b>Qt AUTOMOTIVE</b>	Supports Qt Automotive, featuring e.g. safe rendering and IVI applications.
<b>ANDROID</b>	Supports Android
<b>EXPANSION CARDS &amp; MODULES</b>	Mini-PCIe boards and modules can be added for extending functionality and performance. E.g. AI/ML accelerator modules, radio and connectivity modules, storage cards.
<b>OS IN CO-PROCESSOR</b>	Supports use of an RTOS in the integrated Cortex- M4F companion microcontroller (co-processor). For implementation of real-time critical and safety functionality.
<b>KEY SWITCH</b>	Support for a second key switch for pre-ignition.

\* Typical values

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