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QUANTUM
Machine Intelligence

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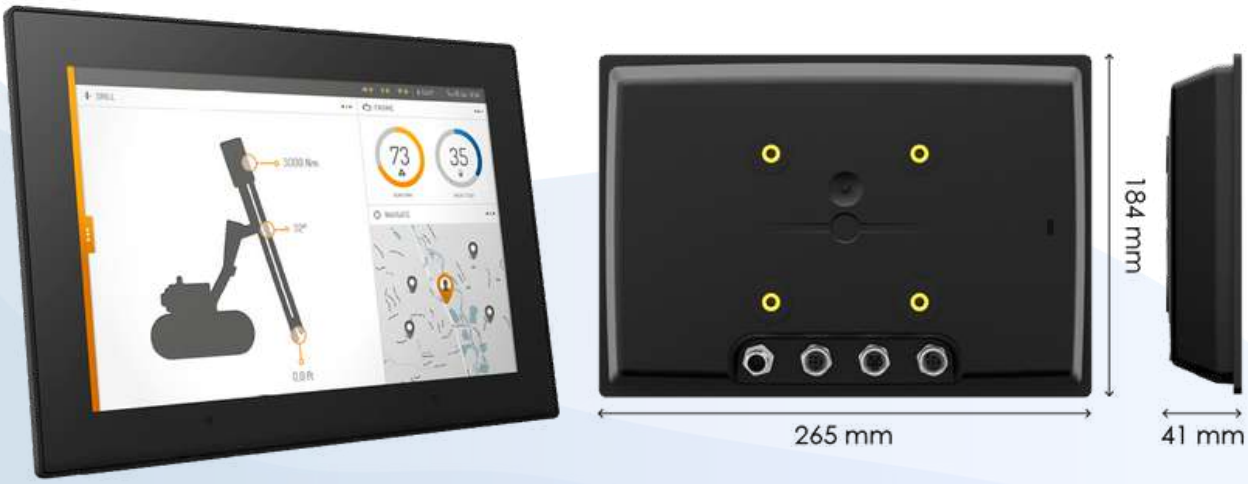
making machines smarter, safer and more productive

CCpilot V1000

I.MX 8 BASED DISPLAY COMPUTER FOR INDUSTRIAL VEHICLES

About Us

The **CCpilot V1000** is a 10.1" display computer powered by an i.MX 8QuadXPlus processor, offering superior graphics performance. Its high brightness, high contrast Wide XGA screen with IPS technology ensures wide viewing angles and color accuracy. The optically bonded screen reduces reflections, ensuring readability even in direct sunlight. Wired interfaces include up to 4 CAN ports, Gigabit Ethernet, and USB 2.0, along with a USB-C connector for USB 3.0 peripherals. Optional Wi-Fi & Bluetooth enable over-the-air updates and wireless features. With the LinX software platform, users can customize firmware, utilize pre-packaged application toolchains, and choose from various application modules. The open platform approach allows integration of optional features like AI/ML accelerators via a mini-PCIe module slot, making it a versatile solution for machine intelligence.



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crosscontrol - CCpilot V1000 Product Specifications

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

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

DISPLAY	
TYPE	IPS Type with >88° viewing angles in all directions
COVER LENS	Tempered glass with AG coating
OPTICAL BONDING	Display, touch screen and cover lens optically bonded to achieve sunlight readability.
SIZE & RESOLUTION	10.1" WXGA, 1280x800 pixels
COLOUR DEPTH	24 bit, 16 million
CONTRAST RATIO*	800:1
BRIGHTNESS*	800 cd/m²
DIMMING	Yes, in steps, 1-100%
AMBIENT LIGHT SENSOR	Yes, enabling automatic dimming

HMI	
TOUCH SCREEN	Projective Capacitive with up to 10-point multi-touch. Calibrated to support interaction with gloves or be insensitive to water drops.
STATUS LED	RGB LED
BUZZER	Yes, Configurable frequency and volume. Max 75dB @ 10cm from front

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MECHANICAL

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

SOFTWARE FRAMEWORKS & TOOLS

DEVELOPMENT ENVIRONMENT	Virtual machine or Native Linux.
PROGRAMMING	Supported languages include C++, C, QML, Javascript, Python, HTML5, IEC61131-3
GCC COMPILER	GCC C++17 or newer
UI FRAMEWORKS	Supports Qt6 and Qt5. Qt Commercial is optional, enables closing access to the system. Support for web frameworks.
WINDOWING	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.

GUI DESGIN	UX Designer, a pre-built virtual machine with Qt Creator, compilers, libraries, graphical components and templates.
CAN NETWORKING	Fieldbus Access, easy configuration of J1939 and CANopen network.
ISOBUS	Universal Terminal
SMART DEVICE INTEGRATION	Smart Connect, framework for building apps and integrating smart phones and tablets (Service tools, Secondary HMI)
REMOTE APPLICATION ACCESS	VNC server and client, web browser and server.
SOFT PLC	CODESYS 3.5
DIGITAL VIDEO	Ready-made solutions 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.

INTERFACES

CAN	2 ports, physical layer ISO 11898 2:2016, ISO11783-5:2019 compatible (2ms interrupts with a capacitor). Configurable bit rate. CAN FD compliant. 2 additional ports optional.
USB	USB 1 x USB 2.0 high speed, 1 x USB 3.0 super speed
ETHERNET	1 x 1000BASE-TX
WI-FI	Optional. 802.11ac/a/b/g/n, dual-band 2,4/5GHz
BLUETOOTH	Optional. Bluetooth 5.0.
POWER SUPPLY	12/24 VDC nominal, range 9-36 VDC. Power on from 4.5 Volt over DC.
KEY SWITCH	1 Key switch input, for start-up/suspend/resume/shutdown.

ENVIROMENTAL SPECIFICATIONS

IP CLASS	IP65, IP66, and IP67
EMC CONFORMITY	2014/30/EU, ISO 14982:2009, ISO 13766-1:2018, ISO13766-2:2018
VIBRATIONS	IEC 60068-2-64. Random, 0.02g²,Hz 5-2000Hz 3x3h
SHOCK	IEC 60068-2-27. ±25g /6ms±3 x 3, 15000 total shocks
TEMPERATURE RANGE(°C)	Operating: -30 to +70, Storage: -40 to +80

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.

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