MULTILIN H500

Windows Industrial Computer

GE Vernova's Multilin H500 is a member of the advanced Multi-function Controller Platform (MCP), which offers a high-capacity set of modular and scalable hardware and software components, designed to simplify deployment, operation, and maintenance of automation systems for a variety of applications. The H500 is secure, future-proof, substation-hardened, and can fit nicely into a company's existing Windows environment.

Designed to withstand the stresses of substation environments, the H500 provides a reliable platform to run Windows applications for industrial and utility applications. The H500's modern and robust design is perfectly suited for rugged computing needs and mission critical applications where high-performance processing, and reliable operations are required. GE Vernova's highly flexible and reliable multi-function industrial computers are shaping the future of industrial automation within the power industry.

Key Benefits

- Standardize substation architectures with a reliable IEC 61850-3 compliant platform, with no moving parts
- Flexible operations with Windows operating system allowing users to run multiple software applications tailored to their needs
- Simplify engineering and operations through consolidation of hardware interfaces
- Reduce system cost by eliminating external redboxes, with built-in PRP and HSR functionality
- Improve time synchronization performance with Precision Time Protocol (PTP/IEEE1588)
- Expandable serial connectivity with up to 12 physical ports on the three PCIe expansion modules
- Simplified IT/OT Integration, system expansions, and technology upgrades
- Cost-effective retrofit solutions where individual automation and communication components can be replaced with a single device
- Common platform for multiple applications, optimized training, maintenance, inventories, and life cycle management

Applications

- Hardened Engineering Workstation with Microsoft Windows operating system for a wide range of control, monitoring, configuration, and communication applications
- Rugged industrial computer for industrial automation applications
- Substation hardened computer for substation automation applications
- Substation HMI and data aggregator computer
- Digital Substation component
- Flexible architecture for Edge computing and Cloud integration applications

Security

- Storage encryption
- Trusted Platform Module (TPM)
- Physical Presence button

Hardware

- High performance multi-core CPU
- Encrypted SSD (SED) Storage
- Hot swappable dual power supplies
- 6 x SFP Ethernet ports with PRP, HSR, Single LAN, and Redundant LAN modes built-in
- Compliant to IEC 61850-3 and IEEE 1613
- Standard time synchronization [IEEE 1588 PTP, IRIG-B]

GE VERNOVA

HMI Computer

Install your favorite Windows HMI software on the H500 to gain greater visibility of what is happening in your substation or industrial plant and enable real-time analysis and operation.
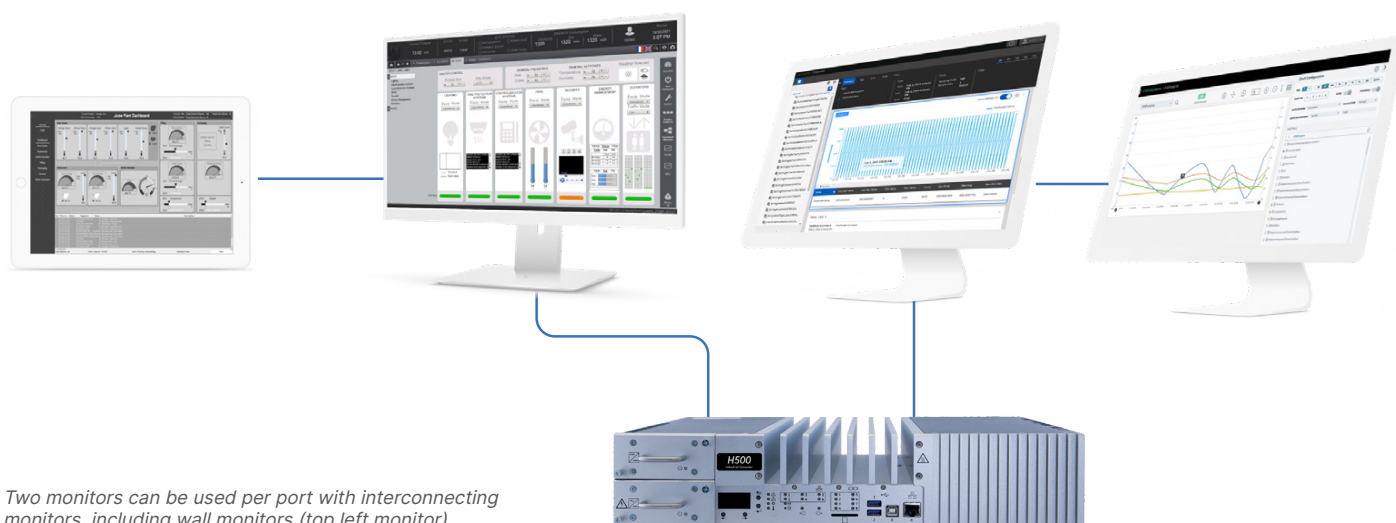
Two monitors can be used per port with interconnecting monitors, including wall monitors (top left monitor).

Engineering Workstation Computer

Need a dedicated computer inside the substation? Install tools, setup software, and other programs to eliminate the need to connect additional computers to the substation network. Securely access device information such as configuration files, drawings, documents and reports.

Example software to install:

- Relay Setup Software
- DS Agile Studio
- Wireshark

Plant Data Management

The H500 can be deployed to store and archive plant data including SCADA and non-SCADA information. The H500 substation computer can run your software software of choice for data concentration, analytics, and archiving capabilities of substation disturbances, faults, and events.

The flexibility of our design allows users to integrate a variety of devices via network or serial connections.

Industrial Plant SCADA

Besides substation applications, the H500 can be deployed as an industrial computer for applications such as IEMS or PMCS applications, data acquisition, automatic control, data collection from the field devices/sensors, interconnection with other control systems, local HMI (control/monitoring), and asset performance management.

Hardware Overview

Central Processing Unit

H500 is built on a high-performance multi-core AMD CPU:

- 4-core/2.7 GHz CPU with 16 GB of RAM

Storage

H500 comes by default with one industrial solid-state drive

- 256 GB Secure Encrypted SSD
- Additional drive options will be available in the future

Ethernet Interfaces

H500 has six Ethernet interfaces available through SFP cages. Each cage supports the following SFP transceivers:

- 100/1000BASE-T (RJ45 copper),
- 100BASE-FX (LC fiber multimode),
- 1000BASE-SX (LC fiber multimode),
- 1000BASE-LX (LC fiber single mode)

Ethernet Interface Modes – PRP/HSR

The H500 hardware has built in PRP and HSR support – no RedBox required.

Each pair of the six interfaces can be configured to operate in one of four modes:

- As a PRP pair
- As an HSR pair
- As independent interfaces
- As a Redundant LAN pair

Environmental Support

The H500 has been designed and tested to operate reliably in a wide variety of environmental conditions and CPU load conditions.

Redundant Power Supplies

The H500 is equipped with dual redundant hot swappable power supplies, which ensures continuous uptime. Each power supply can be connected to different source of different voltages. For example, power supply 1 could be connected to Mains, while power supply 2 is connected to the battery system.

Substation HMI
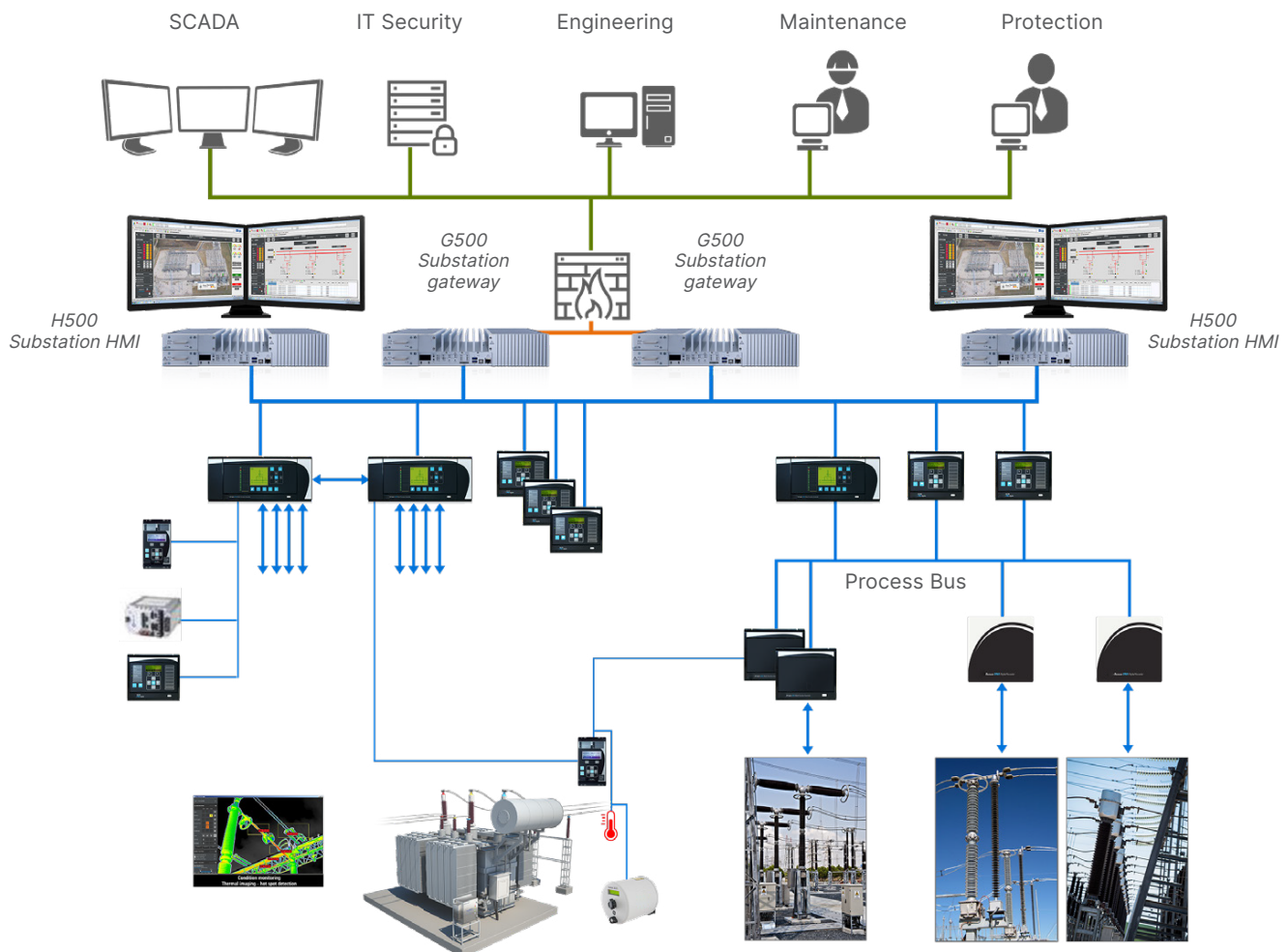
Serial Ports and PCIe Modules

The H500 supports three PCIe expansion modules for future expandability and customizability.

While no serial ports are equipped by default, serial ports can be added by adding expansion PCIe modules. Each serial PCIe module includes four RJ45 connector serial ports. Each port can be individually configured in software for RS-232 or RS-485 2/4 wire communication. There is no need to open the unit and change jumpers.

Time Sync Support

In addition to the typical Windows and NTP time sync methods, the H500 hardware supports IEEE 1588 PTP and IRIG-B time sync inputs.

Advanced Security

The H500 supports hardened cybersecurity features such as Encrypted SSD drives for storage and Trusted Platform Module (TPM) for securely storing artifacts. It also has a physical presence detection feature, to confirm that someone is physically at the unit for certain specific secure hardware maintenance operations.

Display Ports

The H500 has two display ports on the rear of the chassis, capable of supporting up to 4k resolution. This allows for very large displays on very large monitors.

For setups requiring more than two monitors, the H500 also supports the multi-stream transport (MST) technology, which allows for two monitors that support MST to be daisy-chained on each port, allowing for a total of 4 monitors to be used. The max resolution for each monitor when using MST is 2k.

USB Ports

For different uses such as storage or access to keyboards, the H500 supports seven USB ports as follows:
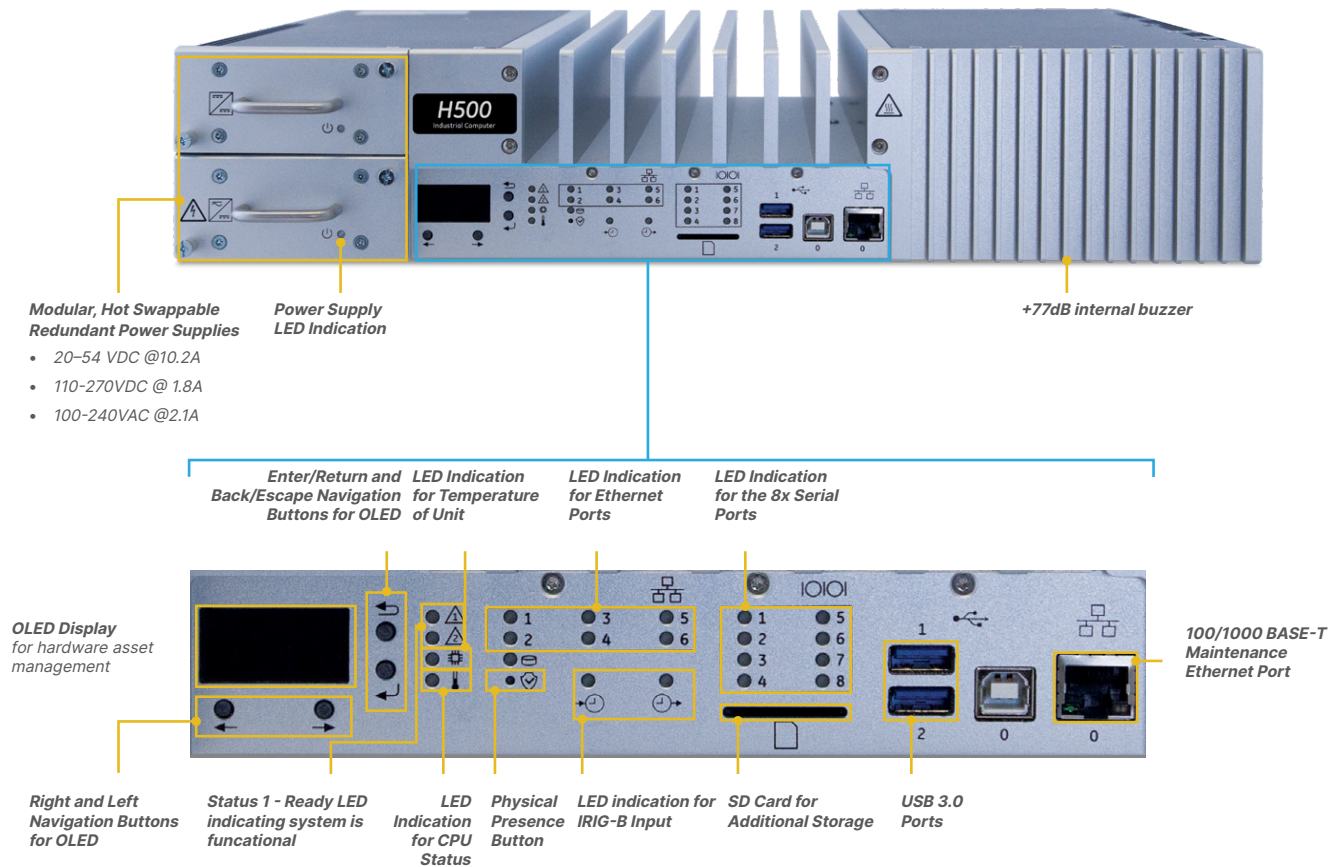
- 2x USB 3.0 on front of the unit
- 4x USB 2.0 on rear of the unit
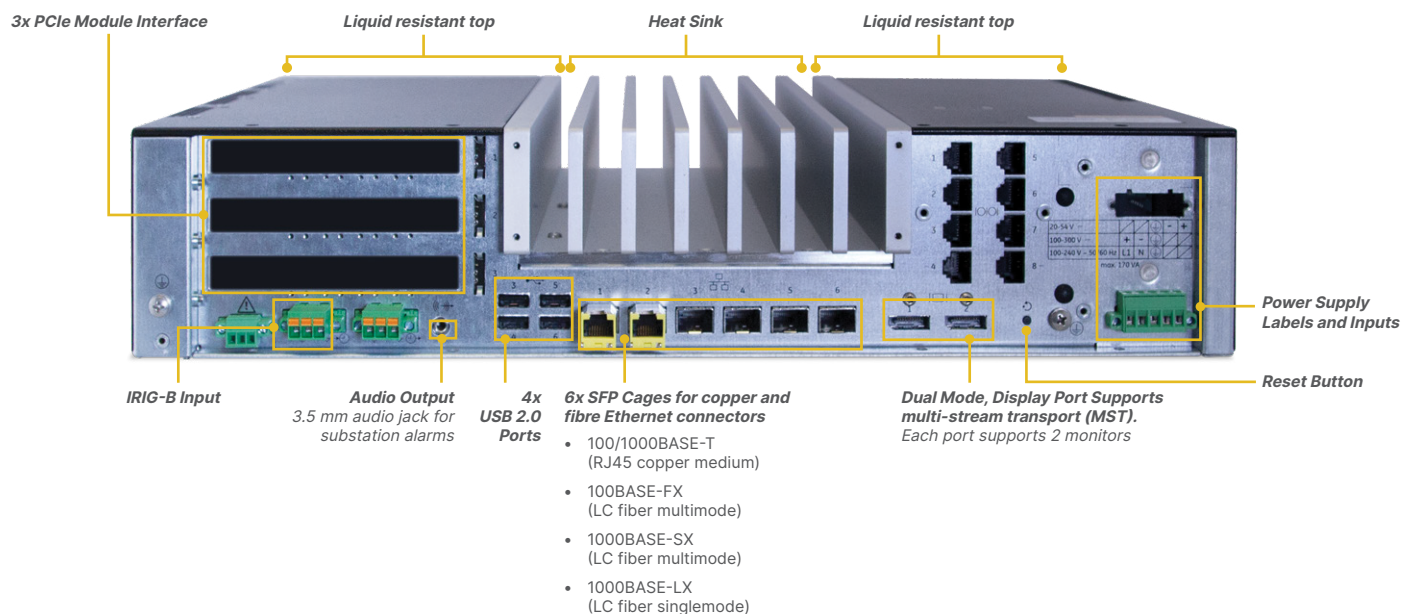- 1x USB 2.0 internal - for software license keys

Maintenance Ports

The H500 has a separate 100/1000BASE-T maintenance port available on the front of the unit. This maintenance port is independent from the six ethernet ports on the rear of the unit and is intended for local connections only.

Front Panel

Modular, Hot Swappable Redundant Power Supplies
- 20–54 VDC @10.2A
- 110-270VDC @ 1.8A
- 100-240VAC @2.1A

Power Supply LED Indication

+77dB internal buzzer

Enter/Return and Back/Escape Navigation Buttons for OLED

LED Indication for Temperature of Unit

LED Indication for Ethernet Ports

LED Indication for the 8x Serial Ports

OLED Display *for hardware asset management*

100/1000 BASE-T Maintenance Ethernet Port

Right and Left Navigation Buttons for OLED

Status 1 - Ready LED indicating system is funcational

LED Indication for CPU Status

Physical Presence Button

LED indication for IRIG-B Input

SD Card for Additional Storage

USB 3.0 Ports

Back Panel

3x PCIe Module Interface

Liquid resistant top

Heat Sink

Liquid resistant top

Power Supply Labels and Inputs

Reset Button

IRIG-B Input

Audio Output *3.5 mm audio jack for substation alarms*

4x USB 2.0 Ports

6x SFP Cages for copper and fibre Ethernet connectors
- 100/1000BASE-T (RJ45 copper medium)
- 100BASE-FX (LC fiber multimode)
- 1000BASE-SX (LC fiber multimode)
- 1000BASE-LX (LC fiber singlemode)

Dual Mode, Display Port Supports multi-stream transport (MST). *Each port supports 2 monitors*

Technical Specifications

PROCESSOR, MEMORY, AND STORAGE

CPU	AMD Embedded R-Series CPU (2.7GHz 4core)
Memory	DDR3 SDRAM (16GB)
Storage	Self-encrypted Solid-State Drive (256 GB)

OPERATING SYSTEM

Windows 10 IoT

COMMUNICATIONS

Ethernet	6 Ethernet ports, configurable as independent LAN, Redundant LAN, PRP, or HSR. Accessible via SFP modules: • 100/1000BASE-T (RJ45 copper) • 1000BASE-FX (LC fiber multimode) • 1000BASE-SX (LC fiber multimode) • 1000BASE-LX (LC fiber single mode) 100/1000BASE-TX Ethernet port available via front of the unit
Serial (RS-232/485)	Serial interfaces accessible via individual RJ45 ports on expansion PCIe cards, 4 ports per card • Serial interfaces use 16550 compatible UART • Support baud rates 300, 600, 1200, 2400, 4800, 9600,115.2k • RS232 mode supports flow control and handshaking signals (RTS, CTS, DCD) • Software controlled mode of operation between RS232 or RS485 2/4 wires • Software controlled termination resistor (120 ohm) for RS485 mode • All software selections persist when power cycled

TIME SYNCHRONIZATION (HW SUPPORT)

PTP	Can be configured for IEEE1588 PTP input
IRIG-B input	Supports IRIG-B TTL, through a 3-position removable terminal block on rear of the unit

VIDEO OUTPUT

Display Port	2x DP++ (Dual-mode DisplayPort) available on the rear of the chassis Each DP++ supports up to two multi-stream displays Resolution: • up to UHD (4k, 3840×2160) for single displays connected to each port • up to 2k when using MST and two displays connected to each port
Video Card	AMD Radeon™ R7 Graphics
Touch Screen Support	Touch Screen Panel Controls are supported if the appropriate driver is installed into Windows

AUDIO OUTPUT

3.5 mm audio jack for substation alarms
Built in high (+77dB) pitch audio buzzer

USB PORTS

• 2x USB 3.0 on front of the unit
• 4x USB 2.0 on rear of the unit
• 1x USB 2.0 internal - for software license keys

SD CARD

• SD, SDHC and SDXC SD-Cards according to Version 1.0, Version 2.0 and Version 3.0
• Maximum SDXC size 64GB
• SD card slot accessible on front of the unit, uses push-pull mechanism

MAINTENANCE PORTS

USB-B Console port	• Not used on Windows
Local Ethernet	100/1000BASE-T maintenance Ethernet port accessible via front of the unit

POWER SUPPLY

	Dual/ Redundant hot-swappable power supplies each with individual removable Phoenix terminal block
Low Voltage	20–54 VDC @10.2A
High Voltage	• 110-270VDC @ 1.8A • 100-240VAC @ 2.1A

PHYSICAL

Dimensions	• 19 Inch rack mount (482.59 mm) • 2U (3.47" / 88.12 mm) in height • 3U with Rack mounting kit installed • 12.20"(310.00 mm) in depth • Rack mount kit included: 6 mounting holes, 2 slotted for easy installation
Weight	• 0 serial ports, without PSU 10.2 Kg • 4 serial port serial expansion card 0.2 Kg • Rack mounting bracket 1.2 Kg • AC/DC PSU 1.2 Kg

OPERATING ENVIRONMENT

Operating Temperature	-40° to +60°C (4 core)
Humidity	5-95% relative humidity, non-condensing
Altitude	Maximum altitude is 3000 m
Ingress Protection	IP30 (Protected from tools and wires greater than 2.5 millimeters) + resistant to liquid falling vertically

REAL TIME CLOCK

When powered off, the real-time clock remains active for 7 days

PHYSICAL PRESENCE

The physical presence button (recessed on front of the unit) and optionally configured password shall be required to enter UEFI mode

TEST	REFERENCE STANDARD	TEST LEVEL
Insulation Resistance Test	EN 60255-27	500 Vdc
Dielectric voltage withstand	EN 60255-27	2.0 kV
Impulse voltage withstand	EN 60255-27	5 kV
Damped Oscillatory	IEC 61000-4-18	100 kHz & 1 MHz 2.5kV CM, 1kV DM
Electrostatic Discharge	IEC 61000-4-2	Level 4
RF immunity	IEC 61000-4-3	Level 3
Fast Transient Disturbance	IEC 61000-4-4	Level 4
Surge Immunity	IEC 61000-4-5	Level 3 & 4
Radiated & Conducted Emissions	CISPR22 & CISPR32	Class A
Sinusoidal Vibration	IEC 60255-21-1	Class 1
Shock & Bump	IEC 60255-21-2	Class 1
Seismic	IEC 60255-21-3	Class 2
Power magnetic Immunity	IEC 61000-4-8	Level 5
Voltage Dip & interruption	IEC 61000-4-11	0,40,70,80% dips, 250/300cycle interrupts
Conducted RF Immunity		
0-150khz	IEC 61000-4-16	Level 4
Voltage Ripple	IEC 61000-4-17	15% ripple
Ingress Protection	IEC 60529	IP30
Environmental (Cold)	IEC 60068-2-1	-40°C 16 hrs. (Storage and Operational)
Environmental (Dry heat)	IEC 60068-2-2	60°C 16hrs for Quad Core
85°C 16 hrs. Storage (both models)		
Relative Humidity Cyclic	IEC 60068-2-30	6day, variant 2, 55°C/95%RH
Change of Temperature	IEC 60068-2-14	Quad Core: -40°C to 60°C
Method Nb		
Damp Heat Steady State	IEC 60068-2-78	40°C & 93%RH for 240 hrs
Damped Oscillatory	IEEE/ANSI C37.90.1	2.5kV@1MHz CM/DM
RF Immunity	IEEE/ANSI C37.90.2	20V/m 80-1GHz + Spot Freqs
ESD	IEEE/ANSI C37.90.3	8kV CD, 15kV AD
IEEE Standard Environmental and Testing Requirements for Communications Networking Devices Installed in Electric Power Substations	IEEE 1613:2009	Per Standard
Communication Networks and systems for power Utility Automation-Part 3	IEC 61850-3:2013	Per Standard
SAFETY	EN/IEC 60950-1: 2005	Per Standard
UL marking	UL60950-1 2nd Ed /CSA C22.2 60950-1-07	NWGQ2 & NWGQ8

Order Code

	H500 B * * U - * * * * * * * - B U U U - * * * - U U U - S - WA ** 000 - UU UU UUU	Description
CPU and Memory	B	2.70 GHz 4 core APU, 16 GB DDR3 SDRAM
Power Supply Options - Primary and Redundant	H H L L U	110-270 VDC / 100-240 VAC (Conformal Coated) 20–54 VDC (Conformal Coated) Not Required
Built-in Serial Ports	U	No built-in Serial Ports
Ethernet Interfaces - SFP type	T T T T F F F F S S S S L L L L U U U U	100/1000BASE-T (RJ45 copper medium) 100BASE-FX (LC fiber multimode) 1000BASE-SX (LC fiber multimode) 1000BASE-LX (LC fiber singlemode) Not Required
Storage	B U U	256 GB Self encrypted Solid State Drive Not Required
PCIe Expansion	U U U 4 4 4	Not Required 4x Serial Ports, RS-232/ RS-485 independently configurable and isolated
Operating System	WA	Windows 10 IoT Industrial Computer
Software Version	00 A0	Latest Software Version Win 10 IoT Ent LTSB 2016+2020-07 Updates
Additional Licenses	000	Licenses (Future)

Spare Parts and Accessories

SFP Transceiver

MCP-S	-	1	-	*	Description
SFP Transceiver Options				F	SFP MODULE 100BASE-FX LC TRANSCEIVER OPTICAL MULTI-MODE 1300nm -40 TO 85C [580-3784]
				S	SFP MODULE 1000BASE-SX LC TRANSCEIVER OPTICAL MULTI-MODE 1310nm -40 TO 85C [580-3785]
				T	SFP MODULE 100/1000BASE-T RJ45 TRANSCEIVER COPPER -40 TO 85C W/WO RX_LOS [580-3786]
				L	SFP MODULE 1000BASE-LX LC TRANSCEIVER OPTICAL SINGLE-MODE 1310nm -40 TO 85C [580-3787]

Power Supply

MCP-S	-	2	-	*	Description
Power Supply				H	MCP PSU, HV 90-264VAC/88-330VDC [528-2001LF-CC]
				L	MCP PSU, LV 18-60VDC [528-2001LF-CC]

UART Card

MCP-S	-	3	-	*	Description
UART Card				S	MCP PCIe UART Card, 4x PORT (RJ45) RS232/485 [528-1001LF]

NOTE: Please visit the online store for the latest configuration and options.

For more information, visit
gevernova.com/grid-solutions

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