Bundle solution for motion application

**Servo drives • Motion controller
PLC • HMI • Communication**

Short overview 2023

CORVINA CLOUD

IN Your Innovation

Bundle solution for motion application

The factory of the future will reach a new level of productivity, effectiveness, and profitability thanks to comprehensive communication. Panasonic Industry Europe's equipment and components offer state-of-the-art Industry 4.0 features, as connectivity, energy efficiency, reliability, and robustness play a crucial role in modern production environments. Not only are our products like PLCs, servo drivers and motors, sensors, touch terminals, and our newest development, the GM1 motion controller, easily connectable, but also can all products be integrated into existing production environments.

Solutions for Industry 4.0

FP series PLCs
The PLC comes already equipped with the functionality required for position control tasks.

MINAS A6 series servo drives
Highly dynamic servo drives with state-of-the-art technology. Large power range (50W to 15kW) combined with a light-weight and compact design.

Motion Controller GM1
Motion controllers offer a compact solution for complex motion control applications. Panasonic Industry presents the first motion controller in its comprehensive lineup: the GM1 .

Motion control libraries, configuration and programming software
The PLC programming software Control FPWIN Pro (compliant with IEC 61131-3) and the free configuration software PANATERM, M-SELECT and GM Programmer shorten the time required for commissioning. In addition, you can download motion control libraries for free..

Communication unit FP-I4C
Working like a data collector, the FP-I4C connects programmable controllers to the distributed control system and thus enables remote access even for small systems.

Corvina Cloud – The IIoT Cloud solution
It is an application designed for the supervision of plants in a user-friendly manner. Using this application, users and maintenance staff are able to connect to remote machines, to configure users, devices, assign roles and grant permissions. Corvina Cloud is an OpenVPN- and SSL-based solution.

HM touch terminals
Touch terminals allow humans and machines to interact with each other. Panasonic's innovative touch terminals are optimally suited both for factory and building automation.

3 Year Warranty
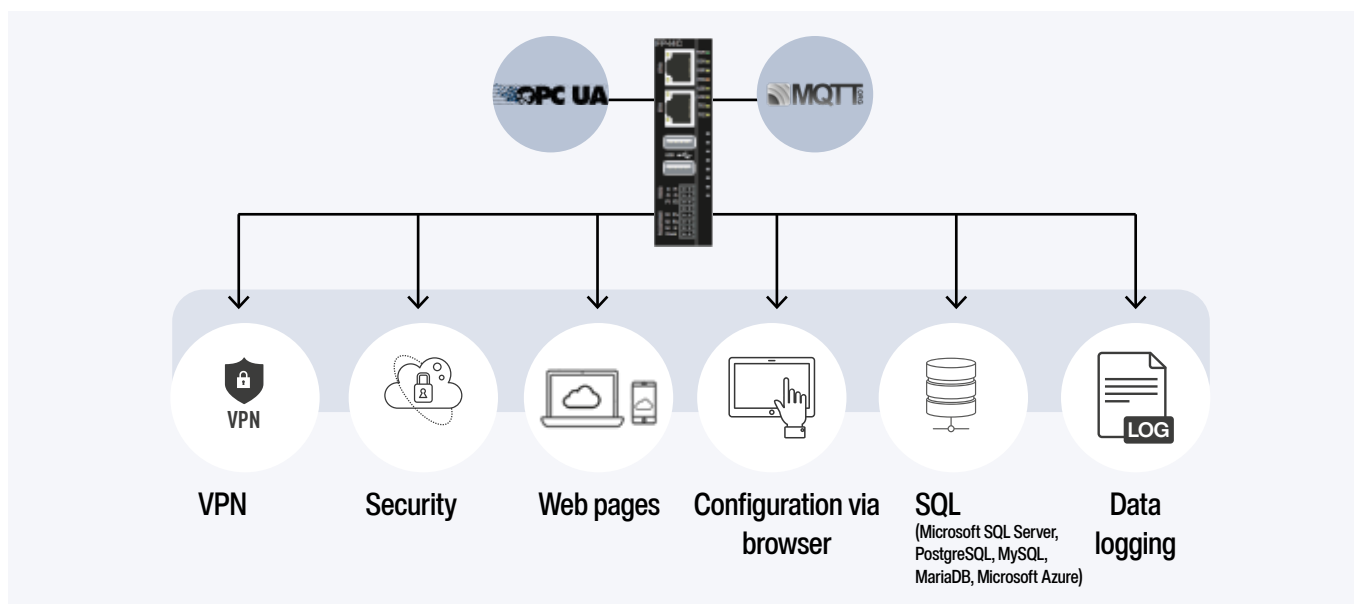
CORVINA CLOUD

FP-I4C

The IIoT gateway

› Web server with HTML5 pages for mobile and PC connectivity

› Corvina Cloud with integrated VPN for remote access to the PLC (remote maintenance)

› Expandable with I/O units of the FP0R PLC series to collect information from sensors and actuators

› Sending files via FTPS client / server services

› Data management: storage of information in the internal memory or on a USB memory stick

› Excellent connectivity: two Ethernet ports (separate), 2 USB ports, 1 serial RS232C / RS485 port

› Configurable via internet browser and with the HMWIN development environment

Item	FP-I4C
PLC connection 1	PLC COM1: RS232C via 16-pin spring force plug; Phoenix contact product: MC 0.5/8-ST-2,5
PLC connection 2	PLC COM2: RS232C/RS485 via 16-pin spring force plug; Phoenix contact product: MC0.5/8-ST-2,5
Power supply	24V DC. Connection with the power supply cable (AFPG805) supplied with the unit.
2x Ethernet connection	10BASE-T / 100BASE-TX autoneg via RJ45 female connector
USB 1	USB 2.0 full speed, 500mA (power supply)
USB 2	USB 2.0 full speed, 100mA (power supply)
Protocols and standards	TCP/IP, UDP/IP, DHCP, FTP, FTPS, SSH, http, https, SMTP, ESMTP-Auth, POP3, IEC60870, NTP, Modbus, DynDNS, SNMP, OpenVPN, Cloud service, VNC
Flash memory	2.4GB user/configuration data
RAM	496MB
Degree of protection	IP20

FP-I4C: for everything in IIoT that requires remote operation, assistance and alarms

In today's world, users want to be able to instantly connect to, monitor, and operate machines and devices securely, no matter where they are. The FP-I4C gives you full insight into all IoT devices with real-time status alerts and early warnings. Thanks to the data provided, you can react quickly to reduce risks and proactively stop issues before they have a negative effect on your business.

| VPN | Security | Web pages | Configuration via browser | SQL (Microsoft SQL Server, PostgreSQL, MySQL, MariaDB, Microsoft Azure) | Data logging |

MINAS A6 series

Servo drivers

> Fast (max. 6500rpm)
> Powerful
> Compact
> Precise
> The same interfaces, accessories, and flange as MINAS A5 in an even more compact housing

> Even smaller, high-resolution 23-bit encoder that can be used both as an absolute and as an incremental encoder
> Triple-lip oil seal (optional)

MINAS A6 series	200/400V AC				400V AC
	A6SE	A6SG	A6SF	A6N/A6B	A6 Multi
Rated power	50W–1.5kW (200V AC), 1kW–5kW (400V AC)				400W–5kW
Supply voltage	1/3-phase (200V AC), 3-phase (400V AC)				3-phase
Bandwidth (velocity response)	3200Hz				
Rated rotational speed	2000–3000rpm				
Max. rotational speed	3000–6500rpm				
Rated torque	0.16–15.9Nm (200V AC), 0.64–23.9Nm (400V AC)				
Peak torque	0.48–47.7Nm (200V AC), 2.23–71.6Nm (400V AC)				
Control functions	Position control		Position, velocity, torque control		
IP degree of protection (motor)	IP67				
Control input	Pulse		Pulse, analog	Network	Network

MINAS A6 Multi

400V servo drive system. Compact, modular design for maximum performance

> Compact servo drive in book format
> Modular construction
> DC link bus system
> Quick servo control technology
> Anti vibration technology
> State-of-the-art network technology

> 18 integrated safety functions
> Configuration via EtherCAT
> Robust rotatable screw connections according to IEC, CENELEC, and IEEE
> Remote control via EoE
> Dual-axis servo driver

Servo driver units

Product no.	Size	Number of axes	Rated power
MADM2A4KBX	A	2	For motors 0.4–0.75kW
MADM2A6KBX	A	2	For motors 0.75–1.5kW
MADM2AAKBX	A	2	For motors 1.5–3.0kW
MBDM1ABKBX	B	1	For motors 3.0–5.0kW

Power supply units

Product no.	Size	Input voltage	Rated power
MADMPN14	A	3-phase 380–480V C	15kW

MINAS A6 series

Servo motors

> › High-precision encoder, 23bit/rev; 8.38 mil. pulses/rev
> › Max. rotational speed: 6500rpm
> › Low cogging torque
> › Even more compact design with new housing (split core structure, encoder even more narrow)
> › IP67 rating for all motors with connector
> › 50W to 5000W
> › Common encoder (usable as an absolute and an incremental encoder)
> › Triple-lip oil seal

Model	MSMF		MDMF		MHMF	
	Low inertia		Medium inertia		High inertia	
Rated power W	Flange Ø mm	Rated rotational speed (max.) rpm	Flange Ø mm	Rated rotational speed (max.) rpm	Flange Ø mm	Rated rotational speed (max.) rpm
200V AC						
50	38	3000 (6000)	–	–	40	3000 (6500)
100	38		–	–	40	
200	60		–	–	60	
400	60		–	–	60	
750	80		–	–	80	3000 (6000)
1000	80/100	3000 (6000)/3000 (5000)	130	2000 (3000)	80/130	3000 (6000)/2000 (3000)
1500	100	3000 (5000)			130	2000 (3000)
400V AC						
200	-	-	-	-	60	3000 (6500)
400	-	-	-	-	60	
750	-	-	-	-	80	3000 (6000)
1000	100	3000 (5500)	130	2000 (3500)	80/130	3000 (6000)/2000 (3500)
1500	100		130		130	2000 (3500)
2000	100		130		176	
3000	120		130		176	
4000	130	3000 (5000)	176		176	
5000	130	3000 (5000)	176	2000 (3000)	176	2000 (3000)
Features	Low to high power range, low inertia, suitable for all kinds of applications, also suitable for high-speed applications, especially for machinery with high rigidity and repetition rate		Medium to high power range, medium inertia, suitable for belt-driven machinery with low rigidity		Low to high power range, high inertia, suitable for belt-driven machinery with low rigidity	
Applications	Equipment for transistor production (like bonders, SMD machinery), packaging machines, machines for food production, etc.		Conveyor machinery, robots, textile machines, etc.		Conveyor machinery, robots, machines for LCD production, etc.	

MINAS LIQI

AC servo drivers and motors

> › Cost effective
> › Reliable and high-performance
> › Easy to use
> › Excellent price-performance ratio

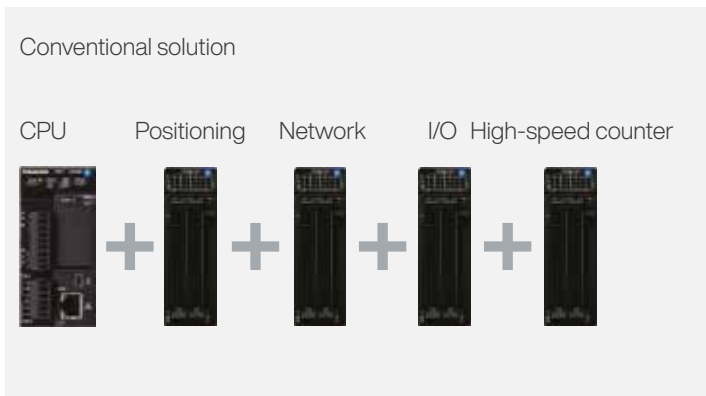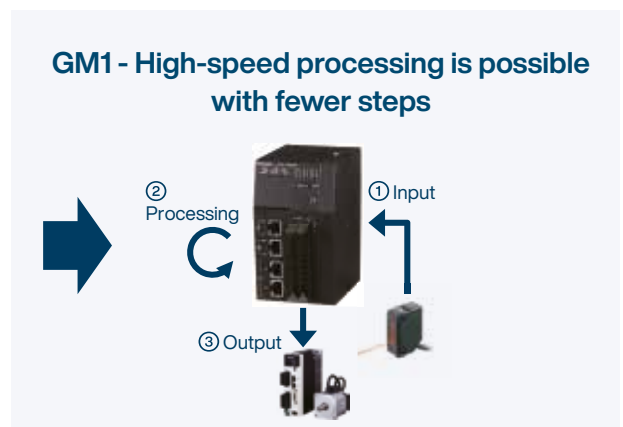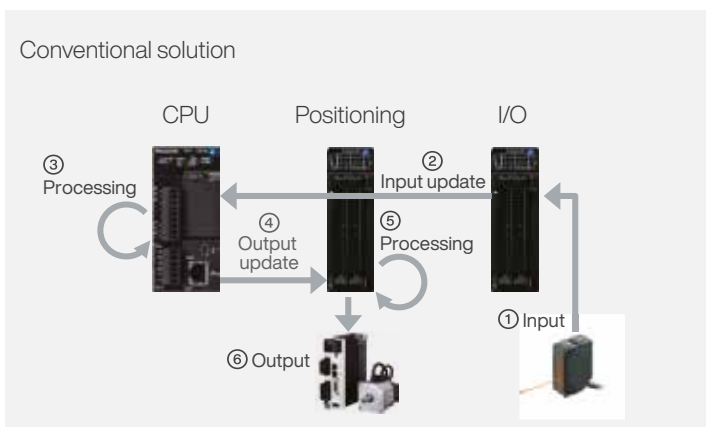| Supply voltage	Rated power	Control mode	Torque
1 x 200V, 1 x 200V AC	50–1000W	Position control	0.16 – 3.2 (Nm) min

GM1 series

EtherCAT-Typ

RTEX-Typ

> Synchronous control for complex multi-axis systems
> EtherCAT type: max. 32 axes
> RTEX type: max. 16 axes
> Two independent Ethernet connectors for e. g. EtherNet/IP, CODESYS protocol, OPC UA, Modbus-TCP
> Slot for SD card (32GB)
> 2 channels for high-speed counter input: 4MHz/8MHz
> 4 channels for PWM output: up to 100kHz
> 16 digital inputs, 16 digital outputs (PNP)
> Up to 15 expansion units possible (max. 992 I/O)
> Communication cycle: 0.5ms
> Easy programming: Configuration software GM Programmer based on CODESYS (compliant with IEC 61131-3)

Product name	Number of axes	Network	Inputs/outputs	High-speed counter	Rated voltage	Specifications Output	Product no.
GM1 Controller	16 axes	RTEX	16 inputs 16 outputs	2 channels	24V DC	Transistor output (NPN)	AGM1CSRX16T
	32 axes	EtherCAT				Transistor output (PNP)	AGM1CSEC16P

The all-in-one unit saves space

Conventional solution

CPU   Positioning   Network   I/O   High-speed counter

GM1 - 4 functions in one

125 mm

97.3 mm

71.4 mm

The all-in-one unit is faster and more accurate

Conventional solution

CPU   Positioning   I/O

③ Processing
② Input update
④ Output update
⑤ Processing
① Input
⑥ Output

GM1 - High-speed processing is possible with fewer steps

② Processing
① Input
③ Output

Expansion unit line-up

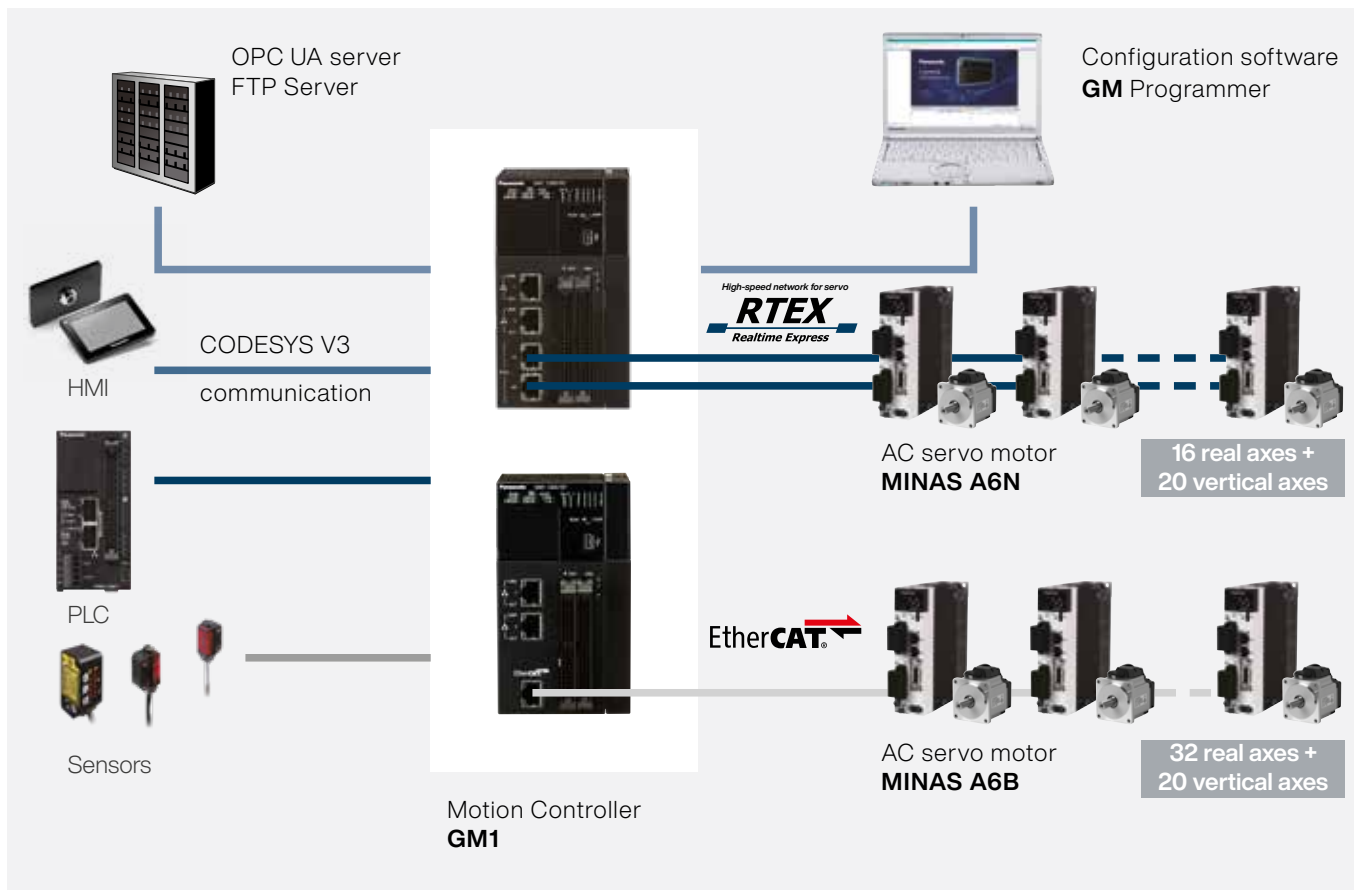| Input / output unit	Analog input / output unit	Pulse output unit
› 64 I/O per expansion unit (up to 15 units) › NPN/PNP transistor outputs	› Insulation range Support various devices with high-speed sampling	› Ultra high-speed positioning control has achieved › Very low startup speed of 1μs

System configuration

OPC UA server
FTP Server

Configuration software
GM Programmer

HMI

CODESYS V3

communication

RTEX
High-speed network for servo
Realtime Express

AC servo motor
MINAS A6N

16 real axes +
20 vertical axes

PLC

EtherCAT

Sensors

AC servo motor
MINAS A6B

32 real axes +
20 vertical axes

Motion Controller
GM1

FP0H series

A compact PLC with multiple interfaces

› 2 Ethernet ports as a hub

› Fieldbus communication

› Integrated PWM output

› Built-in-4-axis pulse output

› High processing speed of 10ns per basic instruction (up to 10k steps)

› High program capacity up to 64k steps

› 16 inputs / 16 outputs (transistor)

› Max. 7 expansion units

› Position control with either 2 RTEX positioning units (max. 2 x 8 axes + 4 axes (CPU) or with pulse control (max 4 x 2 axes + 4 axes (CPU)

› SD memory card slot for data recording function and program memory

Positioning units, suitable for ultra-fast linear servo drives

› Pulse output of up to 4Mpps and fast startup in 5µs

› Ideal for applications with short-stroke actions such as palletizing of electronics parts

› Biuilt-in high-speed counter can detect abnormalities by counting feedback pulses from encoders during positioning

FP7 series

Modular and limitless connectivity

› Compact size with room for expansion functions

› Interface for communication and application cassettes

› Add-on cassettes can be added to the CPU to increase functionality without increasing the width of the unit. Communication cassettes support communication via RS232C, RS422, and RS485

› Up to 64 units can be connected

› High-capacity SD (SDHC) memory cards of up to 32GB are supported.

› Equipped with a large memory capacity (up to 220k program steps or up to 500k data words) and a high-speed processor (11ns/step)

› GT power supply terminals

Motion control of up to 64 axes in one unit

A single FP7 motion control unit can control 64 axes of MINAS A6B and 32 virtual axes. Easy to perform multi-axis control.

› Max. 32 synchronous groups (32 x 2 axes per group or 2 x 32 axes per group)

› 0.5ms control cycle (4 axes: 2 x 2-axis interpolation per group)

› Control system: Cyclic position control

› Positioning table: 1000 tables per axis

Virtual axis
32 axes

Real axis
64 axes

Total 96 axes
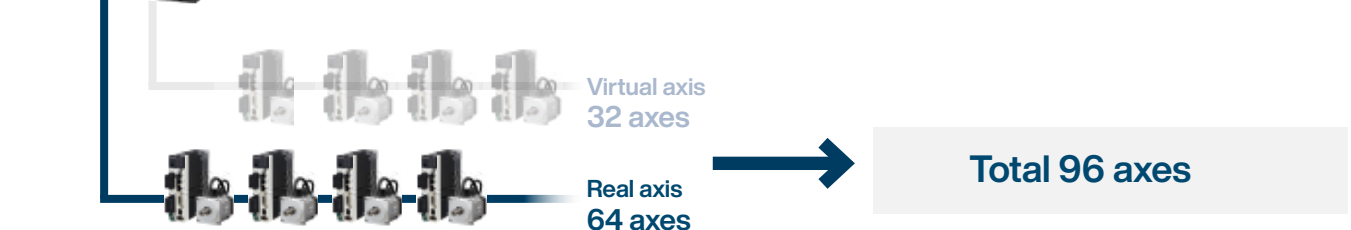
Positioning units FP0H (RTEX) – support servo driver MINAS A6N

Capable of performing motion control through a high-speed network and supporting an open network with a small PLC

› **Easy control** of network servos with an ultra-compact PLC.

› **Highly accurate** control of multi-axis position control using high-speed 100Mbit/s communication.

› **Minimization of wiring costs** by using commercially available Ethernet cables.

› **Position control** of 4 or 8 axes for servo drivers with Ethernet (RTEX) interface.

› **Easy configuration** with the software Control Configurator PM instead of complex programming.

› **Precision teaching** supported by manual pulser input

Product	Number of axes	Output type	Product number
Positioning units FP0H	4	RTEX Ethernet	AFP0HMAN
	8		AFP0HM8N

RTEX

the multi-axis Ethernet servo system

Synchronous control

› 4-axis type: up to six axes including virtual axes (virtual axis: 2 axes)
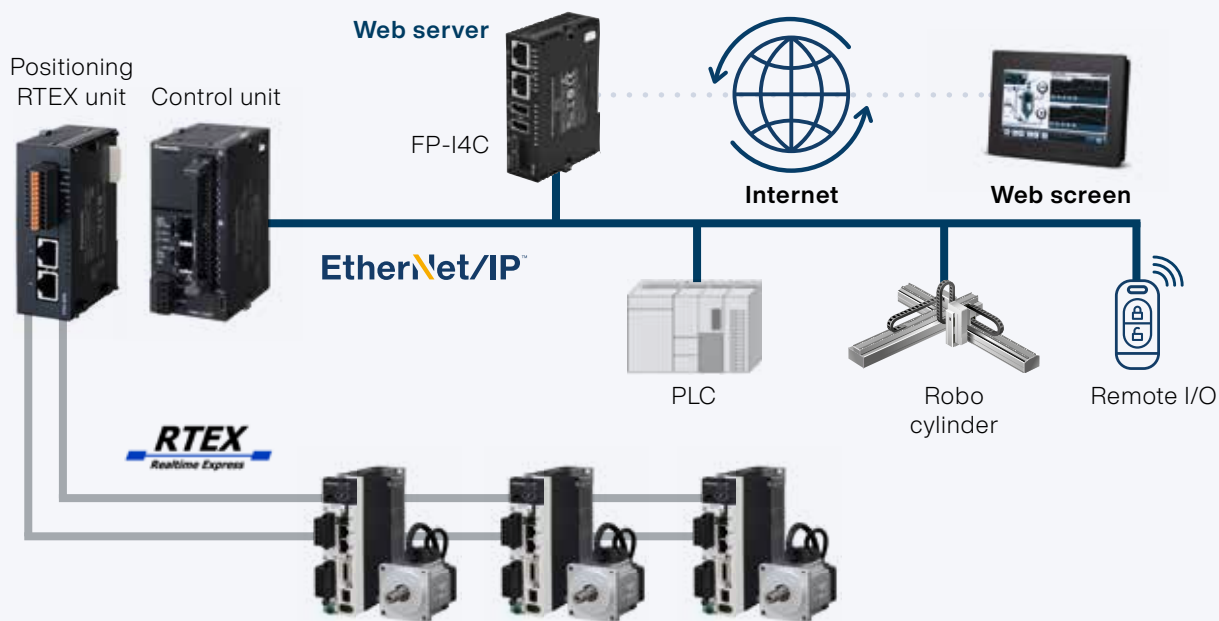
› 8-axis type: up to eight axes including virtual axes

Multi-axis synchronous control

› Electronic gear

› Electronic clutch

› Electronic cam

Interpolation control

› 2-axis and 3-axis linear interpolation controls

› 2-axis circular interpolation control

› 3-axis spiral interpolation control

Easy checking of servo drive data on web server

Positioning RTEX unit

Control unit

Web server

FP-I4C

Internet

Web screen

EtherNet/IP™

PLC

Robo cylinder

Remote I/O

RTEX
Realtime Express

HM series touch terminals

All terminals are equipped with Ethernet ports and support VNC technology. The web server architecture is based on current HTML5 web technology providing users with advanced control and remote monitoring from any modern browser or from a smartphone, tablet, or computer. The ability to capture, store and share data in higher-level structures makes the HM series the perfect choice for integrating systems across the entire enterprise. The HM series supports Panasonic PLC, SVG graphics, Javascript, OPC UA Server / Client gateway, Modbus TCP (RTU), EtherNet/IP. This makes the HM series a perfect tool for IIoT implementation and Industry 4.0 in a controlled and safety-aware manner.

HMs700 series – smart & innovative

›   PoE (Power over Ethernet)
›   Multiude of installation topologies
›   Wi-Fi connection
›   Internal temperature sensor

HMx700 series – high-end Multi touch

›   Capacitive glass touch panel
›   UV resistant, scratch resistant, resistant to chemicals
›   Three Ethernet ports
›   Display size 5", 7", 10.1", 15.6" and 21.5"

HMe series – economical

›   A top product in its class
›   Inexpensive
›   Cost-efficient
›   Reliable
›   Industrial grade

PoE (HMs700)

Power over Ethernet
Maximum connectivity thanks to standard CAT5 wiring

›   Only one cable needed (power and Ethernet)
›   Up to 100m distance from source

MQTT (all models)

Message Queuing Telemetry Transport

›   Designed for connections with remote locations
›   Suitable for limited network bandwidth

Fanless (HMs & HMx)

Passive cooling

›   Protection against dust, oil and splash water
›   Low maintenance
›   Noiseless

OPC UA (all models)

Standardized communication protocol

›   Platform-independent exchange of machine data

Wide variation of mountings (HMs700)

VESA, wall, tube, gooseneck, table stand

›   High flexibility for installation

Web server architecture (all models)

Based on the current HTML5 web technology Supports VNC technology

›   Offers many possibilities of remote monitoring and control

WI-FI (HMs700 except HMs705)

Wireless Local Area Network

›   Ease of installation and use
›   Offer wireless access to employees and customers
›   Connection to the wider Internet

Full IP67 degree of protection (HMs700)

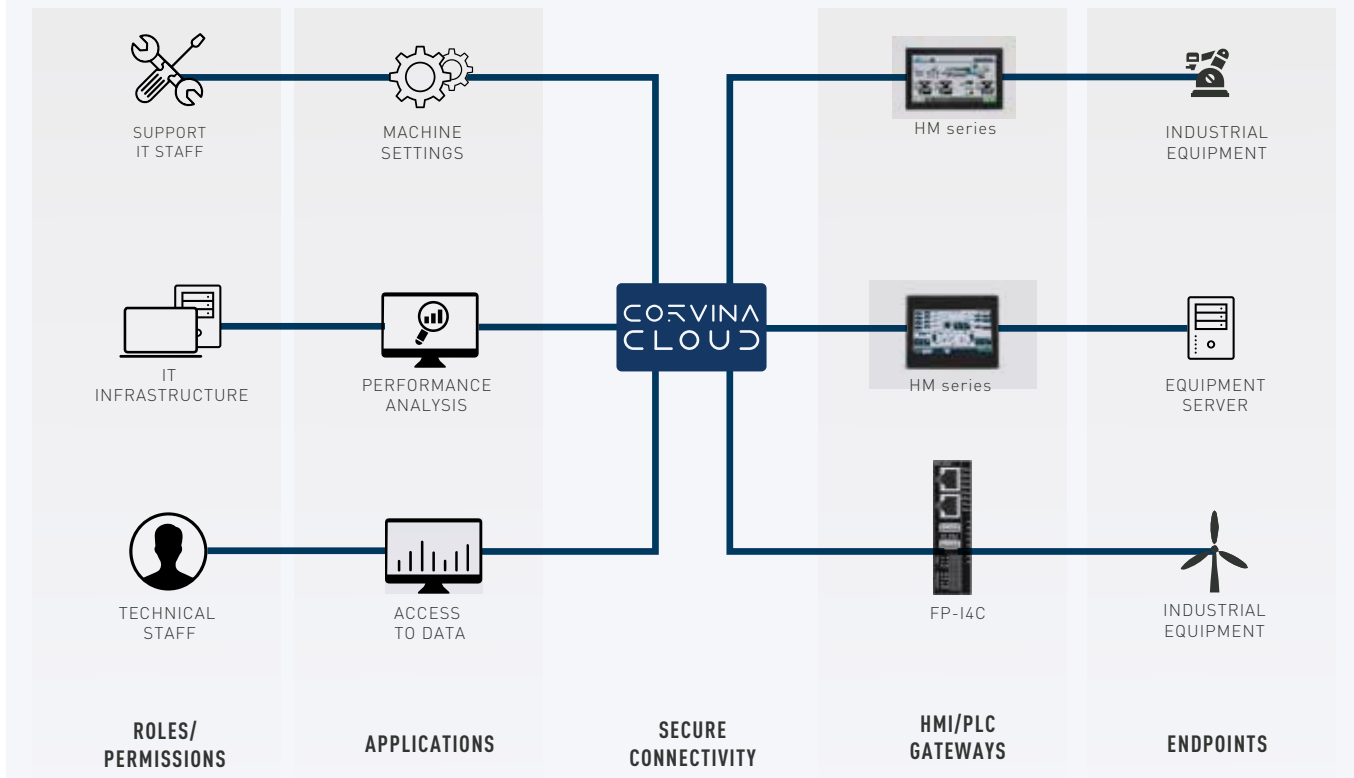**The complete encapsulation enables the HMI to be installed under extended environmental conditions.**

›   Ideal for mounting with a swivel arm directly to the machine.
›   Cost-efficient

Cloud solution for the HM series and FP-I4C

Corvina Cloud is a safe cloud solution based on OpenVPN and SSL and allows remote administration of industrial installations. This way, you have a platform making the administration of your IIoT business easy.

How does Corvina Cloud work?

SUPPORT IT STAFF	MACHINE SETTINGS		HM series	INDUSTRIAL EQUIPMENT
IT INFRASTRUCTURE	PERFORMANCE ANALYSIS	CORVINA CLOUD	HM series	EQUIPMENT SERVER
TECHNICAL STAFF	ACCESS TO DATA		FP-I4C	INDUSTRIAL EQUIPMENT
ROLES/ PERMISSIONS	APPLICATIONS	SECURE CONNECTIVITY	HMI/PLC GATEWAYS	ENDPOINTS

Roles & applications

It is possible to define different roles with different user rights. Roles can be given access rights depending on the data needed and the application.

Secure connectivity

In its core, Corvina Cloud is a high-performance server with the latest open technologies to manage data and control flows, thus acting as a Platform as a Service (PaaS).

Gateways & endpoints

Our touch panels serve as gateways to the local network (HMe series, HMx700 series, HMs700 series, FP-I4C). They connect to a central server. All Panasonic PLCs, IP cameras, and other devices capable of connecting to the Internet can act as endpoints.

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