Fuji Electric

Innovating Energy Technology

Programmable Operator Interface

MONITOUCH

Edge-computing accelerates
the transition to smart production sites

X1 STANDARD MODEL *Series*

The X1 series features the broad FA and IT connectivity and flexibility to digitize your factory.

Integration with IT systems

Microsoft Azure | Microsoft SQL Server | OPC UA | MQTT

In addition to the HMI fucntions for operating and monitoring production machines, the X1 achieves data linkage between FA and higher level IT or cloud systems via OPC UA and MQTT connections.

By connecting with MES and ERP systems, data visualization, improvement of productivity and optimization of production management can be conducted.

Visibility and User-friendliness

A high speed CPU, high resolution LCD and PCAP touchscreen improve visibility and operability.

A vectorized rendering engine allows for high quality scaling. Beautiful high quality screens can be created regardless of the display resolution.

Utilization of User Applications

Since Windows is installed, Windows applications and user applications can be used at production sites.

Applications can be run by switches on the HMI display and used freely at production sites.

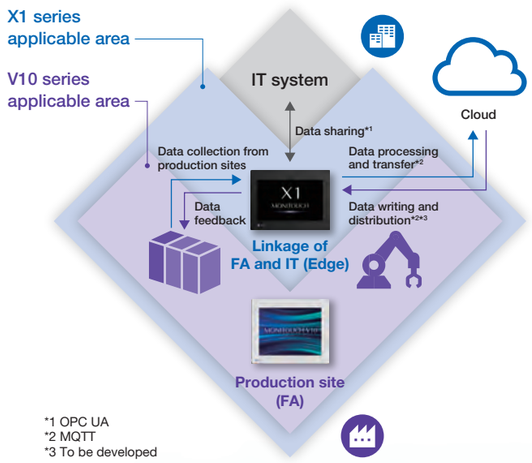
Data collection, processing and analysis can be conducted between production sites and host systems, contributing to the digitization of your factory.

Inheritance of V-series Screen Assets

Screen assets created for the V-series can be converted for use in the X1 series. The configuration software V-SFT Ver.6 can be used as well.

MONITOUCH's highly-developed communication drivers can be used for connection with various equipment without programming.

Positioning



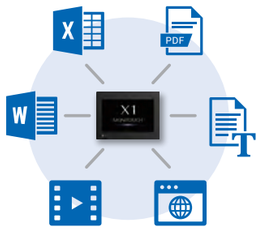
*1 OPC UA
*2 MQTT
*3 To be developed

Smart factory realization factors

Seamless connection between production sites and IT systems

- Various communication functions
- Linkage with cloud servers

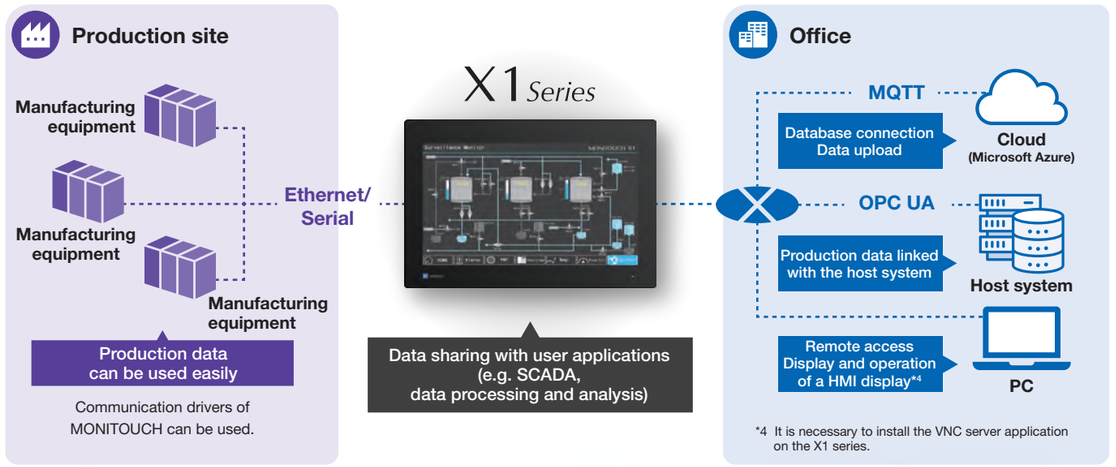
Utilization of user applications



- Windows installed
- User applications are fully utilized at production sites

Operation Scheme

In addition to the communication and display functions of the MONITOUCH HMI, data processing and analysis are available through connecting with user applications and the host system.

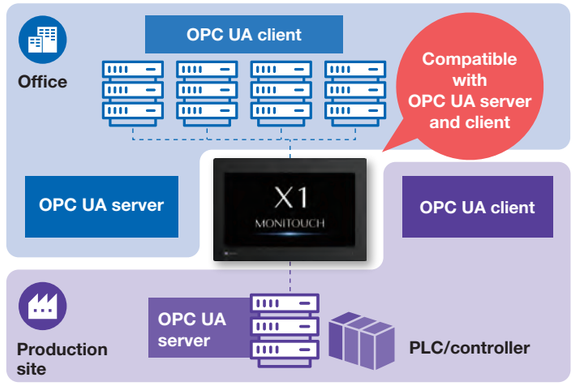


*4 It is necessary to install the VNC server application on the X1 series.

The X1 series facilitates the implementation of smart factories that effectively utilize data.

Compatible with OPC UA Server and Client

- The X1 series is equipped with OPC UA server and client, so data can be collected by connecting to both offices and production sites.
- Even if devices at the production site are incompatible with OPC UA, the X1 series can fulfil the role of a gateway to OPC UA in order to transfer data to OPC UA clients in the host system.
- OPC UA enables data sharing between production sites and the host system, and facilitates the standardization of equipment.



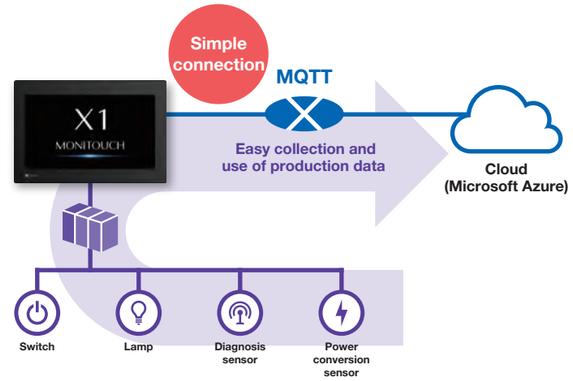
Cloud (MQTT) Compatible

- Operation data, production data, status data, etc. are sent to the cloud system via MQTT for collection and storage. It contributes to the visualization and improvement of the factory.
- Since the system is linked with the Microsoft Azure platform, various tools and frameworks of the cloud service can be used.

Linkage with Microsoft services via Azure IoT Hub is possible

Visualization, analysis, AI / Machine learning

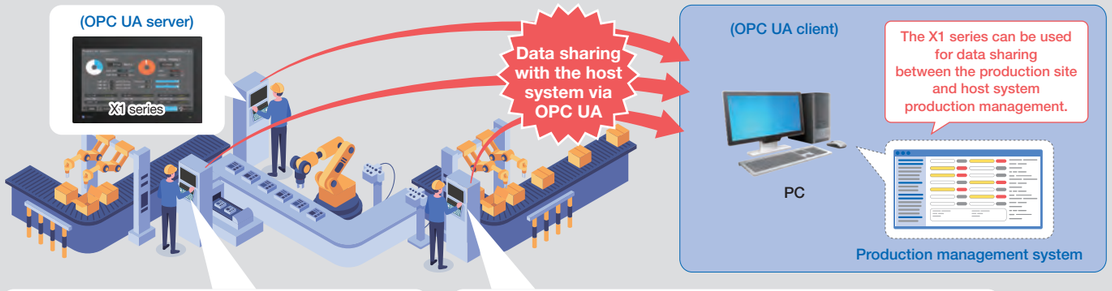
- Visualization
- Progress management
- Diagnosis / Analysis
- Prediction / Status detection
- Cause analysis
- KPI management



Application example

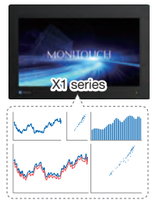
Workpiece conveyor

The X1 series collects data from multiple machines at production sites and shares it with the host system via OPC UA. This helps to improve productivity and product quality, and it facilitates the standardization of equipment. Adoption of the X1 series for devices equipped with industrial robots adds further value to the robots that contribute to factory automation.



Engineering tool

If engineering tools of connected devices are installed, it is possible to edit and monitor the programs of robots or PLCs through the X1 series. Bringing a PC into the production site is no longer necessary.

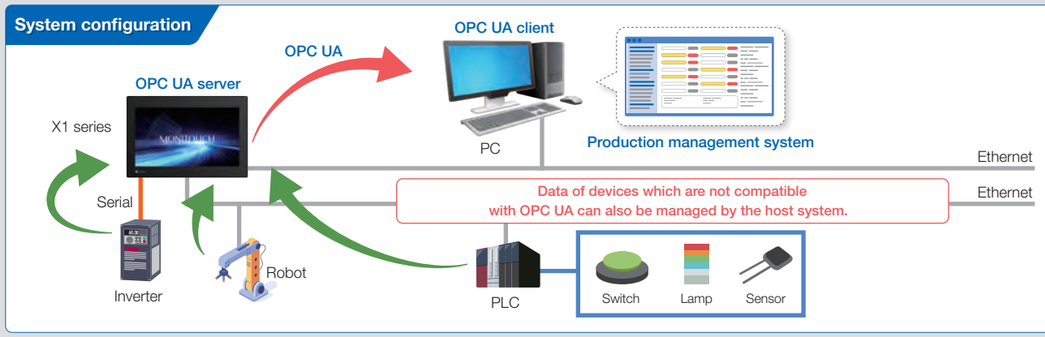


Data collection using Excel

Operation data of transfer robots can be linked to Excel on the X1 via V-Server (our data collection software). Graphs created by Excel can be displayed on the X1 by installing and linking Excel and V-Server.

It is possible to use applications such as Excel on the X1 at the production sites.

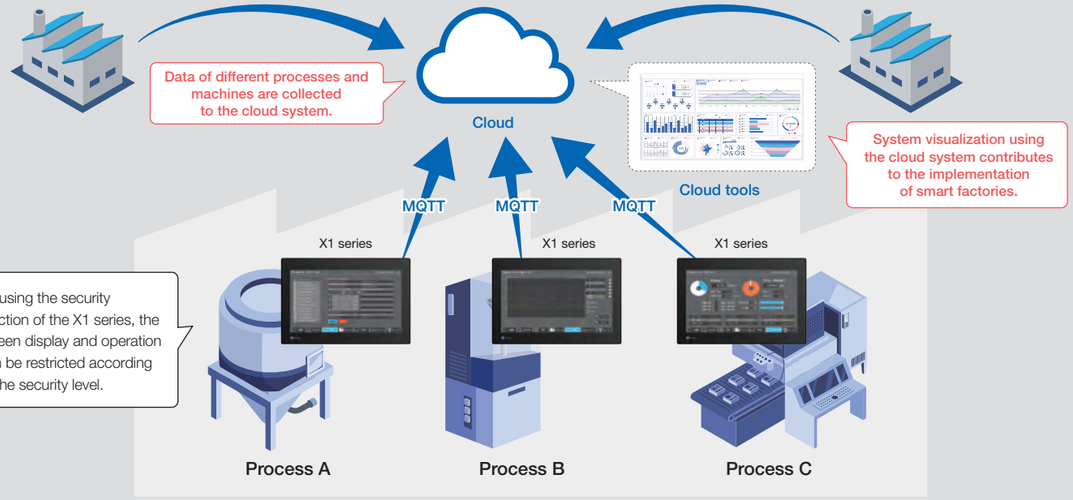
System configuration



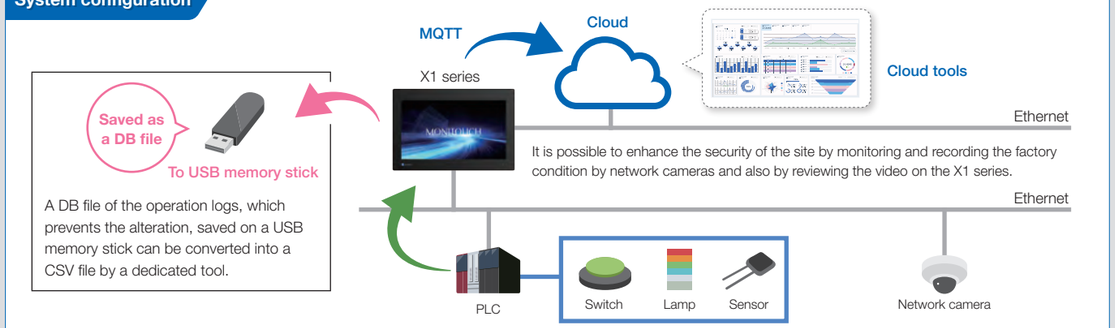
Application example

Pharmaceutical equipment

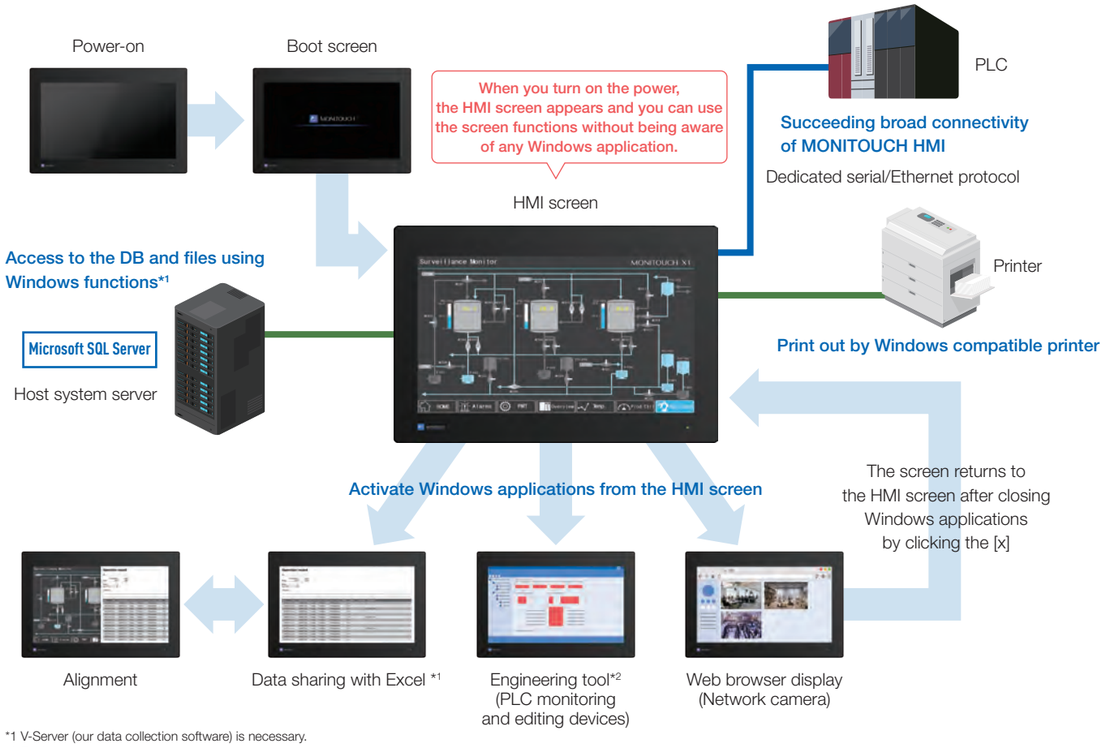
Increased efficiency and improvement of the production system is realized by connecting to the cloud and analyzing, visualizing and identifying trends of the collected data. Besides, it contributes to ensuring the security in pharmaceutical manufacturing by installing the X1 series on pharmaceutical equipment that requires high-level security management.



System configuration



Operation



*1 V-Server (our data collection software) is necessary.
*2 Engineering tools of the connected devices are necessary.

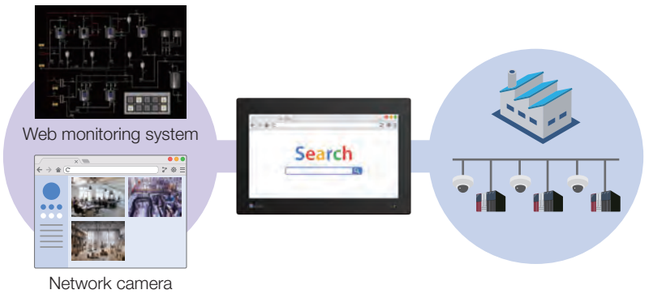
Utilization of User Applications

Since Windows is installed on the X1 series, Windows applications can be used, meaning there is no need to bring your computer to the manufacturing site. The display position and window size of the application can also be specified, allowing for operation with a display position and size suited to the X1 series screen layout.

In addition, it is possible to reduce maintenance tasks and the space required for PCs at the production site by integrating PCs with the X1 series.

The X1 series with Windows applications improve versatility and expandability, as well as functioning of HMIs.

Standardized Web Browser



Since the X1 series is equipped with a web browser as standard, it is possible to use the browser function in applications and IT systems.

When combined with a monitoring system or network cameras, it is possible to monitor different machines on the network, and to check each status easily.

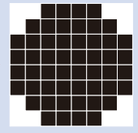
Vector Graphics

Vector graphics enable high quality and tailored screen creation as it allows the enlargement/reduction of parts while maintaining a clear image.

Raster Image (Conventional Method)

Color and density are specified for each pixel

Jagged edges become visible when scaling

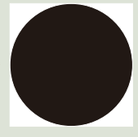


Indicate “white, white, black, black, black, black, white, white …”

Vector Image (New Method)

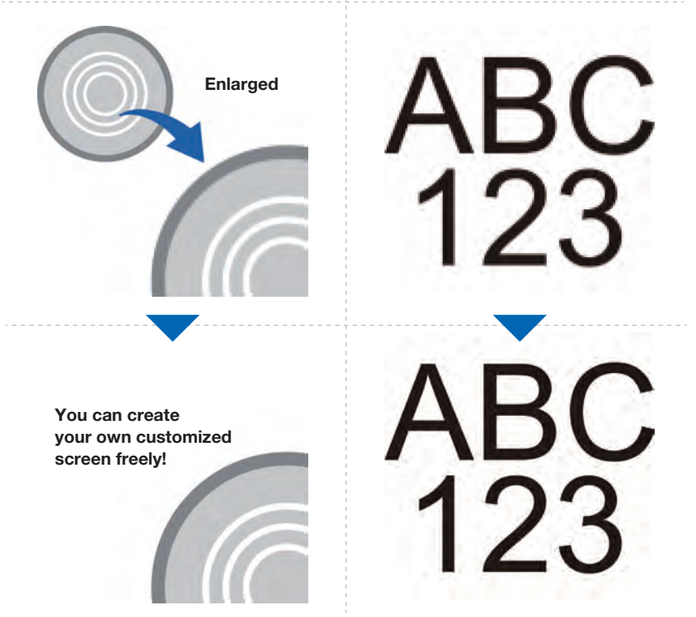
Images are defined by mathematical equations

Images remain sharp and smooth in all sizes by changing the parameters



Draw a circle by specifying the reference point and radius

<circle cx=“150” cy=“150” r=“150”/>



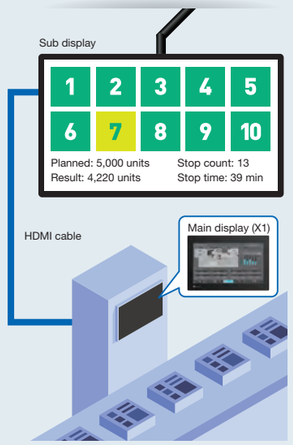
It is possible to maintain clear edges even after scaling to any size.

Multi-Display

Two screens can be used simultaneously, each with independent display and operation. A different screen can be displayed on a large external monitor, or 2-split screen is available. Since the X1 series display and the external display can be installed in landscape or portrait (90° to the right) mode, setups matching the on-site environment and space are possible.

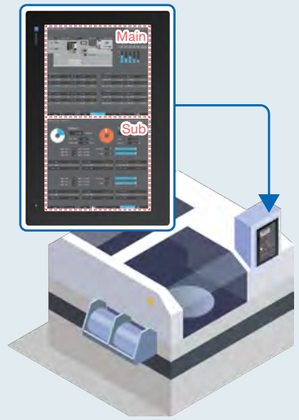
Andon monitor display

It’s possible to visualize the operating status of equipment and share information by displaying details such as production plans and results on an Andon monitor (large display) connected via an HDMI cable. There is no need to prepare a computer for the Andon display; the X1 series alone can display and operate as an HMI as well as display information on an Andon monitor.



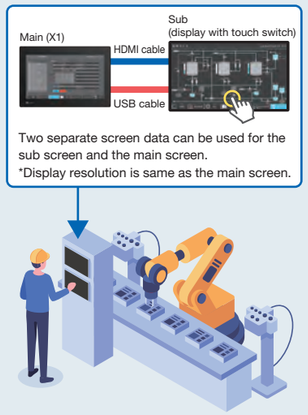
2-split screen

Two X1 applications (main & sub) can be run on the X1 series and displayed and operated on the same screen simultaneously by splitting the screen horizontally or vertically. In addition to displaying data from the same or a different screen, it also supports the display of user applications such as engineering tools, displaying information with a high degree of density and freedom.



Expansion of the display / operation screen

To improve work efficiency, the amount of information that can be checked at one time can be increased by using the X1 series with an external display. Touch operation is also possible on external displays with a touch switch, via connection using a USB cable. One X1 series unit can be used for HMI display and operation equivalent to two units.



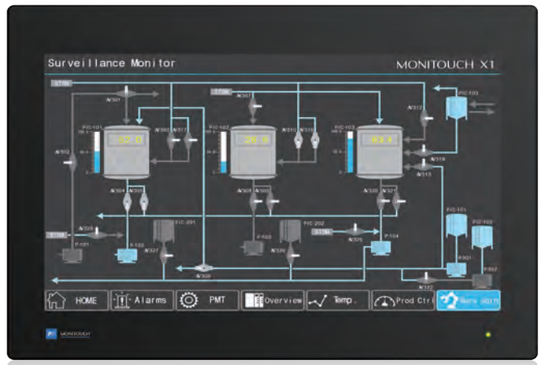
Two separate screen data can be used for the sub screen and the main screen.
*Display resolution is same as the main screen.

The X1 series with Windows performs as a gateway from the production sites to the IT systems. It contributes to efficient communication between the factory and management office or cloud system.

X112□iSD / X112□iSRD

12.1″ wide screen | Resolution: WXGA 1,280 × 800
Dimensions (W×H×D): 320 × 241 × 66.7 mm

X115□iSD / X115□iSRD



15.6″ wide screen | Resolution: FHD 1,920 × 1,080
Dimensions (W×H×D): 406 × 271 × 68.2 mm

PCAP (Capacitance)	16.7M colors *1	Ethernet 2ch	Wireless LAN *2	Bluetooth *2	USB-A 3.0×2 2.0×2	HDMI 1ch	Serial 1ch	IP66	Sound output 1ch

*1 Only pictures and 3D parts available for HMI screens *2 R-type models only

Model X1 □□□ iS□ D

Display size
- **12**: 12.1" wide screen
- **15**: 15.6" wide screen

Functions
- **R**: with WLAN and Bluetooth
- **N/A**: without WLAN and Bluetooth

Main memory
- **1**: 4GB
- **2**: 8GB*3

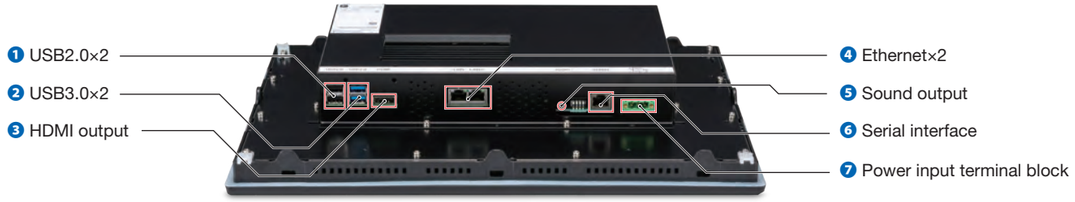
*3 Only models without WLAN and Bluetooth

General Specifications

Item		X112□iSD	X112□iSRD	X115□iSD	X115□iSRD
Power Supply	Rated Voltage	DC24V			
	Permissible Range of Voltage	±10%			
	Permissible Momentary Power Failure	Within 1ms			
	Power Consumption (Max. Rating)	41W or less		51W or less	
	Rush Current	24A or less, 6ms (Ambient temperature 25℃)			
Insulation Resistance		Between DC external terminal and FG: DC500V 10MΩ or higher			
Physical Environment	Ambient Temperature	0 to 45°C			
	Ambient Humidity	85%RH or less (without dew condensation, max. wet-bulb temperature: 39°C or lower)			
	Operating Altitude	2,000m or less			
	Operating Atmosphere	No exposure to corrosive gas or conductive dust			
	Storage Ambient Temperature	-10 to 60°C			
	Storage Ambient Humidity	85%RH or less (without dew condensation, max. wet-bulb temperature: 39°C or lower)			
	Contamination Level	2			
Mechanical Operating Conditions	Resistance to Oscillation	JIS B 3502 (IEC61131-2) compliant Vibration frequency: 5 to 9 Hz, Half amplitude: 3.5 mm, 9 to 150 Hz, Constant acceleration 9.8 m/s² (1G) X, Y, Z: 3 directions (10 times each)			
	Resistance to Shock	JIS B 3502 (IEC61131-2) compliant Peak acceleration: 147 m/s² (15G), X,Y,Z: 3 directions, 3 times each (18 times in total)			
Electric Operating Conditions	Resistance to Noise	Noise voltage: 1,000Vp-p, Pulse width: 1μs, Pulse rise time: 1ns (by noise simulator)			
	Resistance to Static Discharge	Complies with IEC61000-4-2, contact: 6kV, air: 8kV			
Installation Conditions	Grounding	D class grounding (3rd-class grounding) FG/SG is internally connected in the X1 series.			
	Protection Structure	Front case: IP66 (when water-proof gasket is used), Rear case: IP20			
	Cooling System	Natural air cooling			
	Dimensions W*H*D (mm)	320 × 241 × 66.7 mm		406 × 271 × 68.2 mm	
	Panel Cutout (mm)	309 × 230 mm		395 × 260 mm	
	Weight	Approx. 3.2 kg		Approx. 3.9 kg	
Case	Color	Black			
	Material	PBT and GF30 resin (front part)			

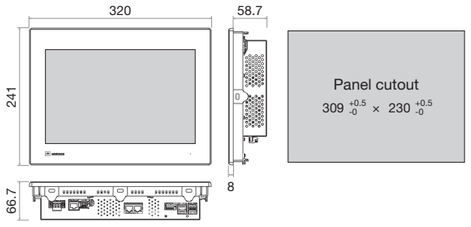
Interface

Various interfaces for achieving edge-computing

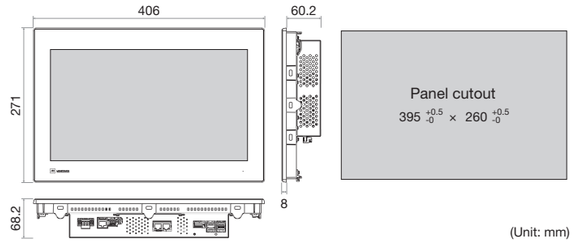


Dimensions and Panel Cutout

X112□iSD / X112□iSRD



X115□iSD / X115□iSRD



(Unit: mm)

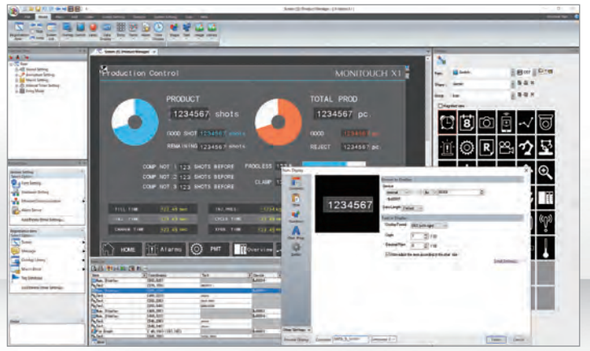
Performance Specifications

Item		X112□iSD	X112□iSRD	X115□iSD	X115□iSRD
Hardware	Processor	Intel Atom® ×5-E3940			
	Number of Cores / Number of Threads	4/4			
	Main Memory	□:1 4GB □:2 8GB			
	Internal Storage	SSD(3D NAND)：64GB (free space 30GB)			
Software	OS	Windows 10 IoT Enterprise 2019 LTSC (64bit)			
Display	Display Device	TFT color			
	Resolution	WXGA: 1,280 × 800		FHD: 1,920 × 1,080	
	Display Size	12.1" widescreen		15.6" widescreen	
	Colors	16.7 million colors (for HMI screens, pictures and 3D parts only)			
	Contrast Ratio	1,000:1			
	Backlight	LED			
	Backlight Life	Approx. 50,000 hours			
Touch Switch		PCAP (Capacitive type)			
External Interface	Ethernet (RJ-45) × 2	10BASE-T/100BASE-TX/1000BASE-T			
	Serial Port (RJ- 45) × 1	Asynchronous: RS-232C/RS-422/RS-485 (switchable) Data length: 7, 8 bits Parity: Even, odd, none Stop bit: 1, 2 bits Baud rate: 4800, 9600, 19200, 38400. 57600, 76800, 115200 bps			
	USB-A Ver. 3.0 × 2	Ver.3.0 (Low speed: 1.5Mbps, Full speed: 12Mbps, High speed: 480Mbps, Super speed: 5.0Gbps)			
	USB-A Ver. 2.0 × 2	Ver.2.0 (Low speed: 1.5Mbps, Full speed: 12Mbps, High speed: 480Mbps)			
	Sound Output (AUDIO) × 1	3.5φ stereo mini jack, line output			
	Wireless LAN (WLAN)	–	1 × WLAN IEEE 802.11 ac/a/b/g/n	–	1 × WLAN IEEE 802.11 ac/a/b/g/n
	Bluetooth	–	1 × Bluetooth	–	1 × Bluetooth
	HDMI	1,280 × 800		1,920 × 1,080	
Clock	Backup Period	3 years (Ambient temperature 25℃)			
Standard	CE Marking	Compatible			
	UKCA	Compatible*4			
	UL / cUL	UL61010-1/UL61010-2-201			
	KC	Compatible			
	Radio Act *5	Japan: MIC, USA: FCC, Canada: ISED, Europe: RED, South Korea: KC, Taiwan: NCC			

*4 Hardware Ver.b or later *5 Wireless LAN compatible models only

Configuration Software

Achieve Sleeker Screens with Simple, Easy-to-Understand Operations



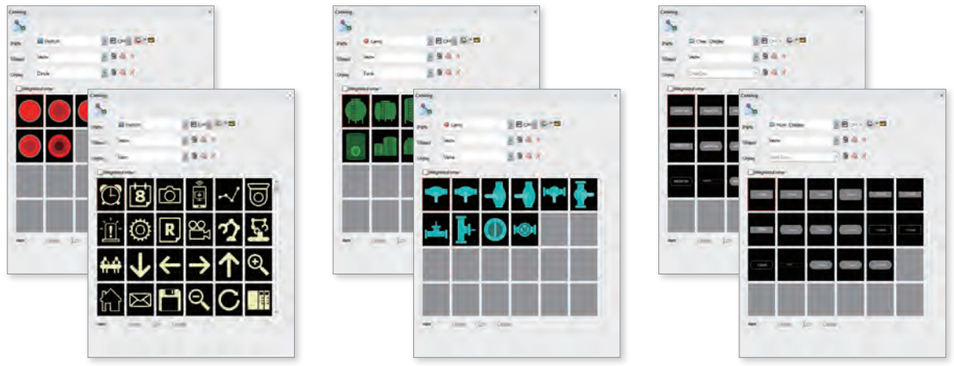
V-SFT Ver. 6

Computer	PC/AT compatible computer running Windows
OS*	Windows Vista(32bit, 64bit)/Windows 7(32bit, 64bit)/ Windows 8(32bit, 64bit)/Windows 8.1(32bit, 64bit)/ Windows 10(32bit, 64bit)/Windows11 (64bit)
CPU	Pentium 4 2.0 GHz or higher is recommended
Memory	1.0 GB or higher (2.0 GB or higher is recommended)
Hard disk	When installed: 4.0 GB or higher
Disc drive	DVD-ROM drive
Display	1024 × 768 (XGA) resolution or higher
Display colors	High color (16 bits) or higher
Others	Microsoft .NET Framework 4.0 or 4.5 (Microsoft .NET Framework 4.0 is installed automatically on computers that do not have either Microsoft .NET Framework 4.0 or 4.5 installed.)

*Administrator privileges are required for installation.

Vector format SVG parts are installed as standard

Since vector format SVG parts are provided with the unit, image quality is maintained regardless of scaling. Beautiful high quality screens can be created.



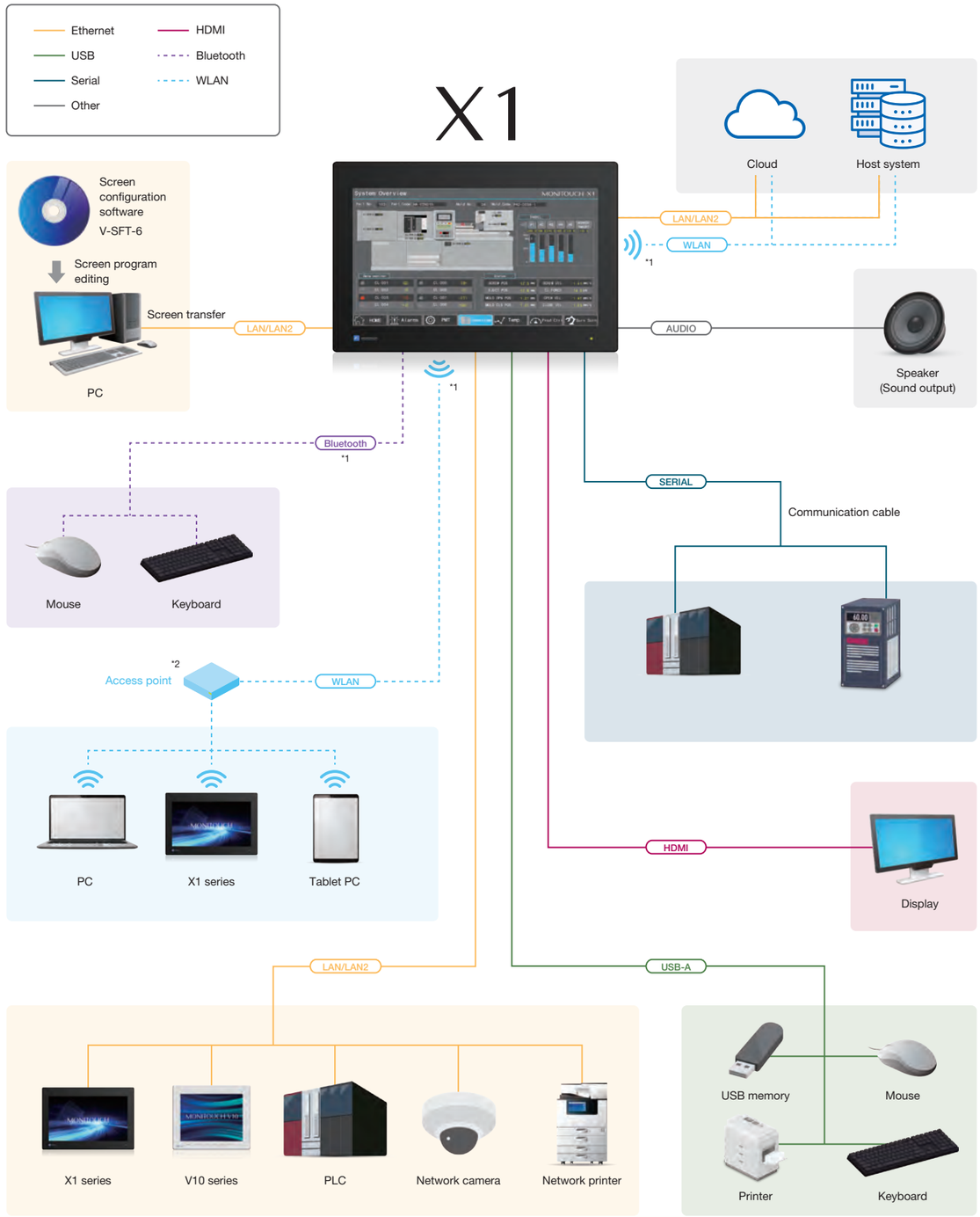
Product List

Model	Display Size	Resolution	Specifications			
			Touch Switch	Main Memory	Wireless LAN	Bluetooth
X1121iSD	12.1” wide screen	1,280 × 800	PCAP (Capacitive type)	4GB	–	–
X1121iSRD					✓	✓
X1122iSD				8GB	–	–
X1151iSD	15.6” wide screen	1,920 × 1,080		4GB	–	–
X1151iSRD					✓	✓
X1152iSD				8GB	–	–

Optional Accessories List

Model	Description
V-SFT-6	Configuration software for MONITOUCH Ver.6
X1-BT	Replacement lithium battery for X1 series
X1-SS	Security software for X1 series

System Configuration



*1 Models with wireless LAN only.
*2 An access point is necessary.

Industry-leading number of connectable equipment

* According to our own research

Outstanding connectability with multiple devices for simultaneous communication and data transfer

PLC Connection

As of December 2023

Manufacturer	Models
Fuji Electric	MICREX-F series
	MICREX-F series V4 Compatible
	SPB (N Mode) & FLEX-PC series
	SPB (N Mode) & FLEX-PC CPU
	MICREX-SX SPH/SPB/SPM/SPE/SPF series
	MICREX-SX SPH/SPB/SPM/SPE/SPF CPU
	MICREX-SX (Ethernet)
Allen-Bradley	PLC-5
	PLC-5 (Ethernet)
	SLC500
	SLC500 (Ethernet TCP/IP)
	NET-ENI (SLC500 Ethernet TCP/IP)
	NET-ENI (MicroLogix Ethernet TCP/IP)
	MicroLogix
	MicroLogix (Ethernet TCP/IP)
	ControlLogix/CompactLogix
	ControlLogix/CompactLogix (Ethernet)
	Micro800 Controllers
	Micro800 Controllers (Ethernet TCP/IP)
	ControlLogix/CompactLogix Tag
	ControlLogix/CompactLogix Tag (Ethernet TCP/IP)
	Micro800 Controllers Tag
	Micro800 Controllers Tag (Ethernet TCP/IP)
AutomationDirect	Direct LOGIC
	Direct LOGIC (K-Sequence)
	Direct LOGIC (Ethernet UDP/IP)
	Direct LOGIC (MODBUS RTU)
Azbil	MX series
Baumuller	BMx-x-PLC
BECKHOFF	ADS Protocol (Ethernet)
	Tag ADS Protocol (Ethernet)
CIMON	BP Series
	CP Series
	XP Series
	S Series
	S Series (Ethernet)
	CP3E
DELTA	DVP series
	DVP series (MODBUS ASCII)
	DVP series (MODBUS TCP/IP)
EATON (EATON Cutler-Hammer)	ELC
EMERSON	EC10/EC20/EC20H (MODBUS RTU)
FANUC	Power Mate
FATEC Automation	FACON FB series
FESTO	FEC
FUFENG	APC Series Controller
GE Fanuc	90 series
	90 series (SNP-X)
	90 series (SNP)
	90 series (Ethernet TCP/IP)
	RX3i (Ethernet TCP/IP)
Hitachi	HIDIC-S10/2alpha,S10mini
	HIDIC-S10/2alpha,S10mini (Ethernet)
	HIDIC-S10/4alpha
	HIDIC-S10/ABS
	HIDIC-S10V
	HIDIC-S10V (Ethernet)
Hitachi Industrial Equipment Systems	HIDIC-H *1
	HIDIC-H (Ethernet)
	HIDIC-EHV *1
	HIDIC-EHV (Ethernet)
HYUNDAI	Hi5 Robot (MODBUS RTU)
	Hi4 Robot (MODBUS RTU)
IDEC	MICRO 3
	MICRO Smart
	MICRO Smart pentra
	MICRO Smart (Ethernet TCP/IP)
JTEKT	TOYOPUC
	TOYOPUC (Ethernet)
	TOYOPUC (Ethernet PC10 Mode)
	TOYOPUC-Plus
	TOYOPUC-Plus (Ethernet)
	TOYOPUC-Nano (Ethernet)
KEYENCE	KZ series link
	KZ/KV series CPU
	KZ24/300 CPU
	KV10/24 CPU
	KV-700
	KV-700 (Ethernet TCP/IP)

Manufacturer	Models
KEYENCE	KV-1000
	KV-1000 (Ethernet TCP/IP)
	KV-3000/5000
	KV-3000/5000 (Ethernet TCP/IP)
	KV-7000/8000 (Ethernet TCP/IP)
	KV Nano
	KV Nano (Ethernet TCP/IP)
JTEKT ELECTRONICS (KOYO ELECTRONICS)	SU/SG
	SR-T (K prt)
	SU/SG (K-Sequence)
	SU/SG (MODBUS RTU)
LS ELECTRIC	MASTER-KxxxS
	MASTER-KxxxS CNET
	MASTER-K series (Ethernet)
	GLOFA CNET
	GLOFA GM7 CNET
	GLOFA GM series CPU
	GLOFA GM series (Ethernet UDP/IP)
	XGT/XGK series CNET
	XGT/XGK series CPU
	XGT/XGK series (Ethernet)
	XGT/XGI series CNET
	XGT/XGI series CPU
	XGT/XGI series (Ethernet)
MITSUBISHI ELECTRIC	A series link
	QnA series link
	QnA series (Ethernet)
	QnH (Q) series link
	QnH (Q) series CPU
	QnU series CPU
	Q00J/00/01 CPU
	QnH (Q) series (Ethernet)
	QnH (Q) series link (Multi CPU)
	QnH (Q) series (Multi CPU) (Ethernet)
	QnH (Q) series CPU (Multi CPU)
	QnH (Q) series (Ethernet ASCII)
	QnH (Q) series (Multi CPU) (Ethernet ASCII)
	QnU series (Built-in Ethernet)
	QnU series (Multi CPU) (Built-in Ethernet)
	QnU series (Built-in Ethernet ASCII)
	L series link
	L series (Built-in Ethernet)
	L series CPU
	FX series CPU *2
	FX2N/1N series CPU
	FX1S series CPU
	FX series link (A prt)
	FX3U/3UC/3G series CPU
	FX3U/3GE series (Ethernet)
	FX3U/3UC/3G series link (A prt)
	FX5U/5UC series
	FX5U/5UC series (Ethernet)
	A-link + Net10
	Q170MCPU (Multi CPU)
	Q170 series (Multi CPU) (Built-in Ethernet)
	Q170 series (Multi CPU) (Ethernet)
	iQ-R series (Built-in Ethernet)
	iQ-R series link
	iQ-R series (Ethernet)
Schneider Electric (MODICON)	Modbus RTU
EATON (MOELLER)	PS4
OMRON	SYSMAC C
	SYSMAC CV
	SYSMAC CS1/CJ1/CJ2
	SYSMAC CS1/CJ1/CJ2 DNA
	SYSMAC CS1/CJ1/CJ2/CP Series (Ethernet)
	SYSMAC CS1/CJ1/CJ2/CP Series (Ethernet Auto)
	SYSMAC CS1/CJ1/CJ2/CP Series DNA (Ethernet)
	NJ Series (EtherNet/IP)
Panasonic	FP Series (RS232C/422)
	FP Series (TCP/IP)
	FP Series (UDP/IP)
	FP-X (TCP/IP)
	FP7 Series (RS232C/422)
	FP7 Series (Ethernet)
RS Automation	NX7/NX Plus series (70P/700P/CCU+)
	N7/NX series (70/700/750/CCU)
	NX700 series (Ethernet)
	X8 series

Manufacturer	Models
RS Automation	X8 series (Ethernet)
	PCD S-BUS (Ethernet)
SAMSUNG	SPC series
	N_plus
	SECNET
SHARP	JW series
	JW100/70H COM port
	JW20 COM port
	JW series (Ethernet)
	JW300 series
	JW311/312/321/322 series (Ethernet)
	JW331/332/341/342/352/362 series (Ethernet)
Siemens	S5 PG port
	S7
	S7-200 (Ethernet ISOTCP)
	S7-300/400 (Ethernet ISOTCP)
	S7-300/400 (Ethernet TCP/IP PG Protocol)
	S7-1200/1500 (Ethernet ISOTCP)
	S7-1200/1500 Tag (Ethernet ISOTCP)
	S7-1200/1500 Optimized Tag (Ethernet ISOTCP)
	LOGO! (Ethernet ISOTCP)
	TI500/505
	TI500/505 V4 Compatible
SINFONIA TECHNOLOGY	SELMART
TECO Electric and Machinery	TP03 (MODBUS RTU)
TOSHIBA	T series /V series (T compatible)
	T series /V series (T compatible) (Ethernet UDP/IP)
	EX series
	nv series (Ethernet UDP/IP)
SHIBAURA MACHINE	TC200
	µGPCsx series
	µGPCsx CPU
	µGPCsx series (Ethernet)
TURCK	BL Series Distributed I/O (MODBUS TCP/IP)
Ultra Instruments	UIC CPU (MODBUS ASCII)
UNITRONICS	M90/M91/Vision Series (ASCII)
	Vision Series (ASCII Ethernet TCP/IP)
VIGOR ELECTRIC	M series
WAGO	750 series (MODBUS RTU)
	750 series (MODBUS Ethernet)
XINJE	XC Series (MODBUS RTU)
	XD Series (MODBUS RTU)
Yaskawa Electric	MEMOBUS
	CP9200SH/MP900
	MP2300 (MODBUS TCP/IP)
	CP/MP EXPANSION MEMOBUS (UDP/IP)
	MP2000 Series
	MP2000 Series (UDP/IP)
	MP3000 Series
	MP3000 Series (Ethernet UDP/IP)
	MP3000 Series EXPANSION MEMOBUS (Ethernet)
Yokogawa Electric	FA-M3
	FA-M3R
	FA-M3/FA-M3R (Ethernet UDP/IP)
	FA-M3/FA-M3R (Ethernet UDP/IP ASCII)
	FA-M3/FA-M3R (Ethernet TCP/IP)
	FA-M3/FA-M3R (Ethernet TCP/IP ASCII)
	FA-M3V
	FA-M3V (Ethernet)
	FA-M3V (Ethernet ASCII)
CODESYS	CODESYS V3 (Ethernet)
Others	Universal Serial
	Without PLC Connection
	MODBUS RTU
	MODBUS RTU EXT Format
	MODBUS TCP/IP (Ethernet)
	MODBUS TCP/IP (Ethernet) Sub Station
	MODBUS TCP/IP (Ethernet) EXT Format
	MODBUS ASCII
	OPC UA server TCP/IP (Ethernet)
	RFID controller (Stepless protocol)
	V-Link
	Modbus slave (RTU)
	Modbus slave (TCP/IP)
	Modbus slave (ASCII)

*1 Communication cannot be established when "transmission control protocol 1, without port" is set.

*2 Connection with FX1 and FX2 is not supported.

Temperature controller / Servo / Inverter Connection

As of December 2023

Manufacturer	Models
Fuji Electric	PYX (MODBUS RTU)
	PXR (MODBUS RTU)
	PXF (MODBUS RTU)
	PXG (MODBUS RTU)
	PXH (MODBUS RTU)
	PUM (MODBUS RTU)
	F-MPC04P (Loader)
	F-MPC series/FePSU
	FVR-E11S
	FVR-E11S (MODBUS RTU)
	FVR-C11S (MODBUS RTU)
	FRENIC5000G11S/P11S
	FRENIC5000G11S/P11S (MODBUS RTU)
	FRENIC5000VG7S (MODBUS RTU)
	FRENIC-Ace (MODBUS RTU)
	FRENIC-Eco (MODBUS RTU)
	FRENIC-HVAC/AQUA (MODBUS RTU)
	FRENIC-MEGA (MODBUS RTU)
	FRENIC-MEGA (G2) (MODBUS RTU)
	FRENIC-MEGA SERVO (MODBUS RTU)
	FRENIC-Mini (MODBUS RTU)
	FRENIC-Multi (MODBUS RTU)
	FRENIC-VG1 (MODBUS RTU)
	FRENIC Series (Loader)
	HFR-C9K
	HFR-C11K
	HFR-K1K
	PPMC (MODBUS RTU)
	FALDIC-alpha Series
	FALDIC-W Series
	PH Series
	PHR (MODBUS RTU)
	WA5000
	APR-N (MODBUS RTU)
	ALPHA5 (MODBUS RTU)
	ALPHA5 Smart (MODBUS RTU)
	ALPHA7 (MODBUS RTU)
	WE1MA (Ver. A) (MODBUS RTU)
	WE1MA (Ver. B) (MODBUS RTU)
	WSZ series
	WSZ series (Ethernet)
Agilent	4263 Series
Azbil	SDC10
	SDC15
	SDC20
	SDC21
	SDC25/26
	SDC30/31
	SDC35/36
	SDC40A
	SDC40G
	SDC45/46
	DMC10
	DMC50 (COM)
	AHC2001
	AHC2001+DCP31/32
	DCP31/32
	NX (CPL)
	NX (CPL) (Ethernet TCP/IP)
	NX (MODBUS RTU)
	NX (MODBUS TCP/IP)
A&D	AD4402 (MODBUS RTU)
	AD4404 (MODBUS RTU)
BANNER ENGINEERING	Presence PLUS (Ethernet/IP (TCP/IP))
Bosh Rexroth	IndraDrive
CHINO	LT400 series (MODBUS RTU)
	DP1000
	DB1000B (MODBUS RTU)
	KR2000 (MODBUS RTU)
	LT230 (MODBUS RTU)
	LT300 (MODBUS RTU)
	LT830 (MODBUS RTU)
DELTA TAU DATA SYSTEMS	PMAC
	PMAC (Ethernet TCP/IP)
FATEK Automation	FACON FBs series (Ethernet)
Gammaflux	TTC2100
	G24 (Ethernet TCP/IP)
Hitachi Industrial Equipment Systems	SJ300 Series
	SJ700 Series
	SJ Series P1 (MODBUS RTU)

Manufacturer	Models
IAI	X-SEL Controller
	ROBO CYLINDER (RCP2/ERC)
	ROBO CYLINDER (RCS/E-CON)
	PCON/ACON/SCON (MODBUS RTU)
KEYENCE	DL-RS1A (SK-1000)
Koatsy Gas Kogyo	R-BLT
KOGANEI	IBFL-TC
Lenze	Servo Drive 9400 (Ethernet TCP/IP)
MITSUBISHI ELECTRIC	FR-*500
	FR-V500
	MR-J2S-*A
	MR-J2S-*CL
	MR-J3-*A
	MR-J3-*T
	MR-J4-*A
	FR-E700
	FR-E800
MOOG	J124-04x Series
M-SYSTEM	R1M Series (MODBUS RTU)
NITTOKU	ITS-HRW110
OMRON	E5AK
	E5AK-T
	E5AN/E5EN/E5CN/E5GN
	E5AR/E5ER
	E5CC/E5EC/E5AC/E5DC/E5GC
	E5CK
	E5CK-T
	E5CN-HT
	E5EK
	E5ZD
	E5ZE
	E5ZN
	V600/620/680
	KM20
	KM100
	V680S (Ethernet TCP/IP)
	EJ1
ORIENTAL MOTOR	High-efficiency AR Series (MODBUS RTU)
	CRK Series (MODBUS RTU)
Panasonic	MINAS A4 series
	KW series
	LP-400
	LP-RF series
	LP-RF series (Ethernet)
RKC INSTRUMENT	SR-Mini (MODBUS RTU)
	CB100/CB400/CB500/CB700/CB900 (MODBUS RTU)
	SR-Mini (Standard Protocol)
	REX-F400/F700/F900 (Standard Protocol)
	REX-F9000 (Standard Protocol)
	SRV (MODBUS RTU)
	MA900/MA901 (MODBUS RTU)
	SRZ (MODBUS RTU)
	FB100/FB400/FB900 (MODBUS RTU)
RS Automation	CSD5 (MODBUS RTU)
	Moscon-F50 (MODBUS RTU)
Sanmei Electronics	Cuty Axis
SanRex	DC AUTO (HKD type)
SHARP	DS-30D
	DS-32D
SHIMADEN	Shimaden Standard Protocol
SHINKO TECHNOS	C Series
	FC Series
	GC Series
	DCL-33A
	JCx-300 Series
	PC-900
	PCD-33A
	ACS-13A
	ACD/ACR Series
	WCL-13A
	PCA1 Series
	PCB1 Series
	JIR-301-M Series
	BCx2 Series
	QTC1 Series(MODBUS RTU)
	QTC1 Series(QMC1)(MODBUS RTU)
Siemens	S120 (Ethernet ISOTCP)
SUS	XA-A*
TOHO ELECTRONICS	TTM-000
	TTM-00BT

Manufacturer	Models
TOHO ELECTRONICS	TTM-200 (MODBUS RTU)
Tokyo Chokoku Marking Products	MB3315/1010
TOSHIBA	VF-S7
	VF-S9
	VF-S11
	VF-S15
	VF-A7
	VF-AS1
	VF-P7
	VF-PS1
	VF-FS1
	VF-MB1
	VF-nC1
	VF-nC3
SHIBAURA MACHINE	VELCONIC Series
ULVAC	G-TRAN Series
UNIPULSE	F340A
	F371
	F800
	F720A
	F805A
YAMAHA	RCX142
Yaskawa Electric	DX200 (High-Speed Ethernet)
Yokogawa Electric	UT100
	UT320
	UT350
	UT450
	UT520
	UT550
	UT750
	UT2400/2800
	UT32A/35A (MODBUS RTU)
	UT52A/55A (MODBUS RTU)
	UT75A (MODBUS RTU)
	µR10000/20000 (Ethernet TCP/IP)
Others	MODBUS RTU
	MODBUS TCP/IP (Ethernet)
	General AE-LINK

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To the purchasers:

The warranty of this product is as follows, unless there are special instructions that state otherwise in the quote, contract, catalog, or specifications at the time of the quote or order.
The purpose or area of use may be limited, and a routine checkup may be required depending on the product. Please contact the distributor from which you purchased the product, or Fuji Electric/Hakko Electronics for further information.
Please conduct inspection of the product promptly upon purchase or delivery. Also, please give sufficient consideration to management and maintenance of the product prior to accepting it.

1 Period and Coverage of the Warranty

1-1 Period

(1) The period of the warranty is effective until twenty-four (24) months from the date of manufacture printed on the plate.
(2) The above period may not be applicable if the particular environment, conditions or frequency of use affects the lifetime of the product.
(3) The warranty for the parts repaired by our service department is effective for six (6) months from the date of repair.

1-2 Coverage

(1) If malfunction occurs during the period of warranty due to negligence on the part of Fuji Electric/Hakko Electronics, the malfunctioning parts are exchanged or repaired free of charge at the point of purchase or delivery. However, the warranty does not apply to the following cases:

1) The malfunction occurs due to inappropriate conditions, environment, handling or usage that is not specified in the catalog, instruction book or users' manual.
2) The malfunction is caused by factors that do not originate in the purchased or delivered product.
3) The malfunction is caused by another device or software design that does not originate in a Fuji Electric/Hakko Electronics product.
4) The malfunction occurs due to an alteration or repair that was not performed by Fuji Electric/Hakko Electronics.
5) The malfunction occurs because the expendable parts listed in the instruction book or catalog were not maintained or replaced in an appropriate manner.
6) The malfunction occurs due to factors that were not foreseeable by the practical application of science and technology at the time of purchase or delivery.
7) The malfunction occurs because the product is used for a purpose other than that for which it is intended.
8) The malfunction occurs due to a disaster or natural disaster that Fuji Electric/Hakko Electronics are not responsible for.

(2) The warranty is only applicable to the single purchased and delivered product.
(3) The warranty is only valid for the conditions stated in (1) above. Any damage induced by the malfunction of the purchased or delivered product, including damage or loss to a device or machine and passive damage, is not covered by the warranty.

1-3 Malfunction Diagnosis

The initial diagnosis of malfunction is to be made by the purchaser. The diagnosis can be conducted by Fuji Electric/Hakko Electronics or our delegated service provider with due charge upon the request of the purchaser. The charge is to be paid by the purchaser at the rate stipulated in the rate schedule of Fuji Electric/Hakko Electronics.

2 Liability for Opportunity Loss

Regardless of the time of occurrence, Fuji Electric/Hakko Electronics are not liable for damage caused by factors that Fuji Electric/Hakko Electronis are not responsible for, opportunity loss on the part of the purchaser caused by the malfunction of a Fuji Electric/Hakko Electronics product, passive damage, damage due to a special situation regardless of whether it was foreseeable or not, or secondary damage, accident compensation, damage to products that were not manufactured by Fuji Electric/Hakko Electronics, or compensation towards other operations.

3 Period for Repair and Provision of Spare Parts after Production is Discontinued (Maintenance Period)

Discontinued models (products) can be repaired for seven (7) years from the date of discontinuation. Also, most spare parts used for repair are provided for seven (7) years from the date of discontinuation. However, some electric parts may not be available due to their short life cycle. In this case, it may be difficult to repair or provide the parts during the seven-year period. Please contact Fuji Electric/Hakko Electronics or our service providers for further information.

4 Delivery

Standard products that do not entail application setting or adjustment are regarded as received by the purchaser upon delivery.
Fuji Electric/Hakko Electronics are not responsible for local adjustments and test runs.

5 Service

The price of the delivered or purchased products does not include the service fee for the technician. Please contact Fuji Electric/Hakko Electronics or our service providers for further information.

6 Scope of Application

The above contents shall be assumed to apply to transactions and product use in the country where a Fuji Electric/Hakko Electronics product is purchased. Please consult your local supplier or Fuji Electric/Hakko Electronics for details.

Operating system and performance guarantee

- The X1 series is equipped with Microsoft's Windows 10 IoT Enterprise 2019 LTSC. Fuji Electric/Hakko Electronics shall not be held responsible for any damages resulting from problems caused by Microsoft products. For problems and specifications of Microsoft products, refer to Microsoft's user manual or contact Microsoft support in your country.
- You can operate your own Windows applications on the X1 series. However, we will not guarantee the performance of applications installed by the customer. Please use them after verifying the performance.

⚠ Safety Considerations

- For safe operation, read the instruction manual or user manual that comes with the product carefully or consult the distributor from which you purchased the product, before using the product.
- Products introduced in this catalog have not been designed or manufactured for such applications in a system or equipment that will affect human bodies or lives.
- Customers, who want to use the products introduced in this catalog for special systems or devices such as for atomic-energy control, aerospace use, medical use, passenger vehicle, and traffic control, are requested to consult the Hakko Overseas Sales Section.
- Customers are requested to prepare safety measures when they apply the products introduced in this catalog to such systems or facilities that will affect human lives or cause severe damage to property if the products become faulty.
- For safe operation, wiring should be conducted only by qualified engineers who have sufficient technical knowledge about electrical work or wiring.

Notes to consider before purchasing

- Appearance and specifications are subject to modification without prior notice due to technical improvements.
- Colors in the catalog may differ from the actual colors due to printing inaccuracies.
- Consult your distributor or us for further information about products in this catalog.

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