

Programmable Operator Interface

MONITOUCH

Consolidating Essential Functionality
while Enhancing Operability and Visibility

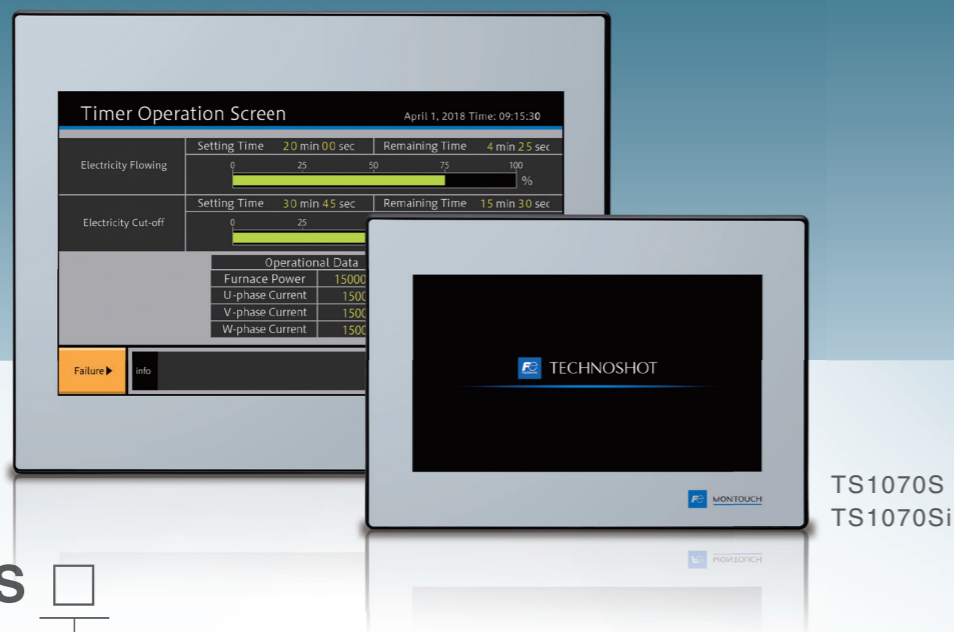


TECHNOSHOT

TS1000 Smart Series

TECHNOSHOT TS1000 Smart Series

- Supports remote operation via VNC server
- Complies with several global standards (CE/KC/UL/cUL)
- Expands FROM capacity 220%*(26 MB) *Compared to TS1000 series



Model

TS1 □ □ 0 S □

Display size
07: 7.0" widescreen
10: 10.2" widescreen

Interface
i : Built-in Ethernet port
None : No built-in Ethernet port

Specifications



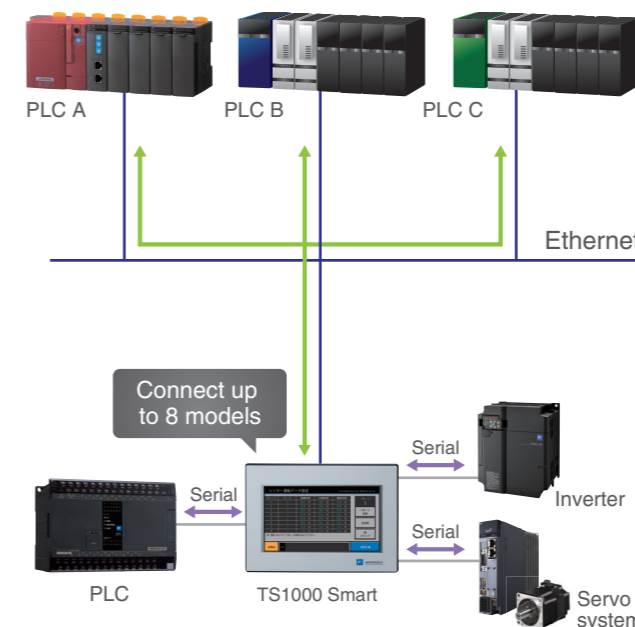
Item	TS1070S	TS1070Si	TS1100Si	
Main unit	Screen size	7.0" widescreen		
	Display device	TFT color		
	Resolution	800 x 480 dots		
	Colors	65,536 colors		
	Backlight	LED		
	Touch screen	Analog resistive		
	Certifications	CE/KC/UL/cUL		
User memory	FROM	26MB		
	SRAM	128KB		
External interface	COM1 D-Sub9 pin (female)	RS-422/RS-485 (4-wire/2-wire) Data length: 7, 8 bits Parity: Even, odd, none Stop bits: 1, 2 dots Baud rate: 4,800, 9,600, 19,200, 38,400, 57,600, 76,800, 115,200, 187,500*1 bps		
	COM2/COM3 D-Sub9 pin (male)	COM2: RS-232C COM3: RS-422/RS-485 (2-wire) Data length: 7, 8 bits Parity: Even, odd, none Stop bits: 1, 2 bits Baud rate: 4,800, 9,600, 19,200, 38,400, 57,600, 76,800, 115,200 bps		
	Ethernet	-	1 ch	
	USB-A	1 ch		
	USB mini-B	1 ch		
Power supply	Permissible range of voltage	DC24V±10%		
	Power consumption (max. rating)	11 W or less	12 W or less	
Physical environment	Ambient temperature	0 to 50°C*2		
	Ambient humidity	85% RH or less (without dew condensation)*2		
	Contamination level	2		
	Operation altitude	2,000 m or less		
	Atmosphere	No exposure to corrosive gas or conductive dust		
	Ambient storage temperature	-10 to 60°C*2		
	Ambient storage humidity	85% RH or less (without dew condensation)*2		
Installation conditions	Protective structure	Panel front	IP65 equivalent (when using waterproof gasket*)/IP40 equivalent (when not using a waterproof gasket*)	
		Rear case	IP20 equivalent	
	Dimensions WxHxD		198.8 x 141.8 x 38.0 mm	266.8 x 206.8 x 38.0 mm
	Panel cutout		189.0 x 134.0 (+0.5/-0) mm	257.0 x 199.0 (+0.5/-0) mm
Case color	Black			

*1 187,500 bps is only for Siemens MPI/PPI communications. *2 Use at a wet-bulb temperature of 39°C or less because higher temperatures may cause failure. *3 This is an optional accessory.

Lineup of Usability Enhancing Features

01 8-Way Communication

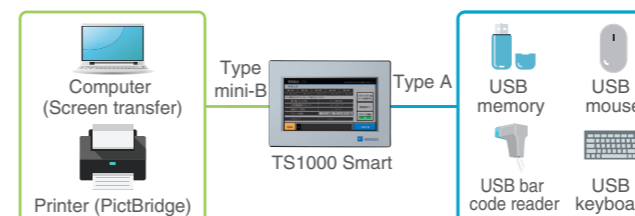
Connect up to eight types of PLC or other devices of various models from multiple manufacturers at the same time via both an Ethernet and serial connection.



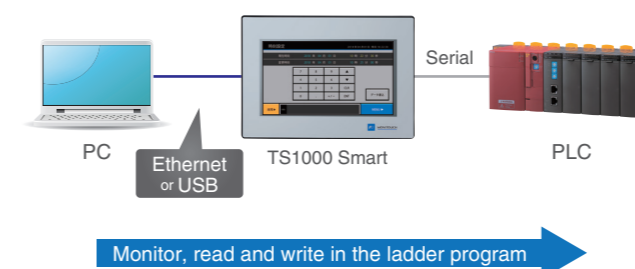
* With TS1070S, up to 3 models can be connected.

02 Expanded Connectivity

- USB port (USB Ver. 2.0 compatible)
USB port is built-in standard. Use the Type A and Type mini-B to connect to a wide range of devices.



- Ladder transfer
Monitor, read and write in the ladder program by computer via TS1000 Smart.
Choose from either Ethernet or USB to connect between the computer and TS1000 Smart.



03 Trend Sampling

TS1000 Smart series chronologically records a broad-range of data that changes over time to display as trend graphs.

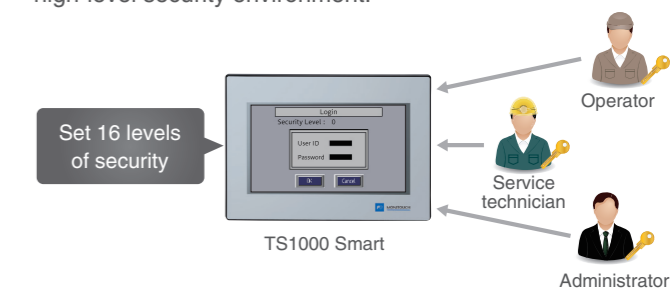
- Enlarged Display Support

Enlarge the display for a particular area of the screen to verify changing waveforms of trend graphs in even more detail.



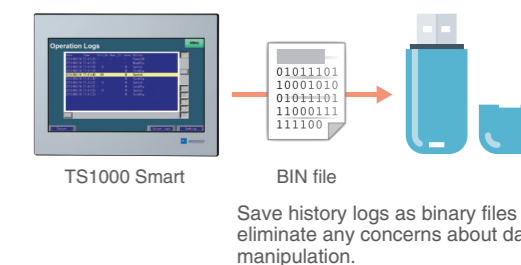
04 Security Features

Restrict functions according to the user to configure a high-level security environment.



05 Operation Log

Record chronological on-screen input, from switch operations to numerical inputs. Combine the operation log with security features and review attribution information to assist in identifying the cause of errors as well as aid in other diagnostics.



06 Multilanguage

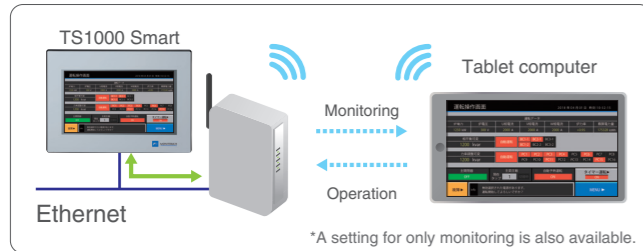
Easily toggle between up to 16 on-screen languages from a single screen to eliminate the need to sort and manage files for each language.



Compatible fonts:
Japanese, English/Western Europe, Chinese (Traditional), Chinese (Simplified), Korean, central European alphabets, Cyrillic alphabets, Greek, Turkish, and Baltic alphabets

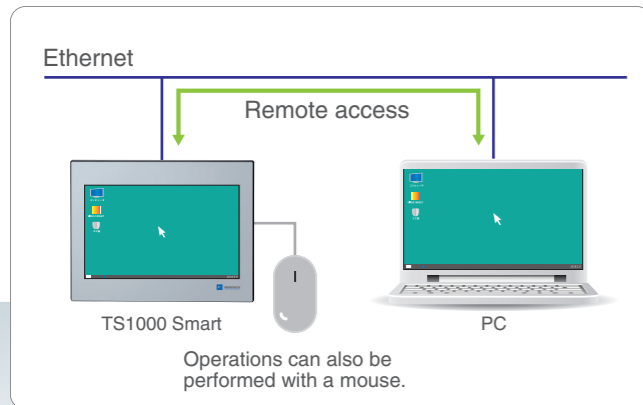
01 VNC Server

Easily setup the VNC viewer tool on a computer to monitor and operate TS1000 Smart screens on the factory floor via the same computer over Ethernet connection. In addition, monitoring and operations can be easily conducted from a tablet device over wireless router.



02 Remote Desktop*

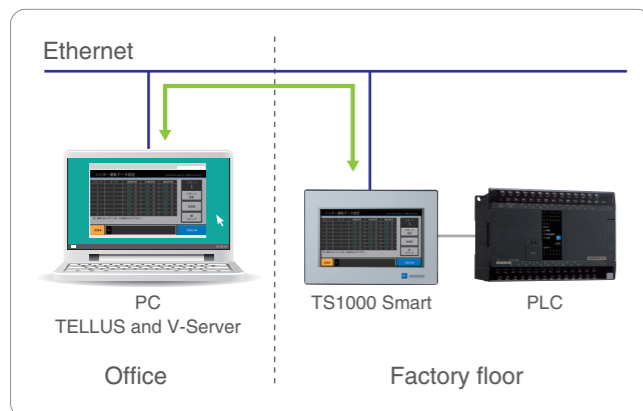
Connect via Ethernet to display and operate the server directly using TS1000 Smart.



*A license for V-RemoteDT (usage license) is required.

03 Remote Maintenance

Use the TELLUS application software to easily monitor and operate TS1000 Smart screen and PLC information remotely at low cost.



A Wealth of Network Features to Connect via Ethernet

*None of the features on this page are included with TS1070S.

TS1070Si

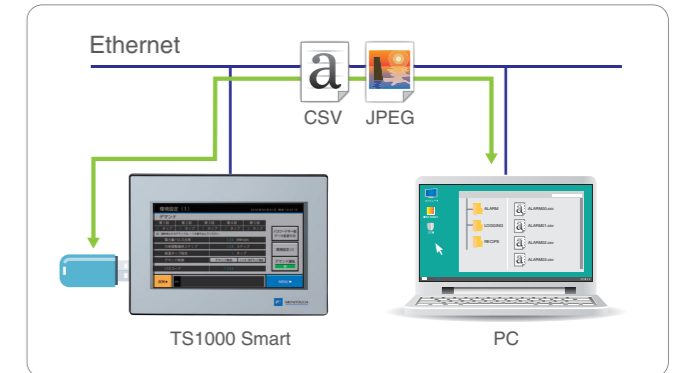


TS1100Si



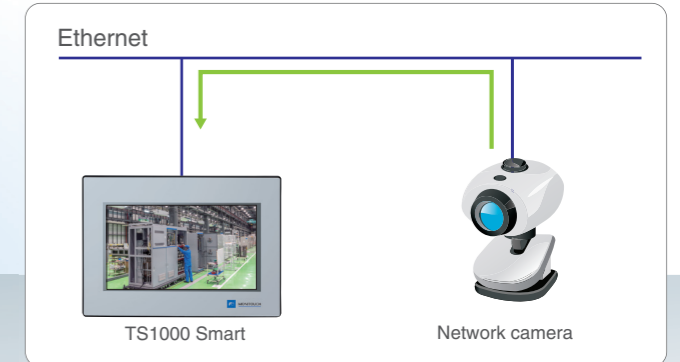
04 FTP Server

Use FTP client tools on a computer to read and write to USB memory mounted on TS1000 Smart.



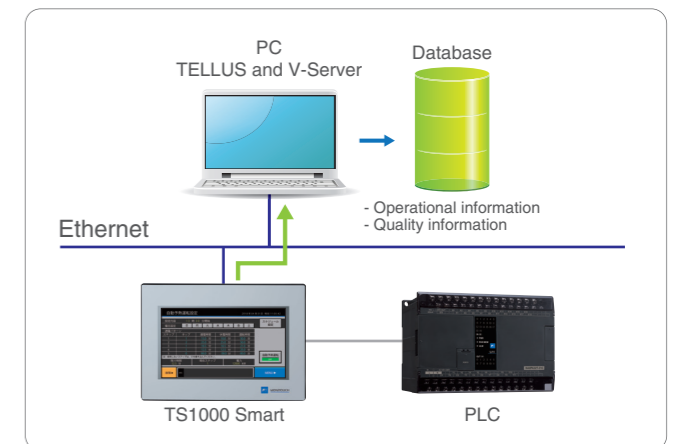
05 Network Camera

Display video from a network camera connected via Ethernet with TS1000 Smart. TS1000 Smart can also monitor factory floors.



06 MES (Manufacturing Execution System)

Collect broad information to store in the server database from production performance to defects and the causes of stoppages with TS1000 Smart through the V-Server.



Application software to connect offices and factory floors at minimal cost

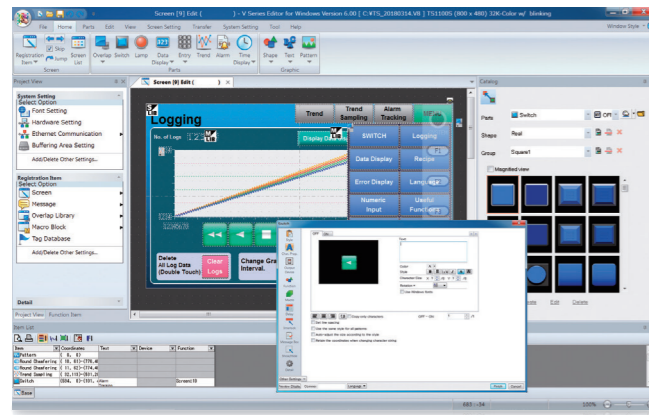
TELLUS and V-Server

The VNC server feature is a remote monitoring and management system able to collect real-time information about factory floors, including data aggregation and data management, via the Internet whether at the office or from overseas.



Catalog No. 9022NE2

Achieve Sleeker Screens with Easy-to-Understand Operations



V-SFT Ver. 6

01 Sophisticated Line-up of Icons

V-SFT Ver. 6 offers a combination of real sign and plain icons that allow users to easily create more sophisticated screens than ever before.



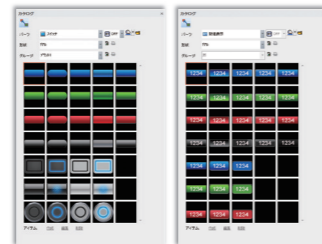
Realizing the Creation of Sophisticated Screens

Computer	PC/AT compatible computer running Windows
Operating system*	Windows XP/XP 64Edition/Windows Vista (32bit, 64bit)/Windows 7 (32bit, 64bit)/Windows 8 (32bit, 64bit)/Windows 8.1 (32bit, 64bit)/Windows 10 (32bit, 64bit)
CPU	Pentium 4 2.0 GHz or higher is recommended
Memory	2.0 GB or higher
Hard disc	When installed: 2.0 GB or higher
Disc device	DVD-ROM drive
Display	1,024 x 768 (XGA) resolution or higher
Display colors	High color (16 bits) or higher
Other	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.

Plain Icons

A wide range of icon designs have been newly added with a design that closely resembles smartphones and other familiar devices.



Real Icons

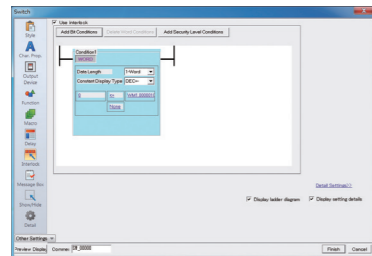
V-SFT expands conventional real icons even further.



Icons with a rich design
Icons with a flat design

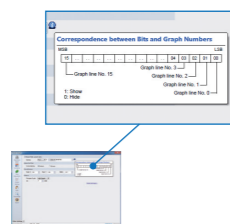
02 Expands Interlock Settings

Set the interlock via the ladder diagram display. The condition settings are easy to understand and convenient even when setting multiple conditions.



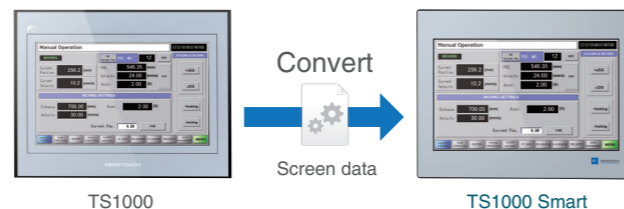
03 Supports Configuration with Tool Hints

Comprehensive tool hints throughout the software support the programming of applications. Easily configure settings without a manual by simply moving the mouse close to a setting to automatically display a supplementary description.



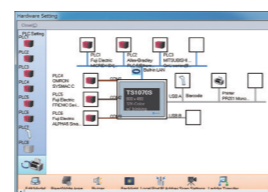
04 Supports Conversion from TS1000 Series

Screen data from previous models created in older versions of V-SFT can be converted in its present form to data for the current model. This allows users to leverage their screen data assets from previous models.



05 Intuitively Capture the Connection Device Configuration

The visual representation of the hardware settings make clear which devices are connected to TS1000 Smart.



Motion System Driving the Best Performance Together with TS1000 Smart Series

Programmable Controller **MICREX-SX Series**

SPF

Achieves excellent cost performance
Flexibly supports machine based systems

- ◆ High-speed, high-functioning computing performance
- ◆ Variety of options for flexible applications
- ◆ 200kHz, compatible with up to 4-axis servo systems



Catalog No. 22B1-E-0019



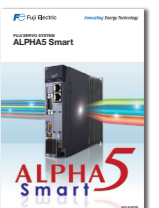
MICREX-SX SPF Plus provides advanced motion control, such as synchronous and circular interpolation controls.

Fuji Servo System

ALPHA5 Smart

Servo System with Enhanced Ease-of-Use

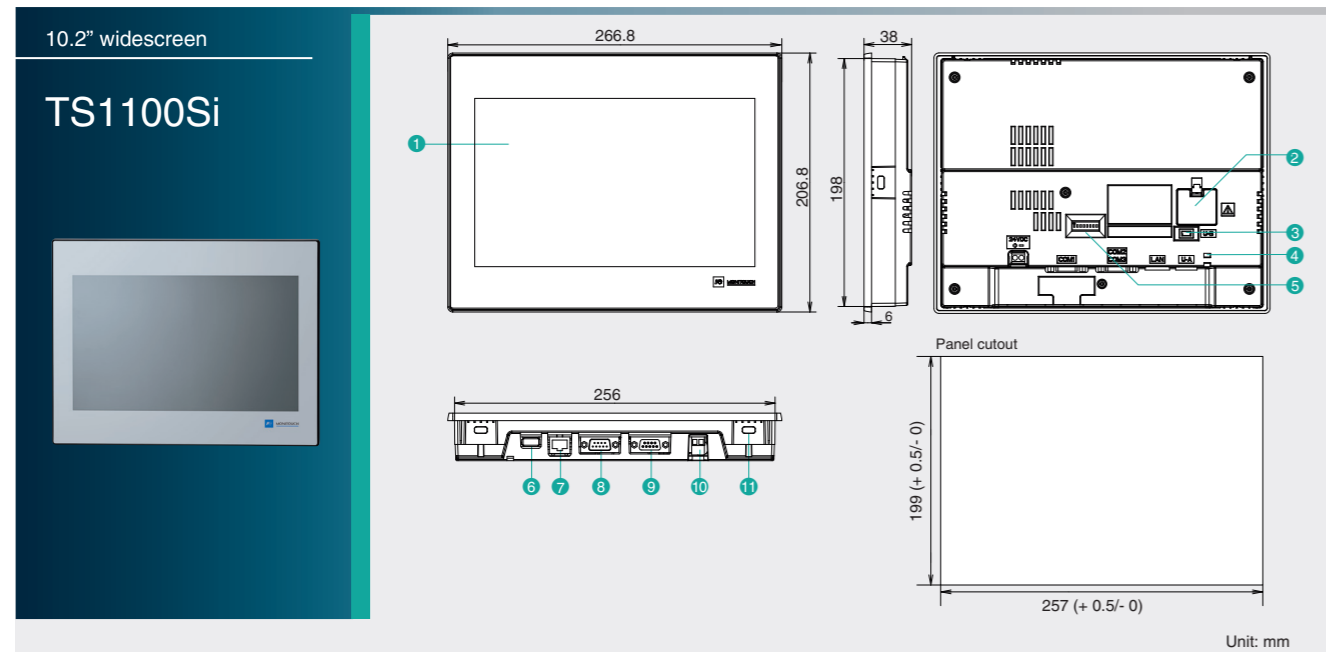
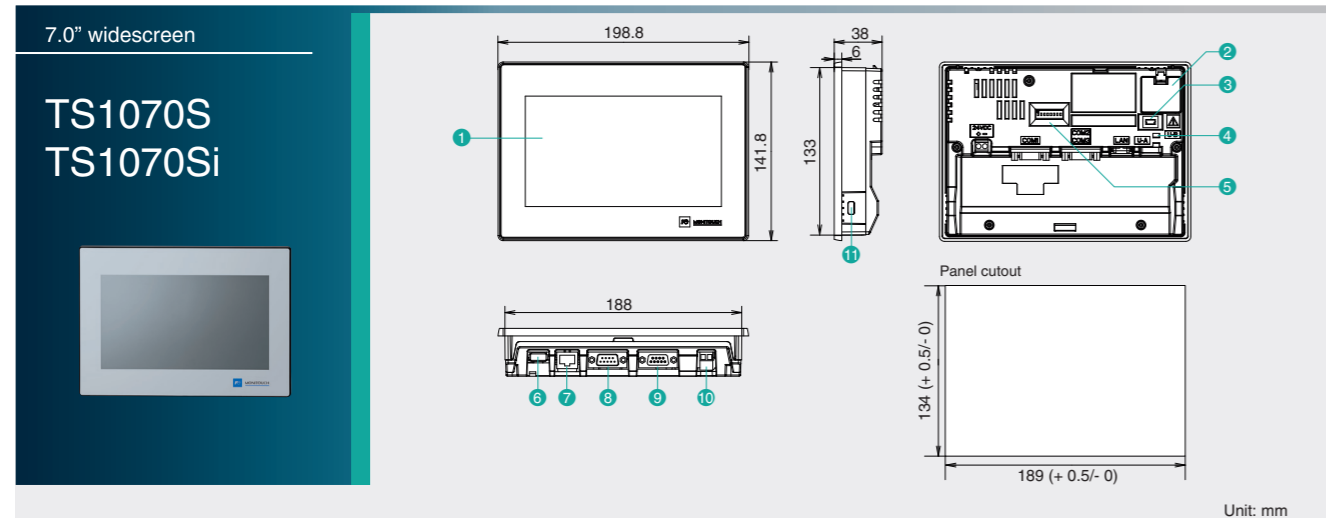
- ◆ High-speed, high precision positioning
 - Frequency response 1500Hz
 - Max motor speed 6000r/min
 - High resolution encoder
 - 18bit ABS/INC 262,144 pulse
 - 20bit INC 1,048,576 pulse
- ◆ Higher cost performance with original main feature
- ◆ New servo operator offers improved usability



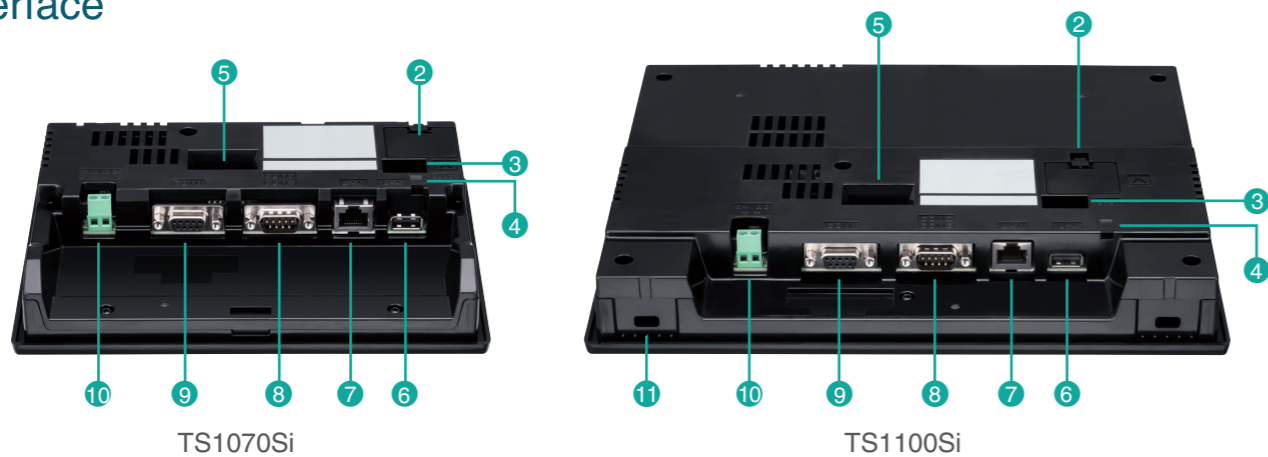
Catalog No. 24C1-E-0010



Dimensions



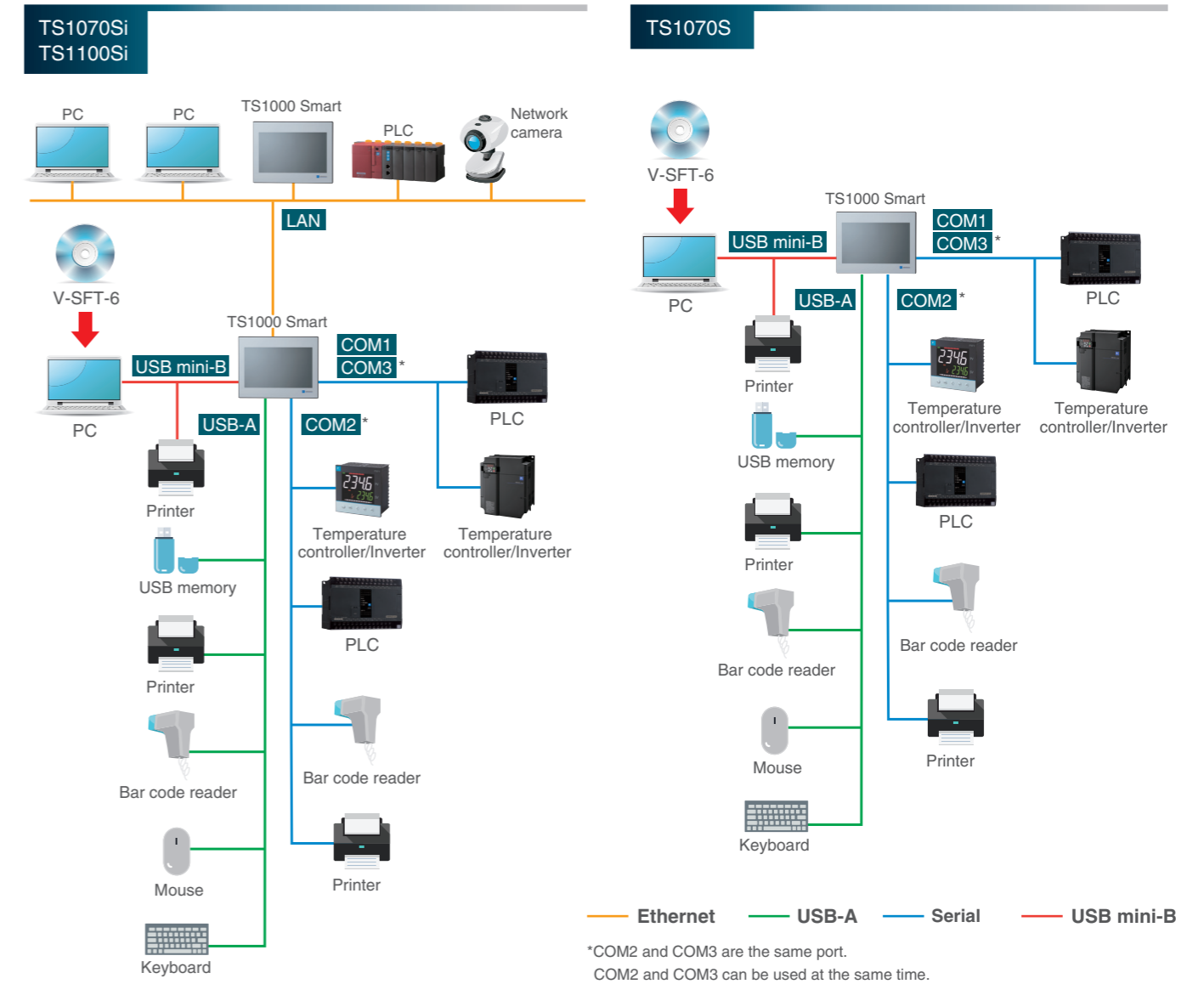
Interface



- 1 Display
- 2 Battery compartment
- 3 USB mini-B (U-B)
- 4 USB cable retention
- 5 DIP switch
- 6 USB-A (U-A)
- 7 100BASE-TX/10BASE-T connector (LAN)
*Only TS1070Si/TS1100Si

- 8 RS-232C/RS-422/RS-485 connector (COM2/COM3)
- 9 RS-422/RS-485 connector (COM1)
- 10 Power input terminal block
- 11 Mounting point

System Configuration



Optional Accessories

Terminal Converter TC-D9

Use the terminal converter if the communication device is connected with TS1000 Smart series via the RS-422/485 block. (COM1)



Waterproof Gasket TS1070S-WP/TS1100S-WP

Use the waterproof gasket if an IP65 protective structure is necessary. This gasket can be used regardless of the Ethernet connection.



Cable for USB-A Port UA-FR

The cable is used when connecting the USB-A (sleeve) port via the board. (Cable length: 1 m)



Connection Device List (PLC)

Manufacturer	Models
Fuji Electric	MICREX-F series
	MICREX-F series V4-compatible
	SPB (N mode) & FLEX-PC series
	SPB (N mode) & FLEX-PC CPU
Allen-Bradley	MICREX-SX SPH/SPB/SPM/SPE/SPF series
	MICREX-SX SPH/SPB/SPM/SPE/SPF CPU
	MICREX-SX (Ethernet)
	PLC-5
Automationdirect	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 (Ethernet)
	Micro800 Controllers
Azbil	Micro800 Controllers (Ethernet TCP/IP)
	Direct LOGIC (K-Sequence)
	Direct LOGIC (Ethernet UDP/IP)
	Direct LOGIC (MODBUS RTU)
BECKHOFF	MX series
	BMx-x-PLC
CIMON	ADS protocol (Ethernet)
	BP series
	CP series
DELTA	S series
	S series (Ethernet)
EATON Cutler-Hammer	DVP series
	DVP series (MODBUS ASCII)
	DVP series (MODBUS TCP/IP)
EMERSON	ELC
	EC10/20/20H (MODBUS RTU)
FANUC	Power Mate
	FACON FB series
FESTO	FEC
	APC series Controller
GE Fanuc	90 series
	90 series (SNP-X)
	90 series (SNP)
	90 series (Ethernet TCP/IP)
Hitachi	RX3i (Ethernet TCP/IP)
	HIDIC-S10/2a,S10mini
	HIDIC-S10/2a,S10mini (Ethernet)
	HIDIC-S10/4a
Hitachi Industrial Equipment Systems	HIDIC-S10V
	HIDIC-S10V (Ethernet)
	HIDIC-H
	HIDIC-H (Ethernet)
HYUNDAI	HIDIC-EHV
	HIDIC-EHV (Ethernet)
	H15 Robot (MODBUS RTU)
	H14 Robot (MODBUS RTU)
IDEC	MICRO 3
	MICRO Smart
Jetter	MICRO Smart pentra
	JetControl series2/3 (Ethernet UDP/IP)
JTEKT	TOYOPUC
	TOYOPUC (Ethernet)
	TOYOPUC (Ethernet PC10 mode)
	TOYOPUC-Plus
KEYENCE	TOYOPUC-Plus (Ethernet)
	TOYOPUC-Nano (Ethernet)
	KZ series Link
	KZ-A500 CPU
	KZ/KV series CPU
	KZ24/300 CPU
	KV10/24 CPU
	KV-700
	KV-700 (Ethernet TCP/IP)
	KV-1000
KV-1000 (Ethernet TCP/IP)	
KOYO ELECTRONICS	KV-3000/5000
	KV-3000/5000 (Ethernet TCP/IP)
	KV-7000 (Ethernet TCP/IP)
	SU/SG
LS	SR-T (K protocol)
	SU/SG (K-Sequence)
	SU/SG (MODBUS RTU)
	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	
None	XGT/XGK series CPU
	XGT/XGK series (Ethernet)
	XGT/XGI series CNET
	XGT/XGI series CPU
	XGT/XGI series (Ethernet)
	A series link
	QnA series link
	QnA series (Ethernet)
	QnH (Q) series link
	QnH (Q) series CPU
QnU series CPU	
Q00J/00/01 CPU	
None	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)
	L series link
	L series (built-in Ethernet)
	L series CPU
FX2N/1N series CPU	
FX1S series CPU	
FX series link (A protocol)	

As of April 2018

Manufacturer	Models
MITSUBISHI ELECTRIC	FX-3U/3UC/3G series CPU
	FX-3U/3GE series (Ethernet)
	FX-3U/3UC/3UG series link (A protocol)
	FX-5U/5UC series
	FX-5U/5UC series (Ethernet)
	A-link + Net10
	Q170MCP (multi CPU)
	Q170 series (multi CPU) (Ethernet)
	iQ-R series (Built-in Ethernet)
	iQ-R series link
MODICON	iQ-R series (Ethernet)
	MODBUS RTU
MOELLER	PS4
	SYSMAC C
OMRON	SYSMAC CV
	SYSMAC CS1/CJ1
	SYSMAC CS1/CJ1 DNA
	SYSMAC CS1/CJ1 (Ethernet)
	SYSMAC CS1/CJ1 (Ethernet Auto)
	SYSMAC CS1/CJ1 DNA (Ethernet)
	NJ Series (EtherNet/IP)
	FP series (RS232C/422)
	FP series (TCP/IP)
	FP series (UDP/IP)
Panasonic	FP-X (TCP/IP)
	FP7 series (RS232C/422)
	FP7 series (Ethernet)
	NX7/NX Plus series (70P/700P/CCU+)
RS Automation	N7/NX series (70/700/750/CCU)
	NX700 series (Ethernet)
	X8 series
	X8 series (Ethernet)
SAIA	PCD
	PCD S-BUS (Ethernet)
SAMSUNG	SPC series
	N plus
SHARP	SECNET
	JW series
	JW100/70H COM port
	JW20 COM port
Siemens	JW series (Ethernet)
	JW300 series
	JW311/312/321/322 series (Ethernet)
	JW331/332/341/342/352/362 series (Ethernet)
	S5 PG port
	S7
	S7-200 PPI
	S7-200 (Ethernet ISOTCP)
	S7-300/400 MPI
	S7-300/400 (Ethernet ISOTCP)
S7-300/400 (Ethernet TCP/IP protocol)	
S7-1200/1500 (Ethernet ISOTCP)	
TI500/505	
TI500/505 V4 Compatible	
SINFONIA TECHNOLOGY	SELMART
TECO	TP-03 (MODBUS RTU)
Telemecanique	TSX Micro
TOSHIBA	T series /V series (T compatible)
	T series /V series (T compatible) (Ethernet UDP/IP)
	EX series
	nv series (Ethernet UDP/IP)
TOSHIBA MACHINE	TC200
	μ GPCsx series
TOYO DENKI	μ GPCsx CPU
	μ GPCsx series (Ethernet)
Turck	BL series Distributed I/O (MODBUS TCP/IP)
	Ultra Instruments
UNITRONICS	UIC CPU (MODBUS ASCII)
	M90/M91/Vision series (ASCII)
VIGOR	Vision series (ASCII Ethernet TCP/IP)
	M series
WAGO	750 series (MODBUS RTU)
	750 series (MODBUS Ethernet)
XINJE	XC series (MODBUS RTU)
	Memobus
Yaskawa Electric	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)
	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)	
None	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

Connection Device List (Temperature Controller/Servo/Inverter)

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)
	FRENIC5000 G11S/P11S
	FRENIC5000 G11S/P11S (MODBUS RTU)
	FRENIC5000 VG7S (MODBUS RTU)
	FRENIC-Ace (MODBUS RTU)
	FRENIC-Eco (MODBUS RTU)
	FRENIC-HVAC/AQUA (MODBUS RTU)
	FRENIC-MEGA (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-α series
	FALDIC-W series
	PH series
	PHR (MODBUS RTU)
	WA5000
	APR-N (MODBUS RTU)
	ALPHA5 (MODBUS RTU)
	ALPHA5 Smart (MODBUS RTU)
	WE1MA (Ver. A) (MODBUS RTU)
	WE1MA (Ver. B) (MODBUS RTU)
	WSZ series
	WSZ series (Ethernet)
	4263 series
Stepping Motor	
Azbil	SDC10
	SDC15
	SDC20
	SDC21
	SDC25/26
	SDC30/31
	SDC35/36
	SDC45/46
	SDC40A
	SDC40G
DMC10	
DMC50 (COM)	
AHC2001	
AHC2001+DCP31/32	
DCP31/32	
NX (CPL)	
NX (MODBUS RTU)	
NX (MODBUS TCP/IP)	
AD4402 (MODBUS RTU)	
AD4404 (MODBUS RTU)	
Presence PLUS (Ethernet/IP (TCP/IP))	
A&D	Indra Drive
	LT400 series (MODBUS RTU)
Banner	DP1000
	DB1000B (MODBUS RTU)
	KR2000 (MODBUS RTU)
	LT230 (MODBUS RTU)
Bosh Rexroth	LT300 (MODBUS RTU)
	LT830 (MODBUS RTU)
CHINO	PMAC
	PMAC (Ethernet TCP/IP)
	TTC2100
	R-BLT
DELTA TAU DATA SYSTEMS	SJ300 series
	SJ700 series
Gammaflux	X-SEL controller
	ROBO CYLINDER (RCP2/ERC)
High-Pressure Gas Industry	ROBO CYLINDER (RCS/E-CON)
	PCON/ACON/SCON (MODBUS RTU)
Hitachi Industrial Equipment Systems	IBFL-TC
	Servo Drive 9400 (Ethernet TCP/IP)
IAI	FR-*500
	FR-V500
KOGANEI	MR-J2S-*A
	MR-J2S-*CL
Lenze	MR-J3-*A
	MR-J3-*T
MITSUBISHI ELECTRIC	MR-J4-*A
	FR-E700
	J124-04x series
	R1M series (MODBUS RTU)
	E5AK
	E5AK-T
	E5AN/E5EN/E5CN/E5GN
	E5AR/E5ER
	E5CK
	E5CK-T
E5CN-HT	
None	E5EK
	E5ZD
	E5ZE
	E5ZN
	V600/620/680
	KM20
	KM100
	V680S (Ethernet TCP/IP)
	High-efficiency AR series (MODBUS RTU)
	CRK series (MODBUS RTU)
MOOG	LP-400
	KW series
M-SYSTEM	

As of April 2018

Manufacturer	Models
Panasonic	MINAS A4 series
	SR-Mini (MODBUS RTU)
	CB100/CB400/CB500/CB700/CB900 (MODBUS RTU)
	SR-Mini (Standard Protocol)
RKC	REX-F400/F700/F900 (Standard Protocol)
	REX-F9000 (Standard Protocol)
	SRV (MODBUS RTU)
	MA900/MA901 (MODBUS RTU)
RS Automation	SRZ (MODBUS RTU)
	FB100/FB400/FB900 (MODBUS RTU)
	CSD5 (MODBUS RTU)
	Moscon-F50 (MODBUS RTU)
SANMEI	Cuty Axis
	DC AUTO (HKD type)
SanRex	DS-30D
	DS-32D
SHARP	SHIMADEN standard protocol
	C series
SHIMADEN	FC series
	GC series
	DCL-33A
	JCx-300 series
	PC-900
	PCD-33A
	ACS-13A
	ACD/ACR series
	WCL-13A
	Siemens
SUS	XA-A*
	TTM-000
TOHO	TTM-00BT
	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-F51
	VF-MB1
VF-nC1	
VF-nC3	
TOSHIBA MACHINE	VELCONIC series
	G-TRAN series
ULVAC	F340A
	F371
	F800
	F720A
UNIPULSE	F805A
	RCX142
YAMAHA	DX200 (High-Speed Ethernet)
	UT100
Yaskawa Electric	UT750
	UT550
	UT520
	UT350
	UT320
	UT2400/2800
	UT450
	UT32A/35A (MODBUS RTU)
	UT52A/55A (MODBUS RTU)
	UT75A (MODBUS RTU)
μR10000/20000 (Ethernet TCP/IP)	
None	MODBUS RTU
	MODBUS TCP/IP (Ethernet)

*The names of the companies and products included in this document are the trademarks or registered trademarks of their respective companies.
*TS1070S does not support an Ethernet connection.

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.

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