



# MONITOUCH V9 Series V9120 OPERATING INSTRUCTIONS

Thank you for selecting the MONITOUCH V9120 series. Make sure that the delivered unit conforms to your requirements and check for any missing or damaged parts. Before using the unit, be sure to thoroughly read this document and the V9 Series Hardware Specifications manual to ensure proper operation.

## Accessories

V9120 OPERATING INSTRUCTIONS (this manual):	1 copy
Fixtures:	4 pcs.
Cable tie for securing USB cables:	1 pc.

## Model



1	Screen size	12	12.1-inch
2	Touch switch specifications	0	Analog resistance film type
3	Functional capabilities	i	Includes built-in LAN port
4	Display specifications	S	TFT color LCD (SVGA, 16.77 million colors*)
		None	No wireless LAN I/F
5	Wireless LAN I/F	R	Includes wireless LAN I/F
		None	No extended LAN I/F
6	Extended LAN I/F	L	Includes extended LAN I/F
		None	100 to 240 VAC type
7	Power supply specifications	None	100 to 240 VAC type
		D	24 VDC type

\* For the display of pictures, 3D parts and video display only. Other parts are displayed in 65,536 colors.

## Notes on Safe Usage

This document describes various precautions categorized under the following two levels with the signal words "Danger" and "Caution."

	<b>DANGER</b>	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	<b>CAUTION</b>	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and could cause property damage.

Note that even items indicated with may also result in a serious accident.

### DANGER

- Never use the output function of MONITOUCH for operations that may threaten human life or cause damage to the system, such as switches to be used in case of emergency. Please design the system so that it can cope with touch switch malfunctions. A touch switch malfunction may result in machine accidents or damage.
- Turn off the power supply when setting up the unit, connecting new cables, or performing maintenance or inspections. Otherwise, you may receive an electrical shock or damage may occur.
- Never touch any terminals while the power is on. Otherwise, you may receive an electrical shock.
- Always cover the terminals on the unit before turning the power on and operating the unit. Without the terminal cover in place, you may receive an electric shock.
- The liquid crystal in the LCD panel is a hazardous substance. If the LCD panel is damaged, do not ingest the leaked liquid crystal. If leaked liquid crystal makes contact with skin or clothing, wash it away with soap and water.
- Never disassemble, recharge, deform by pressure, short-circuit, reverse the polarity of the lithium battery, nor dispose of the lithium battery in fire. Failure to follow these conditions may lead to explosion or ignition.
- Never use a lithium battery that is deformed, leaking, or shows any other signs of abnormality. Failure to follow these conditions may lead to explosion or ignition.
- Even if a screen display becomes dim, the touch switch function remains active. Please do not touch the dim screen, it may cause an accident or damage to your machine by malfunction.

### CAUTION

- Check the appearance of the unit after unpacking. Do not use the unit if any damage or deformation is found. Failure to do so may lead to fire, damage, or malfunction.
- For use in a facility or as part of a system related to nuclear energy, aerospace, medical, traffic equipment, or mobile installations, please consult your local distributor.
- Operate (or store) MONITOUCH under the conditions indicated in this document and related manuals. Failure to do so could cause fire, malfunction, physical damage or deterioration.
- Observe the following environmental restrictions on use and storage of the unit. Otherwise, fire or damage to the unit may result.
  - Avoid locations where there is a possibility that water, corrosive gas, flammable gas, solvents, grinding fluids, or cutting oil can come into contact with the unit.
  - Avoid high temperatures, high humidity, and outside weather conditions, such as wind, rain, or direct sunlight.
  - Avoid locations where excessive dust, salt, and metallic particles are present.
  - Avoid locations where vibrations or physical shocks may be transmitted to the unit.
- Equipment must be correctly mounted so that the main terminal of MONITOUCH will not be touched inadvertently. Otherwise, you may receive an electric shock or an accident may occur.
- Tighten the fixtures on MONITOUCH to an equal torque of 5.31 lbf-in (0.6 N·m). Excessive tightening may distort the panel surface. Loose mounting screws may cause the unit to fall down, malfunction, or short-circuit.
- Periodically check that terminal screws on the power supply terminal block and fixtures are firmly tightened. Using the unit with loose screws or nuts may result in fire or malfunction.
- Tighten the terminal screws on the power supply terminal block to an equal torque of 7.1 to 8.8 lbf-in (0.8 to 1.0 N·m). Improper tightening of screws may result in fire, malfunction, or other serious trouble.
- MONITOUCH has a glass screen. Do not drop or impart any physical shock to the unit. Otherwise, the screen may be damaged.
- Correctly connect the cables to the terminals of MONITOUCH in accordance with the specified voltage and wattage. Overvoltage, overwattage, or incorrect cable connection may cause fire, malfunction, or damage to the unit.
- Always ground MONITOUCH. The FG terminal must be used exclusively for MONITOUCH with the level of grounding resistance less than 100 Ω. Otherwise, electric shock or a fire may occur.
- Prevent any conductive particles from entering into MONITOUCH. Failure to do so may lead to fire, damage, or malfunction.
- After wiring is finished, remove the sheet used as a dust cover before starting to operate MONITOUCH. Operation with the dust cover attached may result in accidents, fire, malfunction, or other trouble.
- Do not attempt to repair, disassemble, or modify MONITOUCH yourself. Contact Hakko Electronics or the designated contractor for repairs. Otherwise, such action may cause a malfunction.
- Hakko Electronics Co., Ltd. is not responsible for any damages resulting from repair, overhaul, or modification of MONITOUCH that was performed by an unauthorized person.
- Do not use sharp-pointed tools to press touch switches.
- Only experts are authorized to set up the unit, connect cables, and perform maintenance and inspection.
- Note that the lithium battery contains combustible material such as lithium and organic solvents. Mishandling may cause heat, explosion, or ignition resulting in fire or injury. Read related manuals carefully and handle the lithium battery correctly as instructed.
- Take safety precautions during operations such as changing settings when the unit is running, forced output, and starting and stopping the unit. Any misoperations may cause unexpected machine movement, resulting in machine accidents or damage.
- In facilities where a failure of MONITOUCH could lead to accidents threatening human life or other serious damage, make sure that such facilities are equipped with adequate safeguards.
- At the time of disposal, MONITOUCH must be treated as industrial waste.
- Before touching MONITOUCH, discharge static electricity from your body by touching grounded metal. Excessive static electricity may cause malfunction or trouble.
- Insert an SD card into the unit in the same orientation as pictured on the unit. Failure to do so may damage the SD card or the slot on the unit.
- The SD card access LED flashes red when the SD card is being accessed. Never remove the SD card or turn off power to the unit while the LED is flashing. Doing so may destroy the data on the SD card. Check that the LED has turned off before removing the SD card or turning off the power to the unit.
- If a LAN cable is inserted into the MJ1 or MJ2 connector, the device on the other end may be damaged. Check the connector names on the unit and insert cables into the correct connectors.
- Be sure to remove the protective sheet that is attached to the touch panel surface at delivery before use. Using MONITOUCH with the protective sheet attached may result in incorrect touch switch activation.

- Do not press two or more positions on the screen at the same time. If two or more positions are pressed at the same time, the switch located between the pressed positions may be activated.

## Notes on LCD

- Tiny spots (dark or luminescent) may appear on the display due to the liquid crystal characteristics. Please note that this is not a fault or malfunction of MONITOUCH.

## UL/cUL Approval (DC power supply type only)

The V9120iSD complies with the following four standards (File No.: E313548 (UL508), File No.: E315977 (ANSI/ISA 12.12.01)).

- UL 508 Industrial Control Equipment
- ANSI/ISA 12.12.01 Electrical Equipment for Use in Class I, Division 2 Hazardous Locations
- CSA-C22.2 No. 142-M1987 Process Control Equipment
- CSA-C22.2 No. 213-M1987 Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations

The V9120iRSD and V9120iSLD complies with the following two standards (File No.: E313548 (UL508)).

- UL 508 Industrial Control Equipment
- CSA-C22.2 No. 142-M1987 Process Control Equipment

## ANSI/ISA 12.12.01/CSA-C22.2 No. 213 Compliance and Handling Cautions

- Power, input and output wiring must be in accordance with Class I, Division 2 wiring methods - Article 501 - 10(B) of the National Electrical Code, NFPA 70.
- This product is certified for use in Class I, Division 2, Groups A, B, C or D hazardous location or non-hazardous locations.
- WARNING: Explosion Hazard: Substitution of components may impair compliance to Class I, Division 2.
- WARNING: Explosion Hazard: Do not disconnect the device while the circuit is alive unless area is known to be non-hazardous. Perform system set-up or diagnostics of the SD card port, USB-A, USB mini-B ports and Audio port only in a non-hazardous location.
- WARNING: Explosion Hazard: For use in a hazardous location, turn off the power before replacing or wiring modules.
- Do not replace a battery in a hazardous location.
- In the case of use in a hazardous location, be sure to check that the externally connected unit and each interface have been secured with screws or have been locked. In a hazardous location, it is impossible to insert or remove a cable from the applicable port. Be sure to check that the location is non-hazardous before inserting or removing it.

## UL Listing Application for Systems Equipped with MONITOUCH

- The back panel of MONITOUCH is not an approved enclosure. For UL listing application, embed MONITOUCH in your system and configure an enclosure so that the entire system will be UL-approved.
- Use MONITOUCH indoors only.
- For use on a flat surface of an indoor only Type 1, 4X, 12 or 13 enclosure.
- Use a bare cable for wiring the power supply.

Screw size	Tightening torque	Power cable
M3.5	7.1 lbf-in (0.8 N·m)	AWG16 to AWG14, Rated temperature 60 °C Use copper conductor only.

- Always use a Class 2 power supply for the 24 VDC power unit.

## CE Marking (DC power supply type except V9120iSRD)

- The V9120 series complies with the following EMC directives and RoHS directives. EN61000-6-2, EN61000-6-4, EN50581
- The V9120 series is identified as a class-A product in industrial environments. In the case of use in a domestic environment, the unit is likely to cause electromagnetic interference. Preventive measures should thereby be taken appropriately.

## General Specifications

Item	V9120iS	V9120iSD
Conformance Standards	KC	CE <sup>1)</sup> , KC <sup>2)</sup> , UL/cUL (UL508, ANSI/ISA <sup>3)</sup> , Regarding Radio Act and wireless license (JPN: TELEC) <sup>4)</sup>
Rated Voltage	100 to 240 VAC	24 VDC
Acceptable Voltage Range	100 to 240 VAC +10 %, -15 %	24 VDC ±10 %
Acceptable Momentary Power Failure	Within 20 ms (100 VAC or more)	Within 1 ms
Power Consumption (Maximum Rating)	70 VA or less	28 W or less
Rush Current	30 A or less, 3 ms (surrounding air temperature at 25 °C)	18 A or less, 5 ms (surrounding air temperature at 25 °C)
Withstand Voltage	AC external terminals to FG: 1500 VAC for 1 minute	DC external terminals to FG: 500 VAC for 1 minute
Insulation Resistance	AC external terminals to FG: 500 VDC, 10 MΩ or higher	DC external terminals to FG: 500 VDC, 10 MΩ or higher
Surrounding Air Temperature	0 °C to +50 °C <sup>5)</sup>	
Storage Surrounding Air Temperature	-10 °C to +60 °C <sup>6)</sup>	
Operational Ambient Humidity	85 % RH or less (without dew condensation) <sup>7)</sup>	
Storage Ambient Humidity	85 % RH or less (without dew condensation) <sup>7)</sup>	
Altitude	2000 m or less	
Atmosphere	No corrosive gas, no excessive dust, and no conductive dust	
Vibration Resistance	JIS B 3502 (IEC61131-2) compliant Vibration frequency: 5 to 9 Hz, Half-amplitude: 3.5 mm, Vibration frequency: 9 to 150 Hz, Constant acceleration: 9.8 m/s <sup>2</sup> (1.0 G), X, Y, and Z: 3 directions (10 times each)	
Shock Resistance	JIS B 3502 (IEC61131-2) compliant Peak acceleration: 147 m/s <sup>2</sup> (15 G), X, Y, and Z: 3 directions, 3 times each (18 times in total)	
Noise Resistance	1500 Vp-p (pulse width 1 μs, rising time: 1 ns)	
Static Electricity Discharge Resistance	Compliant with IEC61000-4-2, contact: 6 kV, air: 8 kV	
Overvoltage Category <sup>15)</sup>	II	
Contamination Level <sup>16)</sup>	2	
Grounding	Less than 100 Ω, FG/SG separated	
Structure	Protection structure: front panel Type 4X/13 <sup>17)</sup> , complies with IP66 (when using waterproof gasket) rear case complies with IP20 in a body Mounting procedure: inserted into a mounting panel Sheet metal thickness: 1.5 to 4.0 mm <sup>18)</sup>	
Cooling System	Natural cooling	
Weight	Approx. 2.5 kg	
Dimensions W × H × D <sup>19)</sup>	327.8 × 261.0 × 54.9 mm	
Panel Cut-Out Dimensions	313.0 <sup>+0.5</sup> × 246.2 <sup>+0.5</sup> mm	
Material	PC resin	
Display Part	Surface Sheet (PC : 0.3 mm)	

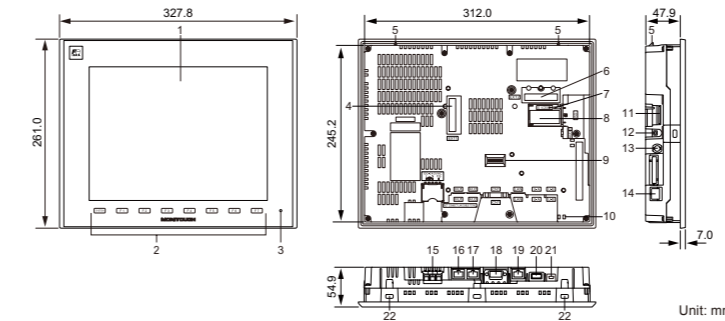
<sup>1)</sup> Except V9120iSRD  
<sup>2)</sup> V9120iSD only  
<sup>3)</sup> V9120iSRD only.  
 Regarding Radio Act and wireless license, refer to "About Wireless LAN on V9 Standard Model" instruction manual.  
<sup>4)</sup> Use MONITOUCH in an environment with a wet-bulb temperature of 39 °C or less. Otherwise, MONITOUCH may be damaged.  
<sup>5)</sup> This indicates the distribution section to which the unit is intended to be connected to within the path between the distribution of the public power network and machinery in the facility. "Category II" applies to devices supplied with power from mains sockets or similar points. The withstand surge voltage is 2,500 V for devices rated up to 300 V.  
<sup>6)</sup> This is an index that expresses the degree of conductive contamination in the environment where MONITOUCH is used.

\*Contamination level 2\* indicates conditions where only non-conductive contamination occurs. However, due to condensation, temporary conductive contamination may occur.

<sup>17)</sup> Only for UL508 compliant models

<sup>18)</sup> Even when the mounting panel thickness is within the specified range, the panel itself may warp depending on the material and size of the mounting panel. Use a panel that can withstand the forces of mounting.

## Names of Components and Dimensions



- Display
- Function switches
- Power lamp
- Communication interface connector (EXT1)
- Fall prevention tabs
- Connector for optional unit (EXT2)
- SD card access LED
- Battery holder
- DIP switches
- USB cable clamp hole
- SD card slot (SD)
- Audio output connector (AUDIO)
- Connector for dipole antenna with wireless LAN (WLAN)<sup>1)</sup>
- Extended LAN connector (LAN2)<sup>2)</sup>
- Power supply terminal block
- Modular jack (MJ1)
- Modular jack (MJ2)
- D-sub 9-pin connector (CN1)
- LAN connector (LAN)
- USB-A port (U-A)
- USB mini-B port (U-B)
- Mounting holes

<sup>1)</sup> V9120iSRD only  
<sup>2)</sup> V9120iSLD only

## D-sub 9-pin connector (CN1)

The CN1 connector is used for serial communication (RS-232C/RS-422/RS-485) with an external device.

CN1 (Female, inch screw thread)	Pin No.	RS-232C <sup>1)</sup>		RS-422/RS-485 <sup>1)</sup>	
		Signal	Description	Signal	Description
	1	-	Not used	+RD	Receive data (+)
	2	RD	Receive data	-RD	Receive data (-)
	3	SD	Send data	-SD	Send data (-)
	4	-	Not used	+SD	Send data (+)
	5	SG	Signal ground	SG	Signal ground
	6	-	Not used	+RS	Request to send (+)
	7	RS	Request to send	-RS	Request to send (-)
	8	CS	Clear to send	-	Not used
	9	-	Not used	+5 V	Use prohibited <sup>2)</sup>

- Select the signal level (RS-232C or RS-422/RS-485) using the screen configuration software or local mode on the V9 series unit. When selecting the RS-232C signal level, always set DIP switches 5 and 7 to OFF (see below).
- This is used when RS-422/RS-485 is selected. However, this is used as the power supply of the terminating resistance for communication with a specific device, and cannot be used as an external power supply.

## Modular Jacks (MJ1/MJ2)

The MJ1 and MJ2 connectors are used for serial communication (RS-232C/RS-485) with an external device. The MJ1 connector can also be used for screen program transfer.

MJ1/MJ2	Pin No.	Signal	Description	Pin No.	Signal	Description
	1	+RD/+SD	RS-485 data (+)	5	SG	Signal ground
	2	-RD/-SD	RS-485 data (-)	6		
	3	+5 V	Externally supplied	7	RD	RS-232C receive data
	4		+5 V <sup>1)</sup>	8	SD	RS-232C send data

<sup>1)</sup> For MJ1 and MJ2, the maximum allowable current is 150 mA in total.

## LAN Connector (LAN) / Extended LAN Connector (LAN2) V9120iSLD only

The LAN connector is used for Ethernet communication (10BASE-TX, 10BASE-T).

Specification: IEEE802.3 (u)-compliant, UDP/IP and TCP/IP support, Auto-MDIX and Auto-Negotiation function support

- MJ1/2 and LAN connector are 8-pin modular jacks. Check the connector names on the unit and insert cables into the correct connectors.
- Do not connect any peripheral device that will carry excess voltage to the LAN connector.

For more information on the LAN connectors and cables, refer to the separate V9 Series Hardware Specifications manual.

## Connector for Dipole Antenna with Wireless LAN (WLAN) V9120iSRD only

This connector is used for external dipole antenna with wireless LAN, "V9-ANT" (optional).

Specification: Reverse SMA jack

For more information on using wireless LAN, refer to the separate V9 Series Hardware Specifications manual.

## USB Ports (U-A/U-B)

These ports are used for connecting USB devices and a printer or transferring screen programs (USB mini-B only).  
Specification: Compliant with USB version 2.0

For more information on using USB ports and securing cables, refer to the separate V9 Series Hardware Specifications manual.

## Audio Output Connector (AUDIO)

This terminal is used for audio output.

Specification:  $\phi$ 3.5 stereo mini jack

For more information on the specifications for audio playback, refer to the separate V9 Series Hardware Specifications manual.

## DIP Switches

The dip switch settings are as follows. (The following figure shows the DIP switch settings upon delivery.)

Turn the power off before changing any DIP switch settings.

(Enlarged view)	No.	Description	No.	Description
	1	Automatic storage upload	5	+SD/-SD terminal resistance of CN1
	2		6	MJ1 terminal resistance
	3	Not used	7	+RD/-RD terminal resistance of CN1
	4		8	MJ2 terminal resistance

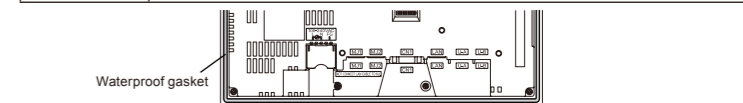
For more information, refer to the separate V9 Series Hardware Specifications manual.

## Mounting Procedure

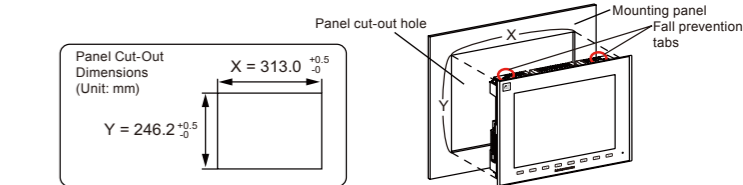
### Mounting Procedure

- Place the V9 series unit on a flat surface with the display facing down and insert the provided waterproof gasket into the groove around the unit.

- The unit will not be waterproof if the waterproof gasket is not correctly inserted into the groove.



- Mount the V9 series unit into the mounting panel (maximum thickness of 4.0 mm) while paying attention to the fall prevention tabs.
  - The V9 series unit can be mounted in upright, 90° left, and 90° right orientations.



- Insert two of the provided fixtures into the mounting holes at the top and bottom of the V9 series unit and tighten them with the tightening screws to secure the unit in place. (Tightening torque: 5.31 lbf-in (0.6 N·m))
  - Ground the mounting panel to prevent any buildup of static electricity.

## Mounting Angle

Install the unit within the angle range of 15 to 135 degrees.

Note that mounting angle will differ depending on the mounting orientation and whether power is supplied externally to the modular jacks (MJ1/MJ2) or USB-A port. For more information, refer to the separate V9 Series Hardware Specifications manual.

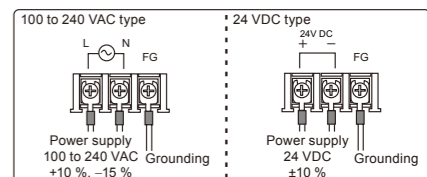
## Electrical Wiring and Grounding

- Electrical shock hazard! Shut off the power before connecting the power supply cable.

## Power Supply Cable Connection

- Connect the power supply cable to the terminal on the backside of the unit.
- When connecting the power supply cable, tighten the terminal screws to the following torque.

Screw size	Tightening torque
M3.5	7.1 - 8.8 lbf-in (0.8 - 1.0 N·m)



- The power supply must be used within allowable range of voltage fluctuation.
- Use a power supply with low noise between cables and between the ground and cables.
- Use the thickest power supply cable possible to minimize drops in voltage.
- Keep power supply cables away from high-voltage, large-current carrying cables.
- Be sure to attach the terminal cover to the terminal block.

## Grounding

- Be sure to establish a ground for MONITOUCH. (The level of grounding resistance should be less than 100 Ω.)

- An independent grounding must be used for the unit.
  - Use a grounding cable with a nominal cross section of more than 2 mm<sup>2</sup>.
  - Set the grounding point near the unit to reduce the length of grounding cables.
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## Notes on Usage of Lithium Battery

The battery provides backup power to the user memory area in SRAM (non-volatile memory SL and \$LD, logging/alarm data storage etc.) as well as the built-in clock.

- A battery is already installed upon delivery.
- This equipment is an open-type device meant to be installed in an enclosure suitable for the environment and is only accessible with the use of a tool.

Type CR2450S rated Max. 610 mAh. Max Abnormal Charging Current Min. 15mA  
For more information on battery specifications, replacement, and disposal, refer to the separate V9 Series Hardware Specifications manual.

## Note on the Directive 2006/66/EC

- The symbol mark on the right is valid for countries in the European Union only.
- The symbol mark on the right is according to the Directive 2006/66/EC Article 20 Information for end-users and Annex II.
- The symbol mark on the right means that battery, at the end-of-life, should be disposed of separately from your household waste.
- If a chemical symbol is printed beneath the symbol on the right, this chemical symbol means that the battery contains a heavy metal at a certain concentration. This should be indicated as follows:  
Hg: mercury (0.0005 %), Cd: cadmium (0.002 %), Pb: lead (0.004 %)
- In the European Union, there are separate collection systems for used batteries. Please dispose of batteries correctly at your local community waste collection/recycling center.



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