Lightweight and robust
For optimal usability

SWITCHES Unlimited

Functional and user-friendly
New solution from IDEC

1
Lightweight and compact, weighs only 500g

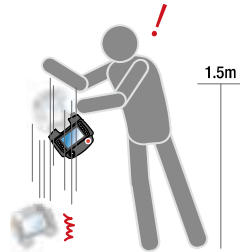Lightweight hand-held structure enables stress-free operation even when the worker needs to move around.

* Not including cable.

2
Robust design

Designed to withstand a drop test from a predictable height during hand-held operation or storage. Prevents damage even when dropped accidentally.

* Not resistant to excessive shock.

1.5m

3
Ergonomic design ideal for long and fatigue-free operation

Designed to fit comfortably in the hand by its ergonomic design.

4
Starts up in only 1.5 seconds!
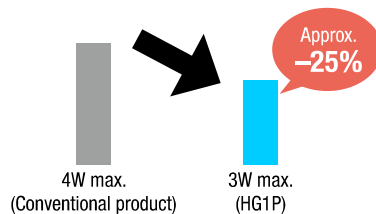
Reduces wait time at start-up.

5
Wall mount bracket available when the HG1P is not used

6
Low power consumption, only 3W!

The size of the power source can be reduced, achieving a more compact system.

Approx. −25%

4W max.
(Conventional product)

3W max.
(HG1P)

7
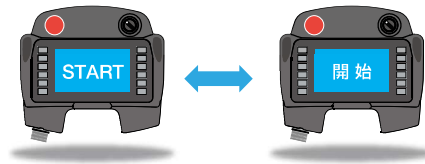## Clear and high resolution 4.3 inch display

Equipped with a high resolution 4.3 inch TFT color LCD touch panel. Clear and informative display enables intuitive operation.
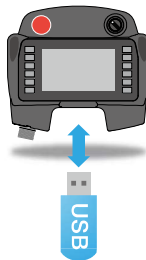
8
Multilingual

Several languages can be selected and changed easily with a button.

9
Easy maintenance with a USB memory

Project data can be saved on a USB memory inserted in the device. No need to use a PC as data inside the HG1P can be updated via USB. Also, teaching parameter data can be saved on USB memory and imported.

10
Removable cable

If damaged, the connection cable can easily be detached and repaired. Saves downtime and cost.

11
Flexible software enables easy designing of the screen

The easy-to-use work space enables the structure of the project to be easily understood and configuration of operating settings simple, allowing a comfortable working environment.

Programming Software

WindO/I-NV4
Automation Organizer

Included in Automation Organizer

3

Solves on-site problems

Case 1

High resolution and clear display makes robot teaching simple

Before **Only experts with know-how can understand an operating screen full of text**

Screens showing indirect values make it difficult to imagine the actual movement and memorize values. Even skilled operators have to refer to manuals during operation.

After

User-friendly screens enable standardization of operations

The high resolution 4.3 inch display achieves an impressive operating screen. Machine operating experience is not required, reducing time required to train staff and enabling quick start-up of a manufacturing site. Also, the operating screen can be easily designed using programming software.
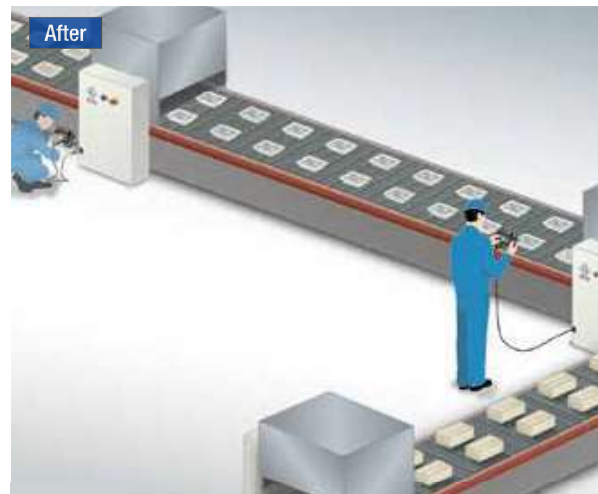
High Resolution 4.3 inch | **Easy design Touchscreen display**

Case 2

Flexible installation. A single touch panel can be used in various locations

Before **Several touch panels are located in different places on the line**

Although touch panels are needed to operate control panels, some are not used frequently.

After
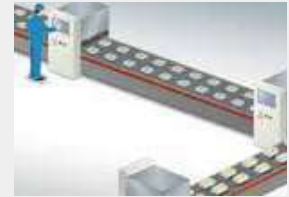
Saves cost and space

Touch panels do not need to be always installed as cables can be detached from the hand-held operator interface and can be connected with external devices when necessary. Lightweight 500g makes the operator interface easy to carry around. Saves cost and helps downsize control panels.

500g Lightweight | **Flexible Use**

Case 3

Labor-saving operation on large machines

Before **Several operators are needed for start-up operation**

On large equipment, several operators had to check with each other to confirm processing work.

After

Portable design helps reduce manpower

The hand-held operator interface is light-weight, and easy to carry around, enabling process work to be checked visually. The ergonomic design reduces fatigue caused by long working hours. Also, the drop resistance is 1.5m, so there is no need to worry about the hand-held operator interface slipping from the hands.

Portable | **Ergonomic Design** | **Drop Resistance 1.5m**

Case 4

Safety ensured during maintenance

Before **Maintenance using PCs may lead to human error**

When checking a PLC setting on a PC, knowledge of ladder software is required to determine the changes needed. Also, parameters that do not require changes might be adjusted, leading to failure. Furthermore, the worker may have to work in an uncomfortable position for long hours.

After
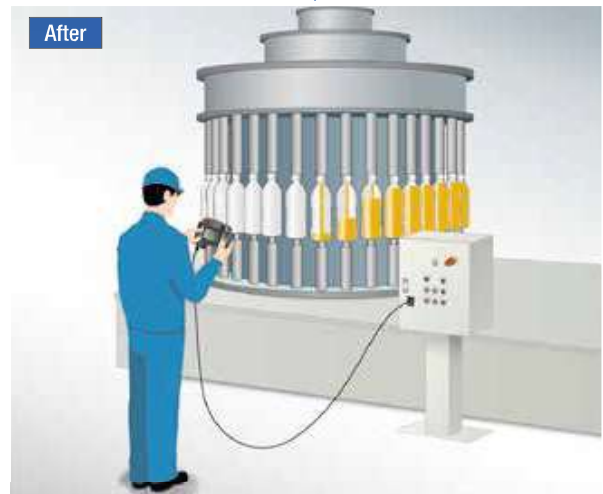
Display only the required data on customized screens

By showing only required data, safe and efficient maintenance is achieved. Data can be saved on a USB memory, making it easy for troubleshooting and maintenance.

Easy maintenance | **USB memory**

Easily readable and functional.
Designed for optimal usability.

(1)   (2)   (3)   (8)   (9)

(4) (5)   (10)

(7)   (6)

(11)   (12)   (13) (14)

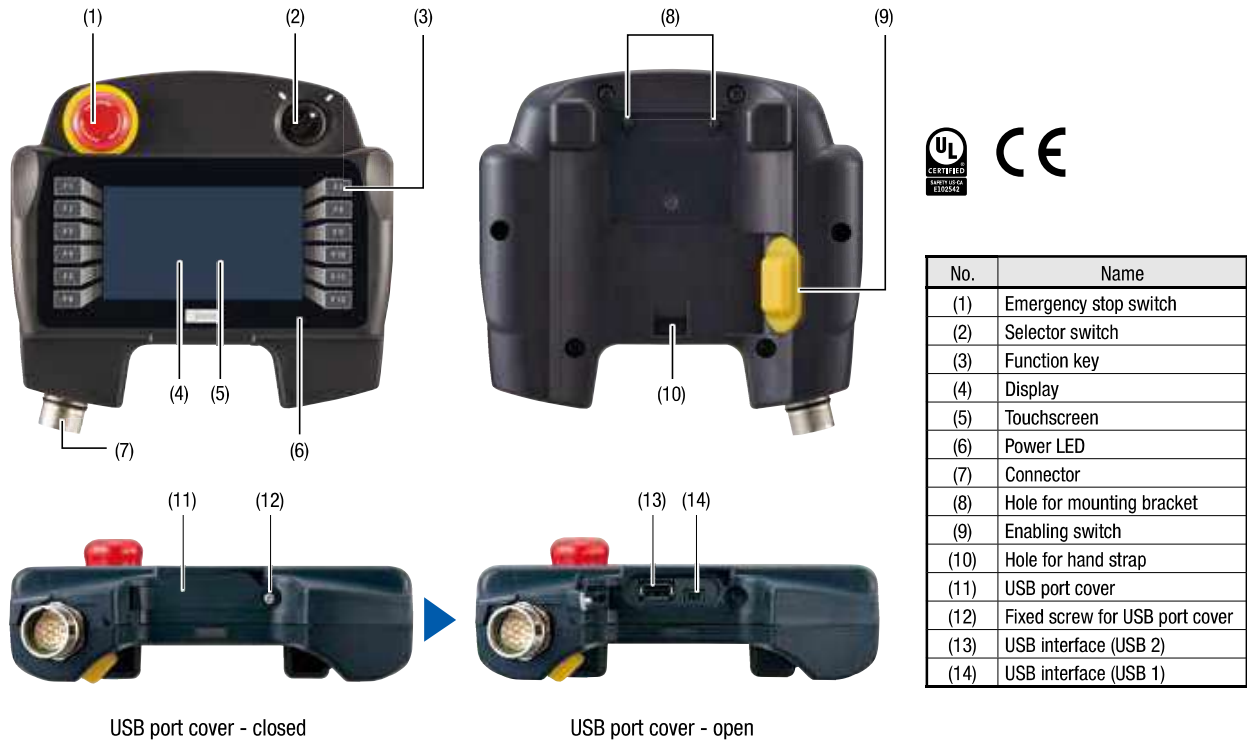| No.	Name
(1)	Emergency stop switch
(2)	Selector switch
(3)	Function key
(4)	Display
(5)	Touchscreen
(6)	Power LED
(7)	Connector
(8)	Hole for mounting bracket
(9)	Enabling switch
(10)	Hole for hand strap
(11)	USB port cover
(12)	Fixed screw for USB port cover
(13)	USB interface (USB 2)
(14)	USB interface (USB 1)

USB port cover - closed   USB port cover - open

HG1P

Display Screen	Operation Style	Communication Interface	Part No.	Approvals
4.3-inch TFT color LCD 65,536 colors	Touch switch (analog resistive) Function switch	RS422 / RS485	HG1P-ST32YBFH-B0	UL61010-1 UL61010-2-201 CSA C22.2 No.61010-1 (c-UL) CSA C22.2 No.61010-2-201 (c-UL)
		Ethernet	HG1P-ST32ZBFH-B0	

* For models without IDEC logo, contact IDEC.

Cable

Item	Communication Method	Length	Weight	Part No.	Remarks
HG1P Option cable	RS422 / RS485 / Ethernet	3m	600g	HG9Z-XCP13	[Connector for HG1P unit] CA-19S1N128007S (Phoneix Contact) [External device connection] D-sub 25 pin (Plug / fixed screw M2.6)
		5m	1,000g	HG9Z-XCP15	
		7m	1,300g	HG9Z-XCP17	

General Specifications

Electrical Specifications	Rated Power Voltage	24V DC
	Power Voltage Range	20.4 to 28.8V DC
	Dielectric Withstand Voltage	500V AC, 10mA (1 minute)
	Power Consumption	3W max. (2W max. when not using USB interface (USB2))
	Allowable Momentary Power Interruption	10 ms max.
	Inrush Current	20A max.
Environmental Specifications	Operating Temperature	0 to +45°C (no freezing)
	Operating Humidity	10 to 90% RH (no condensation)
	Storage Temperature	–10 to +60°C (no freezing)
	Storage Humidity	10 to 90% RH (no condensation)
	Altitude	2,000m max. (during operation) 750 hPa to 1,060 hPa
	Pollution Degree	2
	Vibration Resistance	5 to 8.4 Hz amplitude 3.5 mm 8.4 to 150 Hz acceleration 9.8 m/s^2 10 cycles (100 minutes) on each of three mutually perpendicular axes
	Shock Resistance	147 m/s^2, 11 ms 5 shocks on each of three mutually perpendicular axes
	Drop Test	1.5m drop in six directions
	Connector Insertion Life	HG1P Optional Cable: 100 times USB1: 5000 times, USB2: 1500 times
	Noise Immunity	Fast transient/burst test, Power terminals: ±2 kV, Communication line: ±1 kV (IEC/EN61131-2)
	Lighting surge	Power unit : ±500 V (between power - 0V) : ±1 kV (between power - FE, between 0-FE) (IEC/EN61131-2)
	Electrostatic Discharge	Air: 8 kV Contact: 4 kV (IEC/EN61131-2)
	Atmosphere	No corrosive gas
Construction Specifications	Degree of Protection	IP54F (not including the cable connector) (IEC60529)
	Dimensions	191.0 W × 168.9 H × 56.0 D mm
	Weight (approx.)	500g (except HG1P option cable)

- Do not use the HG1P in an environment subject to strong ultraviolet rays, otherwise the LCD quality will deteriorate.
- Specifications include the use of HG1P option cable designated by IDEC.

Function Specifications

Screen Types	Base screen, popup screen, system screen
No. of Screens	Base screen: 3,000 max. Popup screen: 3,015 max.
Parts	Bit Button, Word Button, Goto Screen, Print Button, Key Button, Multi Button, Keypad, Selector Switch, Potentiometer, Numerical Input, Character Input, Pilot Lamp, Multi-State Lamp, Picture Display, Message Display, Message Switching Display, Alarm List Display, Alarm Log Display, Numerical Display, Bar Graph, Trend Chart, Pie Chart, Meter, Calendar, Bit Write Command, Word Write Command, Goto Screen Command, Print Command, Timer, Screen Script Command, Multi Command, Video Display
Calendar (*1)	Year, Month, Day, Hour, Min., Sec., Day of Week ±90 sec per month (at 25°C)

*1) Calendar data is deleted when power is off if a battery for backup is not installed.

Display Specifications

Display		TFT Color LCD
Color/Shade		65,536 colors
Effective Display Area		95.04 W × 53.856 H mm
Display Resolution		480 W × 272 H pixels
View Angle		Left / right: 80°, top: 65°, bottom: 55°
Backlight		White LED
Backlight Life		30,000 hours minimum (*1)
Brightness		400 cd/m^2 (*2)
Brightness Adjustment		32 levels
Backlight Replacement		Not possible
Display Character Size	1/4 size	8 × 8 pixels (Western European language: ISO 8859-1, Central European language: ANSI 1250, Baltic: ANSI 1257, Cyrillic: ANSI1251, Japanese katakana and symbols: JIS 8-bit code)
	1/2 size	8 × 16 pixels (Western European language ISO 8859-1, Central European language: ANSI 1250, Baltic: ANSI 1257, Cyrillic: ANSI1251, Japanese katakana and symbols: JIS 8-bit code)
		16 × 32 pixels, 24 × 48 pixels, 32 × 64 pixels (Western European language: ISO 8859-1)
	Full size	16 × 16 pixels (Japanese JIS first and second level characters, simplified Chinese, traditional Chinese, Korean)
	Double size	32 × 32 pixels (Japanese JIS first level characters, Mincho font)
Quantity of Characters	1/4 size	60 characters × 34 lines
	1/2 size	60 characters × 17 lines
	Full size	30 characters × 17 lines
	Double size	15 characters × 8 lines (Mincho font)
Character Magnification		0.5, 1 to 8 vertically and horizontally (except for scalable fonts)
Character Attribute		Blink (1 or 0.5 sec period), reverse, bold, shadowed
Graphics		Straight line, polyline, rectangle, arc, pie,circle/ellipse, equilateral polygons (3, 4, 5, 6, 8), picture, fill
Window Display		3 popup screens + 1 system screen
Touch Panel	Switching Element	Analog resistive membrane
	Operating Force	3N maximum
	Mechanical Life	1,000,000 operations
Buzzer		Single tone (sound length adjustable)
User Memory Capacity		12 MB approx. (including extension font)

- Also see operating instructions on the back page.

*1) The backlight life is not guaranteed and refers to the time until the brightness reduces by half after use at 25°C. The actual life depends on operating environments and conditions.

*2) Brightness of the LCD only at 25°C.

Mechanical Specifications

Emergency Stop Switch

Part No.	AB6E-3BV02PRM
Quantity	1
Contact Configuration	2NC (External wiring)
Contact Rating	30V DC, 1A (resistive load / inductive load)
Durability	Electrical: 100,000 operations minimum Mechanical: 100,000 operations minimum
Reset	Pull or turn reset

Enabling Switch

| Part No.	HE6B-M200Y
Quantity	1
Contact Configuration	2C (External wiring)
Contact Rating	30V DC, 1A (resistive load) 30V DC, 0.7A (inductive load)
Monitor Contact	N/A
Durability	Mechanical: Position 　1 → 2 → 1　　　1000,000 operations minimum 　1 → 2 → 3 → 1　100,000 operations minimum Electrical Life: 100,000 operations minimum

Selector Switch

Part No.	LB6S-2T1
Quantity	1
Contact Configuration	SPDT (external wiring)
Contact Rating	30V DC, 0.1A (resistive Load)
LED	Non-illuminated
Durability	Electrical: 250,000 operations minimum Mechanical: 100,000 operations minimum
Angle	90° 2-position
Operation	Maintained (manual)

Function key

Method	Tactile switch
Quantity	12
Contact Configuration	NO contact (internal wiring)

External Interface

Removable
19-pin connector (socket): CA-19P1N126Y00
(Phoneix Contact)
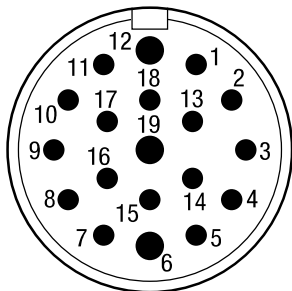
Connector pin layout diagram

Interface Specifications

HG1P-ST32YBFH-B0

Serial Interface (COM)	RS422/485	Electrical Characteristics	EIA RS422/485 compliant
		Transmission Speed	187,500/115,200/57,600/ 38,400/19,200/9,600/ 4,800/2,400/1,200 bps (*1)
		Transmission Distance	20m max.
		Synchronization	Asynchronous
USB Interface (USB1)		Interface	USB 2.0 (device)
		Connector	USB Type Mini-B connector
USB Interface (USB2) (*2)		Interface	USB 2.0 (host)
		Connector	USB Type A connector

• The above specification applies only when a optional cable specified for HG1P is used.

*1) 187,500 bps is available only with SIEMENS SIMATIC S7-300/400 series (MPI port direct connection).

*2) USB memory only

HG1P-ST32ZBFH-B0

Ethernet Interface (LAN)	Interface	IEEE802.3i (10BASE-T) compliant
	Communication Speed	10M bps
USB Interface (USB1)	Interface	USB 2.0 (device)
	Connector	USB Type Mini-B connector
USB Interface (USB2) (*1)	Interface	USB 2.0 (host)
	Connector	USB Type A connector

• The above specification applies only when a optional cable specified for HG1P is used.

*1) USB memory only

Connecter Pin Arrangement

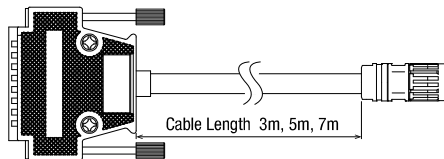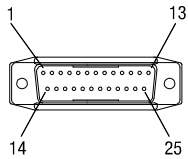| No.	Name	Function
1	C_NC1	Selector switch contact 1 (NC)
2	C_NO1	Selector switch contact 1 (NO)
3	B_C1	Enabling switch contact 1 (COM)
4	B_C2	Enabling switch contact 2 (COM)
5	B_NO2	Enabling switch contact 2 (NO)
6	FG	Frame ground
7	RDA+/TPI+	Receive data (+)
8	RDB-/TPI-	Receive data (–)
9	SDB-/TPO-	Send data (–)
10	A_NC21	Emergency stop switch contact 2 (NC)
11	A_NC22	Emergency stop switch contact 2 (NC)
12	DC24V-	Power supply 24V DC (–)
13	C_C1	Selector switch contact 1 (COM)
14	B_NO1	Enabling switch contact 1 (NO)
15	SG	Communication signal ground
16	SDA+/TPO+	Send data (+)
17	A_NC11	Emergency stop switch contact 1 (NC)
18	A_NC12	Emergency stop switch contact 1 (NC)
19	DC24V+	Power supply 24V DC (+)

Dimensions

All dimensions in mm.

191
169
70.6
51
56
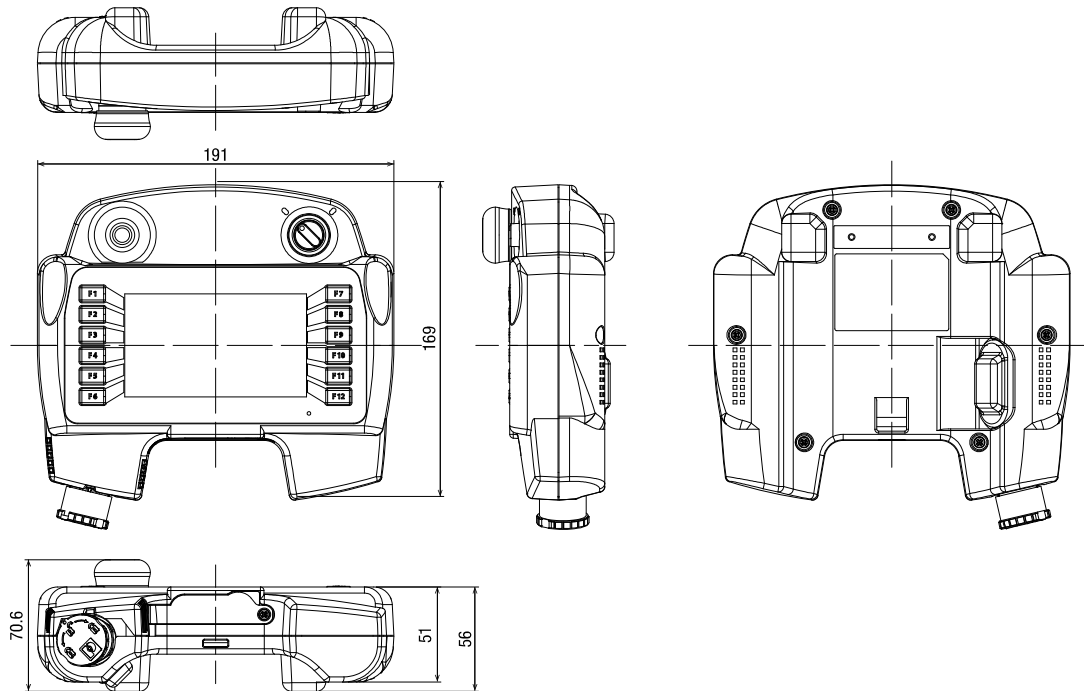
Optional cable (HG9Z-XCP13 / -XCP15 / -XCP17)

Cable Length 3m, 5m, 7m

External device side connection

1   13
14   25

Connector pin layout diagram

Option Cable Connector Terminal Arrangement

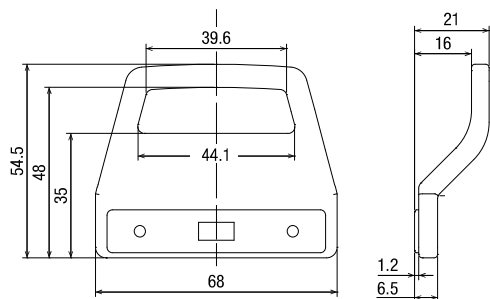| No.	Name	Function	Conductor color
1	FG	Frame ground	Brown
2	RDB–/TPI–	Receive data (–)	Orange
3	RDA+/TPI+	Receive data (+)	Orange (White)
4	SDB–/TPO–	Send data (–)	Green
5	SDA+/TPO+	Send data (+)	Green (White)
6	SG	Communication signal ground	Gray (White)
7	NC	—	—
8	NC	—	—
9	B_NO1	Enabling switch contact 1 (NO)	Pink (White)
10	B_C1	Enabling switch contact 1 (COM)	Pink
11	A_NC11	Emergency stop switch contact 1 (NC)	Yellow
12	A_NC12	Emergency stop switch contact 1 (NC)	Yellow (White)
13	DC24V–	Power supply 24V DC (–)	Black
14	NC	—	—
15	NC	—	—
16	NC	—	—
17	NC	—	—
18	C_NC1	Selector switch contact 1 (NC)	Light blue (White)
19	C_NO1	Selector switch contact 1 (NO)	Light blue
20	C_C1	Selector switch contact 1 (COM)	Gray
21	B_NO2	Enabling switch contact 2 (NO)	Blue (White)
22	B_C2	Enabling switch contact 2 (COM)	Blue
23	A_NC21	Emergency stop switch contact 2 (NC)	Purple
24	A_NC22	Emergency stop switch contact 2 (NC)	Purple (White)
25	DC24V+	Power supply 24V DC (+)	Red

Accessories (optional)

| Name	Part No. (Ordering No.)	Description
Application Software	SW1A-W1C	Automation Organizer (includes WindO/I NV4) • Includes digital manual
User's Manual (English)	HG9Y-B1701	
Hand Strap	HG9Z-PS4	Strap for wrists.
Wall Mount Bracket	HG9Z-PK3	Install on the back of the pendant to enable wall mount
USB Maintenance Cable	HG9Z-XCM42	• Length: 2m • Communication method: USB • Connector (main unit side): USB-miniB • Connector (external device connection side): USB type A
Debug Cable (*1)	HG9Z-PX12	• Length: 2m • Connector (main unit side): CA-19S1N128007S (Phoenix Contact) • Connector (external device connection side): loose wire

*1) Use the Debug Cable only for debugging.
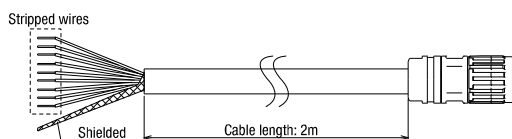
Dimensions
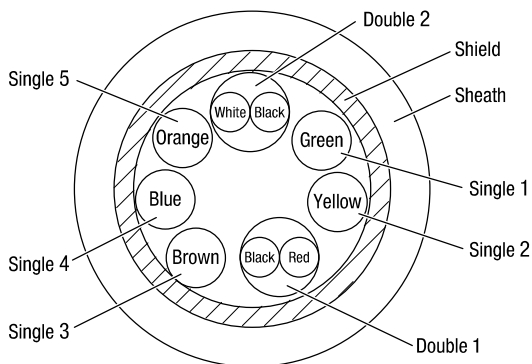
All dimensions in mm.

Wall Mount Bracket (HG9Z-PK3)

Hand Strap (HG9Z-PS4)
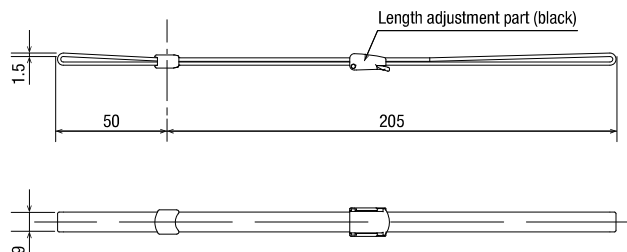
Debug Cable (HG9Z-PX12)

Cross Section View

Wiring Table

No.	Name	Function	Conductor color
1	RDA+/TPI+	Receive data (+)	Double 1: Black
2	RDB-/TPI–	Receive data (–)	Double 1: Red
3	SDA+/TPO+	Send data (+)	Double 2: Black
4	SDB-/TPO–	Send data (–)	Double 2: White
5	FG	Frame ground	Single 1: Green
6	SG	Communication signal ground	Single 2: Yellow
7	DC24V+	Power supply 24V DC (+)	Single 3: Brown
8	NC	—	Single 4: Blue
9	DC24V–	Power supply 24V DC (–)	Single 5: Orange

Compatible PLCs

Manufacturer	Series
IDEC	MICROSmart FC6A (Ethernet)
	SmartAXIS FT1A Pro/Lite (Ethernet)
	MICROSmart FC6A / FC5A / FC4A
	SmartAXIS FT1A Pro/Lite
Mitsubishi	MELSEC-A (link unit)
	MELSEC-QnA (link unit)
	MELSEC-Q (link unit)
	MELSEC-Q (Ethernet)
	MELSEC-FX
	MELSEC-FX (Ethernet)
OMRON	SYSMAC-C
	SYSMAC-CS
	SYSMAC-CJ1
	SYSMAC-CJ2
	SYSMAC-CP1
	SYSMAC (Ethernet)
Allen-Bradley	PLC-5 (Half Duplex)
	SLC-500 (Half Duplex)
	MicroLogix (Full Duplex)
	ControlLogix (Full Duplex)
	CompactLogix (Full Duplex)
	FlexLogix (Full Duplex)
	ControlLogix (Ethernet/IP, Ethernet/IP (Logix Native Tag))
	CompactLogix (Ethernet/IP, Ethernet/IP (Logix Native Tag))
	PLC-5 (Ethernet)
	SLC 500 (Ethernet)
	MicroLogix (Ethernet)
SIEMENS	S7-200
	S7-300 (connects to CPU)
	S7-300 (link unit)
	S7-400
	S7-1200 (Ethernet)
Keyence	KV-700/1000/3000/5000
	KV Nano
	KZ
	KV
	KV (Ethernet)
Hitachi	S10mini
	S10V
JTEKT	TOYOPUC-PC2J
	TOYOPUC-PC3J
Toshiba Machine Works	TC200
	TCmini
GE Fanuc Automation	Series90-30
	VersaMax

Manufacturer	Series
Modicon	Modbus RTU Master (*1)
	Modbus RTU Slave (*2)
	Modbus ASCII Master (*1)
	Modbus TCP Client (*1)
	Modbus TCP Server (*2)
Schneider Electric	Twido
Panasonic	FP Series
Yaskawa Electric	MP
	MP (Ethernet)
Koyo	DirectLOGIC 05
	DirectLOGIC 06
	DirectLOGIC 205
	KOSTAC SZ
	KOSTAC SU
	KOSTAC SU (Ethernet)
Fanuc	Power Mate
	Series
Yokogawa Electric	FA-M3
	FA-M3 (Ethernet)
Fuji Electric	FREX-PC
	MICREX-F
	MICREX-SX
	MICREX-SX (Ethernet)
Toshiba	PROSEC T Series
	V Series
LS Industrial Systems	MASTER-K
VIGOR	VB
	VH
Emerson	FloBoss
Hitachi Industrial Equipment Systems	EH
	EH (Ethernet)

- The compatible PLC information is for reference only (except for IDEC PLCs), and IDEC does not guarantee the operation of any other manufacturers' PLC. When using other manufacturers' PLCs, read their specifications and instruction manual carefully. The PLC must be operated correctly under the user's responsibility.
- The company names and product names are registered trademarks or brand names.

*1) HG series can be connected as a master to the slave/server device.
*2) HG series is connected as a slave to the master/client device.

An updated listing of compatible PLCs can be found at the following website.
http://www.idec.com/oi/drivers

Operating Instructions

Be sure to read this manual carefully before performing installation, wiring, or maintenance work.

- When using the HG1P in applications which require high level of safety, add a fail-safe or backup functionality, and verify an adequate level of safety using the product specifications.
- Turn off the power to the HG1P before installation, removal, wiring, maintenance, and inspection of the HG1P. Failure to turn power off may cause electrical shock or fire hazard.
- Special expertise is required to install, wire, configure, and operate the HG1P. Users without such expertise must not use the HG1P.
- Emergency stop circuit must be configured outside of the HG1P.
- Do not use touch switches and the function keys for an emergency stop circuit or an interlocking circuit. If the HG1P fails, equipment connected to the HG1P will no longer be protected, and serious injury to operators and equipment damage may be caused.
- Be sure to build the system to ensure safety in an event of a loss of communication between HG1P and connected device.
- Connect the emergency stop switch and the enabling switch on the HG1P to function as either a category 0 or category 1 stop in accordance with IEC/EN60204-1.
- Do not under any circumstances, hold the enabling switch on the HG1P in position 2 with tape, string, or deform the rubber cover. The intrinsic function of the enabling switch will be lost, and the enabling switch may not work in an emergency.
- When using the HG1P, place your finger firmly on the enabling switch.
- Perform regular checks to confirm that the emergency stop switch and enabling switch work properly. It is extremely dangerous if a foreign object gets stuck in between causing the enabling switch to remain in position 2 even when the hands are released.
- Stop using the HG1P if it is accidentally dropped or exposed to significant shocks, check the HG1P for damage, and confirm that its various functions work safely and correctly.
- Connect the FG wire to grounding resistance of 100 Ω or less. Otherwise there is a risk of electric shock or mistaken operation.
- When more than one button is pressed at the same time, due to the detection characteristics of an analog type touch panel, only the center of the pressed area is sensed and the unit assumes that only one button is pressed. Do not operate the HG1P by pressing more than one button simultaneously because there is a risk of accident.
- The screen will not be visible if the backlight burns out, but the touch panel and the function key will remain functional. In this case, stop using the HG1P as damage may occur if a touch panel or function key is operated mistakenly with the backlight burned out.

- The HG1P is designed for indoor use only (Not for outdoor use)
- Use HG1P optional cable for wiring. The D-sub connector on the end of the HG1P optional cable is not water- or dust-proof. If protection against water or dust is required, the user must replace the D-sub connector with water-proof characteristics.
- Use the product within the environmental limits given in the catalog and manual. Use of the product in high temperature or high-humidity environments, or in locations where it is exposed to condensation, corrosive gas or large shock may cause electrical shock, fire, or malfunction.
- The HG1P is designed for use in pollution degree 2. Use the HG1P in pollution degree 2 environment. (according to IEC60664-1)
- Prevent metal fragments or wire chips from dropping inside the HG1P housing. Ingress of such fragments and chips may cause fire hazard, damage, or malfunction.
- Use a power supply of the rated value. Using a wrong power supply or wiring in reverse polarity may cause fire hazard or damage.
- Make sure of safety before starting and stopping the HG1P. Incorrect operation of the HG1P may cause mechanical damage or accidents.
- Use the HG1P in a local area network if you download, upload or monitor the project data via the Ethernet port.
- The touch panel of the HG1P is made of glass, and will break if exposed to excessive shock. Be sure to handle with care.
- Do not push or scratch the touch panel and protection sheet with a hard object such as a tool, because they can be easily damaged.
- When used under temperatures over the rated operating temperature, the clock accuracy is affected. Adjust the clock before use or regularly.
- Do not install the HG1P in areas subjected to strong ultraviolet rays, since ultraviolet rays may impair the quality of the LCD.
- Do not attempt to disassemble, repair or modify the HG1P. This can create the risk of fire or electrical shock.
- Do not switch off the power or pull out the USB flash drive while it is being accessed, as this may result in destruction of the stored data. If the data on the USB flash drive is corrupted, reformat the USB flash drive.
- Install the HG1P according to the instructions. Improper installation may result in, failure, electrical shock, fire hazard, or malfunction of the HG1P.
- If the HG1P is used in a way incompatible with the its original purpose, the function of the HG1P may be impaired.
- Note that small black and bright dots may show up on LCD Screen: this is not a failure or malfunction.