



Assisted E-STOP System

(Main Unit: Assisted E-STOP)

XW1E-BS4B12PR

(Optional: Wireless Switch Transmitter / Receiver)

HX1T-AB1/ HX1R-AB1



E-STOP switch with optional activation assist function

Enhances convenience of e-stop operation

Helps to prevent accidents on restart



IDEC CORPORATION

Assisted E-STOP: maintaining the stopped state of equipment, and helping to prevent unintended restarts



Stopping danger: E-stops at the heart of safe equipment design

Emergency stop (e-stop switches) are essential safety devices – key to safe equipment design practices. Workers regularly press e-stops to safely stop machines and other equipment. The switches can then be reset to restart machinery and keep things moving. However, are there times when you want or need to use e-stop functionality from a distance?



The hidden risks of remote stops and restarts

Factory automation systems, remote operations and self-driving vehicles are all in widespread use. Users must consider that having fewer workers on site creates 'blind spots' in terms of safety visibility. Are you able to quickly stop remote or unmanned equipment if it malfunctions? What if workers are not expecting and prepared for the restart timing? What if a machine restarts while a worker is nearby - or even checking inside it?



Stay in control, even from a distance – smart safety and worker well-being

Safety can't rely on assumptions. To address these challenges to safety and worker well-being, IDEC has developed the unique Assisted E-STOP system. It enables the e-stop switch to be activated remotely, via an optional external input. It keeps equipment in a safe stopped state after the e-stop is pressed, helping to prevent unexpected, unintended restarts and harm/damage on restart.



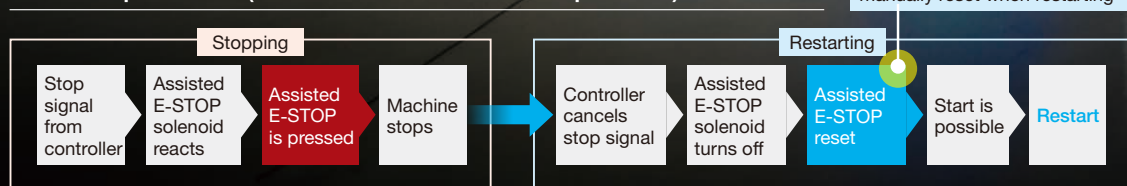
Assisted E-STOP (E-STOP with optional activation assist function)

Enhance the safety and well-being of workers - even from a distance - with Assisted E-STOP

USE CASE The Assisted E-STOP with AGVs



Flow of operations (when Assisted E-STOP is pressed)



The Assisted E-STOP function works alongside the traditional emergency stop switch functionality.



Assisted E-STOP (emergency stop switch with optional activation assist function)

POINT
01

Enables remote activation of e-stop via optional external input (24V DC).
• This function should not be used for safety purposes.

POINT
03

Compatible with conventional e-stop switches, and can be operated manually in the same way.

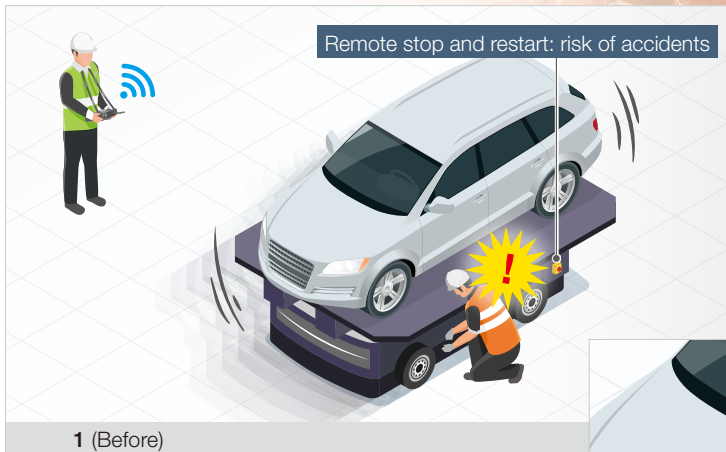
POINT
02

Prevents worker accidents caused by unexpected, unintended restarts.

POINT
04

Can be retrofitted to enhance existing emergency stop systems and circuits.

Noticing workers in blind spots

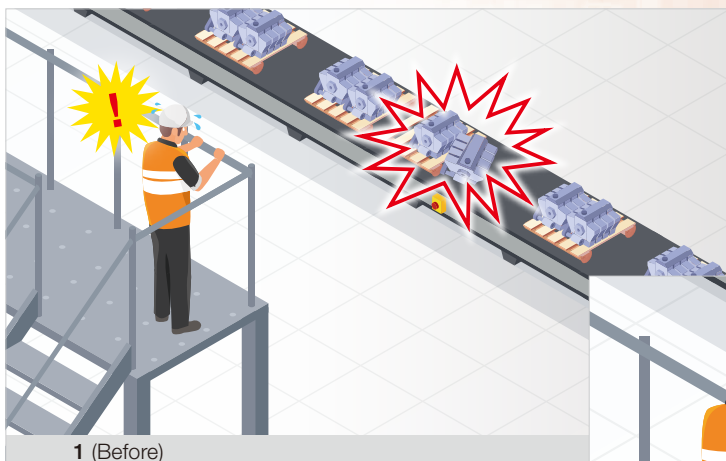


1. When stopping and restarting a machine remotely, there is a risk of accidents - such as a worker in an operator blind spot.

2. With Assisted E-STOP, even if the machine is stopped remotely the E-STOP itself is physically pressed down and latched in place. The E-STOP must be manually reset before the machine can be restarted. Safety is ensured by on-site confirmation.



The need to stop a machine immediately



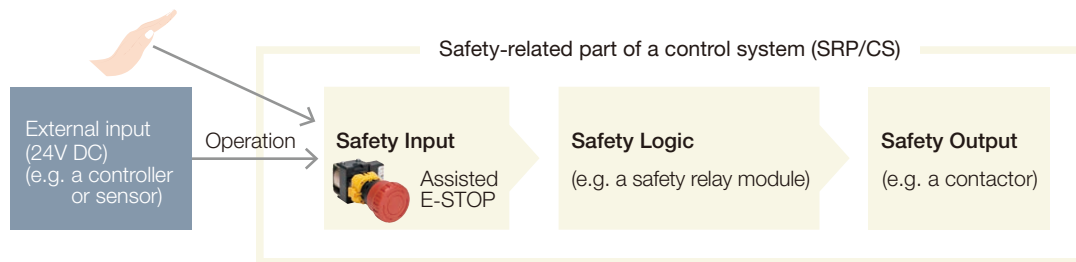
1. If a worker wants to immediately stop a machine, they must physically push the E-STOP.

2. The Assisted E-STOP can be activated by external input (optional).



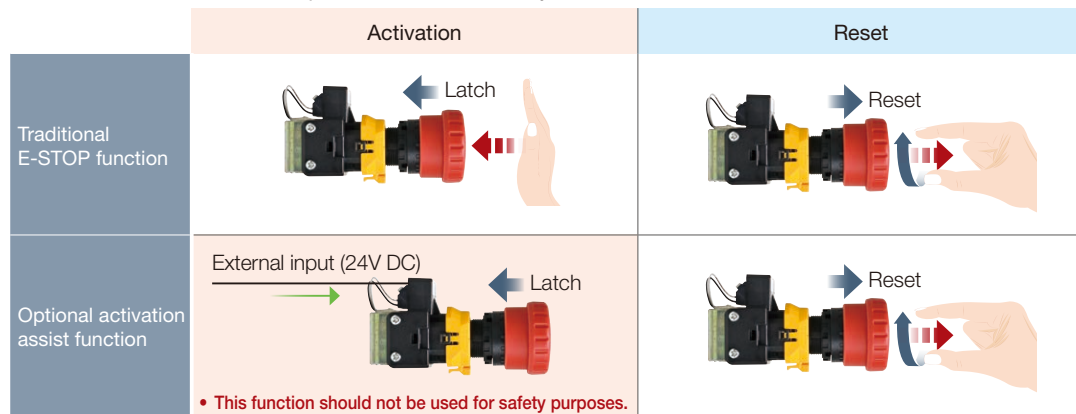
System configuration

Control system (CS)



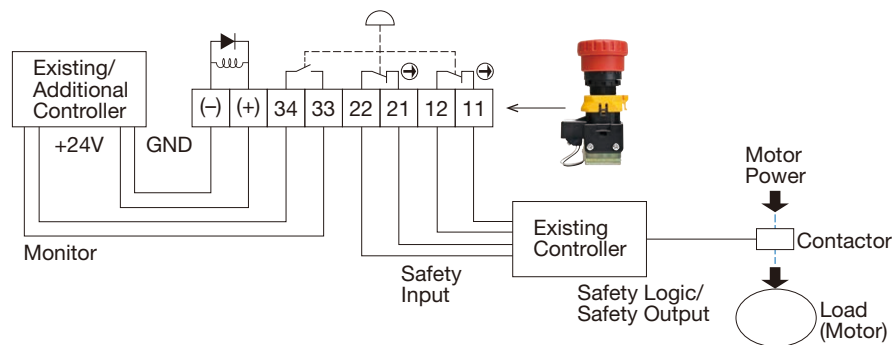
Operation methods

The Assisted E-STOP can be operated in 2 different ways.



In both cases, the E-STOP must be manually reset before the stopped machinery can be restarted.

Wiring example



Assisted E-STOP products

Main unit

Assisted E-STOP
XW1E-BS4B12PR

Mounting hole size $\phi 22\text{mm}$
Panel depth 65.4mm



Accessories

Padlock cover for Assisted E-STOP main unit
XW9Z-PCE



OPTION

A wireless switch transmitter and receiver are also available.



Go to **Page 10**

• Do not use the wireless switch transmitter/receiver as a safety-related part of the control system.

Assisted E-STOP XW1E-BS4B12PR

Enhances convenience of operation, helps to stop and maintain the stopped state of equipment, and to prevent accidents caused by unexpected, unintended restarts

- Manual operation and reset in the same way as conventional emergency stop switches.
- Maintains a highly safe stopped state after an e-stop is pressed, helping to prevent unintended and unexpected restarts.
- 24V DC current to the solenoid enables external activation of the e-stop function.



- See website for details on approvals and standards.



Main Unit

Quantity:1

Name	Shape	Specification	Part No.	Remarks
Emergency stop switch with optional activation assist function		<ul style="list-style-type: none"> • 1NO2NC contact • Solenoid rating 24V DC • IP65 (panel front) 	XW1E-BS4B12PR	—

Accessories

Quantity:1

Name	Shape	Specification	Part No.	Remarks
Padlock cover for Assisted E-STOP		<ul style="list-style-type: none"> • Load capacity: 15N minimum 	XW9Z-PCE	<ul style="list-style-type: none"> • A padlock cover for the Assisted E-STOP. • Locks the e-stop in the pressed state, prevents the switch from being reset.
Box adapter for FB1 series		—	FB9Z-DS1	<ul style="list-style-type: none"> • Used to install Assisted E-STOP on the FB1W-111Y plastic control box. • Be sure to use in conjunction with the FB1W-111Y plastic control box.

Assisted E-STOP (XW1E-BS4B12PR)

Contact ratings

Rated insulation voltage (Ui)				250V 50V (UL/c-UL)		
Rated continuous current (Ith)				2.5A		
Rated operating voltage (Ue)				30V	125V	250V
Rated operating current (*1)	Main contact	AC	Resistive load (AC-12)	-	2.5A	2.5A
			Inductive load (AC-15)	-	1.5A	1.5A
		DC	Resistive load (DC-12)	2A	0.4A	0.2A
			Inductive load (DC-13)	1A	0.22A	0.1A
	Monitor contact	AC	Resistive load (AC-12)	-	1.2A	0.6A
			Inductive load (AC-15)	-	0.6A	0.3A
		DC	Resistive load (DC-12)	2A	0.4A	0.2A
			Inductive load (DC-13)	1A	0.22A	0.1A
Contact material				Gold-plated (silver)		

- Minimum applicable load (reference value) = 5V AC/DC, 1mA
(Applicable range may vary with operating conditions and load types.)
- The current used indicates the type according to JIS C 8201-5-1 closed circuit and interrupting current capacity.

*1) TÜV/CCC certified rating : AC-15 1.5A/250V, DC-13 1A/30V
UL/c-UL approved rating : 1.5A/30V ac (pilot), 1A/30V dc (pilot)

Solenoid unit rating

Rated insulation voltage	30V
Rated voltage	24V DC 100% duty cycle
Rated current	258mA (initial value)
Coil resistance	93Ω (initial value) (at 20°C)
Pickup voltage	Rated operating voltage x 85% max. (at 20°C)
Maximum applicable voltage	Rated voltage x 110%
Power consumption	Approx. 6.2W
Isolation class	Class F

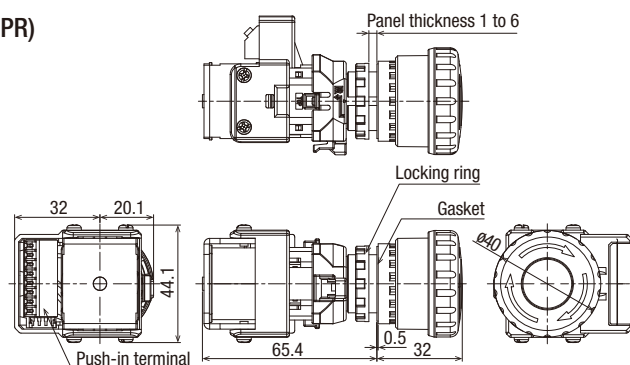
Performance specifications

Applicable standards	UL 60947-5-5 (*2), UL 60947-5-1, IEC 60947-5-1, EN 60947-5-1, JIS C 8201-5-1, IEC 60947-5-5 (*2), EN 60947-5-5 (*2), JIS C 8201-5-5 (*2), GB/T 14048.5 (*2)
Operating ambient temperature	-25 to +50°C (no freezing)
Operating relative humidity	30 to 85%RH (no condensation)
Storage ambient temperature	-40 to +80°C (no freezing)
Storage relative humidity	95% max.
Altitude or atmospheric pressure	2000m max.
Operating force	Push lock :11N Pull reset :17N Turn reset :0.27N·m
Pollution degree	Panel front: 3, panel back: 2
Minimum direct opening force	80N
Minimum direct opening travel	4.0mm
Maximum travel	4.5mm
Contact resistance	100mΩ max. (initial value)
Insulation resistance	100MΩ min. (500V DC megger)
Overvoltage category	II
Impulse withstand voltage	2.5kV, 0.5kV (solenoid circuit)
Operation frequency	900 operations/hour
Shock resistance	Operating extremes: 150m/s ² Damage limits: 500m/s ²
Vibration resistance	Operating extremes: 10 to 500Hz, amplitude 0.35mm acceleration 50m/s ² Damage limits : 10 to 500Hz amplitude 0.35mm acceleration 50m/s ²
Durability	Mechanical: 250,000 times min. Electrical : 100,000 times min. 250,000 times min. (24V AC/DC, 100mA)
Degree of protection	Panel front : IP65, Types 1, 4X (indoor use only), 12, 13 (IEC 60529) Terminal : IP20
Short-circuit protective device	250V/10A fuse (Type aM IEC 60269-1/IEC 60269-2)
Conditional short-circuit current	1000A
Wiring	Push-in terminal
Recommended tightening torque of locking ring	2.0N·m
Applicable wire	0.2 to 1.5mm ² max. (AWG28 to 14)
Weight (approx.)	190g

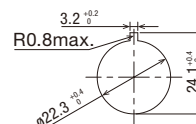
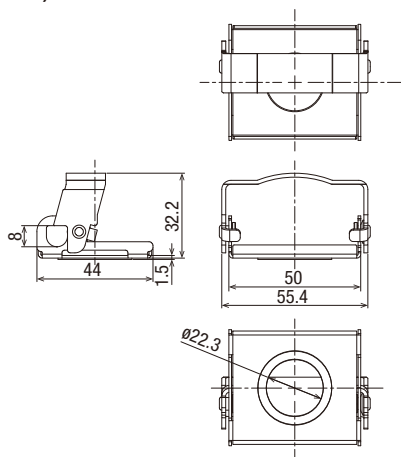
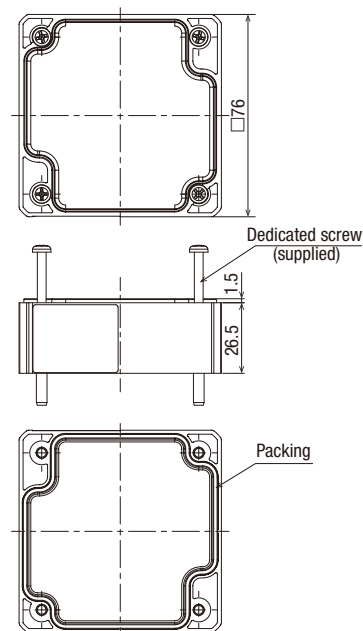
*2) Except optional activation assist function.

Dimensions (Assisted E-STOP (XW1E-BS4B12PR))

All dimensions in mm.

Assisted E-STOP
(XW1E-BS4B12PR)

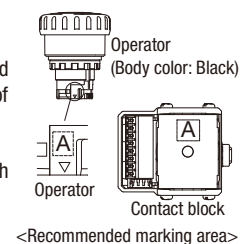
Mounting hole layout

Padlock cover for Assisted E-STOP (accessory)
(XW9Z-PCE)FB1 series deep-box adapter (accessory)
(FB9Z-DS1)

⚠ Warning (Assisted E-STOP (XW1E-BS4B12PR))

- Do not use the optional activation assist function as a safety function. Conduct all risk assessments on the basis that the product (e-stop) will be operated manually.
- When operating the button using the optional activation assist function, confirm that the button on the product operates and is in the locked state. If the button cannot be operated and is not in a locked state, immediately push the button on the product directly by hand.
- Be sure to periodically check the operation of the optional activation assist function after panel mounting and during daily inspections before beginning operations.
- Be sure to perform an operation test in advance to confirm the functionality and performance of the product.
- Provide continuous education and training to workers on the correct use of this product.
- Do not install the product in a location where the workers cannot push the button by hand.
- Solenoid has polarity. Be careful when wiring, as a reverse connection will result in damage.
- Do not apply a voltage that exceeds the rated voltage of the solenoid. Otherwise, the solenoid may be damaged.
- Turn off the power to the product before starting installation, removal, wiring, maintenance, and inspection. Failure to turn power off may cause electrical shock or fire.

- Use wires of the proper size to meet the voltage and current requirements.
- Do not disassemble, modify, or intentionally stop the function of the product. Otherwise, malfunction or accident may occur.
- Do not use the product in an environment where corrosive gases or other substances are present. Otherwise, malfunction or damage may occur.
- The operator body of the emergency stop switch with optional activation assist function is black. Do not mix it up with the XW series emergency stop switches (no optional activation assist function) on yellow or green operators.
- Though the contact block is removed from the operator when mounting this unit to panel, be sure to use the same combination of operator and contact block at the time of purchase. If used in a combination different from that of the time of purchase, the optional activation assist function may not operate properly. Especially if using multiple units simultaneously, mark the units with permanent markers, etc. as shown in the figure on the right to avoid mixing up the operator and contact blocks. ("A" is marked on the unit as an example in the figure on the right)





Instructions (Assisted E-STOP (XW1E-BS4B12PR))

When using this product within a safety-related part of a control system, be sure to operate the product properly while observing the safety standards and regulations of the country or region where the actual machine/system is used. In addition, conduct a risk assessment before starting operation to ensure safety.

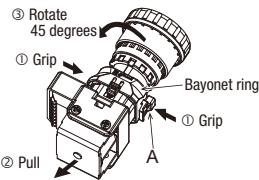
Handling

Do not expose the switch to excessive shock and vibration, otherwise the switch may be deformed or damaged, causing malfunction or operation failure.

Removing the contact unit

Make sure that the button of the operator is not pushed.

Grip in the A part of the bayonet ring (yellow) in the direction of the arrow (①) while pulling down the lock to the terminal side (②). Rotate the contact unit counter clockwise by 45 degrees (③) and remove the contact.



Notes on removing the contact unit

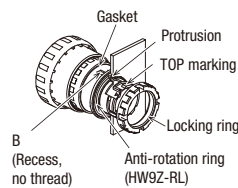
- 1) Do not remove the contact block while the operator is latched, otherwise the switch may be damaged.
- 2) When the contact block is removed, the monitor contact (NO contact) will become conductive.
- 3) When removing the contact block, do not exert excessive force, otherwise the switch may be damaged.

Panel mounting

Remove the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from panel front into the panel hole. Make sure that the B side (recess, no thread) of the operator with the TOP marking upward, and tighten the locking ring using the locking ring wrench MW9Z-T1. Tighten to a torque of 2.0N·m.

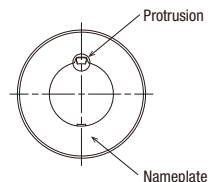
Notes on anti-rotation

An optional anti-rotation ring (HW9Z-RL) or emergency stop switch nameplate (plastic) is recommended to prevent excessive force when the switch is rotated.



Installation

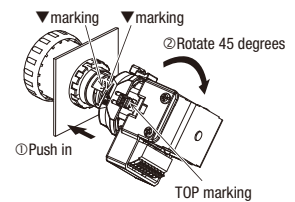
Align the B side of TOP marking side (recess, no thread) of the operator with projection of the anti-rotation ring (MW9Z-T1) or emergency stop switch nameplate (HWAV-*), and then install by aligning the projection of the anti-rotation ring or emergency stop switch nameplate with the cutout on the panel.



Installing the contact block

Make sure that the button of the operator is not pushed. Hold the main part of the contact unit (black) and align the ▼ marking on the operator with the ▲ marking on the bayonet ring (TOP side).

Push the contact block to the operator and turn clockwise by 45 degrees to install the contact unit.



Notes for installing the contact block

Make sure that the bayonet ring is locked to the operator.

Contact bounce

Contact chatter/bounce may occur when the main contact (NC contact) is reset by pulling or turning or when the monitor contact (NO contact) is pressed. Take countermeasures to prevent chatter/bounce. (Reference value: 20ms) Also, do not apply external shock to the switch as chatter may occur.

Optional activation assist function

This function assists the pushing of a button using the driving force of the solenoid by supplying power to the solenoid. The depressed button is locked regardless of whether power is applied to the solenoid and this state is maintained until manually reset.

Operation overview

- Using the optional activation assist function to activate an emergency stop switch is not classed as an emergency stop operation under international safety standards.
- The locked state after using the optional activation assist function to activate an emergency stop switch is classed as a locked state under international safety standards.
- To reset the lock state, perform the reset manually.
- If you do not use this function and operate it directly by hand, XW1E-BS will function as a standard emergency stop switch.

Be sure to read the instruction manual carefully before installation, wiring, or maintenance.

For details on mounting, wiring, and maintenance, see the instruction manual at the following URL.

Assisted E-STOP (XW1E-BS4B12PR)

<https://product.idec.com/XW1E-BS.html>



XW1E-BS4B12PR

Wireless switch transmitter/receiver (optional) HX1T-AB1 / HX1R-AB1

Wireless operation of emergency stop switches from remote locations

- The wireless switch transmitter is equipped with a battery that can last for up to 10 days of continuous use.
- Bluetooth Low Energy (2.4GHz)
- The wireless switch transmitter can be worn as a wearable device on the arm or wrist.
- Setup is simple and does not require additional equipment such as a PC.



• See website for details on approvals and standards.



Main Unit

Quantity:1

Name	Shape	Specification	Part No.	Remarks
Wireless switch transmitter		<ul style="list-style-type: none"> • Push-to-lock, pull-to-reset • Battery powered • USB Type-C charging port • Communication signal strength level switching (4 levels) • IP65 	HX1T-AB1	<ul style="list-style-type: none"> • Users must prepare their own charger. (Type-C 5V DC 100mA) • The strap for the wireless switch transmitter is sold separately.
Wireless switch receiver		<ul style="list-style-type: none"> • 24V DC powered • Equipped with automatic stop function for when no communication signal is detected • IP65 	HX1R-AB1	—

• Do not use the transmitter/receiver as a safety-related part of a control system.

Accessories

Quantity:1

Name	Shape	Specification	Part No.	Remarks
Strap for wireless switch transmitter		—	HX9Z-1TS*	<ul style="list-style-type: none"> • * (Outer circumference when worn) 1: Approx. 14 to 22cm 2: Approx. 22 to 38cm 

Wireless switch transmitter/receiver (HX1T-AB1/HX1R-AB1)

General specifications

Type	Wireless switch transmitter (HX1T-AB1)	Wireless switch receiver (HX1R-AB1)
Applicable standards	UL/cUL 62368-1, EN IEC 62368-1 (CB test certificate), EN 300 328, EN 301 489-1, EN 301 489-17, EN 61000-6-4, EN 61000-6-2	
Radio Law Certification	FCC (USA), ISDE (Canada), MIC (Japan), Radio Equipment Regulations (UK), Radio Equipment Directive (Europe), SRRC (China)	
Environmental Specifications	Operating ambient temperature (No freezing)	-10 to +35°C (for wearable use) -10 to +40°C (for non-wearable use) 0 to +40°C (while charged via USB)
	Storage ambient temperature (No freezing)	-20 to +45°C
	Operating ambient humidity	30 to 85%RH (no condensation)
	Storage relative humidity	30 to 85%RH (no condensation)
	Corrosion resistance	Free from corrosive gases
Electrical Specifications	Rated input voltage	Power: Lithium-ion polymer secondary battery Charging: Type-C DC5V 100mA
	Current draw	2mA Charging current: 100mA (0.5W)
	Input voltage range	Power: Lithium-ion polymer secondary battery Charging: USB 4.4 to 5.25V
	Rated insulation voltage	No insulation
	Inrush current	—
	Insulation resistance	—
	Dielectric strength	—
	Allowable momentary power interruption	—
		24V DC
		80mA (at 24V)
		21.6 to 26.4V DC
		50V DC
		25A maximum
		100MΩ min. (500V DC megger)
		500V AC
		10ms minimum

Type	Wireless switch transmitter (HX1T-AB1)	Wireless switch receiver (HX1R-AB1)
Mechanical Specifications	Mechanical durability	Stop switch: 50,000 operations min. Power/communication check button: 500,000 operations min.
	Shock resistance	Operating extremes: 147m/s ² Endurance : 147m/s ²
	Vibration resistance	Frequency 5 to 8.4Hz Amplitude 3.5mm Frequency 8.4 to 150Hz Acceleration 9.8m/s ²
	IP performance (Degree of protection) (*2)	IP65
	Material	Case, cover, handle: PA66 Rotary SW cover: silicon
Structure Specifications	PC board	FR4
	Mounting	Wrist strap
	Weight (approx.)	60g

*1) The ambient operating temperature limit varies depending on the mounting orientation. For details, see "Restrictions depending on mounting orientation" on page 18.

*2) Degree of protection in non-charging state.
IP20 when connected with a USB cable during charging.

Performance specifications

Bluetooth Interface	Bluetooth standard	Bluetooth 5.2
	Profile	None
	Frequency band	2402 to 2480MHz
	Transmission distance	Approx. 70m maximum (at a location with good visibility)
	Communication style	Advertise
Power terminal (receiver only)	Recommended button force	20N (max. 40N)
	Compatible cable	Cable outer diameter ø4.5 to 8mm Conductor AWG16-24
External I/O output transistor sink output (Receiver)	Output method	Transistor sink
	Rated power voltage	24V DC
	Allowable voltage range	21.6 to 26.4V DC
	Isolation	Photocoupler isolated
	Output points and functions	4 points ES: Assisted E-STOP solenoid drive RE: Stop lamp (red) WT: Power/Stop signal lamp (white) GR: Communication lamp (green)
	Rated current	ES: 400mA WT: 50mA
	Output delay time	300us maximum
	ON voltage	1V maximum
	Leakage current	0.1mA maximum
	Clamping voltage	39V
	Overcurrent protection	None
	Output method	Relay output
	Output points and functions	1 point 1NC contact
	Allowable maximum current	2A, 30V DC (resistive load)
External I/O output Relay output (Receiver)	Minimum switching load	1mA, 5V DC (reference value)
	Initial contact resistance	100mΩ maximum
	Mechanical life	10 million times minimum (no load)
	Electrical life	100,000 times minimum 2A, 30V DC (resistive load)
	Maximum inrush current	2A
	Output delay time	OFF→ON: Maximum 10ms (not including bounce) ON→OFF: Maximum 10ms (not including bounce)

External I/O sink/source Input (Receiver)	Input method	Sink/Source input
	Scores and Functions	1 point Assisted E-STOP monitor contact
	Rated input voltage	24V DC
	Allowable voltage range	21.6 to 26.4V DC
	Rated input current	5mA
	Input impedance	4.4kΩ
	Input threshold	Type 1 (IEC 61131-2) ON state: > 15V, > 3.2mA OFF state: < 5V, < 0.9mA
	Input delay time	OFF→ON: 35μs + software processing ON→OFF: 100μs + software processing
	Isolation	Photocoupler-isolated
	Communication type	RS485
Serial communication port (Receiver)	Communication speed	9600 bps (fixed)
	Communication functions	Modbus RTU slave
	Cable	3-core unshielded cable
	Maximum cable length	15m
	Isolation	Not isolated
Battery performance (transmitter)	Battery type	Lithium-ion polymer secondary battery
	Charging method	USB Type-C connector connection (5V, 500mA maximum)
	Maximum charge current	100mA
	Standard charging time	4 to 5 hours (charging time from complete discharge with the main power slide switch turned off)
	Recommended charging cycle	Fully charged once every 7 to 10 days with 8 to 12 hours of use per day (Up to 500 charge/discharge cycles)
	Charging method	After turning off the main power slide switch of the transmitter, plug in the USB connector to charge the battery. (Charging with the main power slide switch turned on may cause battery deterioration.) (When charging or storing for a long time, turn off the main power slide switch.)

Wireless switch transmitter/receiver (HX1T-AB1/HX1R-AB1)

Communication output setting rotary switch

Wireless switch transmitter (HX1T-AB1)

Switches the output of radio waves emitted from the transmitter.
The communication distance differs depending on the switch settings.

Switch settings	Communication distance (reference value) (*1)
0	approx. 3m
1	approx. 10m
2	approx. 30m
3	approx. 70m

*1) The communication distance indicated above is only an approximate reference and is not a guaranteed value. In wireless communication, the communication distance can vary depending on various factors such as the orientation of the transmitter and receiver, obstacles such as humans, metal, walls, and radio wave conditions. Before using this product, be sure to check the communication status in the environment where you intend to use it.

- If the transmission power (txpower) is weakened, it may become susceptible to environmental effects, which can interrupt communication.
- When switching transmission power (txpower), be sure to restart the transmitter power supply.
(The changeover is reflected by restarting the power supply.)

Communication out-of-range automatic stop setting rotary switch

Wireless switch receiver (HX1R-AB1)

If a wireless switch receiver is not receiving communication from a wireless switch transmitter in the same group, it will automatically execute a Stop Operation.

The conditions under which the Stop Operation is executed differs depending on the switch settings.

Switch settings	Group settings
0	Function OFF (Stop Operation is not executed automatically)
1	If no signal is received for 1 second, the Stop Operation is executed
2	Stop Operation is executed if there is no reception for 5 seconds
3	Stop Operation is executed after 10 seconds if there is no reception

- When switching the communication out-of-range automatic stop function, be sure to restart the receiver power supply.
(The changeover is reflected by restarting the power supply.)

Group setting rotary switch

Wireless switch transmitter (HX1T-AB1)

Wireless switch receiver (HX1R-AB1)

Set up the group for wireless switch transmitters. The wireless switch receivers set in the same group will operate.

The group to be set differs depending on the switch settings.

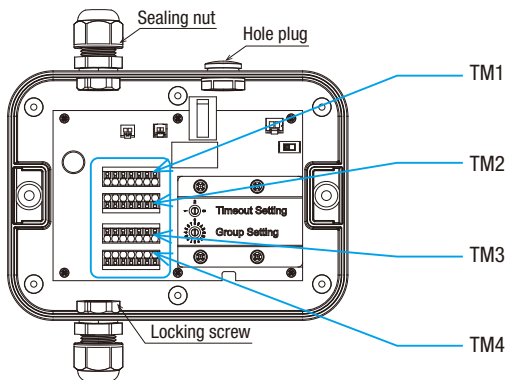
Switch Setting	Groups to be set
0	All Groups
1	Group 1
2	Group 2
3	Group 3
4	Group 4
5	Group 5
6	Group 6
7	Group 7
8	Group 8
9	Group 1+2
A	Group 1 + 2 + 3
B	Group 4 + 5
C	Group 4 + 5 + 6
D	Group 1 + 2 + 3 + 4
E	Group 5 + 6 + 7 + 8
F	Wireless switch transmitter: No group setting (All wireless switch receivers do not operate)
	Wireless switch receiver: Group designated by using Modbus RTU communication

- When the group setting rotary switch is set to "F", the group is set according to the value of the holding register. For details, see User's Manual.
- When switching group settings, be sure to restart the transmitter and receiver power supplies.
(The changeover will be reflected when the power is restarted.)

Wireless switch receiver (HX1R-AB1)

Terminal

Wireless switch receiver (HX1R-AB1)



1 A	2 B	3 SG	4 GR	5 WT	6 RE.	7 ES
7 SUB_IO+	6 SUB_IO+	5 SUB_IO+	4 A22	3 A21	2 A12	1 A11R
1 24V	2 NC1	3 IO+	4 E22	5 E21	6 E12	7 E11R
7 FE	6 0V	5 NC0	4 IO-	3 SUB_IO-	2 CM	1 IN

- Incorrect wiring may damage the internal circuit.
Especially, do not connect power input wires to other than 24V, 0V, IO+ and IO- in white text.
Also, do not connect the positive side of solenoids, relays, or indicators to ES, RE, WT, or GR terminals.

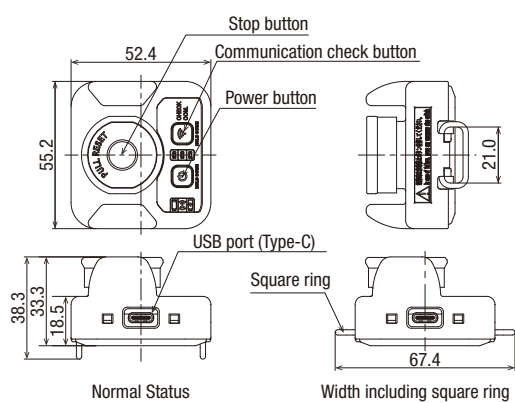
Terminal no.	Pin number	Terminal	Function Description	
TM1	7	ES	Assisted E-STOP solenoid drive	Tr sink output signal (24V DC, 400mA, resistive load)
	6	RE	Output/Error lamp status output	Tr sink output signal (24V DC, 50mA, resistive load)
	5	WT	Power/Stop signal lamp status output	Tr sink output signal (24V DC, 50mA, resistive load)
	4	GR	Communication lamp status output	Tr sink output signal (24V DC, 50mA, resistive load)
	3	SG	Signal ground	RS485
	2	B	Differential signal B	RS485
	1	A	Differential signal A	RS485
TM2	1	A11R	Stop target side: Break contact 1-1	Relay output (paired with E11R)
	2	A12	Stop target side: Break contact 1-2	Connected internally with E12
	3	A21	Stop target side: Break contact 2-1	Connected internally with E21
	4	A22	Stop target side: Break contact 2-2	Connected internally with E22
	5	SUB_IO+	Auxiliary terminal_I/O power supply (+)	Connected internally with IO+ (TM3-3)
	6	SUB_IO+	Auxiliary terminal_I/O power supply (+)	Connected internally with IO+ (TM3-3)
	7	SUB_IO+	Auxiliary terminal_I/O power supply (+)	Connected internally with IO+ (TM3-3)
TM3	7	E11R	Assisted E-STOP side: NC contact 1-1	Relay output (paired with A11R)
	6	E12	Assisted E-STOP side: NC contact 1-2	Connected internally with A12
	5	E21	Assisted E-STOP side: NC contact 2-1	Connected internally with A21
	4	E22	Assisted E-STOP side: NC contact 2-2	Connected internally with A22
	3	IO+	I/O power supply (+)	
	2	NC1	Reserve Main power (+)	Connected internally with 24V (TM3-1)
	1	24V	Main power (+)	
TM4	1	IN	Assisted E-STOP monitor NO contact input (+ side)	
	2	CM	Assisted E-STOP monitor NO contact input (COM side)	
	3	SUB_IO-	Auxiliary terminal_I/O power supply (-)	Connected internally with IO- (TM4-4)
	4	IO-	I/O power supply (-)	
	5	NC0	Reserve Receiver power supply (-)	Connected internally with 0V (TM4-6)
	6	0V	Main power (-)	
	7	FE	Functional earth	

Dimensions (HX1T-AB1/HX1R-AB1)

All dimensions in mm.

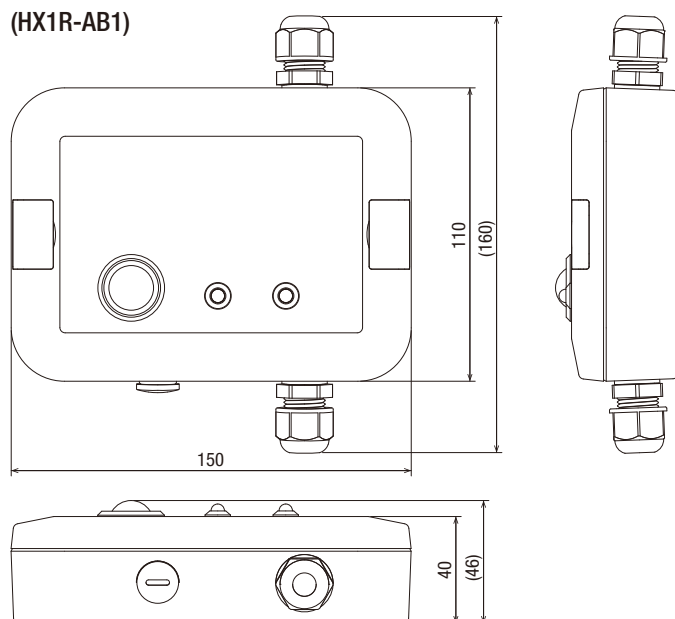
Wireless switch transmitter

(HX1T-AB1)

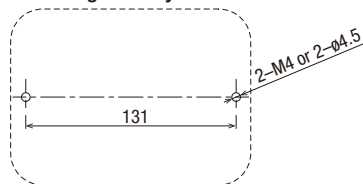


Wireless switch receiver

(HX1R-AB1)



Mounting hole layout



**Warning (Wireless switch transmitter (HX1T-AB1) / Wireless switch receiver (HX1R-AB1))**

- Do not use the transmitter/receiver as a safety-related part of a control system. Using the transmitter and receiver to operate the physical Assisted E-STOP is not classed as an emergency stop operation under international safety standards. It is also not specified as a device communication method under international safety standards.
- When using this product in combination with other products, make sure to comply with applicable laws, regulations, and standards. The customer should also verify that the product is compatible with the system in which it will be utilized.
- For risk assessment, the entire facility should be evaluated and reduced to an acceptable risk.
- Be sure to note the following:
 - Make sure to use the product in conditions that allow a margin for the product's rating.
 - Consider safety designs such as redundancy and malfunction prevention to avoid injury, fire, or social damage that may occur in case of a malfunction or failure of the product.
 - The product must be distributed and installed in a way that enables it to function and perform in accordance with the given specifications.
- To prevent any unforeseen damage resulting from the incorrect use of this product, make sure to understand all the prohibitions and handling precautions before use.
- Wireless communication may not always be stable, even within range. If the stop operation fails after pressing the stop button on the wireless switch transmitter, immediately stop the operated machine.
- Be sure to use the wireless switch transmitter with the communication lamp blinking green (communication mode).
- Be sure to perform a test operation in advance to confirm the functionality and performance of this product.
- Be sure to continue to educate the engineers, installers, and users of systems using this product on the correct use of this product, and establish rules and implement warning signs on equipment to ensure that proper care is taken.
- Do not disassemble, repair, or modify this product. Otherwise, electric shock, fire, or malfunction may occur.
- Be sure to use the product within the environmental limits specified in the catalog and manual. Exposure to high temperature, humidity, condensation, corrosive gas, or shock loads can cause electrical shock, fire, or malfunction.
- The product contains wireless devices that may perform differently depending on the surrounding environment. Be sure to consider the following and test the system's functionality on the actual site before implementation.
 - The range of stable communication is not uniform in all directions and depends on factors such as the orientation of the wireless switch transmitter and receiver, the presence of obstacles such as human body, metal, walls, and reflections.
 - Communication stability throughout all work periods.
 - Other Bluetooth communication devices or wireless switch transmitters and receivers within communication range.
- Discontinue use in environments where communication between the wireless switch transmitter and the wireless switch receiver is not stable.
- Install according to the instructions. Improper installation will cause the product to drop, cause failure, electrical shock, fire hazard, or malfunction.
- The wireless switch transmitter should be securely attached to a readily accessible area, such as the arm.
- Turn off the power before starting installation, removal, wiring, and inspection of each product. Failure to turn power off may cause electrical shock or fire.
- If you experience any malfunctions or abnormalities while using this product, discontinue use immediately and contact IDEC.
- Follow the instructions provided in the manual to inspect and maintain the equipment. Make sure to check all the items listed for inspection in the manual.
- It is essential to conduct a comprehensive risk assessment of the entire system before restarting any equipment. Follow the instructions provided in the manual when restarting the equipment. The communication conditions might differ significantly based on the presence of obstructions and peripheral equipment used. See the manual for the list of inspection items.
- Avoid exposing this product to temperatures or humidity outside of the specified range, as damage may occur.
- Avoid dropping or applying strong impact to the product.
- Do not disassemble, repair, or modify the product. Otherwise, damage may occur.

Installation and wiring

- Turn off the power before starting installation, removal, wiring, maintenance, and inspection of the products. Otherwise, not only damage but electrical shock or fire may occur.
- Installation and wiring of this product requires technical expertise and knowledge. Individuals without such expertise must not use this product.

**Caution (Wireless switch receiver (HX1T-AB1) / Wireless switch receiver (HX1R-AB1))**

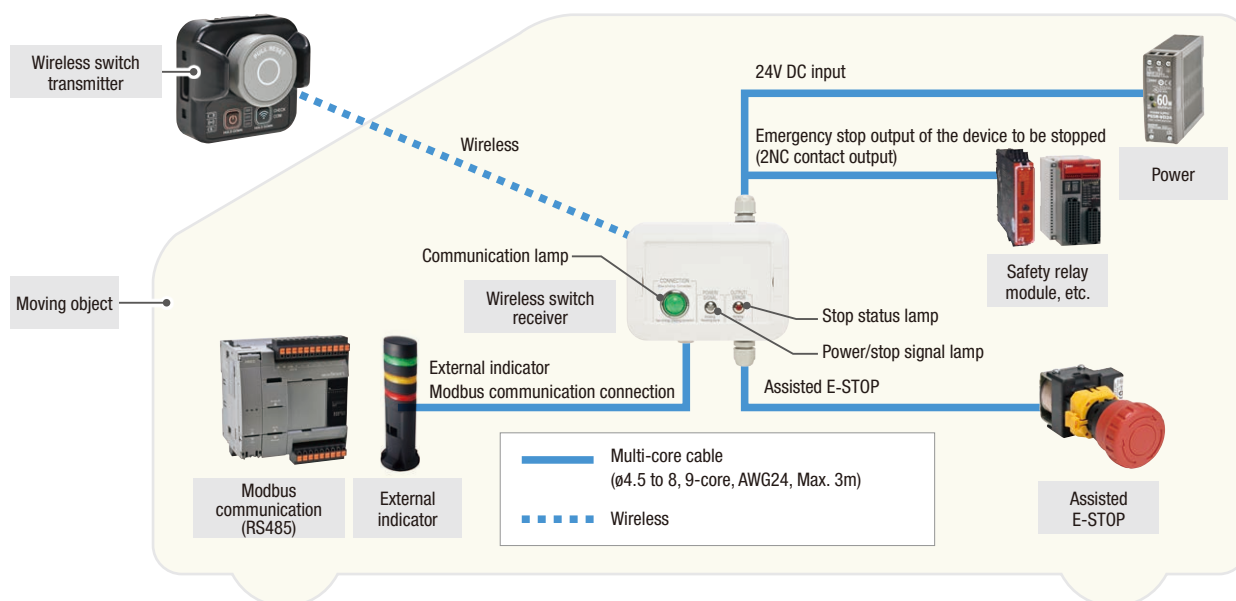
- When disposing of this product, dispose of it as industrial waste. The wireless switch receiver comes with a built-in antenna. Prior to storing it inside a machine or covering it with a cover, verify the communication status.
- Make sure that water, oil, or any other substances do not enter the cable ends while performing wiring work.
- When wiring to the Push-in terminal block of the wireless switch receiver, be careful not to injure your fingers with the tip of the screwdriver.
- When wiring to the Push-in terminal block of the wireless switch receiver, avoid applying excessive force when inserting the driver. Cracks or shavings inside the terminal block caused by the driver can lead to fire or malfunction if they enter the product.
- Be sure to connect a power supply that matches the rating to avoid burnout of the circuit board of the wireless switch receiver.
- Provide adequate operator training so that the operator can assess status based on the lamp lighting status.
- Stop using this product if it is accidentally dropped or exposed to shocks, check for damage, and confirm that its various functions work safely and correctly.
- Prevent the switch from external shock, as it may cause contact bounce.
- The manual provides the minimum guidelines for inspection. The customers should conduct additional checks necessary for system operation and perform appropriate maintenance.
- This product contains a built-in battery. Dispose the battery and accumulator in accordance with local regulations.
- Batteries are built-in the product. Batteries should be disposed of adequately by national and local regulations. The below symbol is only

applicable in countries that are part of the European Union. The symbol indicates that batteries and accumulators should be disposed of separately from household waste.

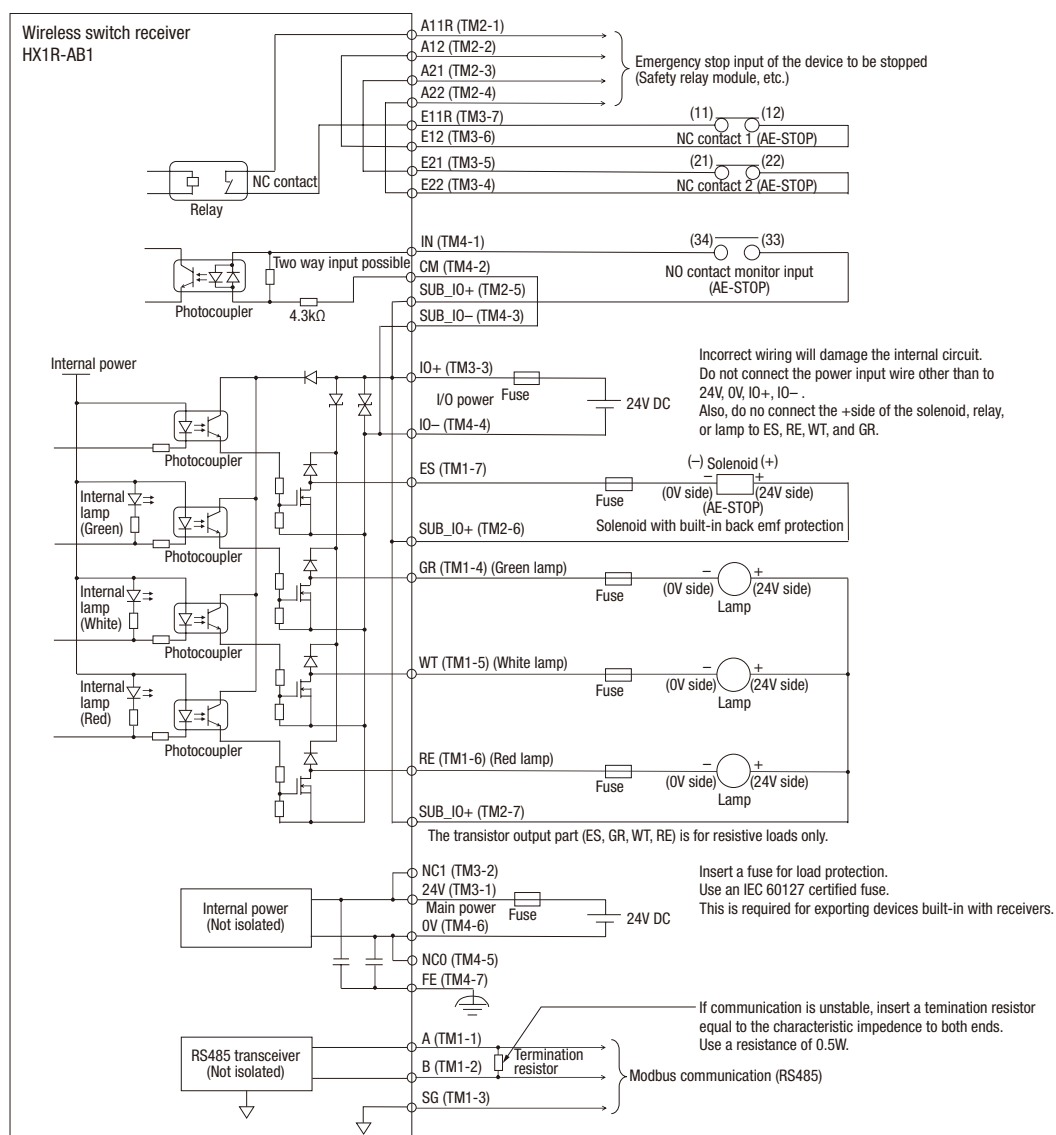


- If there is a chemical symbol beneath the above mentioned symbol, it implies that the battery or accumulator contains a heavy metal at a specific concentration.
Hg: Mercury (0.0005%) Cd: Cadmium (0.002%) Pb: Lead (0.004%).
- Charge the product fully before using it for the first time.
- Do not use this product while charging.
- The battery life of the device is reduced due to factors such as charge and discharge cycles, exposure to temperature and humidity variations, and natural aging.
- Rechargeable batteries (rechargeable lithium-ion polymer batteries) are consumables and will deteriorate over time even when used normally.
- Batteries left uncharged for extended periods may shorten may reduce battery life. Charge the battery regularly.
- If the battery is not fully charged within the specified charging time or if its usable time is less than half of what it was at the time of purchase, it may be an indication that the battery is reaching the end of its useful life. In such cases, it should be replaced.

System configuration



Internal equivalent circuit and external wiring



Using a wireless transmitter/receiver as part of the Assisted E-STOP system

Equipment grouping: flexible control that keeps machines and processes moving

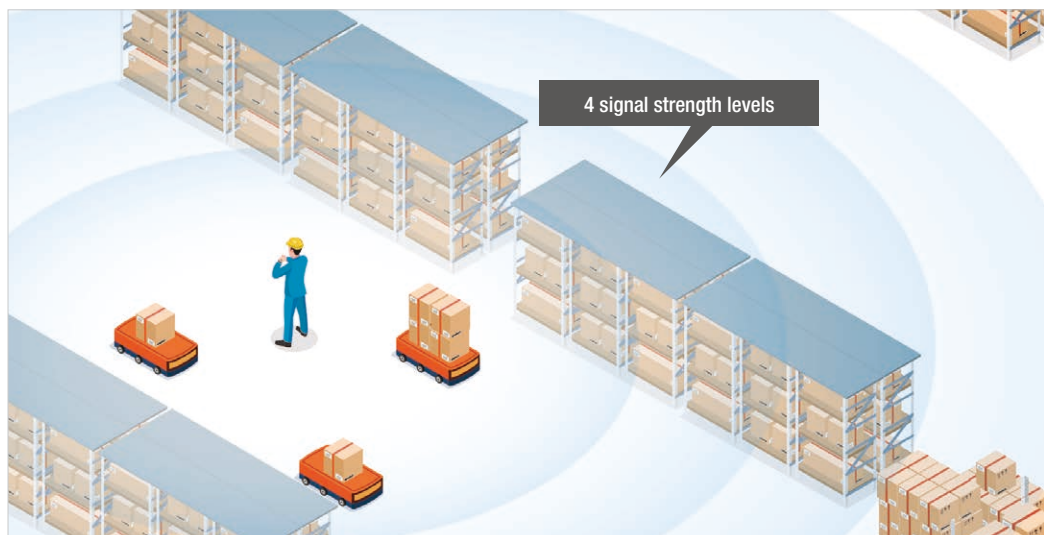
A maximum of eight groups of equipment can be created, designated with numbering from Group 1 to Group 8.

With this feature, automated guided vehicles (AGVs) and other robots and equipment at adjacent work sites can be grouped. This ensures they continue to operate independently of each other, even if another group is stopped.

**Communication output adjustment function:** adaptable signal strength for varied applications

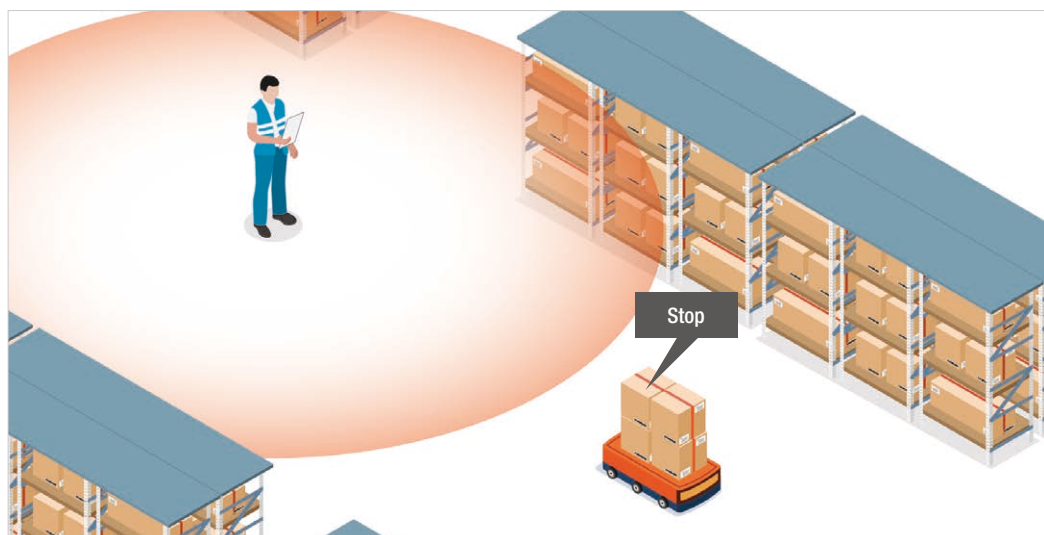
There are four levels of communication output adjustment. At the maximum signal strength, the communication signal can travel up to approx. 70m.

By adjusting the output level for different operators and supervisors, the system can be flexibly adapted to various sites and applications.

**Automatic stop function when there is no signal:** safety when equipment moves beyond control range

The system automatically stops the machinery/equipment if it does not receive a signal from the wireless switch transmitter for a set amount of time.

This function can be set as ON or OFF. It is designed for safe operation even if equipment is out of control range, or if the operator is not nearby.



**Caution (Wireless switch receiver (HX1T-AB1) / Wireless switch receiver (HX1R-AB1))****Installation and wiring**

- During installation and wiring, make sure to prevent wire scraps and drill shavings from entering the wireless switch receiver. Otherwise, it may cause fire, damage or malfunction.
- To avoid electrostatic discharge, refrain from directly touching connector pins with bare hands.

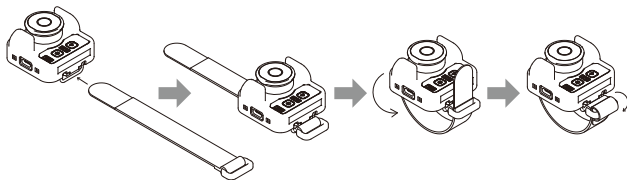
- Be sure to discharge static electricity from the body before handling the wireless switch receiver.
- Keep wiring away from power lines to prevent electromagnetic induction.
- Ensure that the connectors and terminal blocks are wired in such a way that no force is applied to them.

Instructions (Wireless switch receiver (HX1T-AB1) / Wireless switch receiver (HX1R-AB1))**Operating environment**

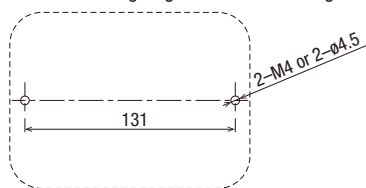
- The wireless switch transmitter/receiver should be installed indoors within the specifications.
- For performance and safety of this product, do not install the product in the following environments:
 - where dust, salt, or iron particles exist.
 - where oil or chemicals are persistent for an extended period of time.
 - where it is filled with oil mist.
 - where the product is exposed to direct sunlight.
 - where corrosive or combustible gases exist.
 - locations where vibration or shock is directly or indirectly transmitted to the wireless switch transmitter.
 - where condensation occurs due to rapid temperature change.
 - locations where water is directly on the wireless switch transmitter.
 - in the vicinity of high-voltage lines, high-voltage equipment, power lines, and power equipment.
 - where strong magnetic or electric fields occur.
- Check the manual before installing the wireless switch receiver. For proper ventilation, ensure that the product has enough surrounding space and is kept at a safe distance from other components, sources of heat, or panel surfaces.

Attaching the strap for wireless switch transmitter

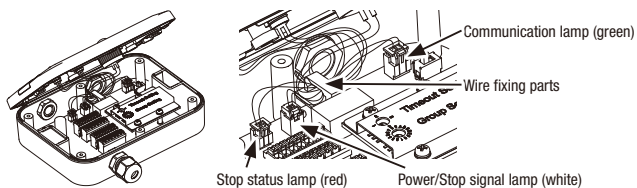
1. Thread the strap between the square brackets.
2. Thread the end of the strap between the plastic buckles of the strap.
3. Fold the end of the strap and glue it in place.

**Wireless switch receiver installation method**

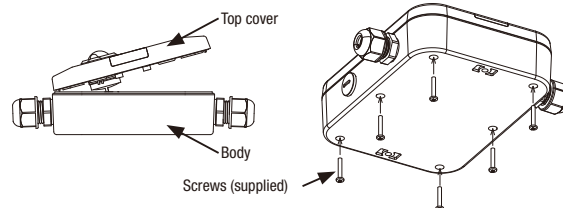
1. Create a hole in the mounting target with the following dimensions.



2. Remove the temporarily fixed tape and open the top cover for internal wiring. As the wires of the lamps attached to the top cover are connected to the internal circuit board with a connector, take care when opening the cover. The top cover can also be completely separated by disconnecting the lamp connectors (3 places) and removing the hooks of the wire fixing parts.



3. Attach the top cover to the body using six supplied screws (M2.5 x 16) and tighten from the rear with a tightening torque of 0.3N·m (reference). If the top cover is completely separated, attach the connector and hook the wires and insert through the wire fixing part before attaching the top cover.

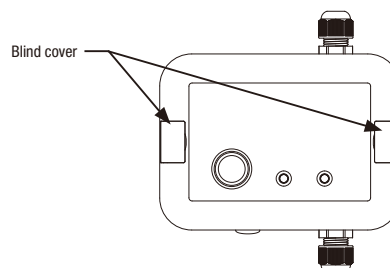


4. Open the blind cover and attach it to the mounting target using two M4 screws. Use M4 screws that are suitable for the installation.

<Reference>

M4 screw: Tightening torque 0.5 N·m

Length (thickness of mounting target) + 8mm minimum

**Restrictions depending on mounting orientation**

- The operating ambient temperature is limited by the mounting orientation as shown in the table below.

Installation orientation	Operating temperature
Upward (Fixed to the floor)	-10 to +50°C
Downward (Fixed to the ceiling)	-10 to +45°C
Other than upward or downward	-10 to +50°C

Be sure to read the instruction manual carefully before installation, wiring, or maintenance.

For details on mounting, wiring, and maintenance, see the instruction manual at the following URL.

- Wireless switch transmitter (HX1T-AB1) / Wireless switch receiver (HX1R-AB1) <https://product.idec.com/?product=HX1>



HX1T-AB1/HX1R-AB1

Instructions (Assisted E-STOP System (XW1E-BS4B12PR / HX1R-AB1))

Applicable wire

When wiring, use the applicable wires shown below. To crimp the ferrules, use a special crimping tool. For wiring, use the recommended screwdriver.

Applicable wires and specifications

Applicable wire	0.2 to 0.75mm ² (AWG24 to 18)
Wire strip length (*1)	8 ± 1mm (*2)
Wire size and recommended ferrules	H0.5 to H1.5 (without insulation cover)
	H0.25 to H0.75 (with insulation cover)

*1) For details on ferrules, see "Wire Sizes and Recommended Ferrules" below.

*2) Strip the sheath of the wire 8 ± 1mm from the end.



- Make sure that the stranded wires do not loosen when using wiring without ferrules.

Wire size and recommended ferrules

Ferrule terminal with insulation cover (for 1 wire) (IDEC)

Wire cross-section (mm ²)	AWG	Wire strip length	Part No.
0.25	24	10 to 11mm	ST3L-H025-12WJ
0.34	22		S3TL-H034-12WT
0.5	20		S3TL-H05-14WA
0.75	18		S3TL-H075-14WW

Ferrule terminal without insulation cover (for 2 wires) (IDEC)

Wire cross-section (mm ²)	AWG	Wire strip length	Part No.
0.34	22	10 to 11mm	S3TL-J034-14WT
0.5	20		S3TL-J05-14WA
0.75	18		(S3TL-J075-14WW) (*3)

*3) When crimping the AWG18/0.75mm² ferrule terminals for two wires, make sure that the long plastic side of the ferrule terminal is not connected in the pitch direction of the terminal block.

- For details, please refer to the instruction manual for each product.

Ordering Terms and Conditions

Thank you for using IDEC Products.

By purchasing products listed in our catalogs, datasheets, and the like (hereinafter referred to as "Catalogs") you agree to be bound by these terms and conditions. Please read and agree to the terms and conditions before placing your order.

1. Notes on contents of Catalogs

- (1) Rated values, performance values, and specification values of IDEC products listed in this Catalog are values acquired under respective conditions in independent testing, and do not guarantee values gained in combined conditions.
Also, durability varies depending on the usage environment and usage conditions.
- (2) Reference data and reference values listed in Catalogs are for reference purposes only, and do not guarantee that the product will always operate appropriately in that range.
- (3) The specifications / appearance and accessories of IDEC products listed in Catalogs are subject to change or termination of sales without notice, for improvement or other reasons.
- (4) The content of Catalogs is subject to change without notice.

2. Note on applications

- (1) If using IDEC products in combination with other products, confirm the applicable laws / regulations and standards.
Also, confirm that IDEC products are compatible with your systems, machines, devices, and the like by using under the actual conditions. IDEC shall bear no liability whatsoever regarding the compatibility with IDEC products.
- (2) The usage examples and application examples listed in Catalogs are for reference purposes only. Therefore, when introducing a product, confirm the performance and safety of the instruments, devices, and the like before use. Furthermore, regarding these examples, IDEC does not grant license to use IDEC products to you, and IDEC offers no warranties regarding the ownership of intellectual property rights or non-infringement upon the intellectual property rights of third parties.
- (3) When using IDEC products, be cautious when implementing the following.
 - i. Use of IDEC products with sufficient allowance for rating and performance
 - ii. Safety design, including redundant design and malfunction prevention design that prevents other danger and damage even in the event that an IDEC product fails
 - iii. Wiring and installation that ensures the IDEC product used in your system, machine, device, or the like can perform and function according to its specifications
- (4) Continuing to use an IDEC product even after the performance has deteriorated can result in abnormal heat, smoke, fires, and the like due to insulation deterioration or the like. Perform periodic maintenance for IDEC products and the systems, machines, devices, and the like in which they are used.
- (5) IDEC products are developed and manufactured as general-purpose products for general industrial products. They are not intended for use in the following applications, and in the event that you use an IDEC product for these applications, unless otherwise agreed upon between you and IDEC, IDEC shall provide no guarantees whatsoever regarding IDEC products.
 - i. Use in applications that require a high degree of safety, including nuclear power control equipment, transportation equipment (railroads / airplanes / ships / vehicles / vehicle instruments, etc.), equipment for use in outer space, elevating equipment, medical instruments, safety devices, or any other equipment, instruments, or the like that could endanger life or human health
 - ii. Use in applications that require a high degree of reliability, such as provision systems for gas / waterworks / electricity, etc., systems that operate continuously for 24 hours, and settlement systems
 - iii. Use in applications where the product may be handled or used deviating from the specifications or conditions / environment listed in the Catalogs, such as equipment used outdoors or applications in environments subject to chemical pollution or electromagnetic interference
If you would like to use IDEC products in the above applications, be sure to consult with an IDEC sales representative.

3. Inspections

We ask that you implement inspections for IDEC products you purchase without delay, as well as thoroughly keep in mind management/maintenance regarding handling of the product before and during the inspection.

4. Warranty

(1) Warranty period

The warranty period for IDEC products shall be one (1) year after purchase or delivery to the specified location. However, this shall not apply in cases where there is a different specification in the Catalogs or there is another agreement in place between you and IDEC.

(2) Warranty scope

Should a failure occur in an IDEC product during the above warranty period for reasons attributable to IDEC, then IDEC shall replace or repair that product, free of charge, at the purchase location / delivery location of the product, or an IDEC service base. However, failures caused by the following reasons shall be deemed outside the scope of this warranty.

- i. The product was handled or used deviating from the conditions / environment listed in the Catalogs
 - ii. The failure was caused by reasons other than an IDEC product
 - iii. Modification or repair was performed by a party other than IDEC
 - iv. The failure was caused by a software program of a party other than IDEC
 - v. The product was used outside of its original purpose
 - vi. Replacement of maintenance parts, installation of accessories, or the like was not performed properly in accordance with the user's manual and Catalogs
 - vii. The failure could not have been predicted with the scientific and technical standards at the time when the product was shipped from IDEC
 - viii. The failure was due to other causes not attributable to IDEC (including cases of force majeure such as natural disasters and other disasters)
- Furthermore, the warranty described here refers to a warranty on the IDEC product as a unit, and damages induced by the failure of an IDEC product are excluded from this warranty.

5. Limitation of liability

The warranty listed in this Agreement is the full and complete warranty for IDEC products, and IDEC shall bear no liability whatsoever regarding special damages, indirect damages, incidental damages, or passive damages that occurred due to an IDEC product.

6. Service scope

The prices of IDEC products do not include the cost of services, such as dispatching technicians. Therefore, separate fees are required in the following cases.

- (1) Instructions for installation / adjustment and accompaniment at test operation (including creating application software and testing operation, etc.)
- (2) Maintenance inspections, adjustments, and repairs
- (3) Technical instructions and technical training
- (4) Product tests or inspections specified by you

The above content assumes transactions and usage within your region. Please consult with an IDEC sales representative regarding transactions and usage outside of your region. Also, IDEC provides no guarantees whatsoever regarding IDEC products sold outside your region.

IDEC CORPORATION

Head Office 6-64, Nishi-Miyahara-2-Chome, Yodogawa-ku, Osaka 532-0004, Japan

 **www.idec.com**

USA IDEC Corporation
EMEA APEM SAS

Singapore IDEC Izumi Asia Pte. Ltd.
Thailand IDEC Asia (Thailand) Co., Ltd.
India IDEC Controls India Private Ltd.

China IDEC (Shanghai) Corporation
IDEC Hong Kong Co. Ltd.
Taiwan IDEC Taiwan Corporation

Japan IDEC Corporation

Specifications and other descriptions in this brochure are subject to change without notice.
Information in this brochure is current as of September, 2025.
2025 IDEC Corporation, All Rights Reserved.
EP1846-0

