HOTRON HR100-CT User Manual

Sensor Partners

CE

COMPLIED STANDARDS
DIN18650-1:2010
EN 12978:2003+A1:2009
EN 16005:2012+AC:2015
EC type examination 44 205 13 738003

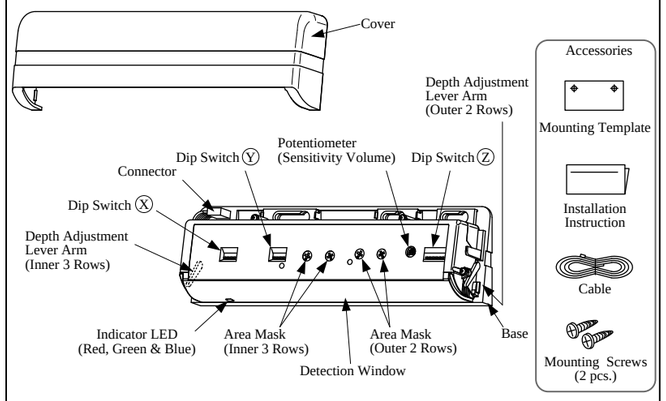
WARNING Disregarding this symbol may result in serious injury or death.

CAUTION Disregarding this symbol may result in injury or damage to equipment.

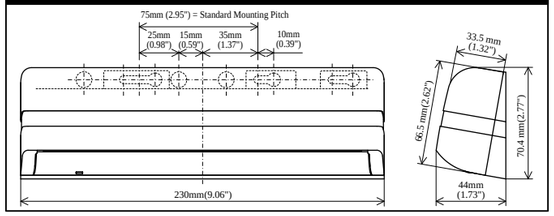
Note Special attention is required when this symbol is shown.

EN16005 Setting required to conform with EN16005.

1. DESCRIPTION



2. DIMENSIONS

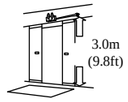


3. LED INDICATORS

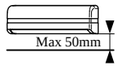
Green	Standby.
Green blinking	Doorway Learning (When dip switch Ⓩ 5 is ON).
Blue	ROW 4,5 Detecting.
Red	ROW 1,2,3 Detecting.
Orange	Detection row "ROW1"("ROW2" when doorway Learning is turned ON) is detecting door movement.
Orange blinking (Fast)	Indicates a change of dip switch settings.
Orange blinking (Slow)	Door Hold is turned Open (When dip switch Ⓩ 4 is Open) .
Green/Red blinking (Fast)	Internal Sensor Error.
Green/Red blinking (Slow)	Reflected infrared signal from the floor is very low.

4. MOUNTING PRECAUTIONS

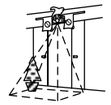
Mounting height is 3.0m (9.8ft) or lower.



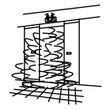
Mount within 50mm from the bottom of the door engine cover.



Ensure there are no moving objects in the detection zone.



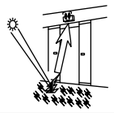
Ensure no condensation gets onto the sensor.



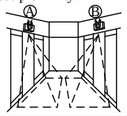
If the sensor is exposed to excessive rain install with a Hotron weather cover.

If possible ensure no accumulation of snow or water on the floor.

Ensure the minimum of reflected sunlight from the floor.



Use different frequency settings for sensors in close proximity.



To maximize the effectiveness of doorway detection, install the HR100-CT outside and inside as shown below.

5. TECHNICAL SPECIFICATIONS

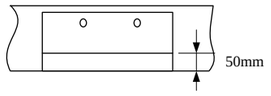
Model Name	HR100-CT	
Detection Method	Active Infrared Reflection	
Installation Height	3.0[m] (9.8 [ft]) Max	
Supply Voltage	AC/DC 12 to 24 [V] ±10% 50/60[Hz]	
Power Consumption	AC12V-1.5 [VA] (Max) AC24V-2.0 [VA] (Max) DC12V-80 [mA] (Max) DC24V-50 [mA] (Max)	
Output Holding Time	Approx. 0.5[s]	
Response Time	0.1[s] ～ 0.2[s]	
Presence Timer	Outer 2 Rows	1[s]
	Inner 3 Rows	2[s],30[s],60[s] or ∞
Output	ROW 1,2	Open collector: 7.5 [mA] (Max) Resistor Load Opto coupler (NPN) Voltage: 55 [VDC] Max. Current : 50 [mA] Max. Dark Current: 100 [nA] Max. (Resistance load)
	ROW 2,3,4,5	Opto Relay Non Pole DC50 [V] 0.1[A] (Resistance Load)
Test Input	6 [mA] Max. @ 24 [VDC]	
Operating Temperature	-20 to +60 [Deg.C],(-4 to 140 [Deg.F])	
Operating Humidity	Below 80[%]	
IP Rate	IP54 (With Base)	
Category	2 , performance level D according to EN ISO 13849-1:2015	
Weight	0.55 [lb.] (0.25 [kg])	
Color	Black, Silver	
Accessories	Cable, Mounting Screw 2pcs., Mounting Template, Installation Instruction	

Notice: Specification may be changed without prior notice.

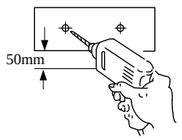
6. MOUNTING & WIRING INFORMATION

WARNING Drilling may cause electric shock.
Be careful of hidden wires inside the door engine cover.

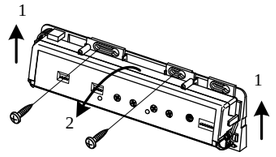
① Attach the mounting template with its bottom parallel to the same position as the bottom edge of the door engine cover.



② Drill holes for mounting (3.5mmφ) and wiring (10mmφ) holes.



③ If you need to remove the sensor body from its base then lift the sensor body from the base and tilt it forward to remove as illustrated.

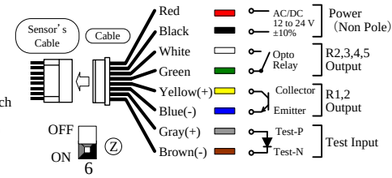


④ Attach the sensor with the mounting screws provided.

⑤-1 Wiring to a door controller that **can** test the sensor.

Note EN16005

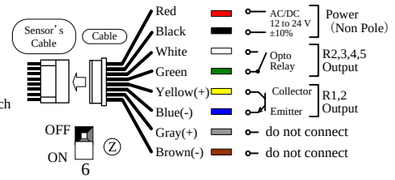
Set "Test input" dip switch setting Ⓩ 6 to "ON"
Ref section 7, Dip Switch Settings.



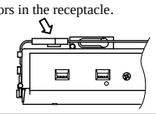
⑤-2 Wiring to a door controller that **cannot** test the sensor.

Note

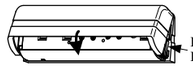
Set "Test input" dip switch setting Ⓩ 6 to "OFF"
Ref section 7, Dip Switch Settings.



⑥ House connectors in the receptacle.



⑦ Replace Cover.

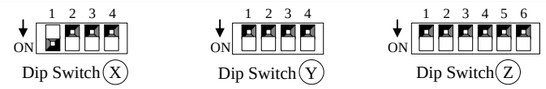


CAUTION Be careful not to inadvertently move the Depth Adjustment Lever Arms when replacing the cover.

7. DIP SWITCH SETTINGS

CAUTION

☆ = Default Setting



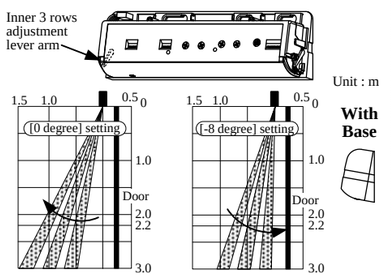
Function	Dip Switch Ⓧ	Description	Possible Setting Options
Presence Timer	☆30s	The sensor will detect a stationary object for the period of the preset presence timer setting on the inner 3 rows. EN16005 To comply with EN16005 set the presence timer to 30s or more.	2s / ☆30s / 60s / ∞
Quantity of Detection Rows	☆R5	The number of rows of detection can be set to 5, 4, 3, 2 depending on detection area requirements.	☆R5 (5 Rows ON) / R4 (4 Rows ON) / R3 (3 Rows ON) / R2 (2 Rows ON)

Function	Dip Switch Ⓨ	Description	Possible Setting Options
Frequency	☆ A	When more than two sensors are installed in close proximity to each other select different frequency settings for each sensor to prevent cross interference.	☆ A / B / C / D
Safety Output	☆ N.O.	Refer to [11.Timing Chart of events] for full details on Safety Output.	☆ N.O. / N.C. (Safety Output (Opto Coupler))
Reflection Diagnostics	☆ Normal	A low reflected infrared signal is indicated by a slow flashing Red/Green LED. To ignore this low reflection error, set this dip switch to "Low Reflection"(ON). EN16005 To comply with EN16005 set to "Normal".	☆ Normal / Low Ref. (Transmitter, Receiver, IR Spot, LED)

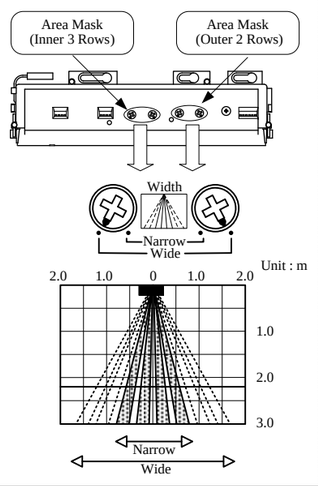
Function	Dip Switch Ⓩ	Description	Possible Setting Options
Direction Detection	☆ OFF	When set to ON, pedestrians moving away from the sensor will not be detected. Note For pedestrian safety purposes when "Doorway Learn" is set to ON the 1st and 2nd row of detection will detect pedestrians regardless of direction of movement.	☆ OFF / ON
Activation Output	☆ N.O.	Refer to [11.Timing Chart of events] for full details on Activation Output.	☆ N.O. / N.C. (Activation Output (Opto Relay))
Monitor Mode	☆ Normal	Set to Snow in instances where false door activations can result from blowing snow, leaves or rubbish in the door close area.	☆ Normal / Snow
Door Hold	☆ Auto	CAUTION Switch to OPEN to hold the door in the open position.	☆ Auto / Open
Doorway Learn	☆ OFF	Doorway Learn allows the 1st row of detection to be focused inside the door close area without detecting the door movement. Note When Doorway Learn is turned ON, the sensitivity level of the inner row of detection is only at maximum when the outer rows of detection are activated.	☆ OFF / ON (Door)
Test Input Setting from Door Controller	☆ OFF	When connected to a door controller without a TEST input, set to "OFF". When connected to a door controller with a TEST input, set to "ON" Refer to [11.Timing Chart of events]. EN16005 To comply with EN16005 set to "ON".	☆ OFF / ON (Without TEST, With TEST, Without TEST; OFF 0v, ON 0v)

8.DETECTION AREA WIDTH AND DEPTH ADJUSTMENT

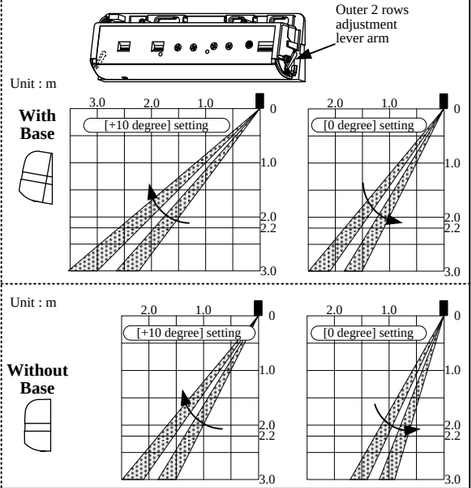
Detection Area Depth Adjustment: Inner 3 Rows



Detection Area Width Adjustment



Detection Area Depth Adjustment: Outer 2 rows



CAUTION The above illustrated detection areas represent the actual position of the infrared beams. The actual detection area observed will vary depending on the sensor installation environment, object been detected and sensor settings. Please ensure that the detection area is set to conform to EN16005.

9. APPLYING POWER AND THE "DOORWAY LEARN" SETTING

"Doorway Learn" is OFF *Ref section 7, Dip Switch Settings.* Ⓩ 5	**"Doorway Learn" is ON** *Ref section 7, Dip Switch Settings.* Ⓩ 5		
Upon power ON, the solid green LED turns on indicating that the sensor is in standby mode and ready to detect.	Upon power ON, the Red LED indicates a door open relay output to begin the doorway learn process.	Green LED blinks for 37s as the "door learn" process is carried out. Door opens/closes.	Door learn process complete, sensor in standby mode.
● Green solid LED	● Red solid LED	✷ Green blinking LED ✷ Green blinking LED	● Green solid LED

Presence Detection: It takes 10s after sensor power up for presence detection to be initiated on all rows of detection.
If before 10s has elapsed someone walks into the detection area it will take about 5s after the person leaves the detection zone for presence detection to be functional.

CAUTION

Presence Detection: During the "Doorway Learn" process the outer 4 rows of detection on the HR100-CT sensor switch from motion detection to presence detection 10s after power ON. The inner "door learn" row of detection will switch from motion to presence detection after the "doorway learn" process is carried out.

"Doorway Learn" Failure & Recovery: If a person enters the detection area during the "doorway learn" process it may not be successfully completed. In this case the sensor will carry out the doorway learn process on door activations by a person in order to build an accurate image of the door open and door close position.

Note When Doorway Learn is turned ON, the sensitivity level of the inner row of detection is only at maximum when the outer rows of detection are activated.

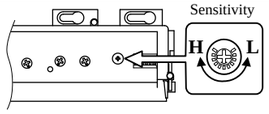
General Caution:

When carrying out the following work, turn off sensor power.

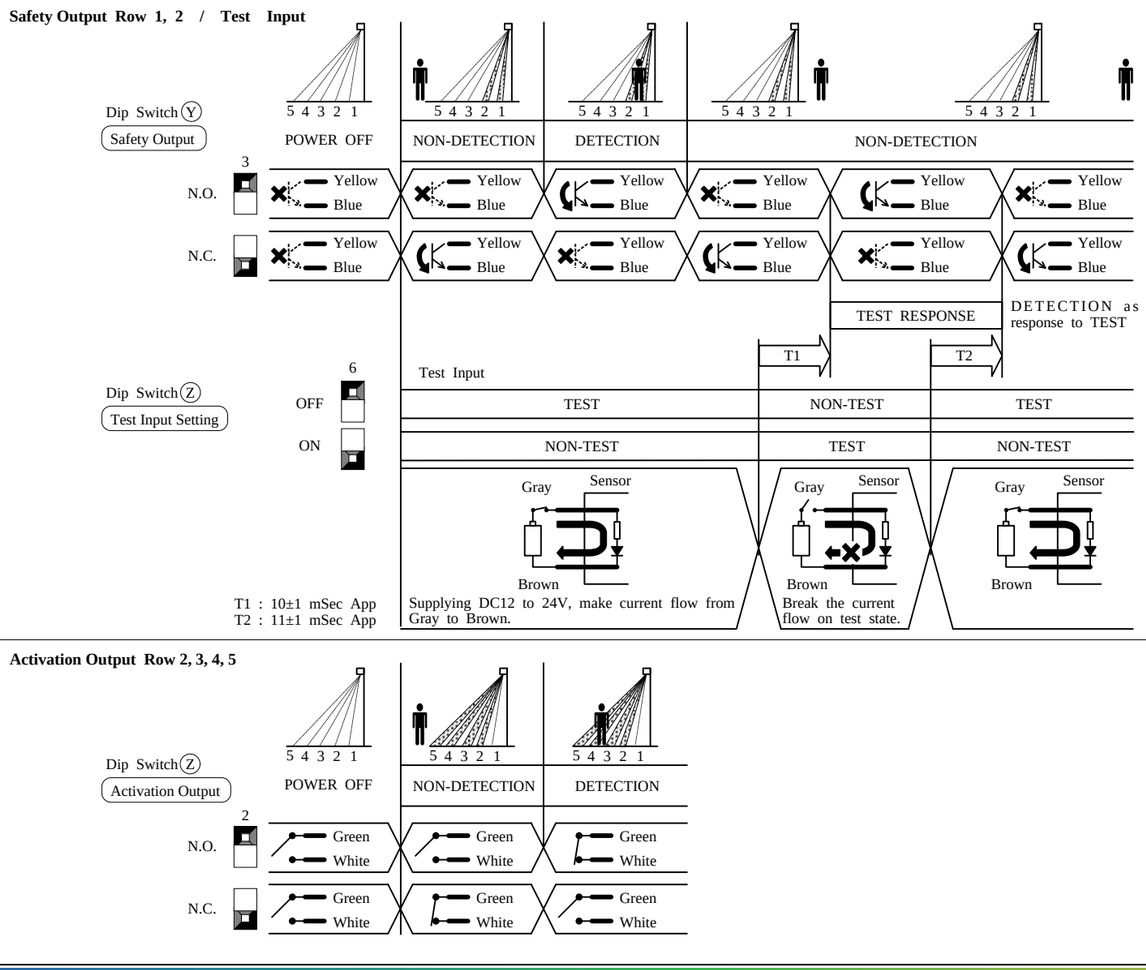
※ When the floor condition is changed by placing a mat on the floor etc.
※ When the detection area pattern or sensor sensitivity is adjusted.

10. VERIFICATION OF OPERATION

After installation is completed "walk test" the sensor detection area. If the detection area is not as expected adjust the detection area as referred to in section 8 or increase the rows of detection using Dip switch Ⓧ 3 & 4
If the detection area is still not as expected then the sensor sensitivity can be increased by turning the potentiometer clockwise. When the sensor detects even though there is nothing in the detection area the sensor sensitivity can be decreased by turning the potentiometer in the anti-clockwise direction.



11. TIMING CHART OF EVENTS

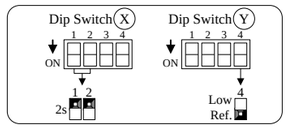


Activation Output Row 2, 3, 4, 5

12. DOOR MAINTENANCE WORK

When carrying out door maintenance work with power applied to the sensor on door controllers that are wired to "test" the sensor ensure to set the dip switches as below.

Note Keep in mind to return the dip switch settings to their original state once door maintenance work has been carried out.



Refer to [7.Dip Switch Settings].

13. SELF DIAGNOSTICS ERRORS

Technical problems with the HR100-CT sensor are indicated by a flashing Green/Red LED. The frequency of flashing indicates the type of problem as explained below.

Flash Frequency	LED	Cause
Fast	Green ✷ ✷ ✷ ✷ ✷ ✷ ✷ Red ✷ ✷ ✷ ✷ ✷ ✷ ✷	Please replace the sensor.
Slow	Green ✷ ✷ Red ✷ ✷ ✷	Confirm that the sensitivity potentiometer is set to maximum and re-power the sensor. If the error persists, set Dip Switch Ⓨ 4 to "Low Reflection".

14. TROUBLESHOOTING

Problem	LED Status	Possible Cause	Solution
Door does not open when a person enters the detection area.	OFF	Sensor Connector not connected correctly.	Tighten or reconnect the connector.
		Incorrect power supply voltage.	Apply proper voltage to the sensor. (AC/DC 12-24V)
		Incorrect sensor wiring.	Double check sensor wiring.
Door opens and closes for no apparent reason (Ghosting).	Door Opens RED Door Closes GREEN	Object moving in the detection area.	Remove the moving object from detection area.
		Sensitivity too high for the installation environment.	Reduce the sensor sensitivity.
		Dust, frost or water droplet on the sensor lens.	Wipe the sensor lens clean and install a weather cover if necessary.
		Detection area overlaps with that of another sensor.	Ensure different frequency setting for each sensor.
		Detection of falling snow, insects, leaves etc.	Turn monitor mode Dip switch Ⓩ 3 to "Snow".
When Door opens or closes, LED ORANGE.	ORANGE	Detection row "ROW1" ("ROW2" when "Doorway Learn" is turned ON) is focused too close to the door.	Adjust detection depth of Inner 3 rows away from the door.
Door opens and remains in the open position.	RED	Detection area changed, while ∞ infinity presence timer setting is in use.	Re-power the sensor or change the presence timer settings to 30s or 60 s.
		Incorrect sensor wiring.	Double check sensor wiring.
		Reflected signal saturation.	Remove highly reflective objects from the detection area, or lower the sensor sensitivity.
	GREEN/RED FAST FLASH	Internal sensor error.	Replace the sensor.
	GREEN/RED SLOW FLASH	Reflection of the transmitted infrared signal from the floor is too low.	Increase sensor sensitivity or change the "Reflection Diagnostics" Dip switch Ⓨ 4 from "Normal" to "Low Ref".
	ORANGE blinking (Slow)	Door Hold (Dip switch Ⓩ 4 set to Open).	Turn "Door Hold" Dip switch Ⓩ 4 to Auto.

15. HR100-CT EC DECLARATION OF CONFORMITY

Compiler of Technical File (EC Community)
David Morgan
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Ph: +353-(0)59-9140345 Fax: +353-(0)59-9140543

Description of Product:
HR100-CT Combined motion and presence detection sensor for the activation and safety of automatic doors.
Technology used is Active Infrared Technology.

Harmonized Standards Used:
EN ISO 13849-1:2015

Other Technical Standards Used:
DIN 18650-1:2010
EN 16005:2012+AC:2015

Above EC Type Directives Certified by:
TUV NORD CERT GmbH
30519 Hannover, Germany
Identification No: 0044

Declaration made by
Teruya Morimoto
Director Quality Assurance

Location of Declaration
Honda Electron Co., LTD.
1-23-19 Asahi-Cho, Machida-City,
Tokyo, Japan

Date
7 July, 2017

Directives Fulfilled:

DIRECTIVE 2006/42/EC	
DIN 18650-1:2010	Powered pedestrian doors Part 1: Product requirements chapter 5.7.4
EN12978:2003+A1:2009	Industrial, commercial and garage doors and gates - safety devices for power operated doors and gates - Requirements and test methods
EN62061:2005	Functional safety of electrical/electronic/programmable electronic safety-related systems
EN ISO 13849-1:2015	Safety of machinery - Safety-related parts of control systems.
EN 16005:2012+AC2015	
EC type examination 44 205 13 738003	

< Disclaimer > The manufacturer cannot be held responsible for below.
1. Misinterpretation of the installation instructions, miss connection, negligence, sensor modification and inappropriate installation.
2. Damage caused by inappropriate transportation.
3. Accidents or damages caused by fire, pollution, abnormal voltage, earthquake, thunderstorm, wind, floods and other acts of providence.
4. Losses of business profits, business interruptions, business information losses and other financial losses caused by using the sensor or malfunction of the sensor.
5. Amount of compensation beyond selling price in all cases.