

Area Sensor

# PAS series

INSTRUCTION MANUAL

Thank you for purchasing Hanyoung Nux products.  
Please read the instruction manual carefully before using this product, and use the product correctly.  
Also, please keep this instruction manual where you can see it any time.

HANYOUNG NUX



HANYOUNGNEXCO.,LTD

28, Gilpa-ro 71beon-gil,  
Michuhol-gu, Incheon, Korea  
TEL : +82-32-876-4697  
http://www.hynux.com

MK0602KE190627

## Safety information

Please read the safety information carefully before use, and use the product correctly.  
The alerts declared in the manual are classified into Danger, Warning and Caution according to their importance

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

### ! DANGER

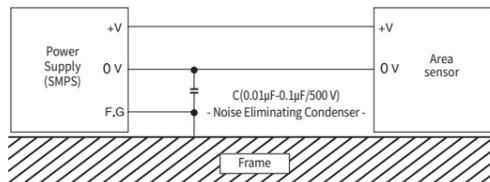
The input/output terminals are subject to electric shock risk. Never let the input/output terminals come in contact with your body or conductive substances.

### ! WARNING

- The contents of this manual are subject to change without prior notice.
- To prevent deflection or malfunction of this product, supply proper power voltage in accordance with the rating.
- Do not use the product at where subject to flammable or explosive gas.
- Remove this product while the power is off. Otherwise, it may cause malfunction or electric shock.
- Due to the danger of electric shock, use this product installed onto a panel while an electric current is applied.
- To avoid electric shock, use this product installed on the panel.
- This product is not for press safety sensors.
- This product does not have control of the disaster prevention and accident prevention.
- Hanyoung Nux shall not be liable for a damage and for a failure.

### ! CAUTION

- The contents of this manual are subject to change without prior notice.
- If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- Do not decompose, modify, revise or repair this product. This may be a cause of malfunction, electric shock or fire.
- Make sure that there is no damage or abnormality of the product during delivery.
- Do not use this product at any place with a large inductive noise or occurring static electricity or magnetic noise.
- Do not use this product at any place with possible thermal accumulation from direct sunlight or heat radiation.
- When the product gets wet, the inspection must be done to avoid electric leakage or fire.
- Make sure that the unused wire insulated.
- Make sure to wire with correct polarity of terminals.
- For the continuous and safe use of this product, the periodical maintenance is recommended.
- Make wiring as short as possible, wire is recommended with its dimension 0.5 mm or more and maximum 25m.
- Avoid continuously switching the power source On and Off.
- Use a dry cloth to wipe off the substance when cleaning the lens or cases. Never use thinner or organic solvents.
- Do not use this product where exposed to dust, vibration or impact.
- Before inserting power source, make sure that the circuit wiring is properly connected.
- In the case of wiring loaded inductors such as DC Relay and others to output, use diode, varistor and others to prevent surge.
- To avoid malfunction caused by noise, do not put high voltage or power line with sensor wire in a same conduit
- Prevent strong disturbance light such as sunlight and others which directly enter into the directional angle of the sensor by putting a glare shield.
- When using the Switching Power Supply as the power source, earth the Frame Ground (F.G) terminal and be sure to connect the noise-eliminating condenser between 0V and F.G.



※ If you do not follow the contents described in the safety information then it is possible to be a cause of the product's malfunction so please follow them.

## Feature

- 13 mm slim body type.
- Mutual interference protection when installed in parallel. (Max 2 sets)

## Suffix code

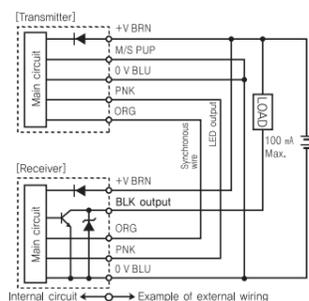
Model	code	content
PAS	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Area Sensor (Slim Type)
Optical axis pitch	20	20 mm
Sensing method	T	Through Beam
Number of optical axis	4	4 optical axis
	8	8 optical axis
	12	12 optical axis
	16	16 optical axis
	20	20 optical axis
Control output	N	NPN open collector
	P	PNP open collector
Operation mode	L	Light ON
	D	Dark ON

## Specification

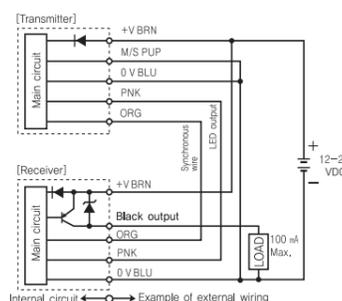
Model	NPN	PAS-T4NL	PAS-T8NL	PAS-T12NL	PAS-T16NL	PAS-T20NL
	PNP	PAS-T4ND	PAS-T8ND	PAS-T12ND	PAS-T16ND	PAS-T20ND
Number of optical axis		4	8	12	16	20
Sensing width		60 mm	140 mm	220 mm	300 mm	380 mm
Sensing distance		5 m				
Sensing object		Opaque object over Ø30 mm				
Optical axis pitch		20 mm				
Light source		IR (860nm)				
Power voltage		12 - 24 VDC ±10% Ripple(p-p)10% Max				
Current consumption		Max. 80 mA	Max. 90 mA	Max. 100 mA	Max. 110 mA	Max. 120 mA
Control output		• NPN / PNP open collector output • Load Current: Max. 100mA (26.4VDC standard) • Residual voltage - NPN: Max. 1 V, PNP:Max. 1 V				
Operation mode		Light On or Dark On				
Operation LED		Transmitter : Power indicator(Green LED), M/S display(Red LED) Receiver : Light on stability display(Green LED), output Display(Red LED), E1 display(Red LED), E2 display(Blue LED)				
Protection circuit		Power reverse connection protection, Output short-circuit over-current protection, Mutual interference prevention function				
Response Time		Max. 7 ms				
Insulation resistance		Min. 20 MΩ (500 VDC mega standard)				
Noise immunity		Square wave noise by noise simulator (pulse width 1 µs) ±240 V				
Dielectric strength		1,000 VAC (50/60 Hz 1min)				
Vibration resistance		10 - 55 Hz, double amplitude: 1.5 mm, X-Y-Z in each direction for 2 hours				
Shock resistance		500m/s², X-Y-Z each direction 3 times				
Ambient illumination		Sunlight : Max. 10,000 Lux, Incandescent lamp : Max. 3,000 Lux				
Ambient temperature		During operation : -10 ~ +55 °C, During storage : -25 ~ +70 °C (Without condensation or icing)				
Ambient humidity		35 ~ 85 % R.H. (Without condensation)				
Degree of protection		IP40 (IEC standard)				
Approval		CE				
Connection method		cable withdrawal type (Number of wires : 5P, Code length : 3m , Dimension : Ø4mm)				
Material	Case	ABS				
	front cover	Acryl				
	lens	Acryl				
weight(g)		160	180	200	220	240

## Output Circuit

### NPN Open Collector Output (N TYPE)

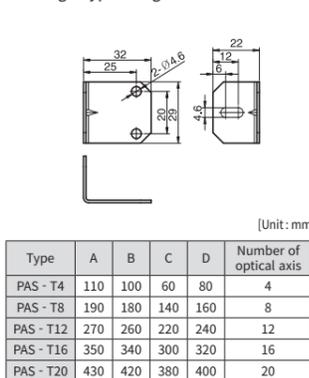


### PNP Open Collector Output (P TYPE)

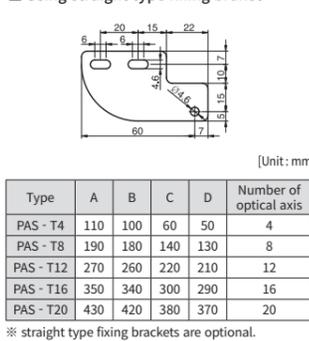


## Demension

### Using L type fixing braket

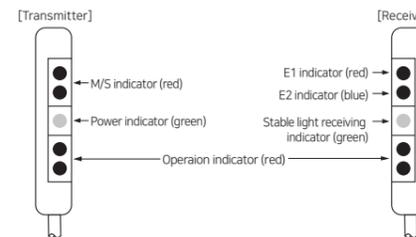


### Using straight type fixing braket



※ straight type fixing brackets are optional.

## Indicator



### Operation LED classification

LED indicator	Transmitter
Red	L.OFF when operation the MASTER / L.ON when operating the SLAVE
Green	Power indicator
Red	Operation LED

LED indicator	Receiver
Red	Operation LED
Green	L.ON stability indicator
Red	L.OFF with the disconnection or break of cluck (sync signal)/reset signal wire
Blue	L.OFF with the appearance of disturbance light such as mercury lamp, luminescent light and etc.

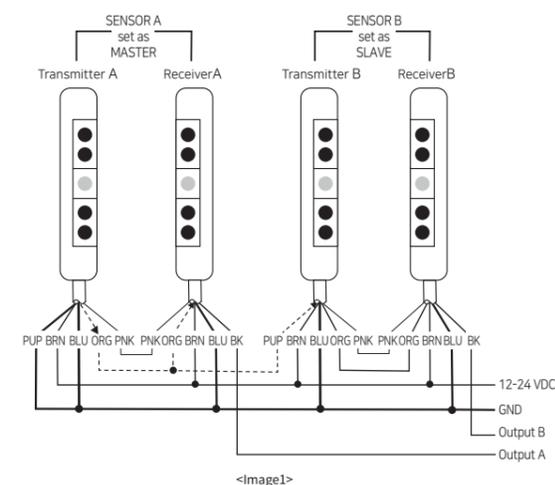
## Operation chart

Operation Mode	Detection status	Safety region operation region
Light ON	Operation indicator (Red LED)	ON
	Control output	OFF
	Stable indicator (Green LED)	ON
	Disturbance light	OFF
	E2 indicator (Blue LED)	OFF

- Green LED on the Transmitter is power indication.
- The E1 indicator on the receiver (red led) is turn off when the sync line is shorted.
- The E2 indicator on the receiver (blue LED) is turn off when there is a disturbance light such as sunlight, fluorescent light, etc. (It may malfunction when the E2 indicator is turn off so please be careful)
- In the case of Dark On, the operation indicator and control output operate in the reverse direction of Light ON.

## MASTER / SLAVE Connection diagram

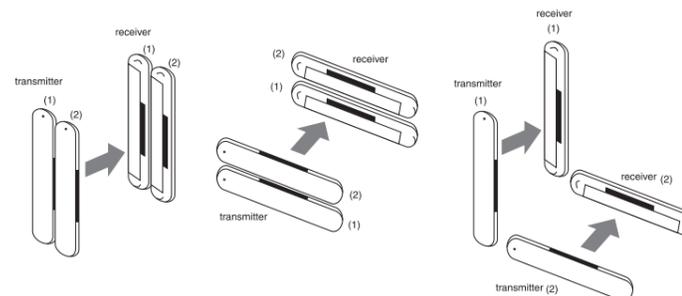
When two sensors are used close together, set them as shown below. Connect sensor A and sensor B according to the connection method in <Image 1>.



- When using two sets of sensors together, wire them so that they do not become the master operation mode or the slave operation mode for both of them.
- Do not connect the sync lines of sensor A and sensor B to each other.
- Check the M / S indicator of the Transmitter after turning on the power.  
Transmitter A (Master operation mode): M/S indicator is Turn off,  
Transmitter B (Slave operation mode): M/S indicator is Turn on

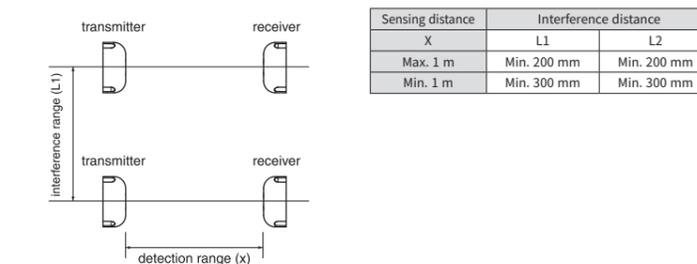
## Example of interference prevention function

Even if two sets of sensors are installed close to each other, they are not interfered with each other.

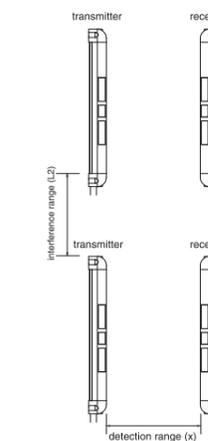


## Example of not using interference prevention function

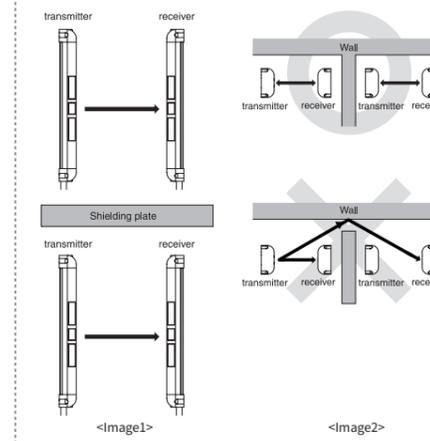
### Installing left and right (arranging left and right)



### Installing top and bottom (arranging top and bottom)



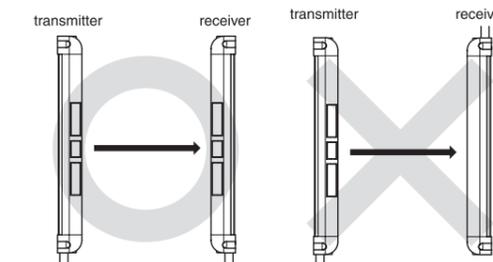
### Installing shielding plate



Install shielding plate just like <Image1> which prevents light to come in from other transmitter. Also, due to reflection from contiguity surface wall or floor surface, there are possibilities of malfunction because of detour of shielding plate. So please be cautious when installing shielding plate. <Image2>

## Precautions for Installation

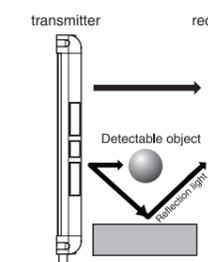
Be sure that strong light such as fluorescent light or incandescent light does not enter within the area angle of the area sensor. When installing area sensor, please avoid strong impact or strong force on to the device because they can destroy some of parts inside. Make sure that direction of code draw out is same for transmitter and receiver.



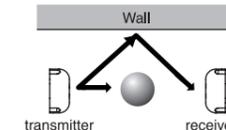
## Considering reflection light within floor and wall surface when installing

If the sensor is installed without maintaining a sufficient distance from the floor as shown in the image, the reflected light from the floor may cause malfunction. There may also be a malfunction due to reflected light from the side wall. Be careful during installation and check the normal operation condition before use.

### Side View



### Top View



## Mounting and optical axis adjustment

- Make sure that the direction of code draw out is the same for transmitter and receiver.
- After checking the connection status, turn on the power and check that the power indicator (green) of the Transmitter is turn on.
- Move the Transmitter up, down, left, and right so that the light stability indicator (green) of the Receiver turns on.
- Automatic sensitivity correction means that automatic sensitivity correction is activated when the power is turned on again, and the sensor is set to the optimum sensitivity.
- If the lens surface is dirty or foreign matter is present, the lens will automatically be set to the optimum sensitivity when the foreign object is removed.

