



M18-E3F 5DP1/5L It is **Photoelectric Sensor Switch** that consists of 2 separate devices; Sender in a format of Infrared LED (**E3F-5L**) and Receiver (**E3F-5DP1**); both devices must be used together. The Receiver has Output as Contact Switch (**NO: Normal Open**) that runs as **PNP** (Switch is connected to VDC when Signal between Sender and Receiver is interrupted by any opaque object).

Signal Infrared is beamed from Sender to Receiver that is placed opposite side (the maximum distance between Sender and Receiver is 5 meter long); so, position of both Sender and Receiver must be in a straight line. Next, it detects any opaque object that interrupts Signal Infrared between Sender and Receiver. If Receiver succeeded in receiving the Signal from Sender, Output Contact of Receiver becomes Open. But, if Receiver failed to receive the Signal from Sender because Signal between Receiver and Sender is interrupted by any opaque object, or Sender doesn't send any signal, or signal doesn't reach Receiver, or position between Sender and Receiver is not in a straight line; in this case, the Output Contact of the Receiver will be connected to anode side of Power Supply of Sensor as long as the Receiver can't receive any Signal Infrared from Sender. When the Receiver succeeded in receiving Signal Infrared from Sender again, the Output Contact of the Receiver will become Open again (it doesn't connect Output to anode side of Power Supply).

SPECIFICATIONS

- 2 Sensors are separately divided to be Receiver "**E3F-5DP1**" and Sender "**E3F-5L**"; both Sensors are used together.
- Both Sender and Receiver use DC Power Supply 6-36V (it is unnecessary to use the same voltage of Power Supply for each Sender and Receiver). The maximum distance for installing both devices is 5 meter long $\pm 10\%$. If using 5V Power Supply, the maximum distance for installing both devices should be less than 2 meter long.
- Sensor detects object by blocking or interrupt light of Infrared that is beamed between Sender and Receiver.
- Sender (**E3F-5L**) uses Infrared LED (660nm) to generate light.
- Receiver (**E3F-5DP1**) has Output as Contact Switch (NO: Normal Open); runs as PNP; and supply the Current 300 mA
- LED shows operating state of both Sender and Receiver
- Response Frequency to object that interrupts Sensor is 300 Hz.
- The maximum Response Time of Output when connecting the Contact to Power Supply of Sensor is 1.5 ms.
- Temperature of Sensor is in a range of $-30\text{ }^{\circ}\text{C}$ to $65\text{ }^{\circ}\text{C}$
- Object that is used to block or interrupt Sensor should be opaque type; the minimum diameter of object is $\varnothing 1\text{ cm}$ with the Frequency 1 Hz (on a trial basis)

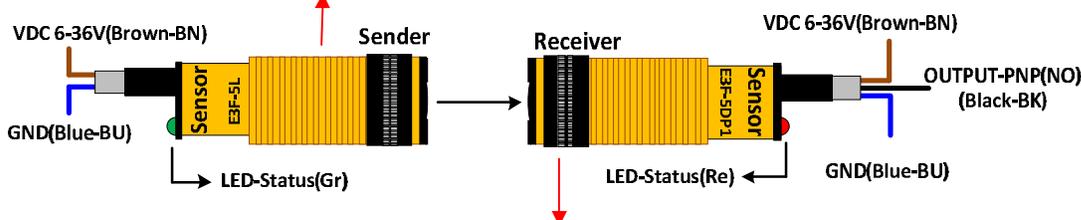
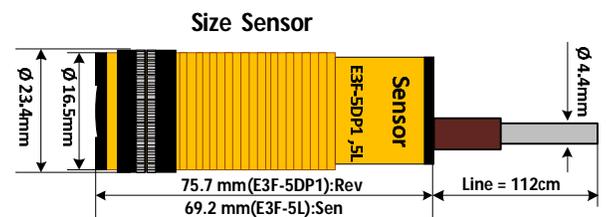
STRUCTURE & CONNECTORS

CONNECTORS OF SENDER "E3F-5L"

VDC 6-36V = Brown Cable (BN) is Power Supply 6V-36V for Sensor on the anode side of Sender.

GND = Blue Cable (BU) is Power Supply for Connector GND.

LED-Status = LED shows the operating state by green color; it is in status ON all the time when received Power Supply.





CONNECTORS OF RECEIVER "E3F-5DP1"

VDC 6-36V = Brown Cable (BN) is Power Supply 6V-36V for Sensor on the anode side of Receiver.

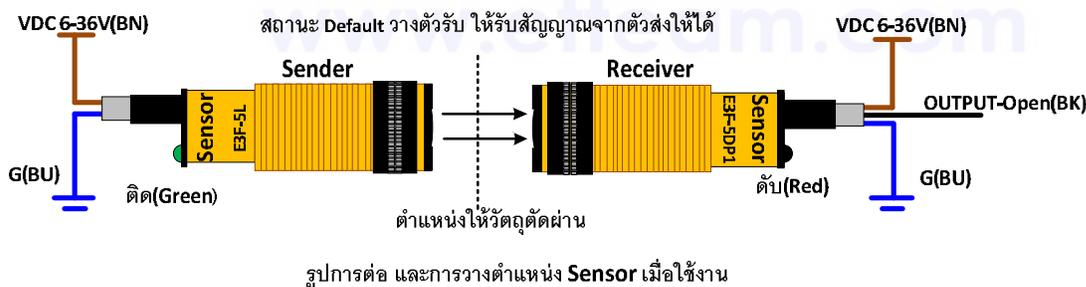
GND = Blue Cable (BU) is Power Supply for Connector GND.

OUTPUT = It is Contact as PNP. When it received Signal from Sender, the Contact becomes Open (NO); but, if it doesn't receive any Signal from Sender, the Contact becomes Close (NC) instead and it tries to connect to VDC; Output supplies the Current 300 mA; and it is Black Cable (BK).

LED-Status = LED shows the operating status by red color; it will turn off when it received the signal from Sender and the Output Contact becomes Open. LED will be lit up (ON) when it doesn't receive any signal from Sender because the signal that is beamed from Sender is interrupted or blocked by opaque object; the Output Contact becomes Close instead and it tries to connect to VDC.

USE&CONNECTION: It has to use both Sender and Receiver together and position of both devices must be placed in a straight line in order to beam signal from Sender to Receiver accurately; next, it has to use an opaque object to break or interrupt the Signal that is beamed between Sender and Receiver; and finally, it can use status value of Output of the Receiver. Please follow these instructions;

- 1) Connect Power Supply 6V-36V to Sensor of both Sender and Receiver; Brown Cable (BN) is connected to anode side and Blue Cable (BU) is connected to GND (On a trial basis, if it connects 5V Power Supply to Sensor either of Sender or Receiver or both devices, both Sensors can work together without any problem but the distance between Sender and Receiver decreases; Output of Receiver also supplies less current; and it has a low tolerance of external noise).
- 2) After provided power successfully, the red LED of Receiver (E3F-5DP1) and the green LED of Sender (E3F-5L) must be lit up when head of both Sensors is turned in different direction.
- 3) Turn head of Sensor of both Sender and Receiver facing each other and then set preferable distance between both Sensors (not longer than 5 meter) as shown in the picture below;



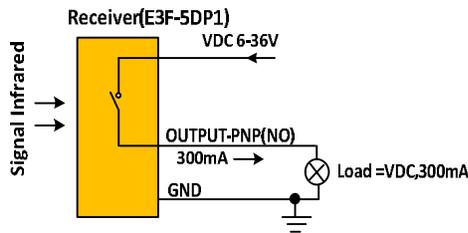
- 4) Adjust position of Sensor of Receiver properly to receive signal from Sender accurately; please look at the red LED of Receiver, it must be turned off that means that it is in the right position and is ready to run.
- 5) Using opaque object blocks or interrupts signal that is beamed between both Sensors, the red LED of Receiver must be lit up while the opaque object is blocking or interrupting the signal between Sender and Receiver.
- 6) Connect Signal OUTPUT from the Receiver (E3F-5DP1) to use; in this case, the OUTPUT status of the Receiver will be
 1. If there is no any interruption between Sender and Receiver while it is receiving the signal from Sender
 - Output Contact becomes Open (NO), it is not connected to any device and LED of Receiver will also turn off.
 2. When there is no any signal from Sender, or there is any object blocking or interrupting signal between Sender and Receiver
 - Output Contact becomes Close (NC), it is connected to VDC Power Supply, and LED of Receiver will be lit up.



User Guide of Photoelectric Sensor Switch M18 E3F-5DP1(Receiver) & E3F-5L(Sender)

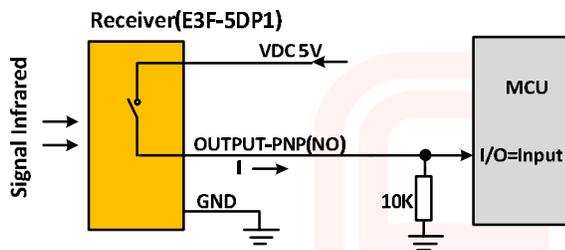
Next, it shows how to connect Output, please consider following factors;

TYPE 1: Directly connect to drive Load. Load must be run by the Voltage that is equal to VDC of Sensor of Receiver and the Current is not higher than 300 mA as shown in the picture below;



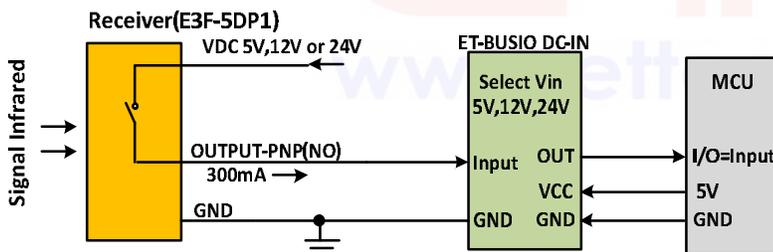
- When signal between Sensors is blocked or interrupted by any object, Output Contact becomes Close and it is connected to VDC; so, the Circuit of Load is complete and it ready to run.

TYPE 2: Directly connect to Input of MCU; in this case, Sensor of Receiver only requires 5V Power Supply



- It has to connect R Pull Down at Pin I/O. When signal is not blocked or interrupted by any object, MCU reads the Input value as "0"; but, if signal between Sensors is blocked or interrupted by any object, Output Contact becomes Close, it is connected to VDC = 5V, and MCU reads the Input value as "1" instead.

TYPE 3: Be connected to Input of MCU through ET-BUSIO-DC-IN; there are 3 type of Power Supply; 5V, 12V or 24V, user must choose only one type of Power Supply for Sensor of Receiver.



- For ET-BUSIO-DC-IN, please set Jumper to choose incoming Input Voltage according to the Voltage supplied to Sensor of Receiver. When signal between Sensors is not blocked or interrupted by any object, Output of BUSIO DC-IN becomes "1"; but when the signal between Sensors is blocked or interrupted by any object, Output Contact becomes "Close", it is connected to VDC, and Output of BUSIO DC-IN becomes "0" instead.