Space optical transfer unit (Ethernet support type)

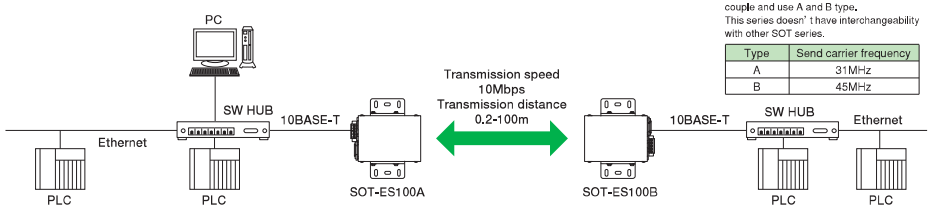
SOT-ES100 ES200 series

10Mbps Ethernet supported

This device is a data transmitting equipment for Ethernet using the space spread of light (Near-infrared rays). The use environment can treat data at the transmission speed of 10Mbps in accordance with IEEE802.3 (Ethernet). Not only a usual data communication but also the personal computer becomes possible the program confirmation and the change on the movement side and improves maintenance in case of the PLC control system of the same network. The transmission distance is 0.2-100m/0.2-200m. This device is DC power supply specification.

■Example of system configuration

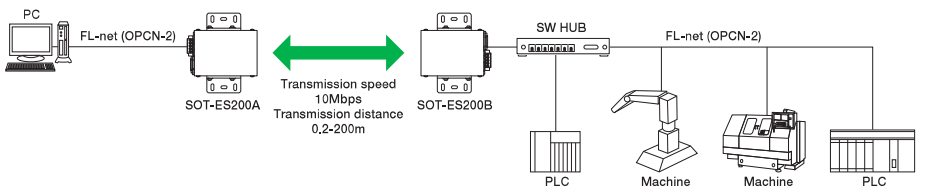
Example of FA-LAN system configuration (Application of SOT-ES100 series)



●**Combination**
Using the SOT-ES Series must assume a couple and use A and B type.
This series doesn't have interchangeability with other SOT series.

Type	Send carrier frequency
A	31MHz
B	45MHz

FL-net (OPCN-2) Example of OpenNet system configuration (Application of SOT-ES200 series)



■The main specification

Model	SOT-ES100□	SOT-ES200□
Use environment	IEEE802.3 (Ethernet)	
Transmission Speed	Cable side 10Mbps	
Power supply voltage	Rated voltage : DC24V Power supply ripple 10% or less Working voltage : DC18V~30V within 30V in peak voltage including ripple	
Current consumption	Less than 150mA (at input DC24V)	
Interface	10BASE-T(for auto negotiation and Auto-MDIX)	
Transmission method	Full-duplex, bi-directional	
Communication Control method	Bit forward	
Connected to:	Network card or Switching HUB	
Transmission distance	0.2~100m	0~200m
Directivity	1.2 degrees	1.0 degrees
Modulation Method	FSK	
Lighting element	Near infrared light emitting diode (light emitting wavelength 870 nm)	
Receiving element	Photo diode	
Auxiliary output	DL : "ON" when communication is permitted. ALM : "OFF" when the reception level is low. Output form : Photo coupler isolated NPN open collector outputs. Output rating : DC30V 50mA MAX	

Connection	For signal : RJ-45 modular jack 1(Up to category 3 or more twist pair cable 100m) For power/aux. output : 5-points connector terminal block 1(Phoenix contat: MSTB2,5/5-GF-5,08)
Check terminal	DC voltage corresponding to the reception level is provided. (Use the DC voltage range with a 10kΩ/V or higher tester.)
Operating ambient illumination	Solar beam: 10,000lx or less Fluorescent, incandescent lamps: 3,000lx or less No externally disturbed light shall directly enter the receiver.
Operating ambient temperature	-10~+55℃ No freezing allowed
Operating ambient humidity	10~85%RH No condensation allowed
Resistance to vibration	Frequency: 10~55 Hz, complex amplitude: 1.5mm, sweep: 5 min X・Y・Z 20 cycles in each of X, Y and Z directions (JIS C0040 conforming)
Resistance to impact	500m/s² 10 times in each of 3 directions X・Y・Z (JIS C0041 conforming)
Protection class	IP40 (Connected part in the back is excluded.)
Outside dimensions	80mm(W)×110mm(D)×43mm(H) Only the main body part
Weight	About 350g
Accessory	Attachment tool: 2 pieces Plug for power/aux. output connector: 1 piece

※A of the send carrier frequency type or B enters for □.

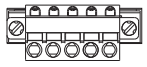
■Explanation of monitor lamp

POW	: Power (RED)	It lights by the power supply.
LINK	: Link (GREEN)	It lights when normally connected with Ethernet.
SD	: Send data (RED)	It lights when the transmission data is input.
RD	: Receive data (GREEN)	It lights when the receive data is output.
FDX	: Full duplex (RED)	It lights when is full duplex connected.
This station CD	: Carrier detected (RED)	When becoming an amount of light received to be able to communicate this station, it lights.
This station LEVEL	: Receiving light level (4 points) (GREEN)	It lights according to a receiving light level of this station.
Other station CD	: Carrier detected (RED)	When becoming an amount of light received to be able to communicate other station, it lights.
Other station LEVEL	: Receiving light level (4 points) (GREEN)	It lights according toa receiving light level of other station.

■Connection and wiring

①Power supply and auxiliary output connector

Signal name	Abbreviation	Terminal number
Power supply	24V	1
	GND	2
Auxiliary output	D L	4
	ALM	5
	COM	3



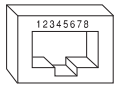
Cable insertion drawing

●**Acceptable connector (bundle)**
Plug : FKCT 2.5/5-STF-5.08 (1902330)
Made of phoenix contact or equivalent goods

●**Use recommendation cable**
Please use the cable of 0.3㎟ or more for the cable for a power supply and a auxiliary output.
(Please use it within 50 meters in total extension after confirming the voltage descent.)

②Connector for signal (Ethernet)

Signal name	Abbreviation	Terminal number
Transmission output	TD+	1
	TD−	2
Receiving input	RD+	3
	RD−	6
Unconnection	−	4
	−	5
	−	7
	−	8



The transmission output and the receiving input might change places according to the connecting cable. (AutoMDIX function)
The polarity of the receiving input might change places according to connected signal. (The polarity detecting function)

●**Acceptable connector**
Plug : category 3 or more is RJ-45 plug or VS-08-ST-RJ45 (1688573).Made of phoenix contact or equivalent goods
Shell : VS-08-T-RJ45/IP67 (1688696).Made of phoenix contact or equivalent goods

●**Use recommendation cable**
Please use the twisted-pair cable (STP) with the shield or the twisted-pair cable (UTP) without the shield of 3 or more by the category. (Within 100m in total extension)

③Configuration switch

●**Ethernet setting**

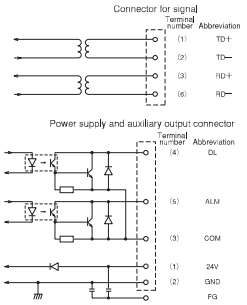
Auto negotiation	Effective Factory setting	Invalidity
SW1	OFF	ON

Full duplex/ Half duplex	Full duplex Factory setting	Half duplex
SW2	OFF	ON

10BASE-T Link at shading	Connected continuance Factory setting	Disconnect
SW3	OFF	ON

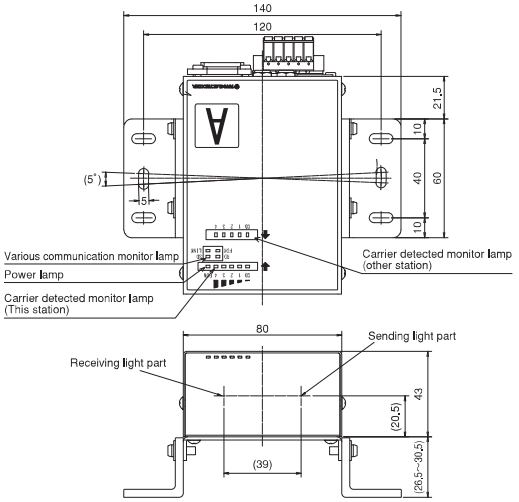
Please change the communicate mode (Full duplex/Half duplex) of the space optical transfer unit to the same setting.
It is necessary to note it especially when connecting with the device that doesn't correspond to an auto negotiation, and setting it invalidly.
The loss of the data frame might occur when it is not the same setting.

●**Details of external output circuit**



■Outside dimensions

(Unit : mm)



●**Connector wiring diagram**
(Back panel)