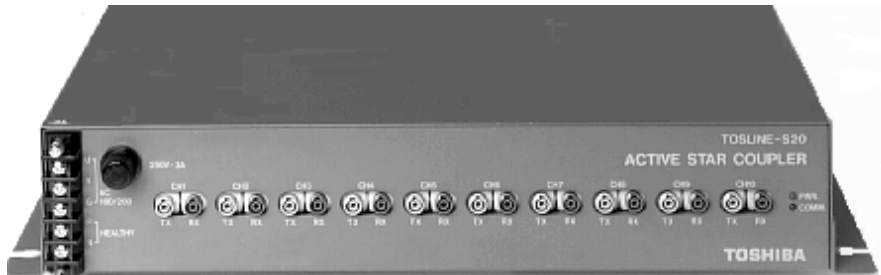


TOSLINE - S20

Active Star Coupler

Instruction Manual



September, 1995

Toshiba International Corporation

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1. Introduction

This instruction manual explains how to use an Active Star Coupler (ASC22) in a TOSLINE-S20 data communication network.

Instruction manuals for other TOSLINE-S20 components are listed below. System designers, device designers, and maintenance personnel using a TOSLINE-S20 network should refer to these manuals for information about how these components can be used in a TOSLINE-S20 network.

- T2 / T3 stations UM-TLS20**-E001
- SIF (Serial Interface) station 6F3B0532
- Loader software S-LS (Ver 1.1) 6F3B0351

2. Overview

The Active Star Coupler (ASC22) is used for distributing fiber optic signals in a TOSLINE-S20 network.

The TOSLINE-S20 is a Bus-style transmission system. If the power is off in one of the stations on this bus, communication is not possible before or after that station.

To prevent this from happening, an Active Star Coupler can be used.

If the Active Star Coupler is used, a station that is off will have no effect on the rest of the transmission system.

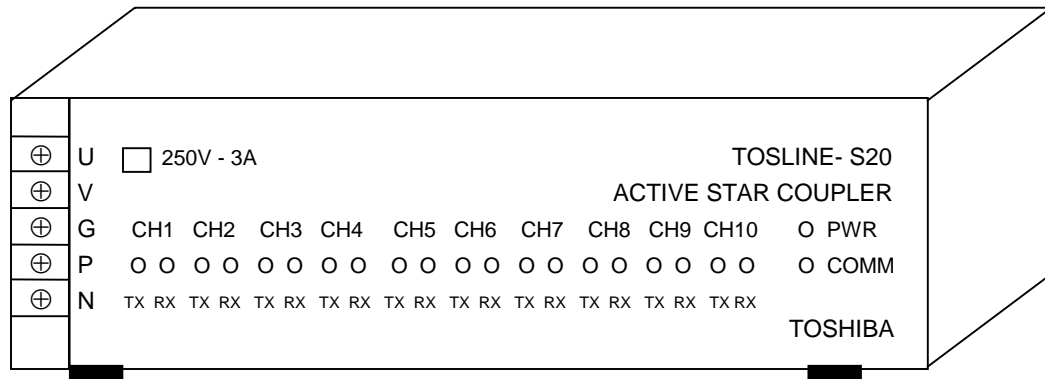


Figure 2.1 Exterior view

Figure 2.1 shows the exterior of the Active Star Coupler. There are 10 sets of Transmit (TX) and Receive (RX) ports. Also, rubber feet are used on the bottom of the device.

3. Specifications

This section presents the specifications for the Active Star Coupler.

3.1 Specification summary

3.1.1 General specifications

General specifications for the Active Star Coupler are shown below.

Item		Specifications	
Power Supply	Voltage	Rating	AC100/110V, 50/60Hz AC200/220V, 50/60Hz
		Range	AC85~132V, 47~66Hz AC170~250V, 47~66Hz
	Power consumption		10 VA (approx.)
	Power-loss ride-through time		< 10 msec, normal operation
	Insulation rating		AC1500V for 1 minute
	Fuse rating		250V - 3A
Environment	Temp	Operation temp	0 ~ 55°C (unit ambient temperature)
		Storage temp	-20 ~ 75°C (unit ambient temperature)
	Humidity		20 ~ 90%, no condensation
	Vibration		Conforms to JIS C 0911 Power OFF / Freq: 16.7Hz / Displacement: 3mm
	Atmosphere		Non-corrosive
	Dust		Density less than 1mg/m ³
	Ground		100 Ω or less
Measurements		390W x 200D x 70H mm	
Weight		3.0 kg	
Cooling		Natural air cooling	
Installation position		Horizontal (cannot be installed vertically or upside-down)	

Table 3.1 General specifications

3.1.2 Functional specifications

Functional specifications for the Active Star Coupler are shown below.

Item		Specification
No. of stations		10 stations maximum
Optic fiber	Cable	Silica glass GI 50/125 μ m (core dia. / clad dia.), JIS C 6820
	Connector	FC connector (JIS C 5970)
Transmission distance		Station - Star coupler: 1km max. Star coupler - Star coupler: 1 km max. Station - Station: 10 km max.
Daisy-chained ASC's		9 maximum
Connectable devices		TOSLINE-S20 fiber optic network stations
* HEALTHY contact (Relay contact)		ON during Normal operation Contact ratings: AC 250V 1A DC 24V 1A

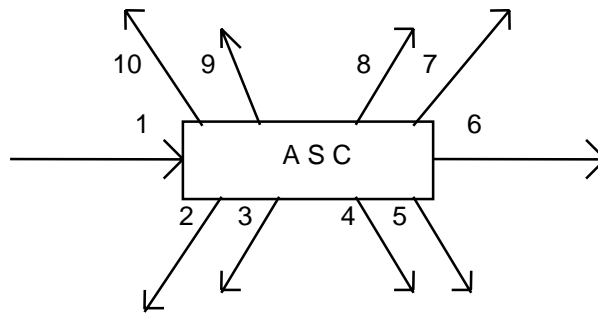
Table 3.2 Functional specifications

* HEALTHY contact: ON if the power supply is within specifications and at least one port is operating normally. (At the same time, the COMM LED will also be lit.) If no stations are connected, the HEALTHY contact will be OFF.

3.2 Function

This section describes the function of the Active Star Coupler.

- (1) When the Active Star Coupler receives a signal at one of its ten ports, it transmits this signal (unchanged) from its remaining nine ports.



Data input at port 1
Data output from ports 2 ~ 10

Figure 3.1 Function of the Active Star Coupler

- (2) The Active Star Coupler has two LEDs for displaying its operation status.
 - When the power supply is within specification, the “PWR” LED (green) is lit.
 - When the power supply is OK and the unit is transmitting normally, the COMM LED (green) is lit.
- (3) If the “PWR” LED is not lit, please check the power supply. If the “COMM” LED is not lit, please check the power supplies of the Active Star Coupler and all of the stations connected to it.

4. Hardware

This section describes the hardware of the Active Star Coupler.

4.1 Product construction

	Part name	Rating ♦ Type form	Qty	Comment
1	Active Star Coupler	ASC22	1	Product Code: SASC22*US
2	Fuse	AC250V - 3A	2	One is installed in the device, another is included as a spare
3	L-brackets		1	Attached to device before shipment
4	Power Cord		1	Option

Table 4.1 Product construction

4.2 System configurations

The systems shown below are possible when using the Active Star Coupler.

(1) Basic configuration

As shown below, up to ten stations can be connected to one Active Star Coupler.

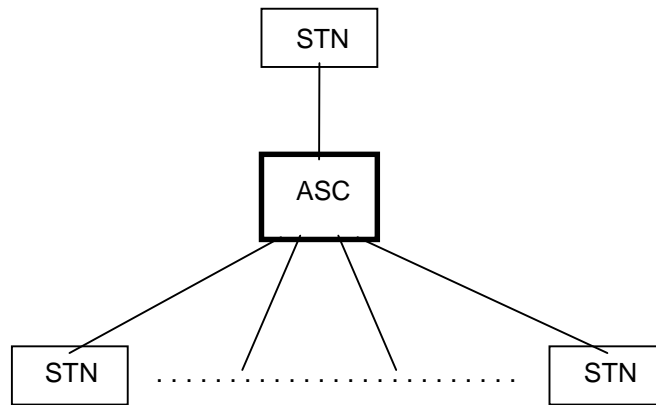


Figure 4.1 Basic configuration

(2) Station-to-station daisy-chain configuration

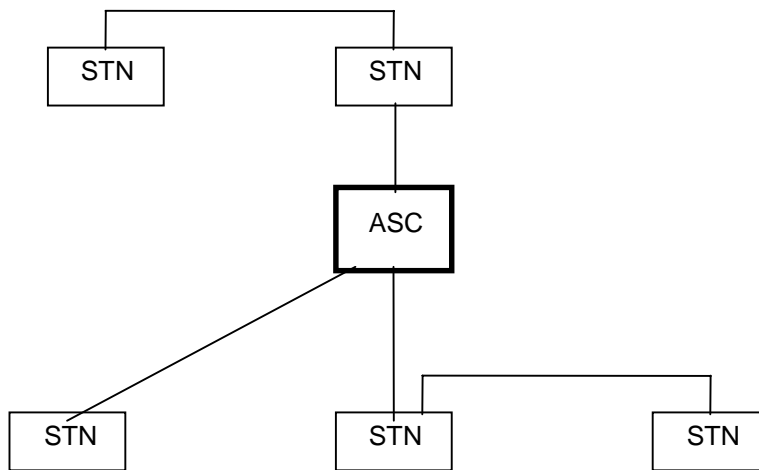


Figure 4.2 Station-to-station daisy-chain configuration

(3) Active Star Coupler daisy-chain connection

As configured below, the Active Star Coupler (ASC) can be daisy-chained to up to nine other ASC's. The total number of stations (STN) cannot exceed 64.

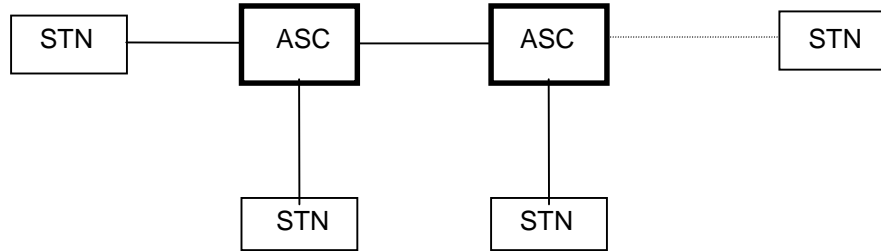


Figure 4.3 Active Star Coupler daisy-chain configuration

(4) Typical example

A typical example of the TOSLINE-S20 fiber optic network with T2 PLC and G3 ASD stations is shown below.

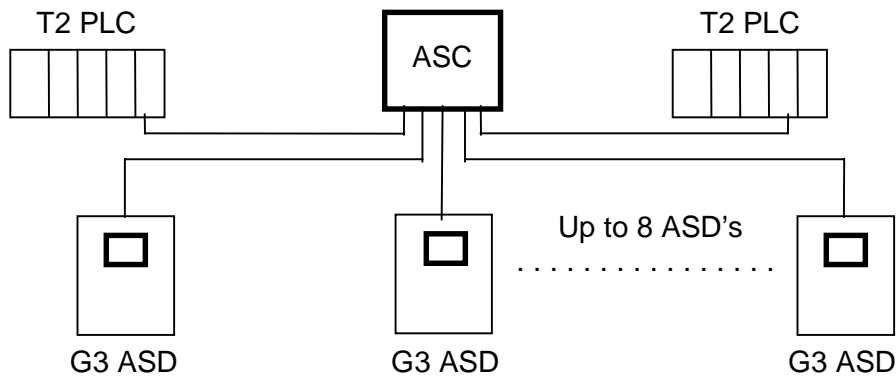


Figure 4.4 Typical example

4.3 External dimensions

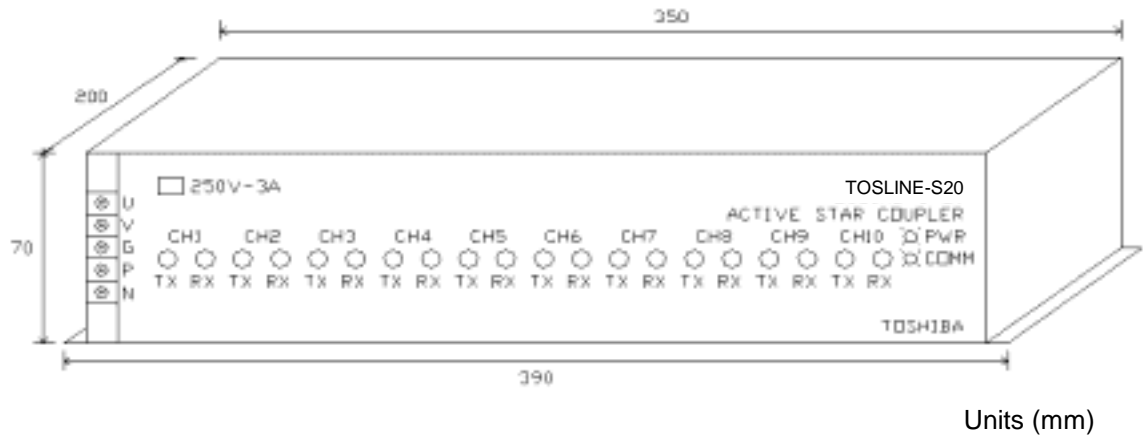
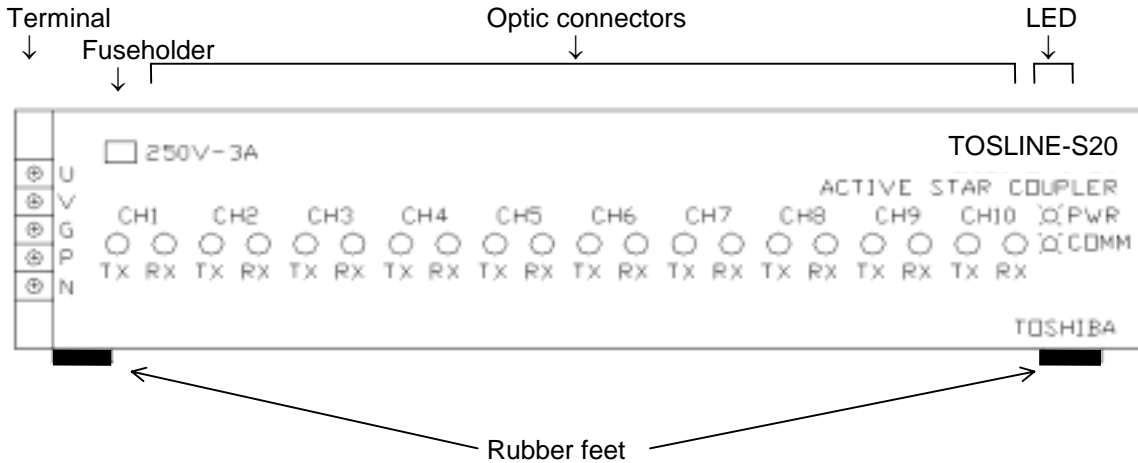


Figure 4.5 External dimensions

4.4 Component identifications

The names of the different parts on the Active Star Coupler are shown below.



Note: Fiber optic connectors are in pairs of Transmit (TX) and Receive (RX) connectors

Figure 4.6 Designation of front-panel components

4.5 Component function

The functions of the individual components on the Active Star Coupler are shown below.

Item	Function	Comment
Status LEDs (PWR, COMM)	Operation status display	
Terminal block	Power supply input and relay contact	
Fuseholder	Power supply protection	
Transmit connector, TX	Fiber optic connection (transmit)	
Reception connector, RX	Fiber optic connection (receive)	

Table 4.2 Function of front-panel components

4.6 LED display

Status LEDs are located on the front panel of the Active Star Coupler. These LEDs indicate the operation of the Active Star Coupler.

(1) Display and labels

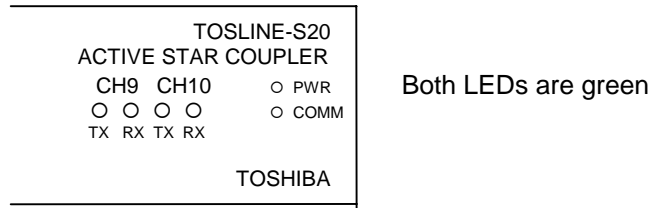


Figure 4.7 LED display and labels

(2) Description

LED	Description
PWR (power)	Indicates whether the power supply is within specification. ON Power supply is OK OFF Power is not within specifications or fuse is open
COMM (communication)	ON Power supply is OK and a signal is being received. OFF ASC's power supply is OFF, power supplies of all stations are OFF, or no stations are connected

Table 4.3 LED displays

4.7 Communication cable connection

The Active Star Coupler uses fiber optic transmission cable. The method for connecting this cable is described below.

For information about cable distribution and wiring, please refer to the Installation & Wiring manual (6E3B0533).

(1) Connection cable

Fiber optic cable: Silica Glass GI (JIS C6820)
(core diameter: 50 μ m / clad diameter: 125 μ m)

Note: For cable details, please refer to the Installation & Wiring manual

(2) Connector locations and designations

The connectors are located on the front panel. There are ten pairs of Transmit (TX) and Receive (RX) connectors.

(3) Cable connection

When making cable connections, connect the Transmit (TX) connector of the Active Star Coupler to the Receive (OR) connector of the station (TOSLINE S-20 module). Likewise, connect the Receive (RX) connector of the Active Star Coupler to the Transmit (OT) connector of the station.

When connecting two Active Star Couplers together, connect the Transmit (TX) connector of one Active Star Coupler to the Receive (RX) connector of the other. Likewise, connect the Receive (RX) connector of the first Active Star Coupler to the Transmit (TX) connector of the second.

Note: On the Active Star Coupler, CH1 ~ CH10 channels can be selected. (The channels are in TX - RX pairs.)

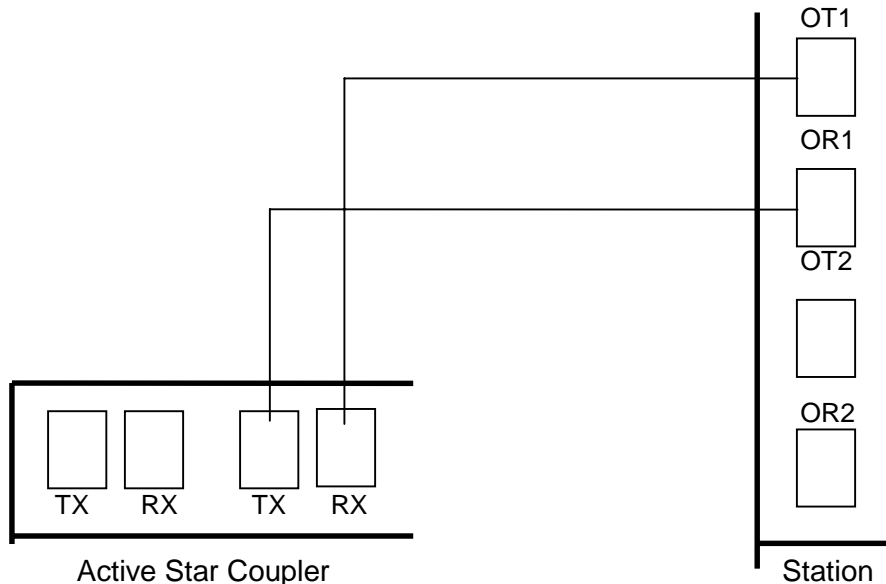


Figure 4.8 Active Star Coupler - Station connection

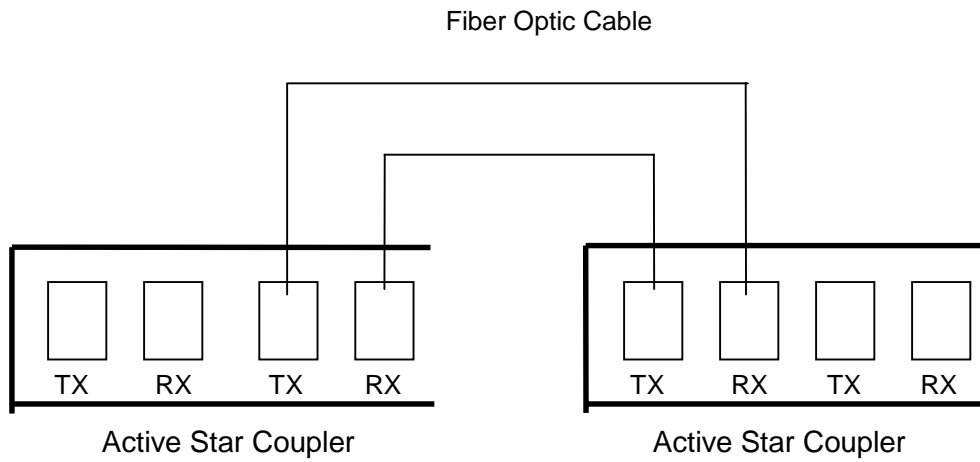


Figure 4.9 Active Star Coupler daisy-chain connection

Notes:

- When connecting the fiber optic cable, be careful not to get dirt on the terminals. Also, the optic components are very delicate. Be careful not to cause unnecessary shock or use too much force when making connections. For information about handling and cleaning the optic components, please refer to the Installation & Wiring manual.
- **Please cover all ports that are not in use.**

4.8 Power cord connection

Please connect a 3-pole power cord to the power supply terminals of the Active Star Coupler. Then, insert the plug into a 3-pole electrical outlet. Please do not connect the power supply terminals to any other power supply.

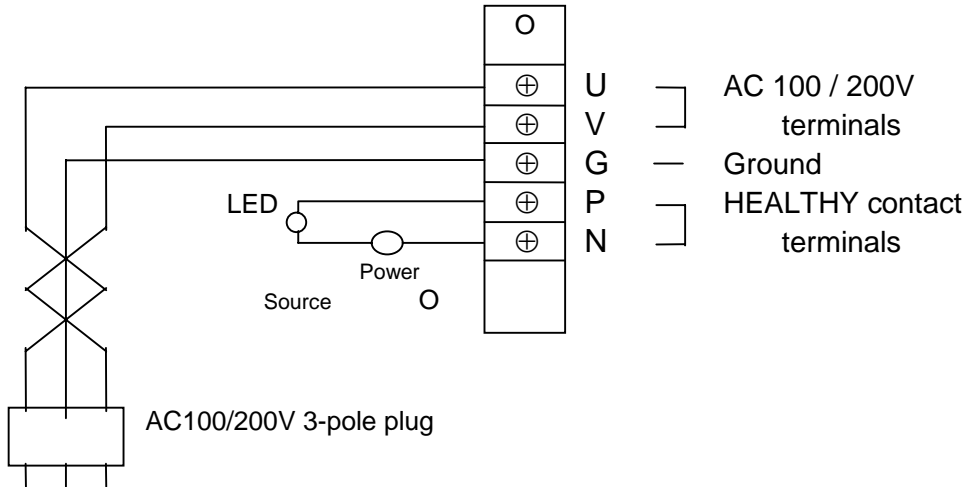


Figure 4.10 Power cord connection

When the Active Star Coupler is connected to a power supply, its power supply LED indicates whether or not the power supply is within specifications.

Note: Switching between 100 / 200Vac is not necessary.

4.9 HEALTHY contact

The HEALTHY contact indicates the status of both the power supply and whether or not communication is taking place. The ON/OFF conditions of the contacts are listed below.

HEALTHY Contact	HEALTHY Contact Conditions
ON	Power supply is OK and at least 1 of the 10 ports is operating normally
OFF	Power supply is OFF or no stations are connected

Table 4.4 HEALTHY contact ON/OFF conditions

HEALTHY contact ratings: 1A / 24VDC or 250Vac

4.10 Fuse replacement

If the unit is connected to a power supply, but the PWR LED is not lit, the fuse may be open. If this situation occurs, remove the power supply, replace the fuse on the front panel of the Active Star Coupler and try powering up the unit again.

Fuse rating: 3A / 250V

4.11 Installation methods

The Active Star Coupler can be mounted inside an enclosure, allowed to stand loose, or mounted to a panel.

4.11.1 Installation inside an enclosure

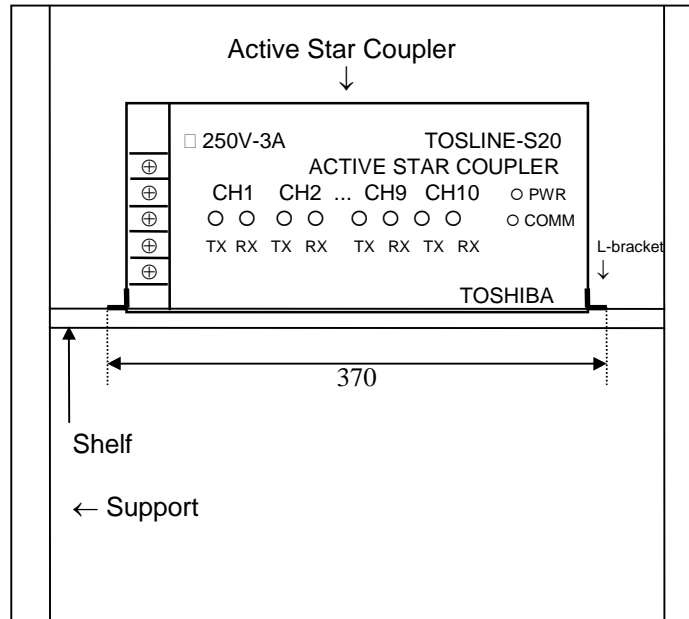


Figure 4.11 Mounting an Active Star Coupler inside an enclosure

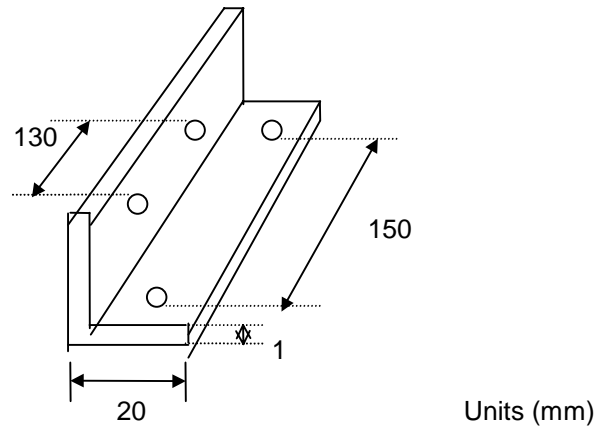


Figure 4.12 L-bracket

Use L-brackets and M5 screws (12 ~ 20 mm) to secure the Active Star Coupler to a shelf. When installing the unit this way, remove the rubber feet from the bottom of the unit. (The L-brackets are secured to the Active Star Coupler before shipment.)

4.11.2 Loose installation

The Active Star Coupler can be set on a table-top or other secure flat surface. There are rubber feet on the under-side of the Active Star Coupler. If the L-brackets are in the way, they can be removed by first removing the screws on the side of the unit. If you remove the L-brackets, make sure to replace all of the screws.

Caution: Stacking the Active Star Coupler may cause damage. Do not stack or place objects on top of the Active Star Coupler.

4.11.3 Panel-mount installation

Use the L-brackets when mounting the Active Star Coupler to a panel. Do not mount the Active Star Coupler vertically or upside-down.

When using the L-brackets, remove the rubber feet from the bottom of the unit.

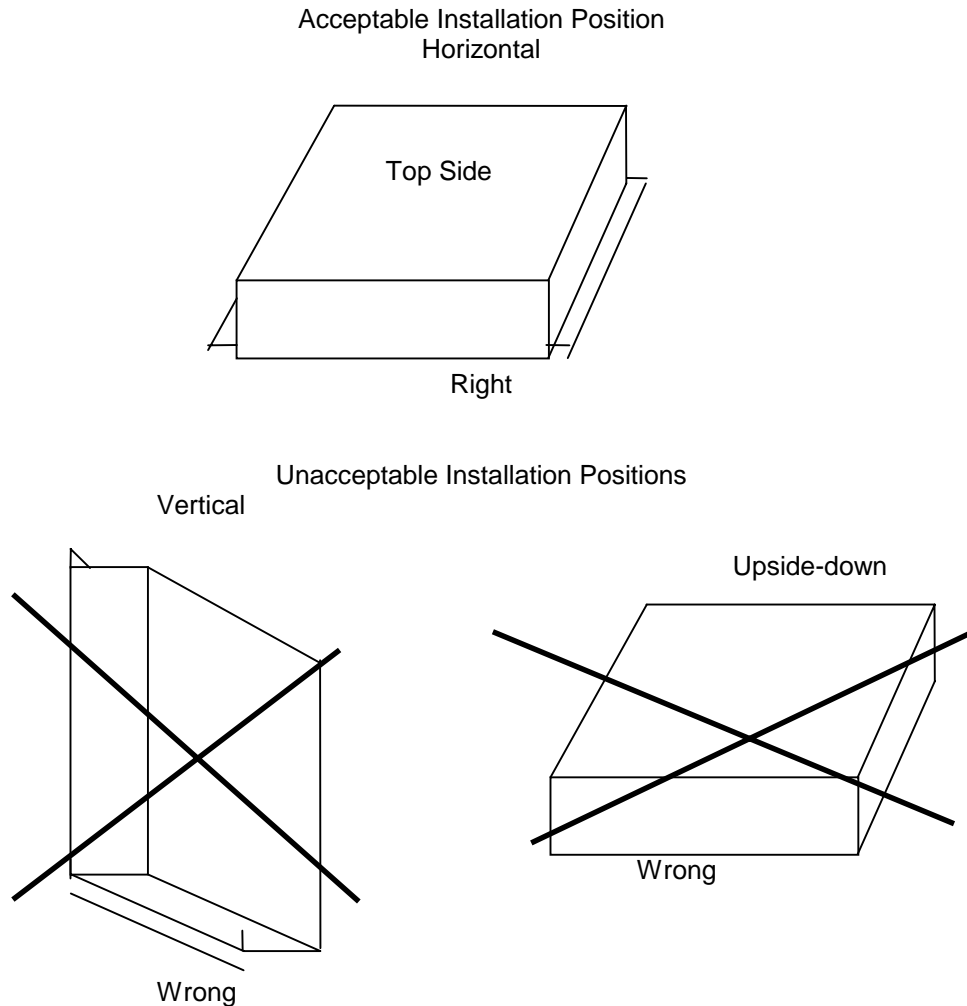


Figure 4.13 Installation orientation

5. Startup and Power-down methods

5.1 Startup method

- (1) Connect power cables to the Active Star Coupler and to each of the stations connected to the Active Star Coupler.
- (2) Connect transmission cables between the Active Star Coupler, stations, and any other Active Star Couplers (daisy-chain configuration) that are to be used. (See section 4.7 for details concerning transmission cable connections.)
- (3) Apply power to the Active Star Coupler and to each of its connected devices. (Note: It is not important which device is powered-up first.)
- (4) Begin transmission at each station. (Refer to the individual instruction manuals for each station.)
- (5) Once the above steps are complete, the Active Star Coupler should begin operating.

5.2 Power-down method

- (1) Remove the power supplies from the Active Star Coupler and each of the connected devices. (Note: It is not important which device is powered-down first.)

6. Cautions for use

Please observe the following cautions when using the Active Star Coupler.

- Do not remove the top cover
- When using fiber optic cable, do not let the optic connectors become dirty. Also, because the optic components are precision components, do not subject them to shock or unnecessary force. For details about handling and cleaning the optic components, please refer to the Installation & Wiring manual.
- Cover optic connectors when not in use.



This mark indicates DANGER. It is applied at those places where misapplication could cause harm or injury. Where this mark is applied, observe the following caution:

The safety cover over the terminal block on the front panel has a sharp angle. Use caution when handling.