Single axis **TS series**

TS-S2/TS-SH/TS-X/TS-P

Robot positioner **CE compliance**

TS series are positioner type controllers that only performs point trace. No program is needed.
Operation is simple. After setting point data, specify the point number and enter a START signal from host controller such as a PLC. Positioning or pushing operation then begins.

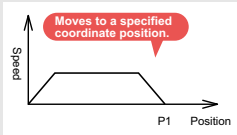
TS-S2 TS-SH TS-X TS-P

Features

1 Main operation patterns

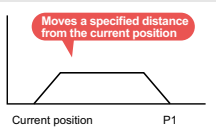
Normal operation

ABS (absolute) operation



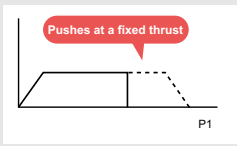
Moves to the target position relative to the origin point and completes positioning.

INC (incremental) operation



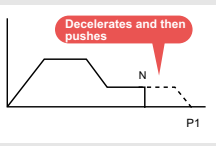
Moves from the current position just by a distance specified in point data and completes positioning.

Pushing operation



Moves while pushing at a preset push force.

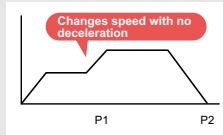
Pushing after decelerating



Pushing starts after decelerating at a distance equal to "Near width (N)" from the target position.

Merge operation

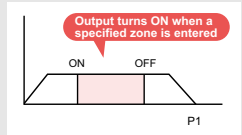
Merge operation



Moves to multiple points in succession. If different speeds were set, then the speeds are changed without decelerating and stopping to continue point-to-point operation.

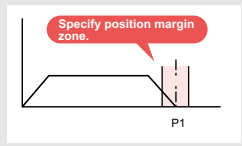
Output pattern

Zone output



Zone for external I/O output can be set for each point.

"Near width" output



"Near width" output zone can be set for each point as a position margin zone where "positioning complete" signal is to be output.

2 Detailed data can be set for each point

Settings such as acceleration, deceleration, zone output range, and position margin zone can be set for each point. Different operations can be easily specified by combining these settings with the above operation patterns.

Setting items

Setting item		Description
1	Run type	Specifies operation pattern such as ABS, INC, positioning, push, and point-to-point link.
2	Position	Specifies position or distance to move.
3	Speed	Specifies maximum speed during operation.
4	Accel.	Specifies acceleration during operation.
5	Decel.	Specifies deceleration during operation (Percentage of acceleration)
6	Push	Specifies motor current limitation during pushing operation.
7	Zone (-)	Specifies upper and lower limits of "personal zone" for each point data.
8	Zone (+)	
9	Near width	Specifies position margin zone where "near width" output should turn on.
10	Jump	Specifies next movement destination after positioning or linked destination for point-to-point operation.
11	Flag	Specifies stop mode and others.
12	Timer	Specifies the waiting time (delay) after positioning completion.

Note:Acceleration and deceleration can be set in easy-to-understand percentage (%) units (standard setup) or in SI units (custom setup) which make it easy to calculate the cycle time.

3 Maximum acceleration auto setting

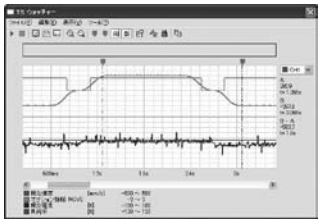
Acceleration is a critical parameter that determines how long the robot can continue operating (or service life). In worst cases, setting the acceleration too high may cause the robot to breakdown after a short time.
On the TS series, the maximum acceleration is finely set by taking into account the service life span of the motor output and the guide for each robot model and payload. This eliminates any worry about setting the acceleration too high by mistake.

4 Full range of monitor functions P.454

The TS-Manager developed exclusively for the TS series not only does data write, edit, backup tasks and parameter settings but also comes loaded with cycle-time, simulator, and monitor functions of all types.
A run-distance monitor for maintenance use is provided as a standard unit feature. Design emphasizes easy, user-friendly operation.

Main monitor displays

- Position · Speed
- Current · Load factor
- Voltage · Temperature
- Input information
- Output information



5 Direct positioning command

"Direct positioning command" is provided that performs the positioning operation by specifying the position and speed data directly for the remote command.
The positioning data can be handled by the control unit and the positioning operation can be performed by one command. The programming of the control unit can be constructed simply.

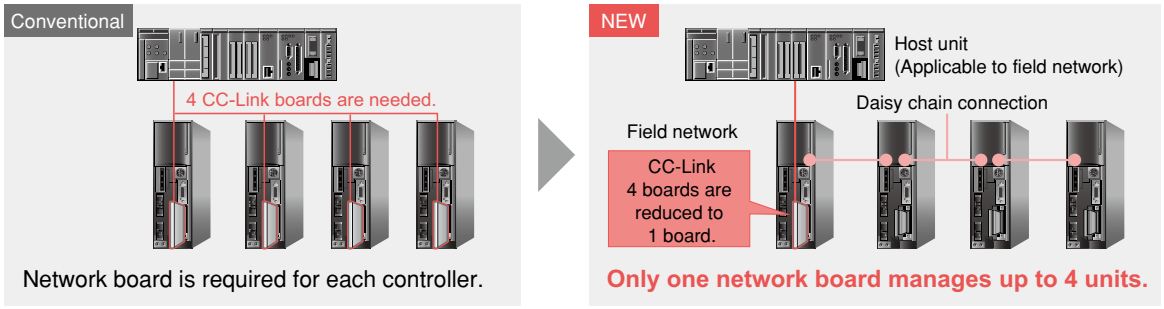
Position and speed data designations and positioning command are transmitted in the batch mode.

WIN0	WIN1	WIN2	WIN3
Command	Speed data	Position data	

6 "Gateway function" reduces the network cost

TS-S2 TS-SH TS-X TS-P

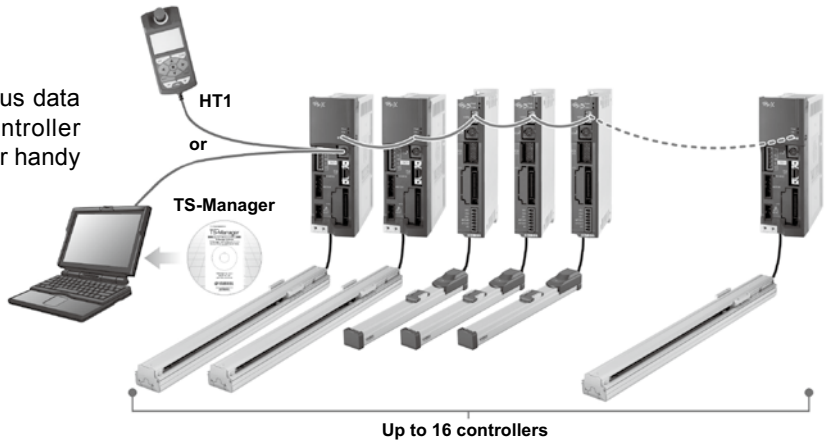
One controller installed on the field network board manages up to four I/O interfaces through the daisy chain connection. This does not require any excess devices and ensures the control in the same way as one board is installed into one unit while reducing the network cost.



7 Daisy chain function

TS-S2 TS-SH TS-X TS-P

This function allows monitoring the various data design and operation status of any controller connected via daisy chain from one PC or handy terminal.



Ordering method

TS-S2 / TS-SH (TRANSERVO)

Robot positioner	Type	I/O	Battery Note 1
S2: TS-S2 SH: TS-SH	No entry: Standard S: Sensor	NP: NPN PN: PNP CC: CC-Link DN: DeviceNet™ EP: EtherNet/IP™ GW: With no I/O board	B: With battery (Absolute model) N: None (Incremental model)

Note 1. Battery can only be selected for TS-SH. (Not provided for TS-S2).

TS-X/TS-P (FLIP-X / PHASER)

Controller	Driver: Power-supply voltage/ Power capacity	Regenerative unit	LCD monitor	Input/Output Selection	Battery Note 2
TSX: TS-X TSP: TS-P	105: 100V / 100W more less 110: 100V / 200W 205: 200V / 100W more less 210: 200V / 200W 220: 200V / 400 to 600W	No entry: None R: With RGT R: With RGU-2	No entry: None L: With LCD	NP: NPN PN: PNP CC: CC-Link DN: DeviceNet™ EP: EtherNet/IP™ GW: With no I/O board	B: With battery (Absolute model) N: None (Incremental model)

Note 2. Battery can only be selected for TS-X. (Not provided for TS-P).

TS-X / TS-P specification selection table

Some specifications are automatically determined by the robot model.

TS-X

			T4LH / C4LH	T5LH / C5LH	T6L / C6L	T9	T9H	F8 / C8	F8L / C8L	F8LH / C8LH	F10 / C10	F14 / C14	F14H / C14H	GF14XL	F17 / C17	F17L / C17L	GF17XL	F20 / C20	F20N	N15 / N15D	N18 / N18D	B10	B14	B14H	R5	R10	R20
Power supply voltage / Current sensor	TS-X	105	●	●	●	●		●	●	●	●	●										●	●	●	●	●	
		110					●	●					●	●													●
		205	●	●	●	●		●	●	●	●	●										●	●	●	●	●	
		210					●						●	●													●
		220													●	●	●	●	●	●	●						
Regenerative unit	No entry (None)					(1)	(2)				(1)	(1)	(2)	●	(3)		(6)	(3)	(4)					(5)			
	R (RGT)					(1)	(2)				(1)	(1)	(2)		(3)	●	(6)	(3)	(4)	●	●			(5)			

(1) Regenerative unit is needed if using in a perpendicular position and movement stroke is 700mm or more.
(2) Regenerative unit is needed if using in a perpendicular position.
(3) Regenerative unit is needed if using in a perpendicular position, using at maximum speeds exceeding 1000mm per second, or if using high leads (40).
(4) Regenerative unit is needed if using at maximum speeds exceeding 1000mm per second.
(5) Regenerative unit is needed if using at maximum speeds exceeding 1250mm per second.
(6) Regenerative unit is needed if using at maximum speeds exceeding 750mm per second.

TS-P

			MR12/12D	MF7/7D	MF15/15D	MF20/20D	MF30/30D	MF75/75D
Power supply voltage / Current sensor	TS-P	105	●					
		110		●	●	●		
		205	●					
		210		●	●	●		
		220					●	●
Regenerative unit	No entry (None)		●	●	●			
	R (RGT)					●	●	
	R (RGU-2)							●

TS-S2/TS-SH/TS-X/TS-P

TS-S2 / TS-SH basic specifications

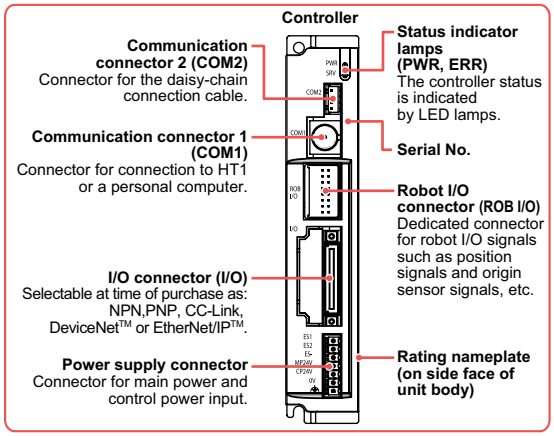
	Item		Model	TS-S2	TS-SH
Basic specifications	Number of controllable axes			Single-axis	
	Controllable robots			TRANSERVO series	
	Current consumption			2.5A (Rating) 4.5A (Max.)	3.5A (Rating) 6.5A (Max.)
	Dimensions			W30 × H162 × D82mm	W30 × H162 × D123mm
	Weight			Approx. 0.2kg	Approx. 0.3kg
	Input power supply	Control power supply		DC24V +/-10%	
		Motor power supply		DC24V +/-10%	
Axis control	Control method			Closed loop vector control method	
	Operating method			I/O point tracing (Positioning operation by specifying point number) / Remote command	
	Operation types			Positioning, merge-positioning, push, and jog operations	
	Position detection method			Resolver	Resolver with multi-turn absolute function
	Resolution			20480 pulses/rev. or 4096 pulses/rev. depending on the robot	
	Origin search method			Incremental	Absolute / Incremental
Points	Points			255 points	
	Point type setting			(1) Standard setting: Set speed and acceleration in percent of the respective maximum settings. (2) Custom setting: Set speed and acceleration in SI units.	
	Point teaching method			Manual data input (coordinates input), Teaching, Direct teaching	
External input/output	I/O interface			Selectable from the following: NPN, PNP, CC-Link, DeviceNet™, EtherNet/IP™	
	Input			Servo ON (SERVO), reset (RESET), start (START), interlock (/LOCK) origin search (ORG), manual mode (MANUAL), jog motion - (JOG-), jog motion + (JOG+), Point number selection (PIN0 to PIN7)	
	Output			Servo status (SRV-S), alarm (/ALM), operation end (END), operation in-progress (BUSY), control outputs (OUT0 to 3), Point number output 0 to 7 (POUT0 to POUT7)	
	External communications			RS-232C 1CH	
	Safety circuit			Emergency stop input, emergency stop contact output (1 system: When the HT1 is used.)	
Options	Handy terminal			HT1, HT1-D (with enable switch)	
	Support software for PC			TS-Manager	
General specifications	Operating temperature / Operating humidity			0°C to 40°C, 35% to 85%RH (non-condensing)	
	Storage temperature/ Storage humidity			-10°C to 65°C, 10% to 85%RH (non-condensing)	
	Atmosphere			Indoor location not exposed to direct sunlight. No corrosive , flammable gases, oil mist, or dust particles	
	Anti-vibration			All XYZ directions 10 to 57Hz unidirectional amplitude 0.075mm 57 to 150Hz 9.8m/s^2	
	Protective functions			Position detection error, temperature error, overload, overvoltage, low voltage, excessive position deviation, overcurrent, motor current error, motor cable faulty wiring, Excitation power failure error Note 1	

Note 1. The excitation power failure error is a protection function that is available only in TS-SH.

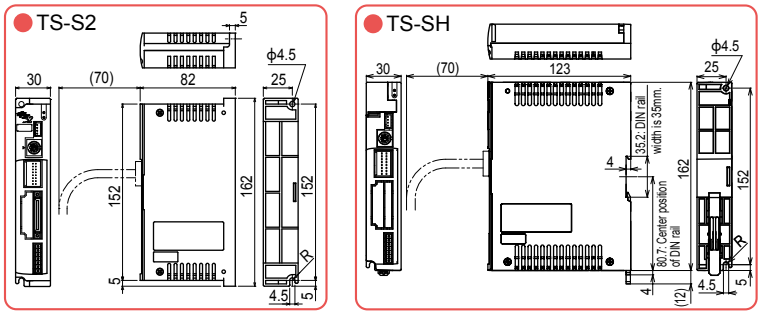
TS-X / TS-P basic specifications

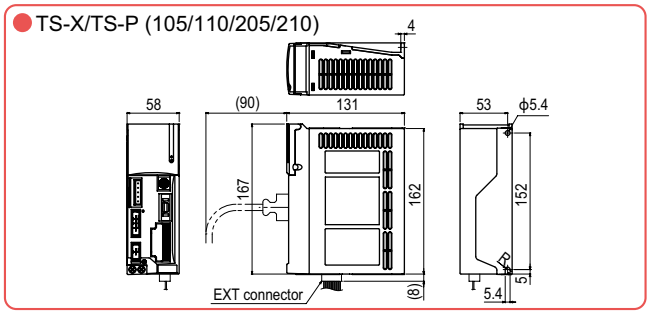
	Item		Model	TS-X / TS-P				
				100V AC input		200V AC input		
Basic specifications	Driver model			TS-X105 / TS-P105	TS-X110 / TS-P110	TS-X205 / TS-P205	TS-X210 / TS-P210	TS-X220 / TS-P220
	Number of controllable axes			Single-axis				
	Controllable robots			TS-X: Single-axis robot FLIP-X series TS-P: Linear motor single-axis robot PHASER series				
	Power capacity			400VA	600VA	400VA	600VA	1400VA
	Dimensions			W58 × H162 × D131mm				W70 × H162 × D131mm
	Weight			Approx. 0.9kg				Approx. 1.1kg
	Input power supply	Control power supply		Single phase AC100 to 115V +/-10% 50/60Hz		Single phase AC200 to 230V +/-10% 50/60Hz		
		Motor power supply		Single phase AC100 to 115V +/-10% 50/60Hz		Single phase AC200 to 230V +/-10% 50/60Hz		
Axis control	Control method			Closed loop vector control method				
	Operating method			I/O point tracing (Positioning operation by specifying point number) / Remote command				
	Operation types			Positioning, merge-positioning, push, and jog operations				
	Position detection method			TS-X: Resolver with multi-rotation absolute function TS-P: Magnetic type linear scale				
	Resolution			TS-X: 16384 pulses/rev. or 20480 pulses/rev. depending on the robot TS-P: 1μm				
	Origin search method			TS-X: Absolute / Incremental TS-P: Incremental / Semi-absolute				
Points	Number of points			255 points				
	Point type setting			(1) Standard setting: Set speed and acceleration in percent of the respective maximum settings. (2) Custom setting: Set speed and acceleration in SI units.				
	Point teaching method			Manual data input (coordinates input) , Teaching, Direct teaching				
External input/output	I/O interface			Selectable from the following: NPN, PNP, CC-Link, DeviceNet™, EtherNet/IP™				
	Input			Servo ON (SERVO), reset (RESET), start (START), interlock (/LOCK) origin search (ORG), manual mode (MANUAL), jog motion - (JOG-), jog motion + (JOG+), Point number selection (PIN0 to PIN7)				
	Output			Servo status (SRV-S), alarm (/ALM), operation end (END), operation in-progress (BUSY), control outputs (OUT0 to 3), Point number output 0 to 7 (POUT0 to POUT7)				
	External communications			RS-232C 1CH				
	Power supply for brake			DC24V +/-10% 300mA (prepared by the customer)				
	Safety circuit			Emergency stop input, main power input ready output, emergency stop contact output (1 system: When the HT1 is used.)				
Options	Handy terminal			HT1, HT1-D (with enable switch)				
	Support software for PC			TS-Manager				
General specifications	Operating temperature / Operating humidity			0°C to 40°C, 35% to 85%RH (non-condensing)				
	Storage temperature / Storage humidity			-10°C to 65°C, 10% to 85%RH (non-condensing)				
	Atmosphere			Indoor location not exposed to direct sunlight. No corrosive , flammable gases, oil mist, or dust particles				
	Anti-vibration			All XYZ directions 10 to 57Hz unidirectional amplitude 0.075mm 57 to 150Hz 9.8m/s^2				
	Protective functions			Position detection error, power module error, temperature error, overload, overvoltage, low voltage, excessive position deviation, overcurrent, motor current error				
	Protective structure			IP20				

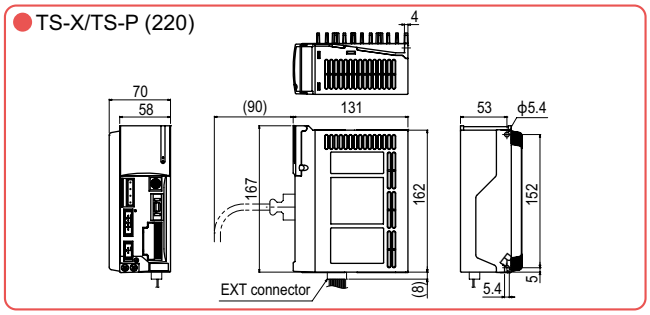
TS-S2 / TS-SH part names



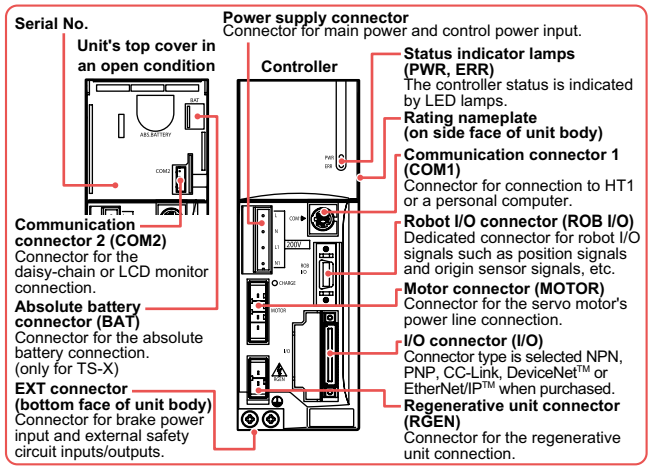
TS-S2 / TS-SH / TS-X / TS-P dimensions





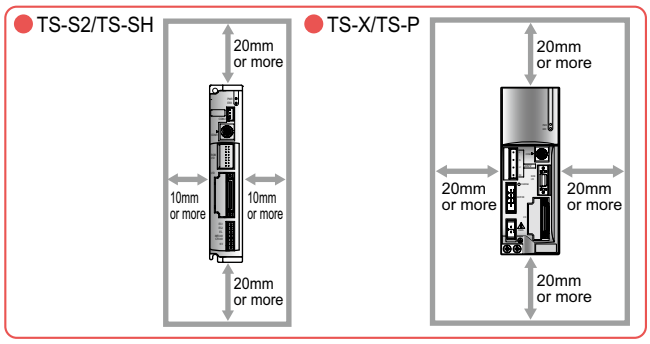


TS-X / TS-P part names



Installation conditions

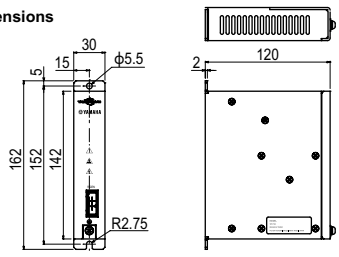
- Install the TS-S2/TS-SH/TS-X/TS-P inside the control panel.
- Install the TS-S2/TS-SH/TS-X/TS-P on a vertical wall.
- Install the TS-S2/TS-SH/TS-X/TS-P in a well ventilated location, with space on all sides of the TS-S2/TS-SH/ TS-X/TS-P (See fig. at right.).
- Ambient temperature : 0 to 40˚C
- Ambient humidity : 35 to 85% RH (no condensation)



Regenerative unit RGT/RGU-2

Regenerative unit RGT

Dimensions



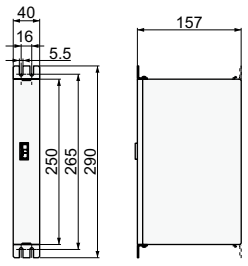
Basic specifications

Item	RGT
Model	KCA-M4107-0A
Dimensions	W30 × H142 × D118mm (Not including installation stay)
Weight	470g
Regenerative voltage	Approx. 420V or more
Regenerative stop voltage	Approx. 380V or less
Accessory	Cable for connection with controller (300mm)

Note. Always leave an empty space (gap of about 20mm) between this unit and the adjacent controller. Also, always use the dedicated cable when connecting the controller.

Regenerative unit RGU-2

Dimensions



Basic specifications

Item	RGU-2 TS-P
Model	KCA-M4107-2A (Including accessory)
Dimensions	W40 × H250 × D157mm
Weight	0.9kg
Regenerative voltage	Approx. 380V or more
Regenerative stop voltage	Approx. 360V or less
Accessory	Cable for connection with controller (300mm)

Note. Always leave an empty space (gap of about 20mm) between this unit and the adjacent controller. Also, always use the dedicated cable when connecting the controller.

Cautions on TS-S2 / TS-SH

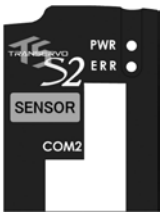
For the RF type sensor specifications, the controllers “TS-S2” and “TS-SH” become “TS-S2S” and “TS-SHS”, respectively.

TS-S2 / TS-SH (Standard specifications)

“BK” label is affixed to the front of the controller.

TS-S2S / TS-SHS (Sensor specifications)

“SENSOR” label is affixed to the front of the controller.
(Be aware that “TS-S2S” is affixed to the front of the controller.)



Data overview

Point data and parameter data settings must be specified in order to operate a robot from a TS series controller.

Point data

The point data used in positioning operations includes items such as the “RUN type”, “Position”, and “Speed”, etc.
Up to 255 points (P1 to P255) can be registered. There are two point data setting types: “Standard setting” type that automatically defines optimal positioning simply by specifying the payload and “Custom setting” type that allows setting the speed (mm/s) and acceleration (m/s^2) in SI units. Select the desired setting type according to the application.

Parameter data

Parameter data is divided into the following categories: “RUN parameters”, “I/O parameters”, “option parameters”, and “servo parameters”.

● Data structure

Data

Point data — **P1 to P255**

1	RUN type	7	Zone (-)
2	Position	8	Zone (+)
3	Speed	9	Near width
4	Accel.	10	Jump
5	Decel.	11	Flag
6	Push	12	Timer

Sets the point data to be used in positioning.
Select the desiredsetting type (“standard setting” or “custom setting”) according to the application.

(1) Standard setting
Optimum positioning is provided simply by specifying the payload.

(2) Custom setting
Speed and acceleration can be set in SI units.

Parameter data

- **K1 to K20** — RUN parameter: Specifies parameter settings related to positioning and return to-origin operations.
- **K21 to K39** — I/O parameter: Specifies parameter settings related to terminal assignments and I/O function selection.
- **K80 to K99** — Option parameter: Specifies parameter settings related to options such as CC-Link, etc.
- **K40 to K79, K100 to ...** — Servo parameter: Specifies parameter settings specified to the connected robot. These parameters are specified during initial processing.

Point data

Point data item list

P1 to P255		
Item		Description
1	RUN type	Specifies the positioning operation pattern.
2	Position	Specifies the positioning target position or movement amount.
3	Speed	Specifies the positioning speed.
4	Accel.	Specifies the positioning acceleration.
5	Decel.	Specifies the positioning deceleration (as a percentage of the acceleration).
6	Push	Specifies the electrical current limit value for “Push” operations.
7	Zone (-)	Specifies the “personal zone” output range.
8	Zone (+)	
9	Near width	Specifies the “near width” zone (distance tolerance relative to target position).
10	Jump	Specifies the next movement destination, or the next merge operation merge destination point No. following positioning completion.
11	Flag	Specifies other information related to the positioning operation.
12	Timer	Specifies the waiting time (delay) after positioning completion.

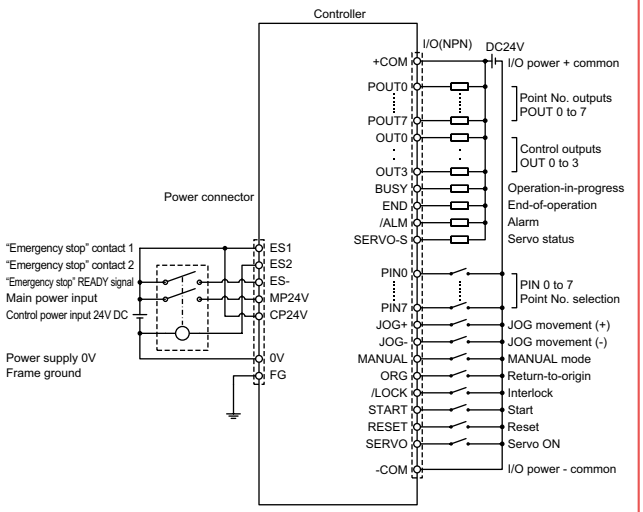
“Standard setting” and “custom setting”

There are 2 setting types for point data (“standard setting” or “custom setting”). Select the desired setting type according to the application.
The maximum number of setting points for both setting types is 255 points (P1 to P255).

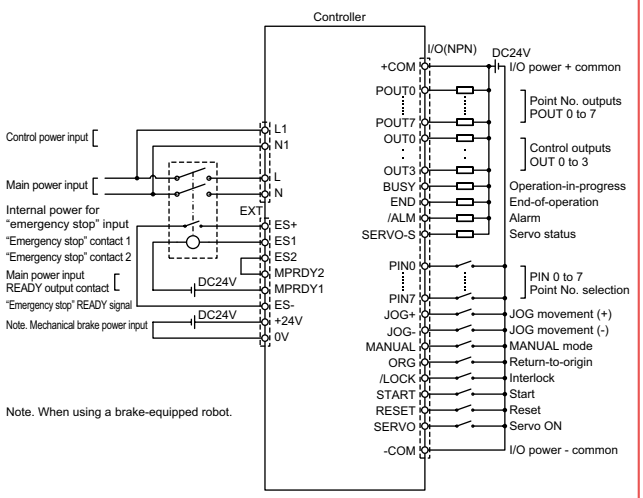
Setting Type	Description
Standard setting	Optimum positioning is provided simply by specifying the payload. This setting type is well-suited to assembly and transport applications.
Custom setting	Allows changing the speed and acceleration in SI units so the desired positioning operation can be set. This setting type is suited for machining and inspection systems.

NPN type input / output wiring diagram

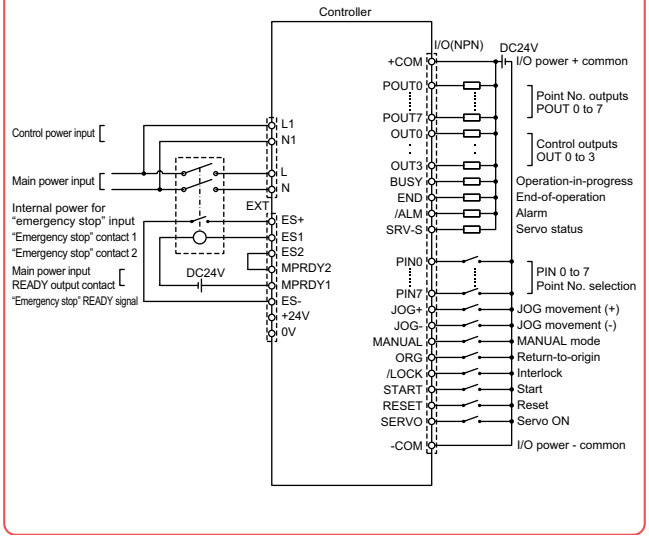
TS-S2 / TS-SH



TS-X

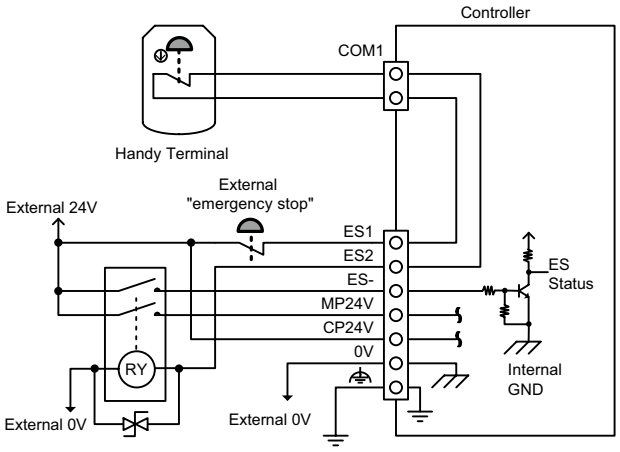


TS-P



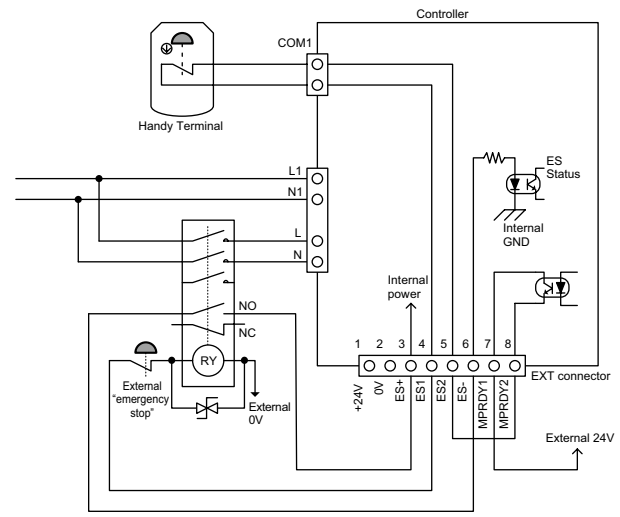
Emergency stop circuit example

TS-S2 / TS-SH (power connector and host unit connection example)



Note. Always connect a surge absorber unit to the coil on the electromagnetic contactor.

TS-X / TS-P (EXT connector and host unit connection example)



Note. Always connect a surge absorber unit to the coil on the electromagnetic contactor.

Installing an external safety circuit will satisfy safety category class 4 standards. See P.529 for more information.

I/O Specifications

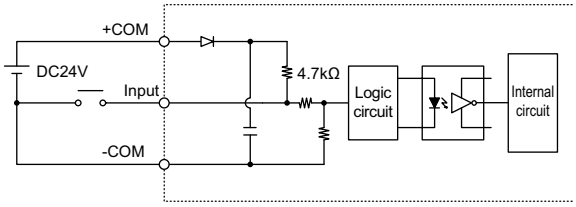
Item	Description
NPN	Input 16 points, 24VDC +/-10%, 5.1mA/point, positive common Output 16 points, 24VDC +/-10%, 50mA/point, sink type
PNP	Input 16 points, 24VDC +/-10%, 5.5mA/point, minus common Output 16 points, 24VDC +/-10%, 50mA/point, source type
CC-Link	CC-Link Ver.1.10 compatible, Remote station device (1 node)
DeviceNet™	DeviceNet™ Slave 1 node
EtherNet/IP™	EtherNet/IP™ adapter (2 ports)

I/O signals (NPN / PNP)

No.	Signal Name	Description		No.	Signal Name	Description	
A1	+COM	I/O power input, positive common (24VDC +/-10%)		B1	POUT0	Outputs	Point No. outputs
A2				B2	POUT1		
A3	NC	No connection		B3	POUT2		
A4	NC			B4	POUT3		
A5	PIN0	Inputs	Point No. select	B5	POUT4		
A6	PIN1			B6	POUT5		
A7	PIN2			B7	POUT6		
A8	PIN3			B8	POUT7		
A9	PIN4			B9	OUT0		OUT0 to OUT3 assignments include: • Zone output • Personal zone output • MANUAL mode status • Return-to-origin end status • NEAR output • Movement-in-progress • Push status • Warning output
A10	PIN5			B10	OUT1		
A11	PIN6			B11	OUT2		
A12	PIN7			B12	OUT3		
A13	JOG+		JOG movement (+ direction)	B13	BUSY		Operation-in-progress
A14	JOG-		JOG movement (- direction)	B14	END		Operation-end
A15	MANUAL		MANUAL mode	B15	/ALM		Alarm
A16	ORG		Return-to-origin	B16	SRV-S		Servo status
A17	/LOCK		Interlock	B17	NC	No connection	
A18	START		Start	B18	NC		
A19	RESET		Reset	B19	-COM	I/O power input, negative common (0V)	
A20	SERVO		Servo ON	B20			

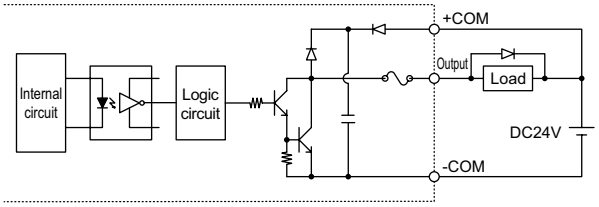
NPN type I/O circuit details

Input circuit



Type : DC input (plus common type)
Photo-coupler isolation format
Load : 24VDC +/- 10%, 5.1mA
OFF voltage : 19.6Vmin (1.0mA)
ON voltage : 4.9Vmax (4.0mA)

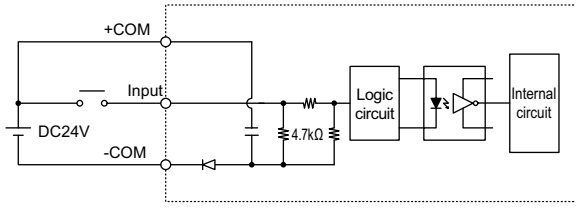
Output circuit



Type : NPN open collector output
(Minus common type)
Photo-coupler isolation format
Load : 24VDC, 50mA/point

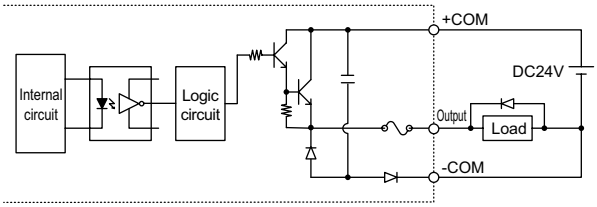
PNP type I/O circuit details

Input circuit



Type : DC input (minus common type)
Photo-coupler isolation format
Load : 24VDC +/- 10%, 5.5mA
ON voltage : 19.6Vmin (4.5mA)
OFF voltage : 4.9Vmax (1.1mA)

Output circuit



Type : PNP open collector output
(Plus common type)
Photo-coupler isolation format
Load : 24VDC, 50mA/point

Accessories and part options

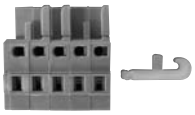
Standard accessories

Power connector

TS-S2 TS-SH TS-SD

Model	KCC-M4421-00

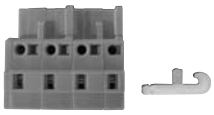
Power connector (AC100V specifications)



TS-X TS-P

Model	KCA-M5382-00

Power connector (AC200V specifications)



TS-X TS-P

Model	KAS-M5382-00

EXT connector

For braking power and safety circuit connections.

TS-X TS-P

Model	KCA-M5370-00

Dummy connector

TS-S2 TS-SH TS-X TS-P

Model	KCA-M5163-00

I/O cables (2m)

TS-S2 TS-SH TS-X TS-P

Model	KCA-M4421-20

Absolute battery

TS-X TS-SH

Model	KCA-M53G0-10 (For TS-X)
	KCA-M53G0-01 (For TS-SH)

Absolute battery basic specifications

Item	For TS-X	For TS-SH
Model	KCA-M53G0-10	KCA-M53G0-01
Battery type	Lithium metallic battery	
Battery capacity	3.6V / 1,650mAh	3.6V / 2,750mAh
Data holding time	About 1 year (in state with no power applied)	
Dimensions	ϕ18 × L50mm	ϕ17 × L53mm
Weight	24g	22g

Note. The absolute battery is subject to wear and requires replacement.
If trouble occurs with the memory then remaining battery life is low so replace the absolute battery. The battery replacement period depends on usage conditions. But generally you should replace the battery after about 1 year counting the total time after connecting to the controller and left without turning on the power.

CC-Link connector (CC-Link specifications)

Connector

Jump socket

TS-S2 TS-SH TS-X TS-P TS-SD

Model	Connector Note.	KCA-M4872-00
	Jump socket	KCA-M4873-00

Note. This is a single connector type. (Insert two connectors into a branching socket.)

Options

Handy terminal HT1 / HT1-D

Has graphic LCD display with backlight for easy viewing.

HT1

HT1-D

TS-S2 TS-SH TS-X TS-P

		HT1	HT1-D
Model	3.5m	KCA-M5110-0E	KCA-M5110-1E
	10m	KCA-M5110-6E	KCA-M5110-7E
Enable switch		–	3-position
CE marking		Not supported	Applicable

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TS-Monitor (LCD monitor)

A liquid crystal display is integrated into this unit. It allows checking each operating state, current position, electrical current and voltage values, etc.

TS-X TS-P

Model	For TS-X	KCA-M5119-00
	For TS-P	KCA-M5119-10

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Support software TS-Manager

Besides data writing, editing and backup functions, the TS-Manager also offers cycle time simulation and various types of monitor functions.

TS-S2 TS-SH TS-X TS-P TS-SD

Model	KCA-M4966-0J (Japanese)
	KCA-M4966-0E (English)

TS-Manager environment

OS	Microsoft Windows 2000 / XP / Vista / 7
CPU	Exceeding the environment recommended by the OS being used
Memory	Exceeding the environment recommended by the OS being used
Hard disk	Vacant capacity of more than 20MB in the installation destination drive
Communication port	Serial (RS-232C), USB
Applicable controllers	TS-S2 / TS-SH / TS-X / TS-P / TS-SD

Note. Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.

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Data cables

Communication cable for TS-Manager.
Select from USB cable or D-sub cable.

USB

D-Sub

Model	USB type (5m)	KCA-M538F-A0
	D-Sub type (5m)	KCA-M538F-01

Note. USB driver for communication cable can also be downloaded from our website (driver supports VIP+, POPCOM, and TS-Manager).

Daisy chain and gateway connection cable

TS-S2 TS-SH TS-X TS-P TS-SD

Model	KCA-M532L-00 (300mm)

CC-Link termination connector (CC-Link specifications)

TS-S2 TS-SH TS-X TS-P TS-SD

Model	KCA-M4874-00

TS-S2/TS-SH/TS-X/TS-P

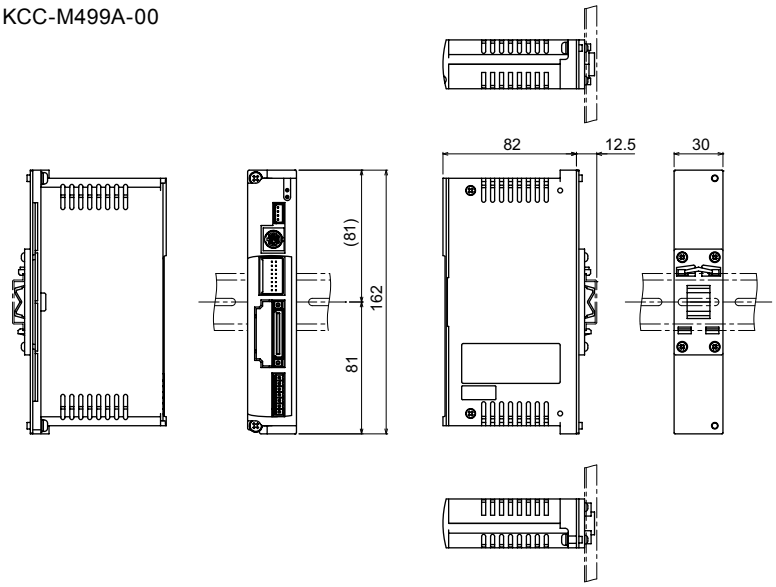
Options

DIN rail mounting bracket (This bracket is provided in TS-SH as standard equipment.)

TS-S2

Model	For TS-S2
	KCC-M499A-00

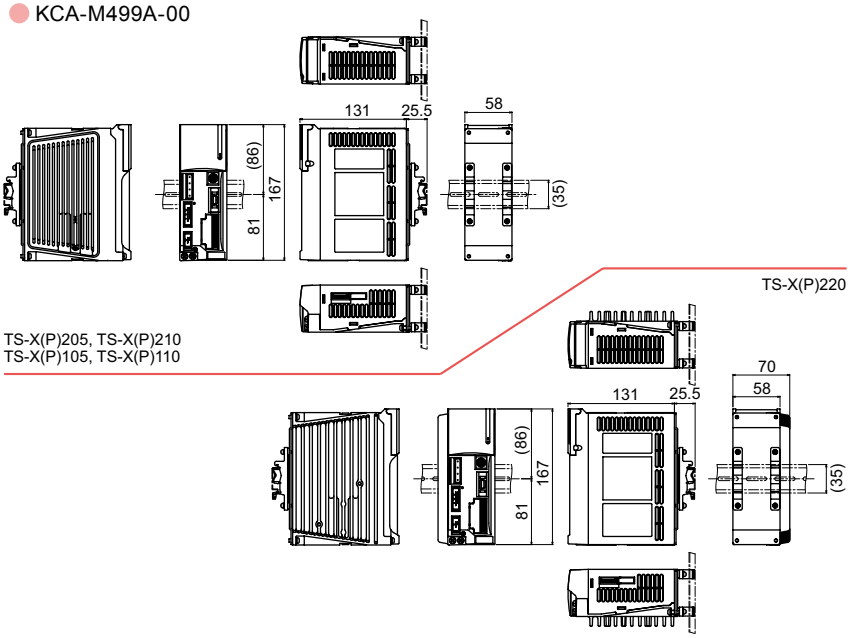
KCC-M499A-00



TS-X
TS-P

Model	For TS-X / TS-P
	KCA-M499A-00

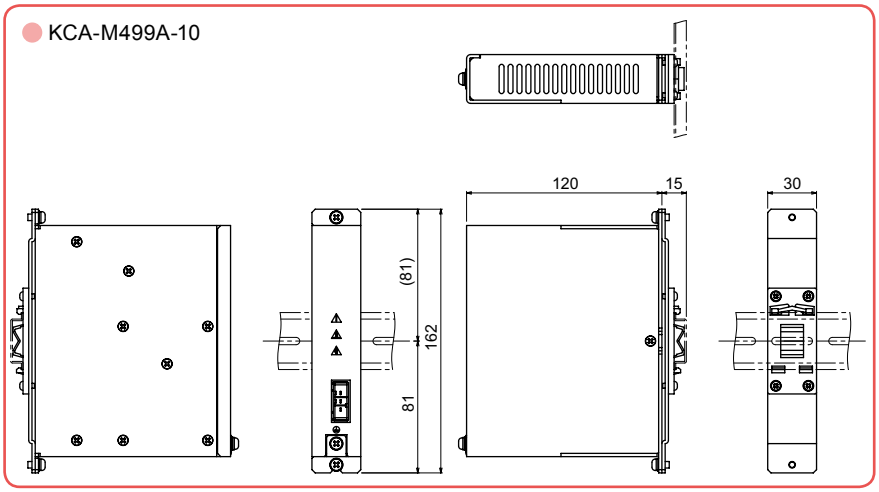
KCA-M499A-00



TS-X
TS-P

Model	For TS-X / TS-P with RGT
	KCA-M499A-10

KCA-M499A-10



Handy terminal

HT1/HT1-D

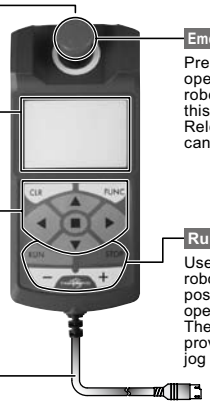
Applicable controllers ▶ TS-S2 TS-SH TS-X TS-P

This Handy Terminal is a device that can perform any operation such as robot manual operation, point data edit, teaching, and parameter setting, etc. Has graphic LCD display with backlight for easy viewing.

HT1 / HT1-D basic specifications

Name		HT1	HT1-D
External view			
Applicable controllers		TS-S2 / TS-SH / TS-X / TS-P	
Model	Japanese specifications	KCA-M5110-0J(3.5m) KCA-M5110-6J(10m)	KCA-M5110-1J(3.5m) KCA-M5110-7J(10m)
	English specifications	KCA-M5110-0E(3.5m) KCA-M5110-6E(10m)	KCA-M5110-1E(3.5m) KCA-M5110-7E(10m)
Display		Dot matrix monochrome display (with backlighting) 32 characters × 10 lines	
Operation keys		Mechanical switch	
Emergency stop button		Normally closed contact point (with lock function)	
Enable switch		-	3-position
Safety connector		-	15 pin D-sub connector (male)
CE marking		Not supported	Applicable
Operating temperature		0°C to 40°C	
Operating humidity		35% to 85%RH (non-condensing)	
Dimensions		W88 × H191 × D45mm (Emergency stop button not included.)	
Weight		260g (not including cable)	300g (not including cable)
Cable length		3.5m / 10m	

Part names and function



Strap holder
Attaching a short strap or necklace strap here prevents dropping the HT1 while operating it or installing it onto equipment.

LCD screen
This is a liquid crystal display (LCD) screen with 32 characters × 10 lines (pixel display), showing the operation menus and various types of information.

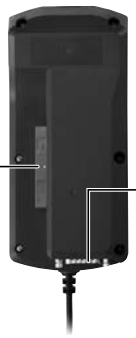
Data edit keys
Use these keys to select menus and edit various data.

Connector cable
This cable connects to the controller. One end of this cable is terminated with an 8-pin MD connector (male). Plug this cable into the COM1 connector on the controller front panel.

Emergency stop button
Pressing this button during operation immediately stops robot movement. To release this button, turn it clockwise. Releasing this button also cancels emergency stop.

Run/stop keys
Use these keys to operate the robot for teaching or positioning, or to stop operation.
The ⊖ and ⊕ keys are also provided to move the robot in jog mode.

HT1-D rear side



Enable switch (only on HT1-D)
This switch is effective for use with remote safety circuits. This switch cuts off the circuit when pressed or released but allows circuit operation when in the middle position.

Safety connector (only on HT1-D)
Use with remote safety circuits triggered by the emergency stop button or enable switch.

Field network system with minimal wiring

NETWORK

Applicable controllers ▶ TS-S2 TS-SH TS-X TS-P

CC-Link

- Option unit with networking functions that can be incorporated in YAMAHA robot controllers, TS-S2 / TS-SH / TS-X / TS-P.
- As connection of the robot system and the sequencer requires only one (4-wire) dedicated cable, it is possible to save wiring of the entire system, which contributes to efficient wiring work, reduction of installation and maintenance costs, etc.
- 16 input/outputs usable as I/O.
- Operation occurs as a CC-Link remote device station, on a one-unit to one-station basis.
- Remote commands can read or write point data and load each type of status.

Basic specifications for network modules CC-Link

Item	Network modules CC-Link
Applicable controllers	TS-S2 / TS-SH / TS-X / TS-P
Version supporting CC-Link	Ver. 1.10
Remote node type	Remote device node
Number of occupied nodes	1 node
Node number setting	1 to 64
Communication speed setting	10Mbps, 5Mbps, 2.5Mbps, 625Kbps, 156Kbps
No. of CC-Link inputs/outputs	Input 16 points , Output 16 points
Shortest distance between nodes Note1	0.2m or more
Overall extension distance Note1	100m/10Mbps, 160m/5Mbps, 400m/2.5Mbps, 900m/625Kbps, 1200m/156Kbps
Monitor LED	L RUN, L ERR, SD, RD

Note 1. These values apply when a cable that supports CC-Link Ver.1.10 is used.

DeviceNet™

- Option unit with networking functions that can be incorporated in YAMAHA robot controllers, TS-S2 / TS-SH / TS-X / TS-P.
- As connection of the robot system and the sequencer requires only one (4-wire) dedicated cable, it is possible to reduce wiring of the entire system, which contributes to efficient wiring work, reduction of installation and maintenance costs, etc.
- 16 input/outputs usable as I/O.
- Operate as slave stations, with each unit occupying 6 input and 6 output channels.
- Remote commands can read or write point data and load each type of status.

Basic specifications for network modules DeviceNet™

Item		Network modules DeviceNet™
Applicable controllers		TS-S2 / TS-SH / TS-X / TS-P
Applicable DeviceNet™ specifications		Volume 1 Release2.0/Volume 2 Release2.0
Device type		Generic Device (device number 0)
Number of occupied CH		Input 6ch, Output 6ch
MAC ID setting		0 to 63
Communication speed setting		500Kbps, 250Kbps, 125Kbps
DeviceNet™ inputs/outputs		Input 16 points, Output 16 points
Network length	Overall extension distance	100m/500Kbps, 250m/250Kbps, 500m/125Kbps
	Branch length	6m or less
	Overall branch length	39m or less/500Kbps, 78m or less/250Kbps, 156m or less/125Kbps
Monitor LED		Module, Network

EtherNet/IP™

- Option unit with networking functions that can be incorporated in YAMAHA robot controllers, TS-S2 / TS-SH / TS-X / TS-P.
- For connection of the robot system and the sequencer, the daisy chain connation can be constructed with a LAN cable (CAT5 or more) that is generally available on the market. As it is not necessary to use the hub, the wiring can be saved and the costs necessary to install the entire system can also be reduced.
- Operate as adapters, with each unit occupying 6 input and 6 output channels.
- Remote commands can read or write point data and load each type of status.

Basic specifications for network modules EtherNet/IP™

Item	Network modules EtherNet/IP™
Applicable controllers	TS-S2 / TS-SH /TS-SH/TS-X/TS-P Note
Applicable EtherNet/IP™ specifications	Volume1 : Common Industrial Protocol (CIP™) Edition 3.8 Voluime2 : EtherNet/IP™ Adaptation Edition 1.9
Device type	Generic Device (device number 43)
Number of occupied CH	Input 6ch, Output 6ch
Ethernet interface	10BASE-T/100BASE-TX
Network length	100m
Monitor LED	MS, NS, Activity, Link

Note. Supported by controller software version V1.10.121 or later. Necessary parameters can be set with the support tool, HT-1 (V1.13 or later) and TS-Manager (V1.3.3 or later).