Functions and Applications

Support for Sample Projects

TOSHIBA MACHINE × Pro-face

Sample Projects are a collaborative system between Toshiba Machine Co., Ltd. and Digital Electronics Corporation. They enable users to check the status of the robot on the touch panel display device.

Features and Advantages

- When an error occurs in the robot, the error information or details can be checked on the Alarm Monitor Screen (see the below figure).
- Additionally, various other screens for functions including Robot I/O Monitor, Current Position Monitor, I/O Time Chart and Connected Device Data Transfer are provided.



► The above robot screens can be downloaded from the website of Digital Electronics Corporation free of charge. There is no need to create these screens and they can be used immediately after product purchase.

http://www.pro-face.com/otasuke/download/sample/manufactures.html

- ► The status of the robot can be checked even by people who cannot operate the teach pendant.
- ▶ Because the information about both the robot and the system is displayed on the same display device, troubleshooting is much easier.

*For product information about the touch panel that is compatible with this system, please contact Digital Electronics Corporation. http://www.pro-face.com/otasuke/sample/detail/common/connection_robot_con_ts_e.html

[Robot unit with touch panel] ain screen creen created by customer or details appe

PC Software for Programming Support

The following PC software tools are provided to shorten the time and increase the efficiency of system designing and installation work.

TSPC6ax: For robot programming

1. Powerful simulation function:

Off-line robot program creation and simulation, with simulated I/O. Lead time up to the start of robot operation can be shortened. Robot programs can be pre-checked without stopping the production line.

2. User-friendly programming environment:

Extensive help information, powerful grammar check, direct, online editing of programs in the controller memory.

3. Multi-functional monitor and support:

Monitoring functions such as active program display, position display, motion status monitor by 3D model, and alarm history display. Operation from on-screen operation panel. Connection via Ethernet (optional) is also supported.



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Built-In PLC

The TSL3100 controller has a built-in PLC(TCmini).

Input and output signals can be controlled by a ladder program, independent from robot motion.

Features and Advantages

- TCmini controls input/output signals of standard I/O, extension I/O and touch-sensitive panel by a ladder program and exchanges data with the robot program.
- ▶ By changing the ladder program, system I/O signals can be used as standard I/O signals, and system I/O signals can be assigned as expansion I/O signals and field network I/O signals.
- Flexible system design and control of peripheral equipment are possible without the added cost of an outside host PLC.
- Creation, monitoring and debugging of a ladder program are possible with powerful programming support software "TCPRGOS-W" (optional).
- ▶ The scan time is 5ms per 1 K-Word (TSL3100). Connection is possible with various programmable controllers and display units etc.





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SM14071-3000-EI Printed in japan

TOSHIBA MACHINE



Cost-effective performance

World-class performance

(standard cycle time of less than 0.4 seconds)

Specifications

Model		TVL500
Туре		Vertically articulated robot
Number of controlled axis		6
Arm length	Total length	500mm
	1st arm	260mm
	2nd arm	240mm
	Reach	602mm
Working envelope	Axis 1 (J1)	±170°
	Axis 2 (J2)	-64~+165°
	Axis 3 (J3)	0~+150°
	Axis 4 (J4)	±190°
	Axis 5 (J5)	±120°
	Axis 6 (J6)	±360°
Maximum speed*1	Axis 1 (J1)	435°/s
	Axis 2 (J2)	348°/s
	Axis 3 (J3)	348°/s
	Axis 4 (J4)	422°/s
	Axis 5 (J5)	422°/s
	Axis 6(J6)	696°/s
	Composite*2	7.98m/sec
Maximum payload mass*1		3kg(rated:1kg)
		(Downward: 5kg)
Standard cycle time*3		< 0.4 sec
Allowable	Axis 4, 5	0.15kg·m ²
moment of inertia	Axis 6	0.2kg⋅m²
Positioning repeatability*4		±0.02mm (X-Y-Z)
Position detecting system		Absolute system/AC servo motor
Power supply		1.5kVA
Robot body	Mass	28kg
	color	White/blue

*1: Acceleration rates are limited depending on motion patterns, payload mass, and offset value.

*2: Under rated load
*3: Continuous operation of standard cycle motion pattern is not possible beyond the effective load ratio. (Horizontal 300 mm, vertical 25 mm, round-trip, coarse positioning)
*4: When the environment temperature is constant.

External view





Alternative installations

Tap holes on the side of the base unit allow for the robot to be installed sideways.



Variety of options

Robot controller cable options

In addition to the standard cabling at the back, cabling can be routed through the base.

This eliminates the need for installation space at the rear, and increases flexibility relating to the application and the space available.





standard

(option) The third arm side



Special features

Tap holes

Tool fixture tap holes are provided at four locations on the arm, upper and lower positions.

They are useful for fixing external cabling and peripheral devices.





IP65 option Dust-proof and drip-proof protection is available if required.

1st arm T-groove



1st arm equipped with a T-groove as standard

The T-groove can be used to place tools, cabling and DIN rails in position.





I/O panel options

The I/O panel can be selected from three options.

An optional elbow type plug is available on the hand-side connection. Option

option





The second arm top surface

(option) Hand side connector elbow type



Compact controller

Controller TSL3100 specifically designed for the vertical articulated robot.

- Space saving and lightweight compared to the controller TS Series.
- Ethernet is equipped as standard, and expansions of I/O and various networks are supported.
- The controller's operation status is indicated by LED display.
- Programs can be backed up easily to USB memory.

Specifications

Model	TSL3100	
Number of controlled axes	Maximuim 6 axes	
Motion modes	PTP, CP (Continuous Path ; Linear, Circular), Short-Cut	
Storage capacity	Approx. Total: 6400 point + 12800 steps 1 program: 2000 point + 3000 steps	
Number of registerable programs	Maximum 256	
Programming language	SCOL (similar to BASIC)	
Teach pendant (optional)	Teach pendants TP3000 and TP1000-6ax (Program can also be written on PC)	
Extended I/O signals	8 inputs / 8 outputs	
Hand control signals	8 inputs / 8 outputs	
External operation signals	Input : cycle operation mode, start, stop, etc. (13 signals) Output : Servo ON, emergency stop, etc. (10 signals)	
Communication port	RS232C : 2 ports, Ethernet	
Other functions	Interruptive functions, self-diagnosis, I/O control and communications during motion, coordinate calculations, built-in PLC, etc.	
Power supply	Single phase AC190V~240V , 50/60Hz(±1Hz)	
Outer dimensions and mass	220(W)×266(H)×304(D)[mm] , 9kg, (including rubber feet)	
PC software for programming support(option)	TSPC : Program editor, teaching, remote operation, etc.	
I/O and Fieldbus options	I/O extension, Field-network (CC-Link, DeviceNet, PROFIBUS)*	
*: Ethernet is a registered trademark of XEROX Corp. in the U.S.A.		

CC-Link is a registered trademark of CC-Link Partner Association. DeviceNet is a registered trademark of ODVA. PROFIBUS is a registered trademark of Profibus User Organization

External view





TSL3100

Teach Pendant Optional

