

THE TOSHIBA MACHINE EASY ROBOT PHILOSOPHY

The Toshiba Machine SCARA is probably the world's easiest to use robot. Our entire philosophy is about making things straightforward for our customers. For us easy is a virtue. It means productivity, efficiency and professionalism. Easy is achieving what you want to achieve quickly and elegantly. It's the very essence of good engineering – making something that your competitors can make but making it better, more economically and quicker. We believe that our versatile, cost effective robots are the very embodiment of this thinking.

Easy to learn:

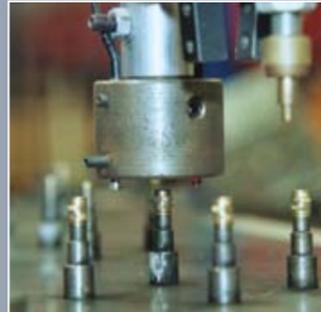
- Master programming with less than a day of training and find out how to input CAD data directly from files
- Discover our fast troubleshooting system with simple codes
- Estimate cycle times instantly, with no need for programming languages

Easy to integrate:

- The built in PLC enables complete system control from within the robot cell
- The simplicity of the robot teaching system means you can be up and running on a new programme in hours
- The easy plug and play integration with EZ vision saves time and money and makes your system massively more efficient

Easy to use:

- The largest range of arm lengths, payloads and options of any SCARA manufacturer
- High accuracy and repeatability regardless of payload
- High speed across the range, which means high productivity in your plant



Easy is productivity, efficiency, professionalism

TOSHIBA MACHINE

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THE EASY GENERATION OF INDUSTRIAL ROBOTS



**Easy is productivity,
efficiency, professionalism**

TOSHIBA MACHINE

TOSHIBA MACHINE'S EASY-USE SCARA RANGE



COMPACT SCARA ROBOT

MODEL	TH180	TH250A	TH350A
Arm length 1 st arm and 2 nd arm	180mm (70+110)	250mm (125+125)	350mm (225+125)
Working envelope	Axis 1	±120°	±115°
	Axis 2	±140°	±140°
	Axis 3 (Z-axis)	120mm	120mm (150mm)
	Axis 4 (Z-axis rotation)	±360°	±360°
Maximum speed	Axis 1	533°/sec	540°/sec
	Axis 2	480°/sec	540°/sec
	Axis 3 (Z-axis)	1013mm/sec	1120mm/sec
	Axis 4 (Z-axis rotation)	1186mm/sec	1143°/sec
Composite	2.6m/s	3.53m/s	3.24m/s
Standard cycle time	0.35s *1 (With 1kg payload)	0.41s *2 (With 1kg payload)	0.41s *2 (With 1kg payload)
Maximum payload mass	2kg	3kg	3kg
Allowable moment of inertia at end	0.01kg·m ² *3	0.017kg·m ² *3	0.017kg·m ² *3
Repeatability	X, Y, Z	±0.01mm	±0.01mm
	Axis 4	±0.005°	±0.005°
Input/output signals for hand	5 inputs / 4 outputs	5 inputs / 4 outputs	5 inputs / 4 outputs
Air piping for hand	φ4×4 pcs	φ4×4 pcs	φ4×4 pcs
Robot-controller cable length	3m (Option 5m)	3m (Option 5m)	3m (Option 5m)
Mass	9kg	14kg	14kg
Controller	TS1000	TS1000	TS1000

ALLOWABLE MOMENT OF INERTIA

*3 The acceleration/deceleration rates may be limited depending on motion patterns, load mass and offset amount



HIGH SPEED, HIGH ACCURACY SCARA ROBOT

MODEL	TH450A	TH550A
Arm length 1 st arm and 2 nd arm	450mm (200+250)	550mm (300+250)
Working envelope	Axis 1	±120°
	Axis 2	±145°
	Axis 3 (Z-axis)	150mm (300mm)
	Axis 4 (Z-axis rotation)	±360°
Maximum speed	Axis 1	600°/sec
	Axis 2	600°/sec
	Axis 3 (Z-axis)	2000mm/sec
	Axis 4 (Z-axis rotation)	2000°/sec
Composite	7.33m/sec	6.21m/sec
Standard cycle time	0.33s *2 (With 2kg payload)	0.33s *2 (With 2kg payload)
Maximum payload mass	5kg	5kg
Allowable moment of inertia at end	0.05kg·m ² *3	0.05kg·m ² *3
Repeatability	X, Y, Z	±0.015mm
	Axis 4	±0.005°
Input/output signals for hand	5 inputs / 4 outputs	5 inputs / 4 outputs
Air piping for hand	φ4×4 pcs	φ4×4 pcs
Robot-controller cable length	5m (Option max.25m)	5m (Option max.25m)
Mass	27kg	29kg
Controller	TS2000	TS2000

MOTION PATTERNS FOR STANDARD CYCLE TIME

- *1: 100mm for horizontal direction, 25mm for vertical direction, round trip
- *2: 300mm for horizontal direction, 25mm for vertical direction, round trip

TOSHIBA MACHINE'S EASY-USE SCARA RANGE



HIGH SPEED, HIGH ACCURACY SCARA ROBOT

MODEL	TH650A	TH850A	TH1050A
Arm length 1 st arm and 2 nd arm	650mm (300+350)	850mm (350+500)	1050mm (550+500)
Working envelope	Axis 1	±160°	±160°
	Axis 2	±143°	±145°
	Axis 3 (Z-axis)	200mm (400mm)	200mm (400mm)
	Axis 4 (Z-axis rotation)	±360°	±360°
Maximum speed	Axis 1	340°/sec	300°/sec
	Axis 2	600°/sec	420°/sec
	Axis 3 (Z-axis)	2050mm/sec	2050mm/sec
	Axis 4 (Z-axis rotation)	1700°/sec	1200°/sec
Composite	7.52m/sec	8.13m/sec	9.15m/sec
Standard cycle time	0.31s *2 (With 2kg payload)	0.39s *2 (With 2kg payload)	0.39s *2 (With 2kg payload)
Maximum payload mass	10kg	20kg	20kg
Allowable moment of inertia at end	0.1kg·m ² *3	0.2kg·m ² *3	0.2kg·m ² *3
Repeatability	X, Y, Z	±0.01mm	±0.01mm
	Axis 4	±0.004°	±0.004°
Input/output signals for hand	5 inputs, 4 outputs	5 inputs, 4 outputs	5 inputs, 4 outputs
Air piping for hand	φ6×4 pcs	φ6×4 pcs	φ6×4 pcs
Robot-controller cable length	5m (Option max.25m)	5m (Option max.25m)	5m (Option max.25m)
Mass	51kg	76kg	80kg
Controller	TS2100	TS2100	TS2100

Straightforward control from the TS range

MODEL	TS1000	TS2000	TS2100
No. of controlled axes	Standard 4 axes (Maximum 5 axes: TS2000/TS2100)		
Motion Modes	PTP (point-to-point), CP (Continuous Path; Linear, Circular), Short-Cut, Arch Motion		
Position Detection	Absolute encoders		
Storage capacity	Approx. Total: 6400 points + 12800 steps 1 program: 2000 points + 3000 steps		
No. of Registrable Programs	Maximum 256 (247 user files + 9 system files)		
Programming Language	SCOL (similar to BASIC)		
Teaching Unit	Teach pendant TP1000: Cable length 5 m / Programming support PC software TSPC also available		
External I/O Signals	16 inputs / 16 outputs 8/8 can be assigned to system signals	31+7 inputs / 22+10 outputs 7/10 can be assigned to system signals	
Hand Control Signals	5 inputs / 4 outputs		
External Operation Signal	Input: cycle operation mode, start, stop, program reset, etc. Output: Servo ON, operation ready, fault, etc.		
Serial Communication Ports	RS232C: 2 ports		
Power Supply and Capacity	Single phase AC190 V - 250 V, 50/60 Hz, 1.1 kVA	Single phase AC190 V - 250 V, 50/60 Hz, 2.3 kVA	Three phase AC190 V - 250 V, 50/60 Hz, 3.5 - 4.4 kVA
Outer Dimensions and Mass	170W×290H×280D (mm)/10kg	290W×230H×280D (mm)/12kg	420W×230H×300D (mm)/16kg
Other Functions	Interruption processing, robot motion ON signal, communication processing, arithmetic operation, torque limit, PLC, self-diagnosis, etc.		
PC Software for Programming Support (optional)	TSPC: Program editor, teaching, remote operation TCPGOS: PLC sequence program creation (Supporting OS: Windows2000, WindowsXP)		
Options	Conveyor synchronization (not supported by TS1000), Additional I/O, I/O cable, position data latch function, smooth (constant speed) function, separated operation panel, network (Ethernet: Not supported by TS1000, CC-Link, DeviceNet, Profibus), CE-compliant		

A simple solution to every challenge

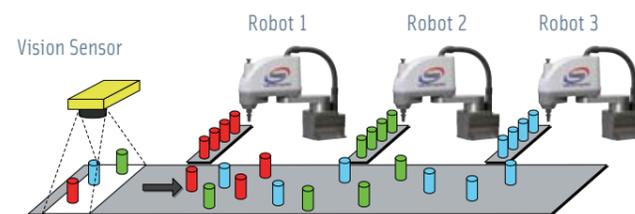
OPTIONS

- **Clean room class 10** (0.1μm - 0.3μm)
TH180 / TH250A / TH350A / TH450A
TH550A / THP550 / TH650A / TH850A
TH1050A
- **Waterproof Design IP65**
THP550 / TH650A / TH850A / TH1050A
(Limitation is imposed on acceleration/
deceleration rates)
- **Z Axis long stroke (Z)**
TH250A / TH350A: 150mm
TH450 / TH550 / THP550: 300mm
TH650A / TH850A / TH1050A: 400mm
- **Protective bellows for Z axis**
TH180 - TH1050A / THP550
Limited acceleration / deceleration
- **Protective cover for Z axis**
TH650A - TH1050A
- **Ceiling Mount (T)**
TH350A - TH1050A / THP550
- **Optional cable lengths**
Between robot and controller:
Maximum 10m (TH180 - TH350A)
Maximum 25m (TH450 - TH1050A)
- **Teach pendant: Maximum 15m**
- **Additional 5th Axis**
(Traverse, Wrist etc...) TH450 - TH050A

Share vision amongst multiple robots with conveyor synchronisation

Our 'one line = one camera' philosophy means you can:

- Cut costs by 'sharing' a single camera between all of the robots on a conveyor
- Sort large quantities and multiple types of workpieces and goods
- Take advantage of easy programming via dedicated commands
- Perfectly synchronized automation reduces damage to conveyed items



COMPETING ON ALL FRONTS - NEW TOSHIBA MACHINE ROBOTS FOR EVERY PURPOSE

THP550

The first in a new generation of SCARA

With an unbeatable cycle time of 0.29 seconds, the THP550 SCARA is the first in a new range of SCARA robots set to compete with the flexpicker style machines already on the market. Its impressive speed and Ethernet connectivity make it ideal for robot synchronisation on a production line. The 550mm arm length, long z-axis stroke and payload of up to 2kg, make this machine ideal for food, pharmaceutical and cosmetics manufacture.



TV800/1000

Six axis technology - completing the range

Toshiba Machine launched the TV800 cell robot in late 2008, introducing a six axis robot into its product portfolio for the first time. As a result, it is now one of the few robot suppliers across the globe to offer SCARA, six axis and Cartesian robot technology produced by a single manufacturer. The TV1000 was launched in 2009 and now provides a larger option for applications that require six-axis flexibility.



The TS3000 series controllers

Toshiba Machine's new range of TS3000 series controllers, comprising the TS3000 and TS3100, feature a built-in Ethernet port on both models, making conveyor and vision synchronisation simple. These controllers also include the built-in TCmini PLC, which allows control of I/O equipment, regardless of operation and program. The net effect is greater efficiency and productivity, combined with savings in vision technology in a single easy to implement package.



MODEL		THP550
Type		Horizontal multi-joint
No. of controlled axis		4
Arm length		550mm (300+250mm)
Working envelope	Axis 1	±120°
	Axis 2	±145°
	Axis 3 (Z-axis)	150mm (optional: 300mm)
	Axis 4 (Z-axis rotation)	±360°
Maximum speed	Axis 1	375°/s
	Axis 2	600°/s
	Axis 3 (Z-axis)	2000mm/s
	Axis 4 (Z-axis rotation)	2000°/s
Composite		6.21m/s
Standard cycle time (with 1kg)		0.29s *1
Maximum payload mass		2kg
Allowable moment of inertia	X-Y	±0.015mm *3
	Axis 3 (Z-axis)	±0.01mm *3
	Axis 4 (Z-axis rotation)	±0.02° *3
Hand wiring		8 inputs/8 outputs
Hand piping		4pcs (ø4)
Position detection		Absolute
Robot-controller cable		5m (optional: max 25m)
Mass		26kgs

MODEL		TV800	TV1000
Type		Vertical Articulated Robot	
No. of controlled axis		6 axis	
Arm length	Total length	800mm	1000mm
	1 st Arm	380mm	480mm
	2 nd Arm	420mm	520mm
	Reach	892mm	1090mm
Working envelope (deg)	Axis 1 (J1)	±170°	
	Axis 2 (J2)	-100~+150°	
	Axis 3 (J3)	-127~+167°	
	Axis 4 (J4)	±190°	
	Axis 5 (J5)	±120°	
	Axis 6 (J6)	±360°	
Maximum speed (deg/sec)	Axis 1 (J1)	237°/s	
	Axis 2 (J2)	240°/s	
	Axis 3 (J3)	288°/s	
	Axis 4 (J4)	350.5°/s	
	Axis 5 (J5)	484°/s	
	Axis 6 (J6)	576°/s	
Composite		8.06m/sec	9.61m/sec
Maximum payload mass		5kg	
Standard cycle time *2		0.4~0.5sec	0.6~0.7sec
Allowable moment of inertia at end	Axis 4, 5	0.3kg/m ²	
	Axis 6	0.05kg/m ²	
Positioning repeatability*3		±0.02mm(X-Y-Z)	±0.03mm(X-Y-Z)
Position detecting system		Absolute system/AC servo motor	
Robot body		46.5kg	48kg

*1: The acceleration/deceleration rates may be limited depending on motion patterns, load mass and offset amount.
 *2: Continuous operation is not possible beyond the effective load ratio on the standard cycle time motion pattern. Horizontal 300mm, Vertical 25mm, round-trip
 *3: At constant temperature

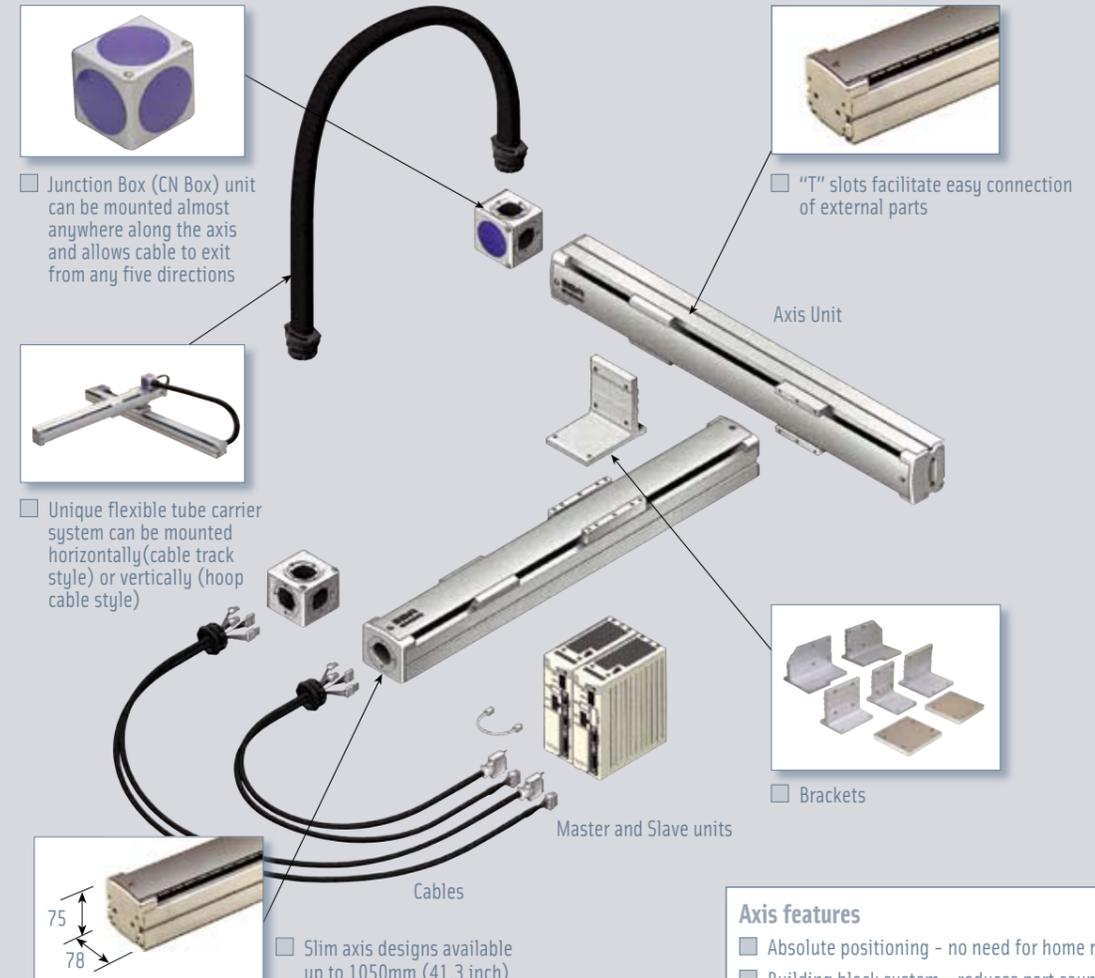
CARTESIAN LINEAR ACTUATORS

Modular construction makes design simple

The BA series Cartesian linear actuator, more commonly known as the ROIbot, uses a modular building block design, allowing single or multiple axis configuration to be built from the same standard components.

Manufactured by Toshiba Machine, this system allows for over 500 configurations whilst the compact design minimises space requirements. With a payload capacity of up to 150kg per axis and an arm length of between 50mm and 2.5m, the BA series is perfect for even the most demanding applications.

Each axis can handle up to 150kg and features AC servomotors, precision ground ball screws and high rigidity linear guides. Motors can be mounted on either side of the axis, or underneath, to reduce its overall length. The junction box unit can be mounted almost anywhere along the axis and allows cable to exit from any of five directions. The ROIbot is supplied with a unique flexible tube carrier system, which can be mounted horizontally or vertically.



- ### Axis features
- Absolute positioning - no need for home return
 - Building block system - reduces part count
 - Slim axes - space saving
 - CE markings comply with European directives

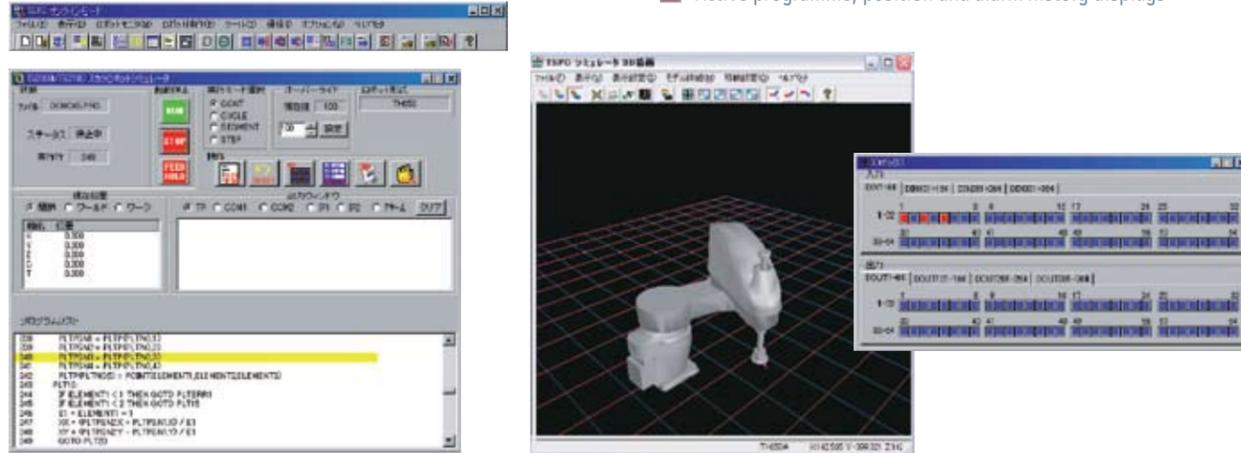
PROGRAMMING AND SIMULATION

Software that makes system design and installation quick and easy

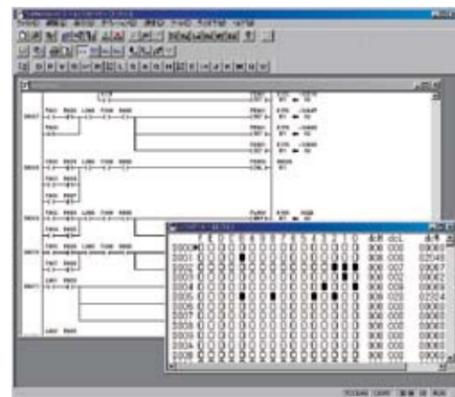
TSPC For robot programming

Toshiba Machine's TSPC software features a powerful simulation function which allows the user to create robot programmes after just basic training. This reduces lead times when integrating a robot and allows for pre-checking of new programmes, without stopping the production line.

- User friendly programming
- Extensive help section and syntax check
- Multi-function monitor and support
- Connection via Ethernet
- Active programme, position and alarm history displays



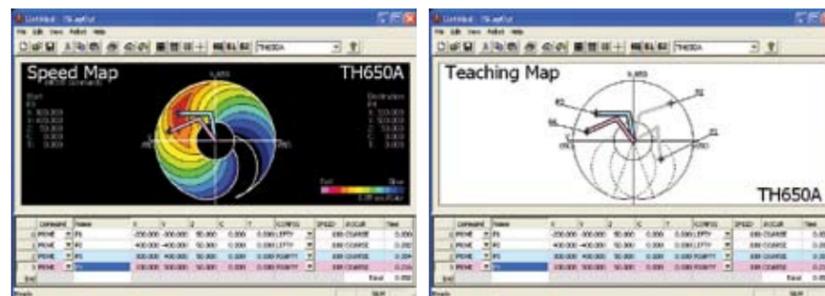
TCPRGOS For programming the built-in PLC



- Ladder style logic programming
- Online monitoring of ladder programme and I/O status helps reduce development and de-bugging time
- Functions include address map and comment displays and search

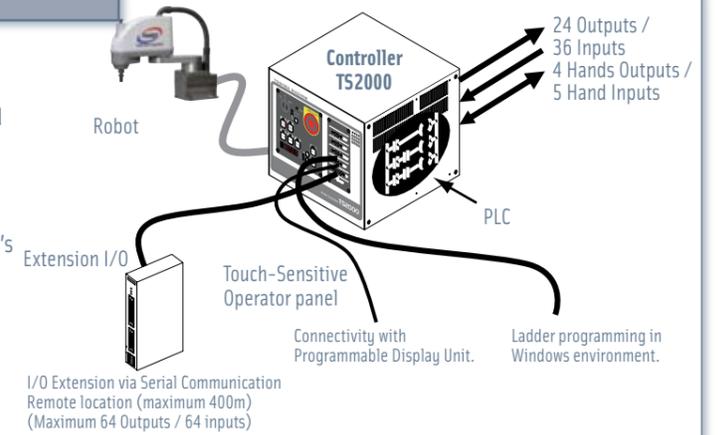
TS LayOut For cycle time and layout review

- **Instant cycle time estimation:** calculated by just pointing at a position with no need for programming language
- **Guidance for high speed motion:** coloured speed map indicates fast motion areas from a given start position, helping generate the most optimised system layout
- **Conversion to robot programme:** input positions can be converted to a robot programme with just one menu click

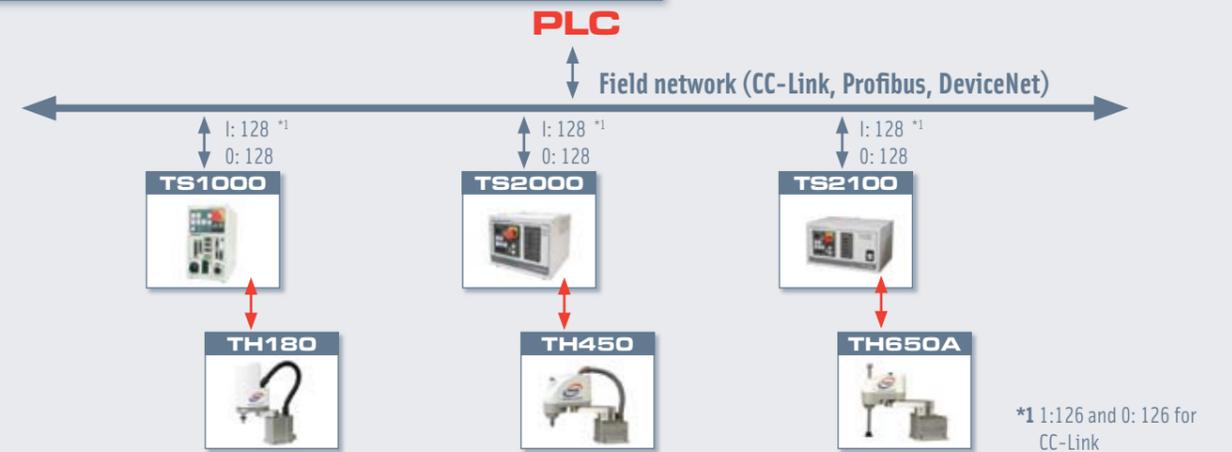


Built in PLC allows for total cell control

Toshiba Machine's TS series controllers all feature a built in TCmini PLC, which allows for control of I/O equipment, regardless of robot operation and programme. This allows for flexible system design and control of peripheral equipment, without the cost of an external PLC. Input and output signals are handled via ladder style programming logic, which is independent from robot motion. Creation, monitoring and debugging of this programming is simple using Toshiba Machine's TCPRGOS-W support software. Connection to non Toshiba Machine programmable controllers and display units is a simple process and scan time is 5ms per 1-K word.



Field network



LEARN TO BE AN INDUSTRIAL ROBOT PROGRAMMER IN JUST 1 DAY

The TM Robotics SCARA Starter Pack is the ideal introduction to the world of easy to use industrial robot plug and play solutions.

THE 7 REASONS WHY THE STARTER PACK IS YOUR IDEAL ROBOT CHOICE:

- Small and fast – your ideal first robot
- Plug and play – works straight out of the box
- Portable – ideal for training / demonstration
- Flexible – transfer the robot from task to task
- True industrial robot – not a stripped down version
- Easy to program - no specialist knowledge required
- Pre-loaded programs and software – no extra cost

Who should use the Starter Pack?

- Systems integrators
- Schools, colleges and universities
- Specialists looking for a robot offering
- End users of robots

What's included in the Starter Pack?

- Toshiba Machine TH180 micro SCARA robot
- TS1000 robot controller
- Teach pendant for easy control
- Portable robot and controller case and cell
- Preloaded example programs
- Pneumatic or electronic gripper options
- Training documentation
- Pre-drawn work surface to teach commands
- 700mm wide by 600mm high and 600mm deep

