TOYODA

TOYOPUC Programmable Controller | Line Up

JTEKT
JTEKT CORPORATION

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Koyo | TOYODA

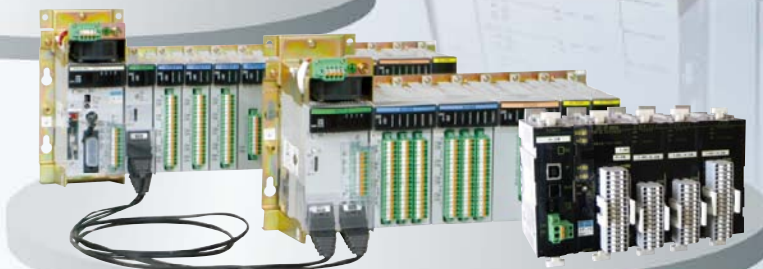# Just fitting with the needs of customer "Further expanding TOYOPUC series in FA solution"

PC3J series

Direct circuit monitor

PCwin/PCwin-Safe2
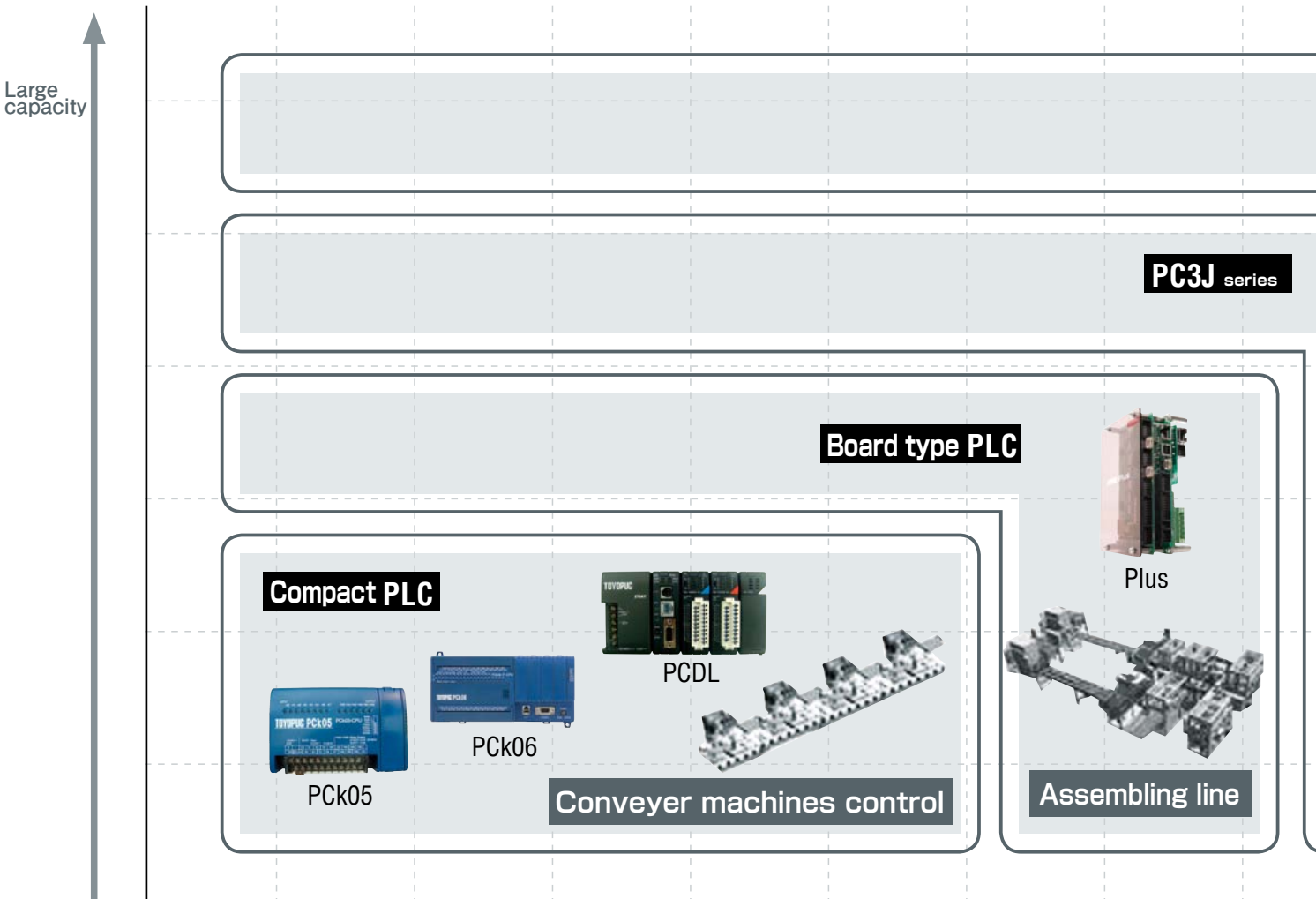
Safety PLC

CONTENTS

PC10 series

Board type PLC

Compact PLC

Factory management and from a line machine control to a small-scale machine , TOYOPUC plays an active part in all the stages.

Memory capacity

Large
capacity

PC3J series

Board type PLC

Plus

Compact PLC

PCDL

PCk06

PCk05

Conveyer machines control

Assembling line

PC10 series

PC10G

PC10P

PC3JX   PC3JX-D

Machine tool

Line control

High-speed → Processing speed

TOYOPUC-Line up will match every facility scale

1. Large-scale facility, high performance, and high speed processing application :PC10 series

2. Middle-scale facility :PC3J series

3. From manual equipment to full automatic equipment: Board type PLC Plus

4. Small-scale/Simple facility :Compact PLC PCDL, PCk05, PCk06

Supporting flexible applications.

1. Selection from memory 2K words ～ 180K words and I/O 14 points ～2048 points.

2. 3 programs can be created independently. (PC10, PC3J series)

Abundant functions

1. The test mode function, which can return to the original program instantly after modifications (PC10 series)

2. 3 languages comments can be installed in a PLC (PC10 series)

Facility memory capacity can realize Visualization

1. Containing the program comment and SFC-FB information. (PC10, PC3J series, Plus)

2. Containing I/O drawing, and realizes CAD-less (PC10 series).

4
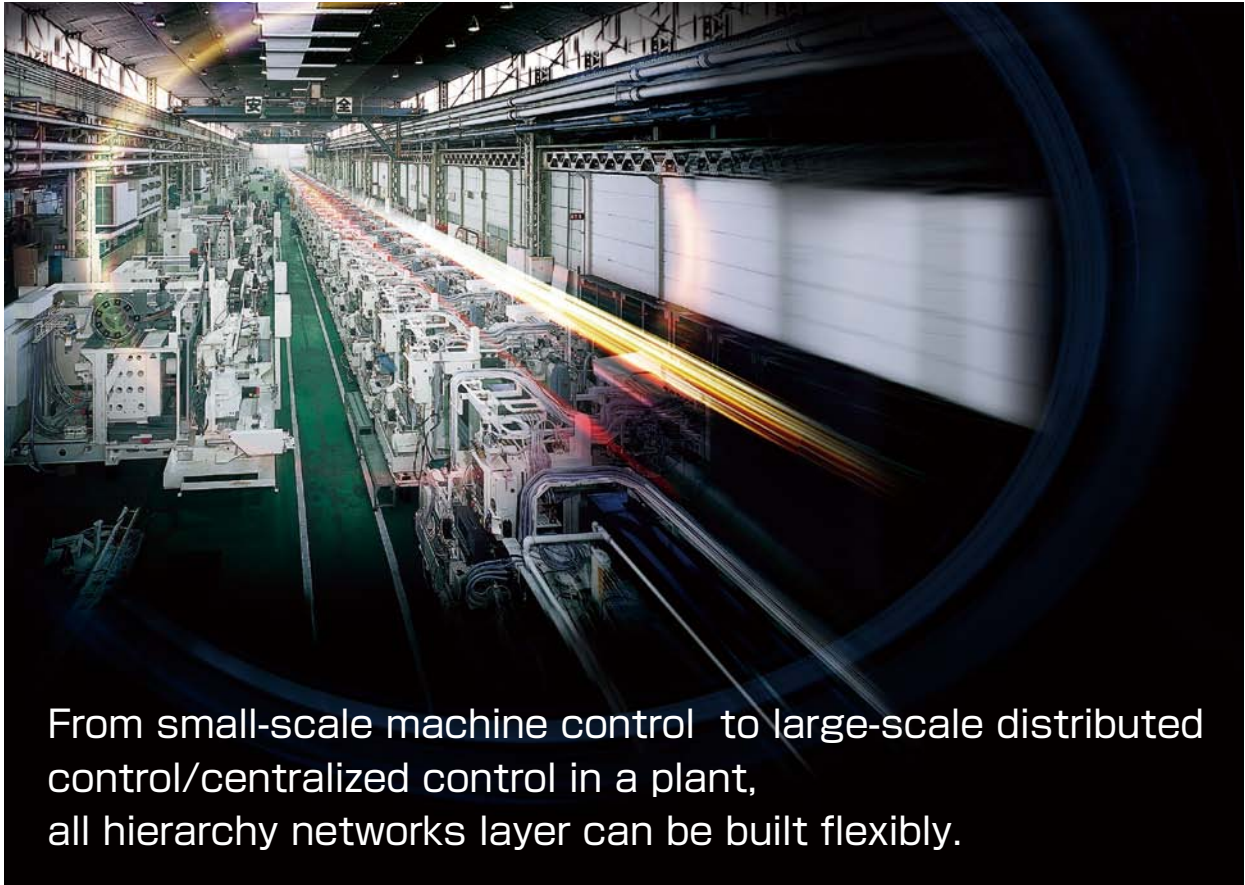
From small-scale machine control to large-scale distributed control/centralized control in a plant,
all hierarchy networks layer can be built flexibly.

Programming tool (PCwin) can be connected by a network.

1. All communication modules, such as FL-net[*], Ethernet[*], and HPC can be connectable
2. Remote programming up to four layers can be possible

Four layers

Remote programming
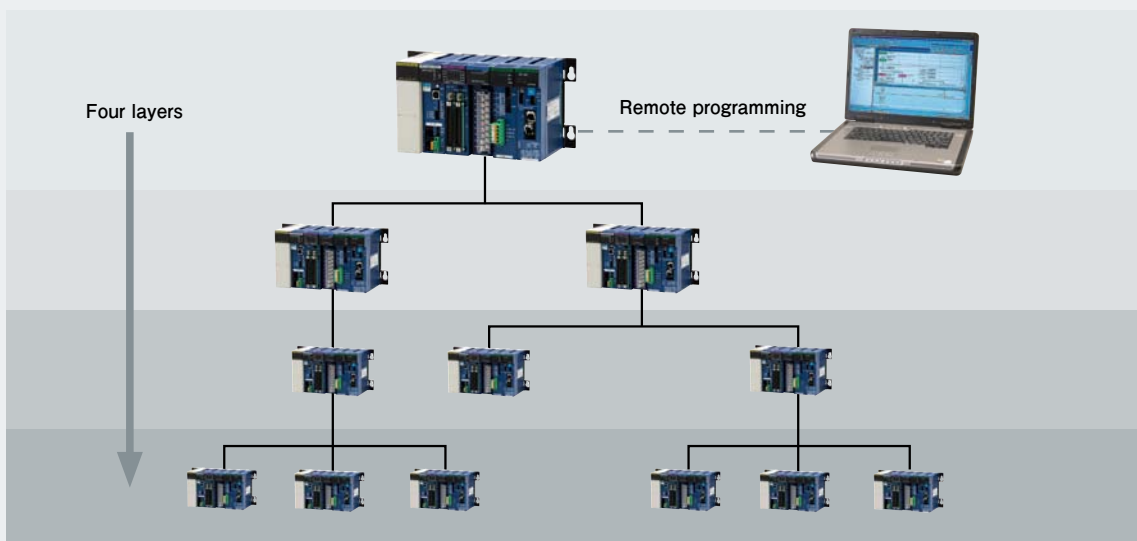
[*]FL-net is a controller level network (OPCN-2) which JEMA (Japan Electrical Manufacturers' Association) defined.
[*]Ethernet is a registered trademark of Fuji Xerox.

All network modules, which covers all hierarchies layers, are prepared.

1 . Each Layer is communized by FL-net and Ethernet* common use.

2 . FL remote and Ethernet* realize the best high speed device communication.

Information system

Ethernet*

Facilities system

FL-net HPC-Link、PC-Link

EtherNet/IP*

CC-Link*

SN-I/F

Device system

DeviceNet*

EtherCAT*

FL- remote

Explanation of a FL-remote terminal with diagnostic functions

- **Short circuit detection**
  Current of each I/O is monitored: Regarding input, detected as short circuited when input is 50 mA or more per point. Regarding output, detected as short circuited when over 500mA (500mA inclusive) flows per point.

- **Wire-cutting detection**
  Current of each I/O is monitored: regarding input, detected as disconnected when input is 0.3 mA or less per point. Regarding output, detected as disconnected when output is at and less than 3mA.

- I/O power voltage monitoring
  Whether I/O power is supplied to units or not is reported to a Master.

Sensor/Actuator

Short circuit

Sensor/Actuator

Wire-cutting

I/O power   I/O power

*Ethernet is a registered trademark of Fuji Xerox.
*EtherCAT is a registered trademark of Beckhoff Automation GmbH.
*CC-Link is a registered trademark of Mitsubishi Electric Corporation.
*DeviceNet is a registered trademark of Open DeviceNet Vendor Association Inc.

TOYOPUC-PC10 series

The programmable controller who knows all about machines

- ■ The CPU function sticking to user-easy-operation
- ■ The large memory which realizes "Visualization"
- ■ Various communication functions

SFC*(Sequential Function Chart) programming is available.

Process operation progress, which has been unclear in the conventional ladder circuit,

"Visualization of process operation" can be performed and maintenance is easy.

Control circuit is described by a flowchart

The progress of processes can be easily followed through the flowchart and colors.

Conventional (ladder circuit)

—SFC circuit—

■ Step

A step means each process and status is displayed as a color.
Orange ⇒ Motion is being commanded
Green ⇒ Motion command complete

■ Transition

Shows completion of motion and controls shift to next step.
The status is displayed through colors.
Orange color ⇒ Waiting for motion completion
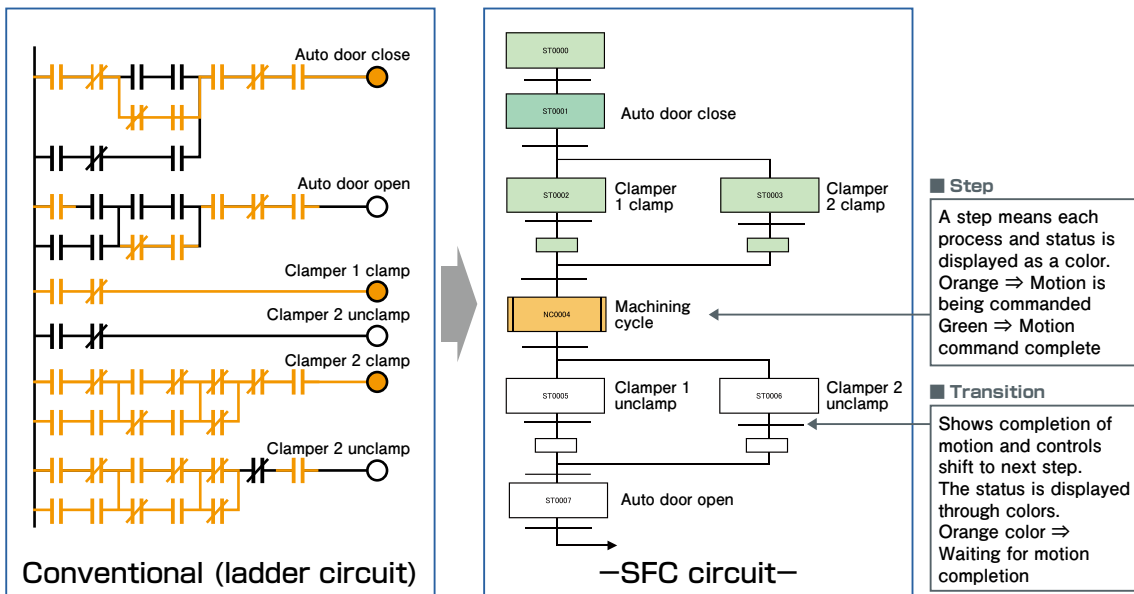
＊SFC（Sequential Function Chart）：One of five programming languages of PLC, which is defined by IEC 61131-3 Standard.

FBD*(Function Block Diagram) function is standard

Multi-function controls become a program component, **a complicated ladder circuit becomes unnecessary** and "Visualization" of a program can be realized.

Configuration

Pallet position

FBD

Related input conditions visualization

Lock condition / Automatic / A — Lock command pallet lock
Jog
Unlock condition / Automatic / B — Pallet unlock command
Jog
Return to the original position
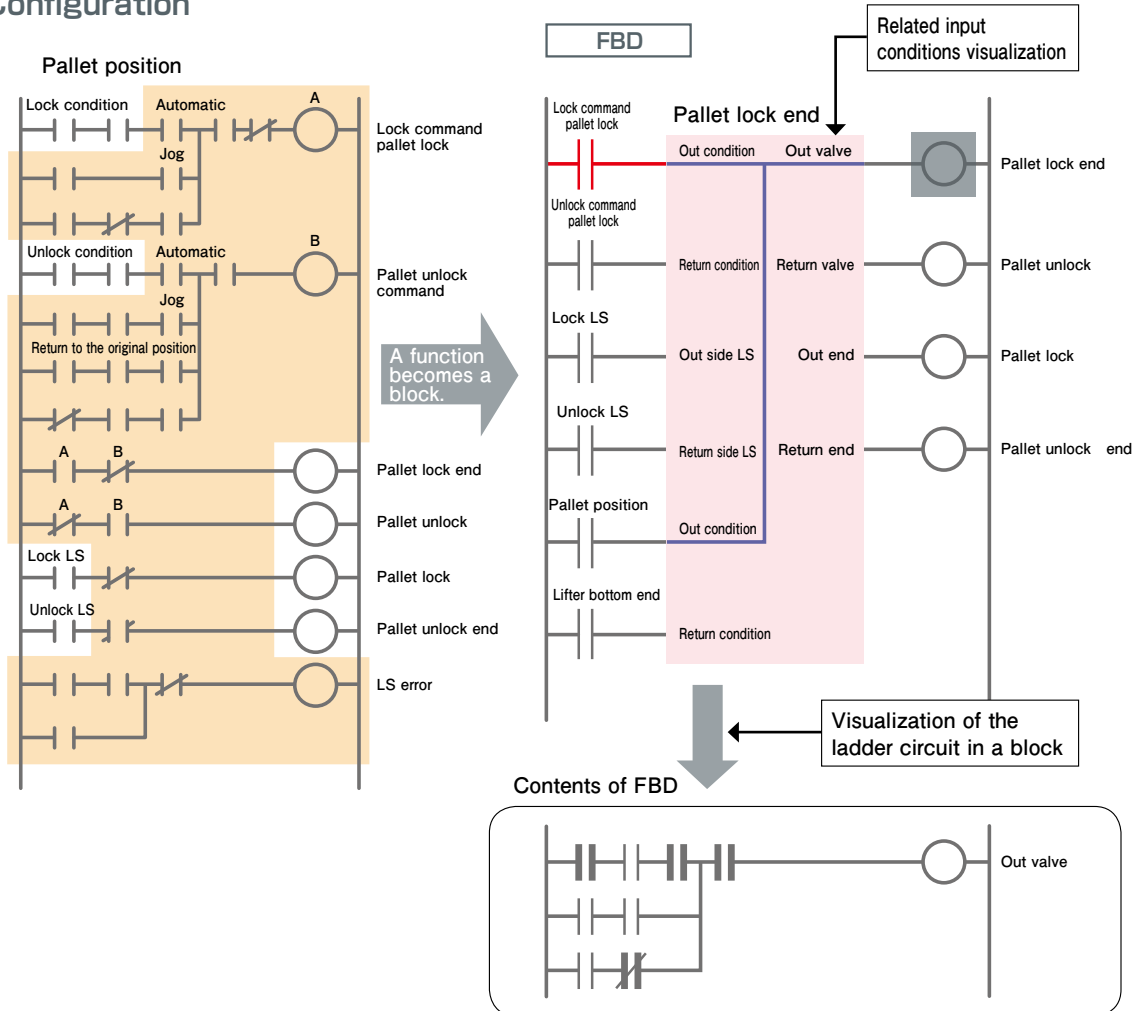A B — Pallet lock end
A B — Pallet unlock
Lock LS — Pallet lock
Unlock LS — Pallet unlock end
LS error

A function becomes a block.

Pallet lock end

Lock command pallet lock — Out condition — Out valve — Pallet lock end
Unlock command pallet lock — Return condition — Return valve — Pallet unlock
Lock LS — Out side LS — Out end — Pallet lock
Unlock LS — Return side LS — Return end — Pallet unlock end
Pallet position — Out condition
Lifter bottom end — Return condition

Visualization of the ladder circuit in a block

Contents of FBD

Out valve

Re-use

Standard circuits become a part of library by FBD*

Debugging completion

Apply to other machine systems.

Function Block Library

Facilities A
Facilities B
Facilities C

Finished FB

＊FBD(Function Block Diagram): One of five programming languages of PLC, which is defined by IEC 61131-3 Standard.

Wide range functions

Cycle monitor, I/O recorder

Cycle monitor

Cycle diagram just before the machine stop is displayed

This action is abnormal

USB Memory

Record of preset data
Max.999 machine cycles

Detailed analysis

I/O recorder

This signal is abnormal

Record of automatically-obtained actual I/O
(512Kbyte≒10 machine cycles)

All I/O information is displayed

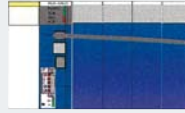| X40D | R3 Start Position |
X40F	R3 Playing Back Program
Y738	OR3 Job2 Complete Rep...
Y739	OR3 Job2 Start Command

Recurrence prevention by root cause can be performed

Program returning function

Machine improvement

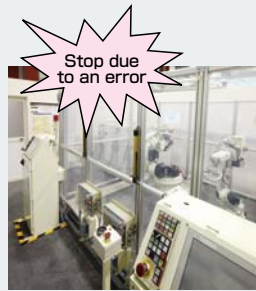A change of this part seems to shorten the cycle time

PC10

Test mode "ON"

Stop due to an error

Program change, Write-in

No good! Return to the original program

Test mode "OFF"

You can immediately return even when making a mistake in circuit change

Layout and wiring-diagram

PCwin

Layout·wiring diagrams are also contained in PLC

Program   Layout, wiring

Control cabinet

I/O diagram

Power supply drawings can also be drawn.

PC10

This is wrong

Broken-down unit
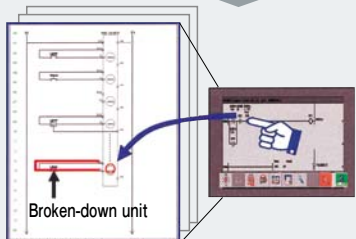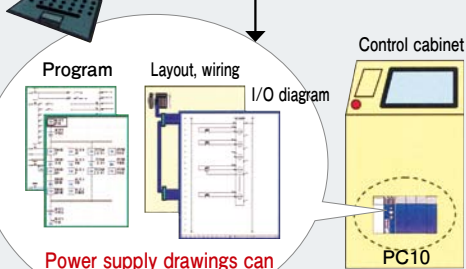
Traceable on monitor screen

A communication-system drawing is also memorized in a PLC.

Design   FL-net

Displayed data are input into PLC as they are

Process control panel
St.0

L1 St1   L2 St2   L3 St3

R1 St4   R2 St5   R3 St6

Production Maintenance

Communication error at L2

The red-color display for error part
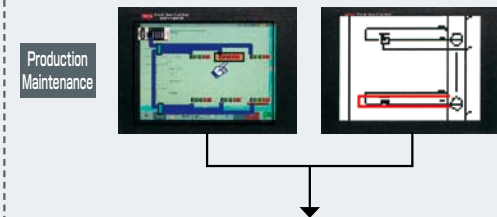
A part causing an error can be found at a glance

TOYOPUC-**PC10G**

High-power functions in a small body

Efficient CPU function

Various sequence programs such as "Equipment control", "Equipment diagnosis" and "Information processing" can be executed by high-speed processing using basic commands of 0.015 μs/word and application commands of 0.05 μs/word. There are more than 700 kinds of application commands, and signed operation, as well as floating point arithmetic, are possible.
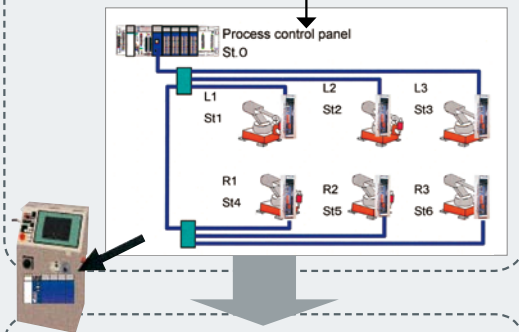
Large capacity memory

In the large capacity equipment information memory (4Mbyte), helpful information that is useful for adjustment of equipment or maintenance work such as comments, project, SFC and I/O diagram can be stored.
The basic area of each program and the memory capacity of a common area have been greatly expanded. Due to the expansion of the basic area, it is possible to store 64 CPU alarm histories. Large capacity expansion USB flash drive 4Mbyte can be used.

Various communication functions

Ports L1 and L2 are provided to select FL-net, Ethernet* or FL remote M capable of 10Mbps/100Mbps communication, EtherCAT* capable of 100Mbps communication. Built-in Ethernet is capable of 32 ports opened simultaneously.
Port L3 is provided to select the communication with CMP link (computer link), PC link, or SN-I/F (safety PLC TOYOPUC-PCS).
By using USB2.0 in connection with PCwin, reading and writing of the program have been achieved at more high-speed than the past.
*Please use the cables recommended by JTEKT.

TOYOPUC-**PC10P**

PLC for PCI buses

Feature

TOYOPUC-PC10P is a programmable controller that can be built into the robot controller with PCI bus, and the data exchange to the robot controller is possible through PCI bus.
The CPU function of PC10P is the same function as PC10G-CPU.
PC10P-CPU can be enhanced by using FL remote I/O board , TOYOPUC BUS-EXP (EXPANDED BUS). and Plus BUS-EX
FL remote I/O board is the remote I/O module of FL remote communication, can be equipped with 40 inputs and 40 outputs, and can be fixed them to a PCI bus rack like PC10P-CPU.
TOYOPUC BUS-EXP (EXPANDED BUS) and Plus BUS-EX are special expansion module for PC10P using the USB communication. Various modules of the PC2J/3J series can be enhanced by using TOYOPUC BUS-EXP (EXPANDED BUS), a conventional base unit and a power supply module, and by mounting TOYOPUC BUS-EXP (EXPANDED BUS) on the CPU/SEL slot.
Function expansion is possible through utilization of Plus BUS-EX. The expansion module of the TOYOPUC Plus series can be mounted additionally.

Efficient CPU function

Various sequence programs such as "Equipment control", "Equipment diagnosis" and "Information processing" can be executed by high-speed processing using basic commands of 0.015 μs/word and application commands of 0.05 μs/word.
Moreover, high-speed reading and writing can be enabled by using USB 2.0 for communication with PCwin.

Mass memory

The equipment data memory is enhanced to 4MB.

Various communication function

PC10P is equipped with one USB port for communication with a peripheral device and one USB port for communication with TOYOPUC BUS-EXP (EXPANDED BUS) and Plus BUS-EX as a standard feature. It is also has two ports (L1, L2) for FL-net capable of 10 Mbps/100 Mbps communication speed, Ethernet* and FL remote M as a standard feature.

*Ethernet is a registered trademark of Fuji Xerox.
*EtherCAT is a registered trademark of Beckhoff Automation GmbH.

TOYOPUC-PC3JX
series

Programmable controller that can be used continuously with ease

- ■ Executing 3 independent programs.
- ■ Mounting facilities information memory which realizes " Visualization"
- ■ Built-in communication ports

Supports adjustment and maintenance of electric circuit design/equipment

- Three programs can be created and edited independently, and job efficiency is much improved.
- Stored equipment information supports adjustment/maintenance of equipment
- Supporting electrical circuit design by CAD combination

TOYOPUC-PC3JX

Sequence CAD

Facilities adjustment / maintenance support
Time chart
Cycle diagram
Machine diagnosis result
Circuit diagram display
with a comment etc.

Peripheral device

Facilities maintenance support
Machine diagnosis result display

PCwin

Sequence program

Ex1 Information processing
Ex2 Equipment check
Ex3 Facilities control program

Three independent programs

Facilities information

Comment
Device code
Cycle diagram

Facilities maintenance support
Machine diagnosis result display

A display, a control panel, etc.

TOYOPUC-**PC3JX**·**PC3JX-D**

PC3J series with higher performance and functionality. Easier to use.

As a successor of the PC3J series

PC3JX and PC3JX-D support the data of PC3J, PC3JL and PC3JD. Ladder circuits and built-in communication functions remain usable.

As a main PLC of equipment control

As a CPU of the main PLC for equipment control, PC3JX and PC3JX-D provide stable high-speed control performance and various control functions. Support visualization (SFC[1],FB[2]) and highly functional calculation. Aging control equipment for machine tools can be easily rebuilt. These models also conform to EU RoHS.

Specifications		Conventional model	Conventional model	Subsequent model	Conventional model	Subsequent model	
		PC3J	PC3JL	PC3JX	PC3JD	PC3JX-D	I/O-328G
Type		TIC-5339	TIC-5783	TCC-6901	TIC-5642	TCC-6902	THK-6905
Product appearance							
Connection with PCwin[3]		RS-422	RS-422	USB	RS-422	USB	—
Built-in link	No. of ports (with options)	1 (2)	2	2	2	2	—
	Used with the 4-wire system of PC/CMP	○	○	○	—	○	—
	Model	PC/CMP	PC/CMP	PC/CMP/SN-I/F/[4] MODBUS/SIO	PC/CMP	PC/CMP/SN-I/F/[4] MODBUS/SIO	—
							—
DeviceNet[5] master (1 port)		—	—	—	DLNK-M equivalent	DLNK-M2 equivalent	—
Program capacity	P1/P2/P3	Each 16K language	Each 16K language	Each 16K language	Each 16K language	Each 16K language	—
	FB/standard/user library	—/—/—	-/32K language/ 32K language	Each 32K language	32K language/- /32K language	Each 32K language	—
Program language	LD	○	○	○	○	○	—
	SFC/FB	—	—	○	○	○	—
Event monitor		—	○	○	○	○	—
Processing speed	Basic command (min. value)	0.08μs	0.08μs	0.021μs	0.08μs	0.021μs	—
	Application command (min. value)	0.72μs	0.72μs	0.08μs	0.72μs	0.08μs	—
CPU operation mode	PC 3 divisions/single/PC2	○	○	○	○	○	—
	Plus expansion	—	—	○	—	○	—
Equipment data memory		448Kbyte	448Kbyte	4Mbyte	448Kbyte	4Mbyte	—
I/O points		1024 points	1024 points	1024 points	1024 points	1024 points	—
Interruption		—	—	4	—	4	—
Battery		Yes	Yes	No	Yes	No	—
Built-in I/O		—	—	—	Input 32 points (5 mA) Output 16 points (0.3 A) Output 16 points (0.05 A)	—	Input 32 points (5 mA) Output 16 points (0.3 A) Output 16 points (0.05 A)

Main usability

● The connection with PCwin has been changed from the RS-422 serial port (D sub 15 pin) to USB.
⇒ Programs can be read and written in short time.

● The terminal block for built-in communication has been changed from the screw type to the no-screw type.
⇒ There will be no screw loosening and tightening error.

● No battery is required.
⇒ Battery replacement does not need to be controlled, and no replacement cost is necessary.

Performance and functions

● High-speed processing has been achieved, such as reducing the basic command processing time to a quarter of the original time.

● The index function, signed arithmetic and floating-point arithmetic can be used. (Plus expansion mode)

*1 SFC（Sequential Function Chart） ※2 FB（Function Block） *3 Use PCwin Ver.14.9 Rev.1 or higher.
*4 Only the L2 communication port can be used. *5 DeviceNet is a registered trademark of Open DeviceNet Vendor Association Inc.

Input/Output module

Building-block type modules makes economical adaptable system for different purposes.

- Adoption of the detachable terminal modules simplifies replacement of a wired module.
- LED Monitor helps check the condition of inputs/outputs visually.

Input module

Model	Name	Type	Input type	Points/module	Isolation method	Rated input voltage	Rated input current	Rated response time OFF → ON	Rated response time ON → OFF	Input display	External connection	Common connection
PC10 ／PC3J	IN-11	THK-2749	AC input	16 points	Photocoupler isolation	AC100/115V	8.5mA	15ms or less	15ms or less	LED illumination when turned on	Terminal block	8 points/ common
	IN-12	THK-2750	DC input				10mA					
	IN-22D	THK-2871		32 points		DC24V	5mA	10ms or less	10ms or less	LED illumination when turned on*1	connector*2	16 points/ common
	IN-22H	THK-6831	DC high speed input	32 points				1ms~8ms (possible to set per 1 m) initial value: 8 ms		LED illumination when turned on	Free screw terminal stand	8 points/ common
	IN-SW	THK-5977	──	16 points	──	──	──	──		──	──	common

*1 It adopts a 16-points display switching system.　*2 Includes connector
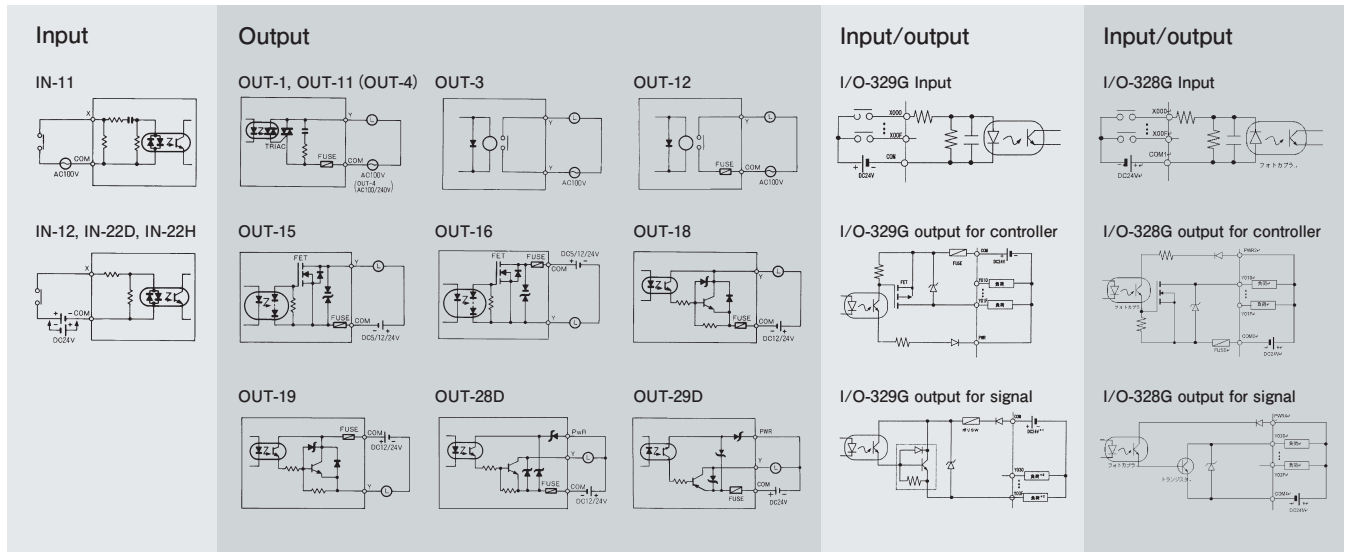
Output module

Model	Name	Type	Output type	Points/module	Isolation method	Rated load voltage	Max, load current	Leak current	Fuse	Output display	External connection	Common connection
PC10 ／PC3J	OUT-1	THK-2751	Triac	8 points	Photocoupler isolation	AC100/115V	1A/Point, 4A/common	1.5A or less	5A/common	LED illumination when turned on	Terminal block	8 points/ common
	OUT-3	THK-2931	Independent Relay contact		Relay isolation	AC240/DC24V	2A/Point	──	on fuse			independent
	OUT-4	THK-5040	Triac	16 points	Photocoupler isolation	AC240V	1A/Point, 4A/common	1.5A or less	5A/common			8 points/ common
	OUT-11	THK-2795				AC100/115V	0.5A/Point, 2A/common		3.2A/common			
	OUT-12	THK-2752	Relay contact		Relay isolation	AC240/DC24V	2A/Point, 5A/common	──	7.5A/common			
	OUT-15	THK-2790	MOS FET (−) common		Photocoupler isolation	DC5/12/24V	1A/Point, (2A/2point) 4A/common	0.1mA or less	6.3A/common			
	OUT-16	THK-2791	MOS FET (+) common									
	OUT-18	THK-2753	Transistor (−) common			DC12/24V	0.5A/Point, 2A/common		3.2A common*1			
	OUT-19	THK-2754	Transistor (+) common									
	OUT-28D	THK-2870	Transistor (−) common	32 points			0.2A/Point, 2A/common			LED illumination when turned on*2	connector*3	16 points/ common
	OUT-29D	THK-5025	Transistor (+) common									

*1 Fuse replacement unavailable（soldered）.　*2 It adopts a 16-points display switching system.　*3 Includes connector
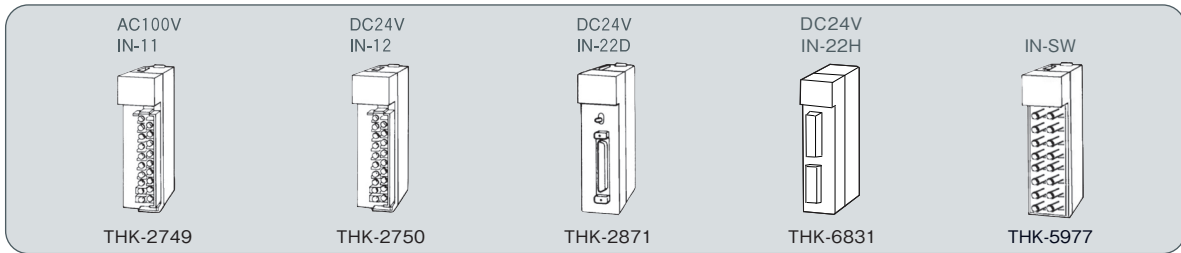
Input/output module

Model	Name	Type	Input/output type	Points/module	Isolation method	Rated input voltage Rated load voltage	Rated input current Max, load current	Rated response time OFF→ON, ON→OFF	Leak current	Fuse	Input/output display
PC10 ／PC3J	I/O-328G	THK-6905	DC input	input 32 points	Photocoupler isolation	DC24V	5mA	10msec or less	──	──	LED illumination when turned on
			MOS FET (−) common	output 16 points for controller			0.3A/Point, 2A/16Poin	1msec less	0.1mA or less	3.2A/common	
			Transistor (−) common	output 16 points for signal			0.05A/Point, 0.8A/16Point		0.5mA or less	──	
	I/O-329G	THK-6410	DC input	input 32 points	Photocoupler isolation	DC24V	5mA	10msec or less	──	──	LED illumination when turned on
			MOS FET (+) common	output 16 points for controller			0.3A/Point, 2A/16Poin	1msec less	0.1mA or less	3.2A/common	
			Transistor (+) common	output 16 points for signal			0.05A/Point, 0.8A/16Point		0.5mA or less	──	

Block diagram

Input	Output				Input/output	Input/output

Input — IN-11

Output — OUT-1, OUT-11 (OUT-4) · OUT-3 · OUT-12

Input/output — I/O-329G Input

Input/output — I/O-328G Input

IN-12, IN-22D, IN-22H · OUT-15 · OUT-16 · OUT-18

I/O-329G output for controller · I/O-328G output for controller

OUT-19 · OUT-28D · OUT-29D

I/O-329G output for signal · I/O-328G output for signal

Module line up

Input module

AC100V IN-11	DC24V IN-12	DC24V IN-22D	DC24V IN-22H	IN-SW
THK-2749	THK-2750	THK-2871	THK-6831	THK-5977

Output module

TRIAC OUT-1	Independent Relay contact OUT-3	TRIAC OUT-4	TRIAC OUT-11	Relay contact OUT-12	FET(−) common OUT-15	FET(+) common OUT-16
THK-2751	THK-2931	THK-5040	THK-2795	THK-2752	THK-2790	THK-2791

Transistor (−)common OUT-18	Transistor (+)common OUT-19	Transistor (−)common OUT-28D	Transistor (+)common OUT-29D
THK-2753	THK-2754	THK-2870	THK-5025

Input/output module

I/O-328G	I/O-329G
THK-6905	THK-6410

Communication module
2PORT-EFR

FL-net function
● Adoption of standard protocol for FL-net
Various makers' devices can connect with a common network by adoption of the FL-net(OPCN-2) protocol which JEMA(Japan Element Manufactures' Association) defines. This module applies to "Version 2" of FL-net.

Ethernet function
● Adoption of global standard protocol
TOYOPUC connects with a computer by the Ethernet*. The protocol corresponds to TCP/IP and UDP/IP.

FL remote function
● Collection of I/O communication and diagnostic information
By connecting with FRMT series, remote I/O communication, which performs I/O data exchange regularly, and diagnostic information can be collected by just link parameter setting.

Model		PC10G／PC3J
Name		2PORT-EFR
Type		THU-6404
FL-net	Station number	Max. 254 stations
	Relay link number	2048/8192 points (8192 points are applied to since PC3JG and PC10G)
	Register link number	2048/6144/8192 words (selected by a switch) (6144/8192 words are applied to since PC3JL, PC3JD, PC3JG, and PC10G)
	Transmission rate	10Mbps/100Mbps
	Date link method	N:N communication, 1:N communication
Ethernet*	Port number	Max. 8 ports
	Computer link data capacity	Max. 1K byte × 8 ports
	File memory data capacity	Transmission 2Kbyte × 8 ports
		Receiving 2Kbyte × 8 ports
	Transmission rate	10Mbps/100Mbp
	Transmission function	①Computer link function, ②File memory function ③General purpose communication function
FL remote	Station number	Max. 63 stations (except Master)
	I/O points	Input: Max. 2048 points, Output: Max. 2048 points
	I/O points per 1 slave	Input: Max. 64 points, Output: Max. 64 points
	Transmission rate	10Mbps/100Mbps

FL remote function

FRMT Series
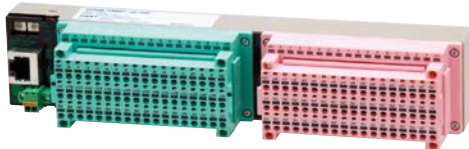
Name	Input number	Output number	Type	Polarity
FRMT-32/00P	32 points	0 point	TCU-6405	PNP
FRMT-00/32P	0 point	32 points	TCU-6406	PNP
FRMT-16/16P	16 points	16 points	TCU-6407	PNP

SW-HUB

FE-SWH05   FE-SWH08

Name	Specifications	Type
FE-SWH05	5 port switching HUB	TCU-6414
FE-SWH08	8 port switching HUB	TCU-6415

A system configuration example

FL remote Master

I/O power supply monitoring information and disconnection short-circuit information are collected.

SW-HUB

FRMT

Sensor

Short circuit

Actuator

Disconnection
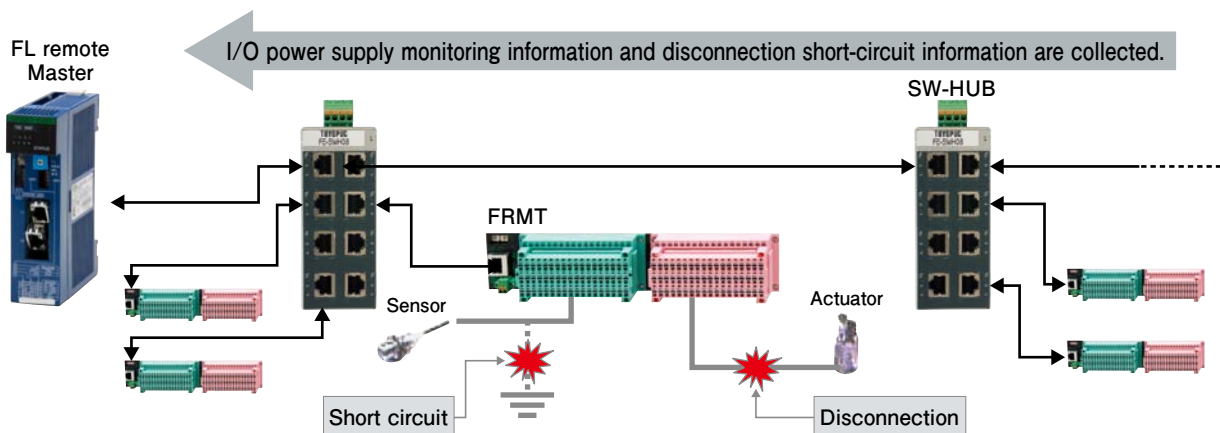
*Ethernet is a registered trademark of Fuji Xerox.

EtherCAT*

Master

EtherCAT* master function is equipped to PC10G-CPU, PC10P and Plus CPU[*1].

- High speed, large volume communication
- Flexible network topology (Daisy chain/Star)
- Network diagnostic function

High speed, large volume communication is possible with the adoption of the EthernetCAT* protocol. Connection to other manufacturers' devices which support EtherCAT* is possible.
For EtherCAT*, only one port can be used for one CPU.

Item	Specification
Corresponding model	PC10G PC10P Plus CPU[*1]
Protocol	EtherCAT*
transmission rate	100Mbps
Communication distance	Max. 100 m between nodes
Max. connections	32 (1 Master, 31 Slaves)
Input/output data size	Input: Max. 4096 bytes Output: Max. 4096 bytes
Process data communication	Non-synchronous (Free Run) mode (Synchronous mode is not supported.)

*1 Can be used at each EX, EX2, EFR and EFR2 board. EFR or EFR2 requires either EX or EX2.

Slave

The remote input/output device is equipped with 2 types of branching slaves of 3-port and 6-port and with the detection function for short circuit and breakage of wiring.

Remote I/O terminal

Name	Input number	Output number	Type	Polarity
EC-32/00P	32p.	0p.	TCU-6922	
EC-00/32P	0p.	32p.	TCU-6923	PNP
EC-16/16P	16p.	16p.	TCU-6924	

Branching slave

Name	Specifications	Type
EC-03JS	3-port branching slave	TCU-6925
EC-06JS	6-port branching slave	TCU-6926

Setting tool

KPA EtherCAT Studio [type: TJA-6927] is necessary for creating and editing EtherCAT* networks.

*EtherCAT is a registered trademark of Beckhoff Automation GmbH.

DeviceNet*

Master

DLNK-M2

J-DLNK-M2 is a TOYOPUC-PC 3J/10G DeviceNet compatible master module.

● Remote I/O and message communication are supported.

Full time I/O data exchange remote I/O communication and message communication which transmit on-demand command and receiving data are supported. The message communication can write and read special information (error information, status and so on) and setting data to a slave which has a special function.

● Diagnose information collection
The result information of diagnostic function I/O remote terminal can be collected by just link parameter setting, not with making message issue program.

● DLNK-M2 communication specifications

Items	Specifications			
Type	THU-6099			
Communication speed	500/250/125kbps（selected by a switch）			
Max.connected node	64 units（Master 1, Slave 63）			
I/O points	Max. 2048（256 byte）, input and output			
I/O allocation	Minimum 8 points unit			
Link aera	X・Y, L, M, EX・EY, EL, EM, GX・GY, GM			
Communication distance	speed	Network max. length	Branch length	Total branch length
	500kbps	Less than 100m	Less than 6m	Less than 39m
	250kbps	Less than 250m	Less than 6m	Less than 79m
	125kbps	Less than 500m	Less than 6m	Less than 156m

＊DeviceNet is a registered trademark of Open DeviceNet Vendor Association Inc.

Slave

DLNK-S, DLNK-S2

An abundant I/O mdules are available, which are mounted on the PC10G/PC3J base.


DLNK-S
THU-5441

● Large line up of I/O modules
Being able to use a large number of I/O modules of PC10G/PC3J enables you to select any kinds of actuator and sensors(24V DC, 100V AC) as widely as you like. J-DLNK-S2 can perform I/O data exchange among computers.

With diagnostic functions
Remote I/O terminal DRMT Series

The DRMT series is DeviceNet compatible Remote I/O terminal with input/output wiring short circuit or wire-cutting detection function.
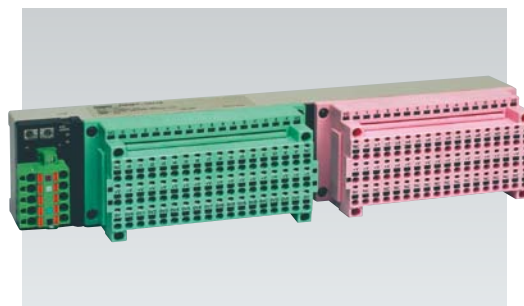
Name	Input points	Output points	Type	Polarity
DRMT-32/00P	32p.	0p.	TFU-6110	PNP
DRMT-00/32P	0p.	32p.	TFU-6111	
DRMT-16/16P	16p.	16p.	TFU-6112	
DRMT-32/00	32p.	0p.	TFU-6120	NPN
DRMT-00/32	0p.	32p.	TFU-6121	
DRMT-16/16	16p.	16p.	TFU-6122	

Multi-link

- ML10 can be used as the succession model of PC/CMP-LINK, PC/CMP2-LINK, 2PORT M-NET and 2PORT-LINK. ML10 also supports RoHS.
- ML10 also supports SIO and MODBUS-RTU.

Module name	Type	No. of communication ports	PC link	Computer link	M—NET	SIO	MODBUS*	2-wire system/4-wire system
ML10	TCU-6903	2	○	○	○	○	○	2-wire system/4-wire system
PC/CMP-LINK	THU-2755	1	○	○	-	-	-	2-wire system
PC/CMP2-LINK	THU-5139	1	○	○	-	-	-	2-wire system/4-wire system
2PORT-LINK	THU-2927	2	○	○	-	-	-	2-wire system
2PORT M-NET	THU-5093	2	-	-	○	-	-	2-wire system

Link function	Changes in communication specifications in ML10
PC link	No changes in communication specifications
Computer link	Transmission rate : Supports 38400, 57600 and 115200 bps Supported commands : Supports expansion command for PC10 mode Communication specifications : Supports RS-485/RS-232C
M-NET	No changes in communication specifications The pin layout of terminal block is not compatible with conventional model 2PORT M-NET.
SIO	Compatible with conventional model SIO module Supports half-duplex mode of RS-485 The control signal is not supported during RS232C.
MODBUS-RTU*	Supports the MODBUS*-RTU function Transmission rate : 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 bps Supports RS-485/RS-232C

High-speed PC link

- High-speed communications and high-speed processing are realized with this PLC link.
- Distributed control by up to 32 stations is available.
- A data link can be constructed with a maximum of 2048 relay link points or a maximum of 1792 register link bytes.
- Because modules are connected with twisted pair wires even for high-speed link, wiring is simple.
- Connection of a programmer (PCwin) allows remote monitoring and programming of any station.

Model	PC10G / PC3J
Name	HPC-LINK
Type	THU-2758
Transmission rate	625Kbps
Transmission cable	Shielded twisted pair wires*
Transmission distance	Max. 500m[0.31mile]（Total length）
No.of linked stations	Max. 32（Master1,satellite31）
No.of linkage points	Relay Link Max. 2048points Register Link Max. 1792bytes
linkage method	N:N

＊Use of JTEKT recommended cable is desirable.

＊MODBUS is a registered trademark of AEG Schneider Automation Inc.

High-speed remote I/O

- Enables you to distribute data to I/O devices in remote locations with greatly reduced wiring costs. Reliability and maintainability are also remarkably improved.
- High-speed transmission and high-speed processing reduce the response delay of satellite I/O.
- Input/output modules are randomly located freely in a satellite station.
- Wiring is simple, with a twisted-pair cable sufficient even for high-speed linkage.
- Remote monitoring and programming of the master station CPU from the satellite station are available using a programmer (PCwin).
- Terminal

Model	PC10G / PC3J	
Name	RMT-I/O M	RMT-I/O S
Type	TUH-2756	TUH-2757
Function	Master	Satellite
Transmission rate	625kbps	
Transmission cable	Shielded twisted pair wires*1	
Transmission distance	Max. 500m[0.31 mile](Total length)	
No.of linked stations	Max. 32(Master 1,satellite 31)	
Transmission timing	Synchronous to sequence scan or asychronous(selected by a switch)	
No.of linkage points	Max. 2048	
No.of I/O points	—	Max. 256*2
Power supply voltage	—	—

*1 Use of JTEKT recommended cable is desirable.
*2 With 8 32-point modules on an 8-slot base.

Serial I/O

- SC10 can be used as the succession model of conventional model SIO module. SC10 also supports RoHS.
- Supports transfer speeds of 38.4 Kbps and 115.2 Kbps.

Model		PC10G/PC3J
Name		SC10
Type		TCU-6904
Interface standard		EIA RS-232C
No. of channels		2 channel/module
Transmission rate		300/600/1200/2400/4800/ 9600/19200/38400/115200bps
Transmission distance		15 m (4.9 ft)
Synchronous method		Asynchronous
Transmission type		Duplex
Transfer procedure		Teletype protocol, XON-XOFF, control signal
Data type	Data length	7、8bit
	Parity	even/odd/none
	Stop bit	1, 2bit
Communication data		1024 bytes/channel

Pulse output

The pulse output module performs independent single-axis simple-position control of a servo motor or stepping motor, which is combined with a pulse-input type motor driver.

● Operation mode

・Positioning control —— Pulses are output until reaching to the command position.

・External signal positioning —— At the stop command ON, pulses are decreased and then stopped. This operation can be performed by a travel completion signal or an external signal using together with positioning control.

・Jogging —— Speed change at real-time is possible.

・Travel of command pulse amount —— Pulse are output at the amount of command. The amount of command pulse can be changed at a real-time.

・Step —— Pulses are output at a step of 1, 10, 100, 1000 pulses.

● Others

・Backlash compensation　　・Setting of current position　　・Teaching

Model	PC10G / PC3J
Name	PULSE OUTPUT
Type	THK-5109
No.of control axes	1
Position command range	-134,217,728-134,217,727 pulse
Acceleration pattern	Trapezoidal
Feed rate	（1-8192）×30pps（max 245,730pps）

Output	No.of points	2
	Signals	Forward pulse, reverse pulse
	Rated load voltage	5—24VDC
	Max. load current	50mA/signal
Input	No.of points	7
	Signals	Origin, near origin, ＋limit, −limit, external positioning signal, in position, operable
	Rated load voltage	24V DC（5V input possible for origin, in position）
	Rated input current	10mA

＊AS-i is an open network of AS-international (AS-i association).

High-performance analog input

- 8 channels and 16-bit high resolution are available (using PC10 mode)
- Very high precision ±0.3% (using PC10 mode)
- Very high conversion speed at 60 μ sec/channel (using PC10 mode)

Model	PC10G / PC3J				
Name	AD10				
Type	TCK-6529				
Mode	PC10 mode		Conventional I/O mode	Extended I/O mode	
Analog input range	−10～+10V、0～+10V、0～+5V、+1～+5V、0～20mA、4～20mA	User range	0～+10V、0～+5V、+1～+5V、0～20mA、4～20mA	−10～+10V、0～+10V、0～+5V、+1～+5V、0～20mA、4～20mA	User range
Digital output	16 Bit With Sign		12 Bit Binary	16 Bit With Sign	
Resolution	1/32000	1/24000	1/4000	1/32000	1/24000
Total accuracy	±0.3%	±1.5%	±0.4%	±0.3%	±1.5%
Conversion speed	60 μs/channel				
Number of channels	8 channels		4 channels	3 channels	
Range selection	Settings for every channel		All channel same		
Input impedance	Voltage 1M ohm Current 250 ohms				
Maximum input	Voltage±15V Current ±30mA				
Wire length	Less than 30m (to avoid noise influence , please shorten as much as possible.)				
Isolation	Insulation by an isolator (between a PLC-analog input) Non-isolation between analog input channels.				
I/O Address	by link parameters		by mounting positions (I/O handling).		
Occupied I/O point	0 point		64 points		

Analogue output

An analog output module will be arranged depending on output specifications.

Analogue output

- 2channels/module
- Resolution 1/4095
- Conversion speed 2.5mS
- Voltage output or current output selectable

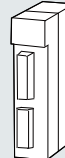| Model	PC10G / PC3J	
Description	Analogue output	
Name	DA-1	DA-2
Type	THK-7931	THK-7932
Input	12-bit binary data／channel	
Output	1～5V 4～20mA	0～10V
Conversion speed	2.5ms	
No.of channels	2	
Resolution	Full scale／4095	
Overall accuracy	±1%FS	
Power supply	External power supply 24VDC±10%, internal power supply 5VDC	
Max.input	—	
Max.output	Voltage output 10V（External load 670Ω or over）, current output 20mA（Extenal load 400Ω or less）	
I/O points occupied	32 points	

High-speed counter

- This module enables counting and comparison of high speed input that cannot be tracked by the counter command and input module of PLC.
- CT10 has improved the function of the conventional high speed counter module and had been made to support RoHS.
- Supports 2 channels
- Supports differential inputting (RS422).
- Supports high speed pulse of max. 8 Mpps.

Model		PC10G/PC3J
Name		CT10
Type		TCK-6856
Mode		PC10 Mode	Conventional high speed counter mode
Applied PLC model		PC10G	PC10G/ PC3J
No. of channels		2	1
Counting input		1-phase addition/subtraction 2-phase addition/subtraction 2-phase phase difference (Multiplications of 1, 2 and 4)	
Signal level	DC input	24 / 12 / 5V	
	Differential input	RS-422	Does not support
Counting speed (Max.)		8 Mpps during differential input (2-phase, multiplication 4) 200 kpps during DC input (2-phase, multiplication 4)	50 kpps during DC input
Counting range		32 bit without symbol 32 bit with symbol	24 bit without symbol 24 bit with symbol
No. of comparison points		Internal: 8 points at all CH External: 8 points shared by CH 1 and 2	Internal: 8 points External: 6 points
Comparison output		ON when the value in within preset comparison range. Non-polar	
I/O points occupied		0 point	64 points

Configuration

Input module

AC100V IN-11	DC24V IN-12	DC24V IN-22D	DC24V IN-22H	IN-SW
THK-2749	THK-2750	THK-2871	THK- 6831	THK-5977

Output module

TRIAC OUT-1	Independent Relay contact OUT-3	TRIAC OUT-4	TRIAC OUT-11	Relay contact OUT-12	FET(−) common OUT-15	FET(+) common OUT-16
THK-2751	THK-2931	THK-5040	THK-2795	THK-2752	THK-2790	THK-2791

Transistor (−)common OUT-18	Transistor (+)common OUT-19	Transistor (−)common OUT-28D	Transistor (+)common OUT-29D
THK-2753	THK-2754	THK-2870	THK-5025

Input/output module

I/O-328G	I/O-329G
THK-6905	THK-6410

Communication module

Multi-link ML10	High-speed PC link HPC-LINK	J-DLINK M2	J-DLINK S2
TCU-6903	THU-2758	THU-6099	THU-5563

High-speed remote I/O Master station RMT-I/O M	High-speed remote I/O Satellite station RMT-I/O S	J-DLNK-S
THU-2756	THU-2757	THU-5441

2PORT-EFR	FL/ET-T-V2H	Serial I/O SIO
THU-6404	THU-6289	THU-2782

Special module

Analogue input AD10	Analogue output DA1-DA2	Pulse output PULSE-OUT	High-speed counter CT10	Motion controller MCML	Motion controller MCSSC
TCK-6529	THK-7931 THK-7932	THK-5109	TCK-6856	TCI-6721	TCI-6805

Base (Use the specific base for PC2 JS/JR)

8-slot base(2) THR-2872
8-slot base THR-2766
6-slot base THR-2813
4-slot base THR-2775
2-slot base THR-2814

I/O cable

0.5m THY-2770
1m THY-2771

I/O branch module

THU-2774

Selector base

8-slot selector base THR-5643
6-slot selector base THR-5644
4-slot selector base THR-5645

PC10G

PC10G-CPU **TCC-6353**
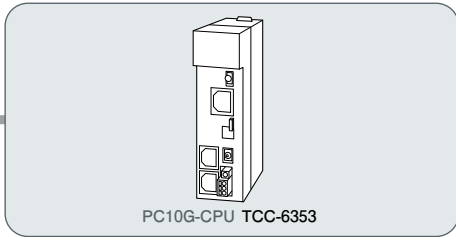
PC10P dedicated extension module

TOYOPUC BUS-EXP
（EXPANDED BUS）
TCU-6367
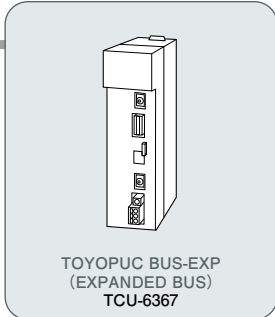
PLC built into a robot controller with PCI bus

USB*
connection

PC10P-CPU
TCC-6372

PlusBUS-EX
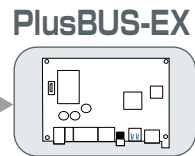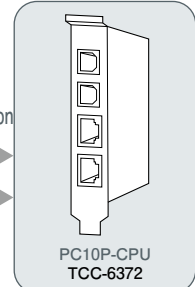
CPU module of PC3JX and PC3JX-D

PC3JX
TCC-6901

PC3JX-D
TCC-6902

Peripheral equipment

PCwin

Windows 2000/XP/Vista/7

TJA-2032

USB*
connection

Printer
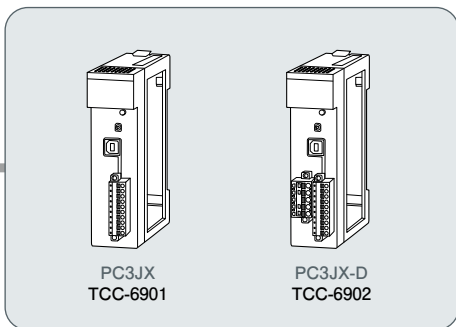
（Purchased on the market）
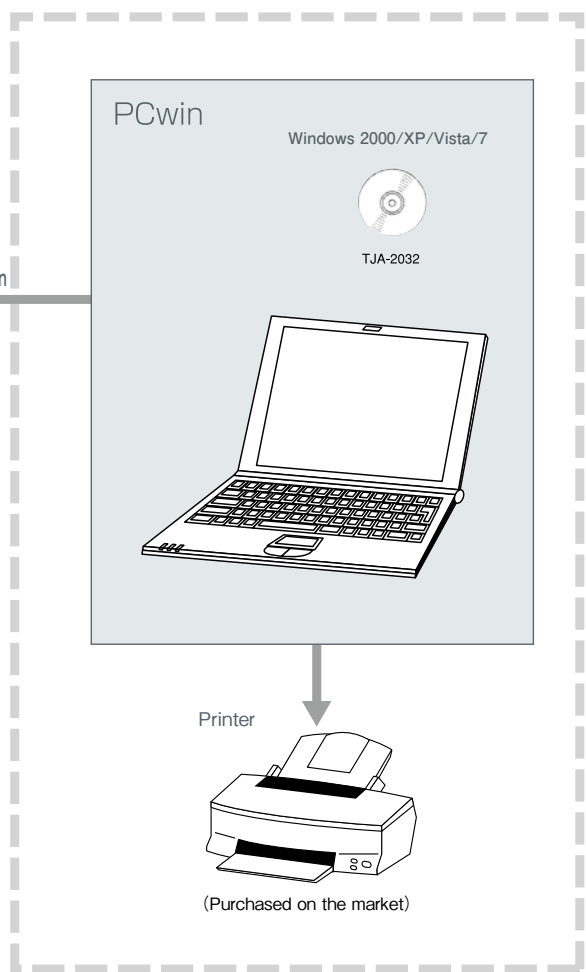
＊Recommended USB cable
Elecom-made
USB2-FS05   0.5m
USB2-FS15   1.5m
USB2-FS3   3.0m
UC2-BN07BK   0.7m
UC2-BN10BK   1.0m
UC2-BN15BK   1.5m
UC2-BN20BK   2.0m
UC2-BN30BK   3.0m
UC2-BN50BK   5.0m

Selector module

SELECTOR

THU-2765

Power module

AC85〜264V
POWER1

DC24V
POWER2H

THV-2747

THV-6374
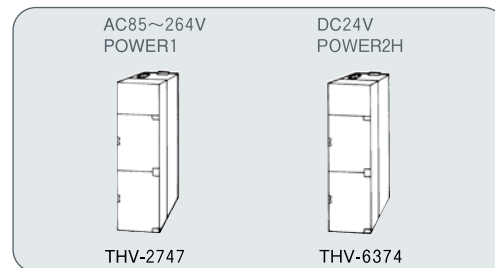
Board type PLC

TOYOPUC-Plus

Evolving in line with change, from manual to semi-automatic, then on to fully-automatic equipment

- ■ The ideal board-type PLC for built-in application.
- ■ It is possible to configure everything from the independent control of manual equipment to the decentralized control of fully-automatic equipment.

Achieving the simple configuration of equipment control

TOYOPUC-Plus, being only the size of a postcard, works away diligently behind-the-scenes.
By having TOYOPUC-Plus built in to your operation panel, a simple control system with an equipment control function is possible.
Functions can be built freely depending on screen data and sequence programs, and external devices can be connected through communication.

Connection with the upper server/PCs
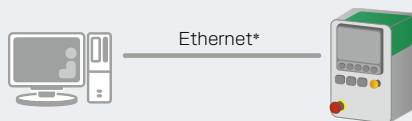
Ethernet*

Connection with remote I/O

FL Remote／EtherCAT*／DeviceNet*
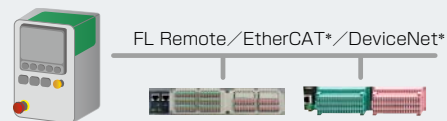
Connection with other equipment/processes

FL-net*

An example of a PLC box installed separately from the operation panel
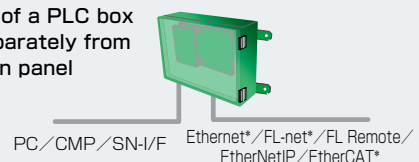
PC／CMP／SN-I/F　　Ethernet*／FL-net*／FL Remote／EtherNetIP／EtherCAT*

∗Ethernet is a registered trademark of Fuji Xerox.
∗FL-net is the controller level network (OPCN-2) stipulated by JEMA (The Japan Electrical Manufacturers' Association)
∗EtherCAT is a registered trademark of Beckhoff Automation GmbH.
∗DeviceNet is a registered trademark of Open DeviceNet Vendor Association Inc.
∗CC-Link is a registered trademark of Mitsubishi Electric Corporation.
∗MECHATROLINK is a registered trademark of MECHATROLINK Association.
∗SSCNET is a registered trademark of Mitsubishi Electric Corporation.

It can be expanded into a control system suitable for the equipment scale

On TOYOPUC-Plus, functions can be added per board.
Controlling small scale equipment with a minimal configuration (1 board).
TOYOPUC-Plus allows for expansion in the limited space of automatic equipment and configures
the ideal control system.
TOYOPUC-Plus does not require PLC model changes, but meets fluctuations in production volume with flexibility.

An equipment and control configuration example

Manual equipment
Connect actuators and sensors with easy operations and I/Os and controlling.

Plus CPU

Minimal configuration

Semi-automatic equipment
Connect workpiece loading/unloading robot with communication and add control.

Plus CPU

Plus IO24/16P

Plus DLNK-M

Add communication for robot and I/O for interlock

Fully-automatic equipment
Connect between-process conveyance equipment with communication and add control.
Connect an upper server production control system with communication.

Plus CPU Plus IO24/16P

Plus DLNK-M

Communication for robot and I/O for interlock

Plus EFR

Communication for conveyance Upper server communication added

Achieving visualization of control through an array of functions

SFC and FBD functions are equipped as standard, and can be easily operated using the follow-up monitor.

＊SFC (Sequential Function Chart), FBD (Fanction Block Diagram)

Achieving a motion control function

Achieves max. 16-axis compact motor control.（When mounting two , Plus MCML／MCSSC）

Board type (total 11 types)   Refer to page 30 for the assembly of the communication board.

Plus CPU
140
90
CPU board

Plus IO24/16P
140
70
Expansion I/O module

Plus EX
72.5
90
Memory expansion Ethernet* system communication board

Plus EX2
72.5
90
Memory expansion Ethernet* system communication board (supports EthernetIP)

Plus EFR
72.5
90
Ethernet* system communication board

Plus EFR2
72.5
90
Ethernet* system communication board (supports EthernetIP)

Plus MCML
140
84
Motion control board MECHATROLINK*-Ⅲ

Plus MCSSC
140
84
Motion control board SSCNETⅢ*

Plus DLNK-M
DeviceNet* communication board
60
72

Plus CLNK-M
CC-Link* master communication board
60
66

Plus CLNK-S
CC-Link* slave communication board
73
90

Compact PLC

TOYOPUC-PCDL

Multiple-purpose distributed control is available using the various communication function in a small size.

Main features

- Conventional user-friendly TOYOPUC programming is inherited.
- Flexible programming by 3 languages (LD, SFC, FBD) possible.
- The optimal compact PLC suitable for space-saving distributed control with the communication function.
- Flexible system extendibility by abundant communication functions.

Base module
(for 2, 3, 5 or 8 slots)
- Built-in power supply
- DIN rail fixing
- A base module for AC power or DC power available

Various modules
- Input/output module
- Analogue module
- Extension module

CPU module
Program capacity: 16K words (LD, SFC part) One program (FBD:8K words)
Machine information memory: 64KB
Communication functions
- I/F : RS232C (PCwin) / MODBUS*-RTU (Slave) → A selection from 2 kinds
- L1 : FL-net
- L2 : CMP-LINK/MODBUS*-RTU (Slave) / Serial I/O (SIO) / PC-LINK / SN-I/F
        → A selection from 5 kinds

Connection example

PC10G-CPU

PCwin

FL-net

SN-I/F

TOYOPUC-PCS-J

*MODBUS is a registered trademark of AEG Schneider Automation Inc.

TOYOPUC-**PCk** series

Compact, yet it is applicable to multipurpose usage

PCk05-CPU
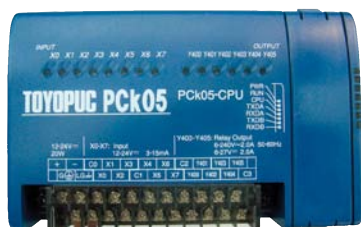
PCk05-CPU is a micro type PLC with 8-point input and 6-point output.

- RS 232C port is equipped as a standard feature.
- 1 slot is arranged for expansion. It is possible to expand to the max. 30 points.
- The DeviceNet* slave module is also arranged. It is easy to communicate with various TOYOPUC series.

PCk06-P-CPU

PCk06-P-CPU is a mixed type PLC of all-in-one design type with 20-point input and 16-point output and module type.

- It is a small type PLC with 20-point input and 16-point output.
- RS 232C/422/485 ports are equipped as a standard feature.
- 4 slots are arranged for expansion. It is possible to expand to the max. 100 points.
- The DeviceNet slave module is also arranged. It is easy to communicate with various TOYOPUC series.

Rich convenient functions

- It is possible to communicate with TOYOPUC series, using DeviceNet* Slave module of kDLNK.
- I/F is possible to connect with PCwin-PCk.
- Port 2 of PCk06-P-CPU is possible to connect with RS232C/422/485 MODBUS*.

TOYOPUC series   PCk series

RS232C/422/485

DeviceNet*   PCk connection cable

PCwin-PCk
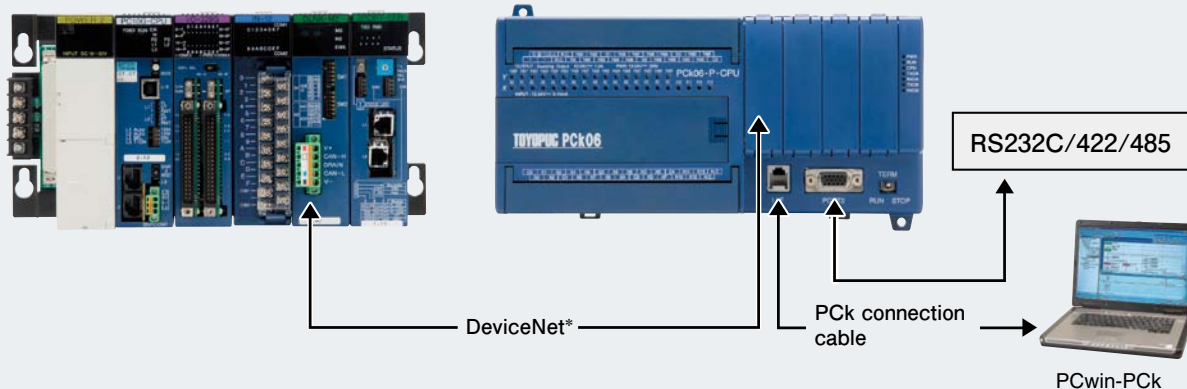
DC input specifications

Items \ Model	PCk05-CPU (TKC-6471)		PCk06-P-CPU (TKC-6472)	
Address allocation	X0～X2 (high speed input)	X3～X7 (standard input)	X0～X3 (high speed input)	X4～X13 (standard input)
Rated input voltage	DC12-24V		DC12-24V	
Max. input current	6mA (DC12V)	4mA (DC12V)	6mA (DC12V)	4mA (DC12V)
	13mA (DC24V)	8.5mA (DC24V)	13mA (DC24V)	8.5mA (DC24V)

Output specifications

Items \ Model	PCk05-CPU (TKC-6471)	PCk06-P-CPU (TKC-6472)	
	Relay output specifications	DC output specifications	
Address allocation	Y400～Y405	Y400～Y401 (pulse output)	Y402～40F (standard output)
Rated load voltage	DC6-27V、AC6～240V (47～63Hz)	DC12-24V	
Max. load current	2A/point, 6A/common	0.5A/point	1A/point

*DeviceNet is a registered trademark of Open DeviceNet Vendor Association Inc.
*MODBUS is a registered trademark of AEG Schneider Automation Inc.

Specifications

PC10, PC3J Series control specifications

Items / Model	PC10G	PC10P	PC3JX	PC3JX-D
Programming method	Stored program method Event monitor function by parameter setting			
Program control method	Cyclic operation method Constant period interruption function (1 ms~)		Cyclic operation method Constant period interruption function	
Input/output control method	Image registration method			
Basic instruction processing speed	Contact···0.015µs~ /instruction		Basic command: 0.021 µs (fastest)	
Application instruction processing speed	0.05µs~ few µs/instruction		0.08 µs/word	
Basic instruction	19 instructions + 1 instruction (the inversion output for screen buttons)	19 instructions	20 instructions	
Timer counter instruction	21 instructions + 1 ms timer, 1s timer	21 instructions	29 instructions	
Application instruction	700 instructions or more The operation with the sign is possible. The floating decimal point is possible.	450 instructions or more	Over 700 commands Data type: BIN, BCD, signed BIN Floating point (single precision, double precision) Size: byte, word, double word	
Program capacity	180K words (60K words × 3) (60k words / 60K words / 60K words, 120k words / 60K words, 180K words) + FB library 60K words + Standard library 32K words + User library 32K words	180K words (60K words × 3) + FB library 60K words + Standard library 32K words + User library 32K words	48K words (16K words × 3) + FB library 32K words + Standard library 32K words + User library 32K words	
Memory element	CMOS-RAM, Flash EPROM		CMOS-RAM, FRAM	
Battery	Rechargeable (Lithium secondary battery: battery longevity 5 years)		None	
No. of external I/O	2048 points (Increase is possible by DeviceNet* and remote I/O		1,024 points	
No. of internal output	86,016 points (4,096 points × 3 + 8,192 points + 65,536 points)	79,872 points (2,048 points × 3 + 8,192 points + 65,536 points)	79,872 points (2,048 points × 3 + 73,728 points)	
No. of keep relay	6,400 points (768 points × 3 + 4,096 points)			
Timer function Counter function	0.1~6553.5 sec / 0.01~655.35 sec 0.001~65.535 sec / 1~65535 sec total 9,728 points 1~65,535 (2,560 points × 3 + 2,048 points)	0.1~6553.5 sec / 0.01~655.35 sec 0.001~65.535 sec / 1~65535 sec total 3,584 points 1~65,535 (512 points × 3 + 2,048 points)	0.1~6553.5 sec / 0.01~655.35 sec 0.001~65.535 sec / 1~65535 sec total 3,584 points 1~65,535 (512 points × 3 + 2,048 points)	
No. of link relay	39,912 points (10,240 points × 3 + 8,192 points)	14,336 points (2,048 points × 3 + 8,192 points)		
Detection of start-up and start-down	11,776 points (2,560 points × 3 + 4,096 points)	5,632 points (512 points × 3 + 4,096 points)		
Data register	164K words / 16 bit (12K words × 3 +128K words) Extension buffer register: 256K words / 16 bit Flash register: 4Mbyte flash drive (read only)*1	44K words / 16 bit (4K words × 3 + 32K words) Extension buffer register: 128K words / 16 bit	12K words(4K words × 3 + 32K words)	
Link register	6K words / 16 bit (2K words × 3)			
Equipment data memory	4Mbyte Program comment, SFC data, FB data, I/O diagram, network diagram		4Mbyte	
Special module installation amount	Communication (link) module: Max 24 sheets No number of sheets limitation by the consumption memory	—— *2	Communication (link) module: MAX. 24 Unlimited number depending on memory usage	
Visualization function — SFC	○			
Visualization function — F B	○			
Library function — F B	○			
Library function — Standard	○			
Library function — User	○			
Event monitor function (possible to monitor at the cycle)	○			
Compulsion ON/OFF function	○			
Scan unit trace function	○			
Maintenance support — Equipment diagnosis function	○ Diagnostic dummy: 2,048 points 128 histories		○	
Maintenance support — Network diagnosis function	○			
Maintenance support — I/O diagram display	○			
I/O recorder	○ 512Kbyte (50 points / change point in one cycle → memory of about 40 cycles)		○	
Test mode	○ Function to return instantaneously to former program when program change is confirmed		○	
Programmer I/F	USB (V2.00) 480Mbps			
Built-in communication function	L1: FL / ET / F remote M 10Mbps/100Mbps L2: FL / ET / F remote M 10Mbps/100Mbps L3: PC／CMP／SN-I/F	L3: PCI bus I/F	L1：PC/CMP/MODBUS/SIO L2：PC/CMP/MODBUS/ SIO/SN-IF	L1：PC/CMP/MODBUS/SIO L2：PC/CMP/MODBUS/SIO/SN-IF DLNK-M2

*1 The range where special instruction is necessary for writing in. *DeviceNet is the registered trademark of Open DeviceNet Vendor Association Inc.
*2 PC10P can be equipped with the special module through the use of BUS-EXP (EXPANDED BUS) or Plus BUS-EX.

Compact PLC PCk series control specifications

Items / Model		PCk05-CPU	PCk06-P-CPU
CPU function	Programming method	Stored program method	
	Program control method	Cyclic operation method (with sub routine function)	
	Program language	LD	
	Input/Output control method	Image register method	
	Basic instruction processing speed	Contact 1.3~2.3µs/instruction, Output 6.8~34.4µs/instruction	Contact 0.37~0.67µs/instruction, Output 1.82~9.2µs/instruction
	Application instruction processing speed	2.4~several 100µs/instruction	
	Basic instruction	13 kinds	
	Timer/Counter instruction	6 kinds	
	Application instruction	More than 110 instructions	
	Program capacity	2,048 words	7,679 words
	Memory device	USB flash drive, RAM	
	Battery	——	Commercial battery CR2354 (Battery life: 5 years, however, please replace to a new battery if the system was shut down for 10 days or more.)
	External I/O points	Input : built-in 8 points + points of mounting modules Output : built-in 6 points (Relay output) + points of mounting modules	Input: built-in 20 points + points of mounting modules Output: built-in 16 points (Source output) + points of mounting modules
	Internal output points	256 points	512 points
	Keep relay points	256 points	512 points
	Timer function	128 points, 0.1~999.9sec./0.01~99.99sec. 128 points, 1~9,999	256 points, 0.1~999.9sec./0.01~99.99sec. 128 points, 1~9,999
	Counter function	Input 1,024 points, output 1,024 points	
	Link relay points	512 points	
	Rising/Downing edge detection	3,200 words	7,296 words
External power		Data register	
No. of modules possible to install		1	4
Installation method		DIN rail or set screw (screw size: M4)	
Communication function	I/F	PCwin-PCk for programmer only	
	Port 2	RS232C (MODBUS*)	RS232C/422/485 (MODBUS*)
Peripheral software	Programmer	PCwin-PCk	
	Cable	Cable connecting PCk (TKY-6485)	

*MODBUS is a registered trademark of AEG Schneider Automation Inc.

Compact PLC PCDL control specifications

Items		Model PCDL
CPU function	Programming method	Stored program method
	Program control method	Cyclic operation method (with sub routine function)
	Program language	LD, SFC, FBD
	Input/Output control method	Image register method
	Basic instruction processing speed	Contact 0.14μs〜/instruction
	Application instruction processing speed	0.94μs〜several 10μs/instruction
	Basic instruction	13 kinds
	Timer/Counter instruction	21 kinds
	Application instruction	More than 450 instructions
	Program capacity	16KW(LD,SFC)1 program (FBD:8KW)
	Memory device	MRAM, Flash memory
	Battery	――
	External I/O points	1,024 points
	Internal output points	10,240 points (2,048 points+8,192 points)
	Keep relay points	4,864 points(768 points+4,096 points)
	Timer function / Counter function	0.1〜6553.5 sec./0.01〜655.35 sec Total 2,560 points*1 / 1〜65,535 (512 points+2,048 points)
	Link relay points	10,240 points(2,048 points+8,192 points)
	Rising/Downing edge detection	4,608 points(512 points+4,096 points) / 4KW/16 bits / 2KW/16 bits*2
	Machine information memory	64KB
	Clock function	Available (no-battery).
External power		AC100V/DC24V
Installation		DIN rail or screws (M4) fixing
Communication function	I/F	RS232C(PCwin)/MODBUS*-RTU(slave)
	L1	FL-net
	L2	CMP-LINK/MODBUS*-RTU(slave) / Multi purpose communication(SIO) / PC-LIN / SN-I / F
Programmer	Programmer	PCwin (Ver.12 or more)
	Cable	PCk connection cable D-SUB 9P⇔RJ12 conversion cable and RJ12⇔RJ12 programmer connection cable (2m) sets

*1 When using SFC, it becomes 512 points. *2 When using SFC, it becomes 1kW.

Board type PLC Plus control specifications

Items	Model Plus	
	Plus standard mode	Plus expansion mode (When mounting EX board)
Program type	Stored program type	
Program control type	Cyclic calculation method, constant scan, fixed cycle interrupt	
Input/output control type	Image register type	
Program language	SFC, LD, FB	
Program size	16KW(+FB_8KW)	16KW×3=48KW(+FB_32KW)
Data memory size	32Kbyte	64Kbyte+128Kbyte
Processing speed	Basic command 21ns (maximum speed)	
Application command	Data format: BIN, BCD Size: Byte, word, double word	Data format: BIN,BCD / BIN with symbols / Floating decimal point (single accuracy, double accuracy) / Size: byte, word, double word
Index register	None	With
Equipment information memory	64Kbyte	4Mbyte
Other functions	None	Event monitor (for cycle monitor) 64Kbyte / Standard library function
I/O recorder	None	With
Scan unit trace	None	With
Forced ON/OFF	None	I/O operation panel, forced output supported
Peripheral equipment I/F	USB2.0 high speed (480Mbps)	
Battery	Not used (backup for non-volatile RAM)	
Display	LED display, POWER, RUN, ERR only	
Clock	None	With (can run for approx. 10 days with power off)
RUN output	Relay output (DC24V/0.5A)	
Communication	①Ethernet*/FL-net*/FL Remote 10Mbps/100Mbps ②PC/CMP/SIO(RS422/RS232C)/MODBUS*	
Input	12 points (5mA/24V 6 points/common Working voltage range: 21.6 to 26.4V Digital filter 1ms to 5ms)	
Output	8 points 0.5A/1 point, 1.6A/(8 points) Working voltage range:10.8 to 26.4V	

Board type PLC Plus combination of communication module

●:1 piece implementation. ●Numbers: Actually implemented no.
△: Not equipped, or either one can be selected. (1-port): The number of ports at the time of selection.

Module	Mounting combination list															
Plus CPU	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Plus CLNK-M	–	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△
Plus DLNK-M	–	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△
Plus CLNK-S	–	–	–	–	–	–	–	–	–	–	–	●	●	●	●	●
Plus EX	–	●	–	–	–	●	–	●	–	–	–	–	–	●	–	–
Plus EFR	–	–	●	–	–	●	●2	–	–	●	–	●	–	–	●	–
Plus EX2	–	–	–	●	–	–	–	–	●	●	–	–	–	–	●	–
Plus EFR2	–	–	–	–	●	–	–	–	●	●	–	●2	●	–	–	●
CC Link* master	–	(1 board)														
DeviceNet*	–	(1 board)														
CC Link* slave	–											1 board				
Ethernet*/FL-net*/FL Remote	1 board	2 board	1 board	2 board	1 board	3 board	1 board		3 board	1 board	2 board	1 board	2 board			
Ethernet*/FL-net*/FL Remote/EtherCAT*	–	1 board	–		2 board*2	–	1 board*2	–	1 board*2	–		1 board	–			
PC/CMP/SIO/MODBUS*/SN-IF*1	1 board	2 board	1 board	2 board	1 board	2 board	1 board	2 board		1 board	2 board	1 board	2 board	1 board		
Ethernet*/FL-net*/FL Remote/EtherNetIP/EtherCAT*	–	1 board*2	–		1 board*2	2 board*2	1 board*2	–		2 board*2	–					

*1 When Plus EX or EX2 is mounted, SN-I/F can be used only in the Plus EX or EX2 port. *2 For EtherCAT, only 1 port can be used if the CPU version is 2.20 or higher.
EtherNetIP can be used when the CPU version is 2.10 or higher. *CC-Link is a registered trademark of Mitsubishi Electric Corporation. *DeviceNet is a registered trademark of Open DeviceNet Vendor Association Inc. *Ethernet is a registered trademark of Fuji Xerox. *FL-net is the controller level network (OPCN-2) stipulated by JEMA (The Japan Electrical Manufacturers' Association) *EtherCAT is a registered trademark of Beckhoff Automation GmbH. *MODBUS is a registered trademark of AEG Schneider Automation Inc.

External dimensions

PC10G／PC3J series

8-slot base 2（THR-2872）

8-slot base （THR-2766）
6-slot base （THR-2813）
4-slot base （THR-2775）
2-slot base （THR-2814）

424（8 slots（2））
409
7.5
4-R3
4-R5
15.5
86
130
112

178
193（2 slots）
249
264（4 slots）
320
335（6 slots）
391
406（8 slots）

I/O branch module
（THU-2774）

7.7　77.6　7
86
113
93
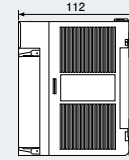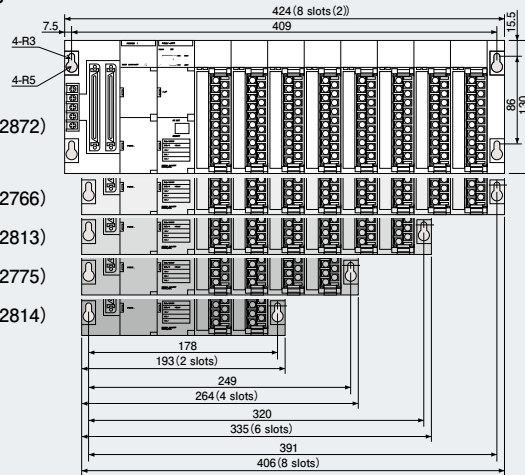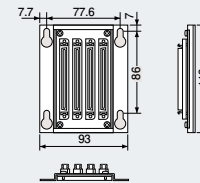
PC10G／PC3J select base

8-slot selector base
（THR-5643）

6-slot selector base
（THR-5644）

4-slot selector base
（THR-5645）

370.5（8 slots）
350
145
160
POWER

※1 Mounting
hole details
R3

※1
4-R3　210
228.5（4 slots）
280
299.5（6 slots）

PC10P
（TCC-6372）

Bracket mounting
area (both sides)
2-φ3.5±0.1　30
5.08　20
φ3.5±0.1　5.08
3.81
174.63
11.63　4.8
6.5
106.8
21.59　7
120.02
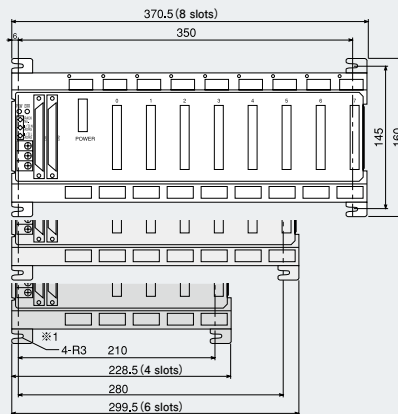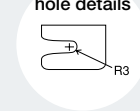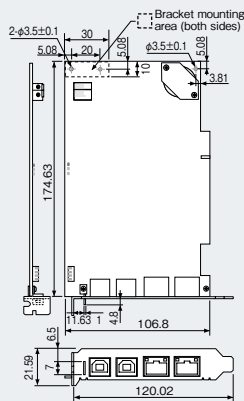
FL remote I/O board
（TCU-6421）

120.02
21.59
10.11　16.45
5.08　9.38
85.39　5.08
174.63
3.81
5.08
20
106.8
5.08
30
17 or 17 or
less less
2-φ3.5±0.1
φ3.5±0.1
Bracket mounting
area (both sides)

TOYOPUC BUS-EXP（EXPANDED BUS）
（TCU-6367）

110　35
BUS-EXP
130

Plus

PCk05-CPU

PCk06-P-CPU

(At using DIN rail)
68mm
65mm

PCDL

Fixing: M4 screw(x4)
or a DIN rail

TOYOPUC
JTEKT

90mm

76mm

75mm

92mm

A
B
C
D
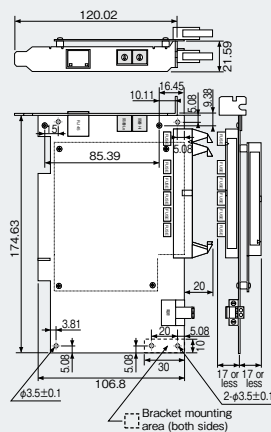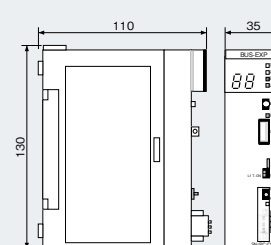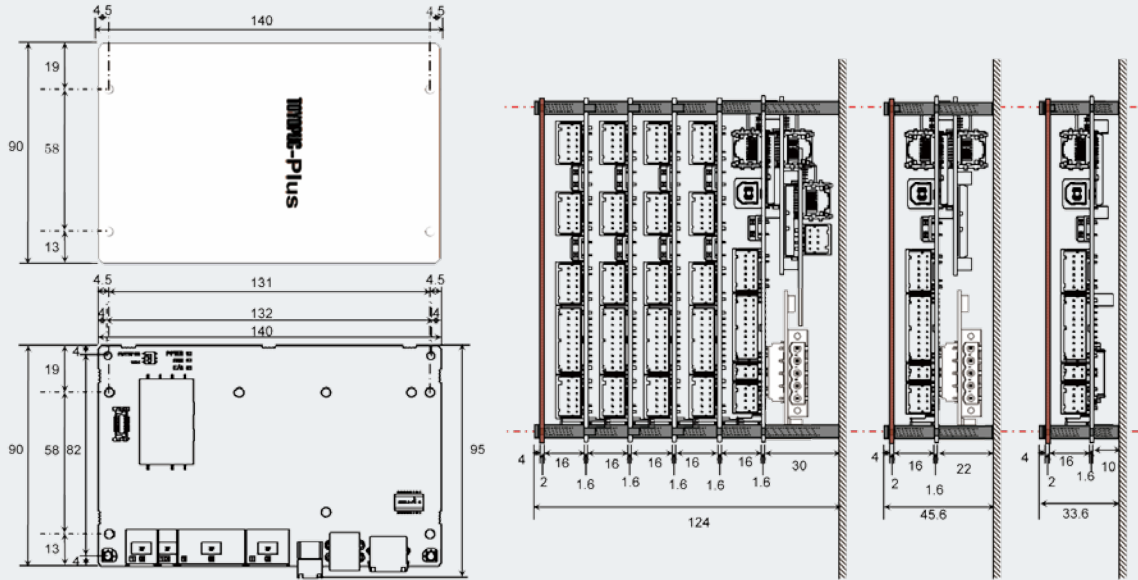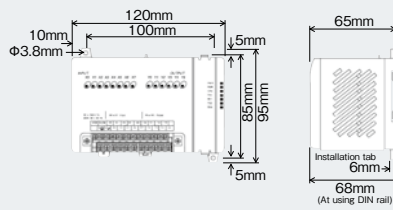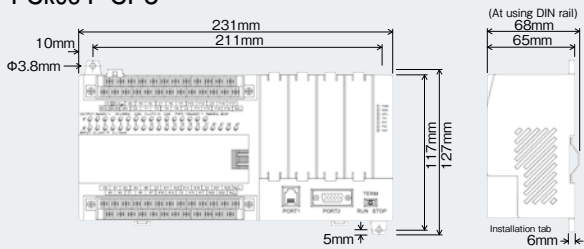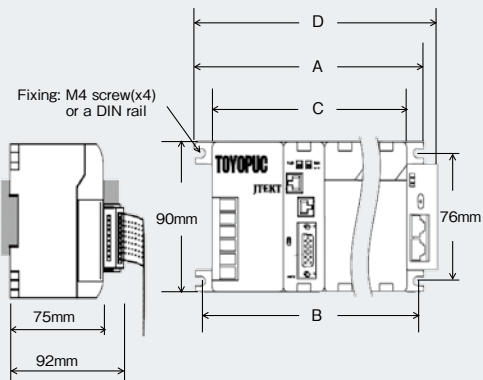
(mm)

Number of slots (Except for a CPU slot)	A (Total base width)	B (Fixing pitch)	C (Module width)	D (Width including an extension unit)	AC power supply base	DC power supply base
2 slots	172	163	148	184	TKR-6689	TKR-6693
3 slots	203	194	179	215	TKR-6690	TKR-6694
5 slots	265	256	241	277	TKR-6691	TKR-6695
8 slots	358	349	334	370	TKR-6692	TKR-6696

TOYOPUC
programming software for Windows*

PCwin/PCwin-PCk

A convenient functional all-in-one

- The model TOYOPUC PC1 to the model TOYOPUC PC10/PC3J, Plus, and TOYOPUC MX, PCk ⋯ "from a control design up to maintenance"⋯ it supports.

- The all-in-one of TOYOPUC GL1, Hellowin and the CAD conversion function was carried out to PCwin.

- PCwin is a programming tool which is conformity with the SFC programming language and FBD (Function Block Diagram) specified by IEC61131-3 (Option 1 is necessary for using FBD)

- The SFC is a programming language which expresses simply a series of production processes by means of various kinds of graphic objects.

- The conventional LD (ladder) programming does not present a clear "operation and progress at each process of an equipment." The PCwin presents visually them with flow charts.

- Limited-to-LD (ladder) programming is also available.

- Editing of FB library can be limited to an authorized person. (Option: Security tool)

- Printing list of the CAD drawing style is enabled. (Option 2)

- I/O diagram function which was impossible without CAD is available (only when using PC10G/PC3JG).

Applicable model / Series / Program area	PCwin							PCwin-PCk
	PC10G PC3J Series	PC2 compatibility mode of PC3J Series	PC2 Series	PC1 Series	MX	PCDL	Plus	PCk
P1	○	○	○	○	○	○	○	○
P2	○				○		○ (When mounting EX board)	
P3	○				○		○ (When mounting EX board)	

Applying model

PC1

MX

PCwin/PCwin-PCk

PCDL

PC2

PCk

Plus

PC3J

PC10G

PC3JX

PC3JX-D

PC3JG

*Windows is a trademark of Microsoft Corporation, USA in the USA and other countries.

Rich convenient functions

The PCwin is fully equipped with convenient functions which are needed in every process for planning, adjusting and maintaining.

Jumping monitor between SFC, LD and I/O drawing

It helps to your search time for abnormal points of the equipment.

Double-clicking the SFC step [ ] transition [+] during PLC monitoring enables direct jumping to the appropriate LD.

Double-clicking the LD contact point enables direct jumping to the coil or I/O drawing (automatic judgment).

And, double-clicking the coil or I/O drawing makes it return to the original contact point.

Maximum 16 jumps are possible.

Double click

Double click

Automatic judgment
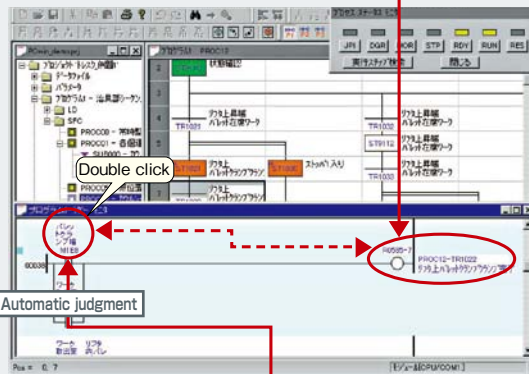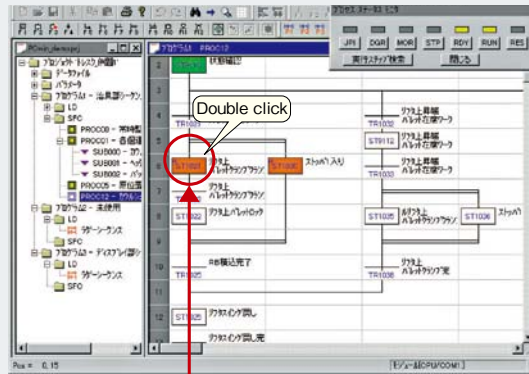
Jumps to a relative I/O.

Jump to a relative coil.

Double click

Double click
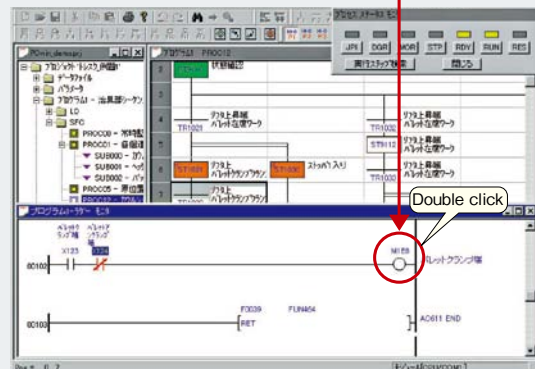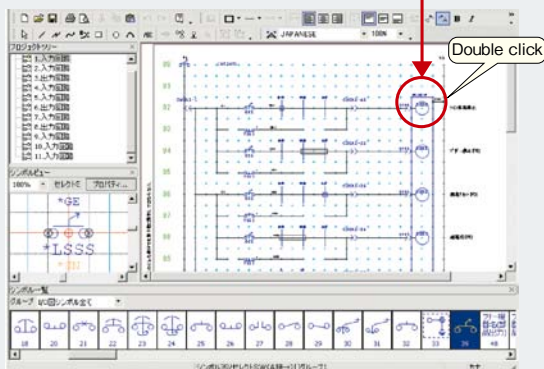
Rich convenient functions

Simultaneous monitoring of SFC, LD and process status

Progress of an equipment process is easily   grasped due to color change of SFC steps and a ladder monitor

SFC monitor

Done

Undone

H marked: Displays holding (under executing) action

Activating

Monitors step elapsed time (in 0.1 sec)

LD monitor

Displays process state monitor and execution status of each SFC chart [process]
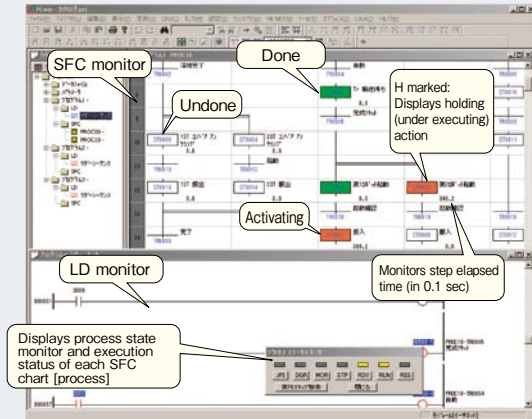
Step diagnostic function

An easy setting can monitor the execution time of each step. If despite the expiration of a setting time, the execution of the step does not finish, it will give you an alarming.

Step diagnostic mark

Step diagnostic judgment
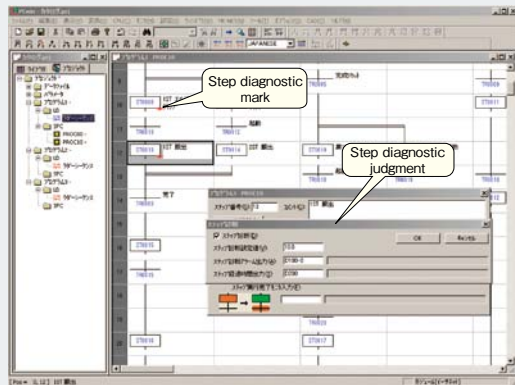
Time chart monitor function

Select the bit device address in the connected PLC, and it displays an ON and OFF time charts on real time

	Regular time-chart monitor	Scanning time-chart monitor
Corresponding CPU	PC3 series, MX PC10 series PCDL Plus	PC3JX PC3JX-D PC10G series Plus
Corresponding PCwin version	since Ver2.1 Rev00	since Ver14.9 Rev01
Sampling points	1 to 32 points	1 to 64 points
Sampling accuracy	0.2sec	one scan
Sampling amount (time)	0.2 to 600 sec	1 to 6000 scan
Scale width	0.5/1/2/4 (s/div)	1/5/10/20/40 (scan /div)

Editing function for I/O diagram

I/O diagram and the network drawing data can be edited and printed. The edited data can be written and read in CPU.

The I/O diagram and the network drawing written in CPU are available for display/jumping monitor, network diagnosis, and short circuit/wire-cutting diagnosis on the direct circuit monitor.

This function can be used with the PC10 series and Plus (during Plus expansion mode).

Creating/editing the I/O drawing and network drawing requires the I/O drawing function expansion tool [TXY-6351].

PCwin

PC10G-CPU

I/O diagram
and network drawing
Writing/Reading

I/O diagram and
network drawing
Reading/Monitoring

I/O diagram and network drawing editing

Print

Direct circuit monitor

I/O diagram

Option:
"I/O diagram function
expansion tool (TXY-6351)"
Sentinel attached is
necessary.

Network drawing (When expanding PC10 series, Plus EX and EX2)
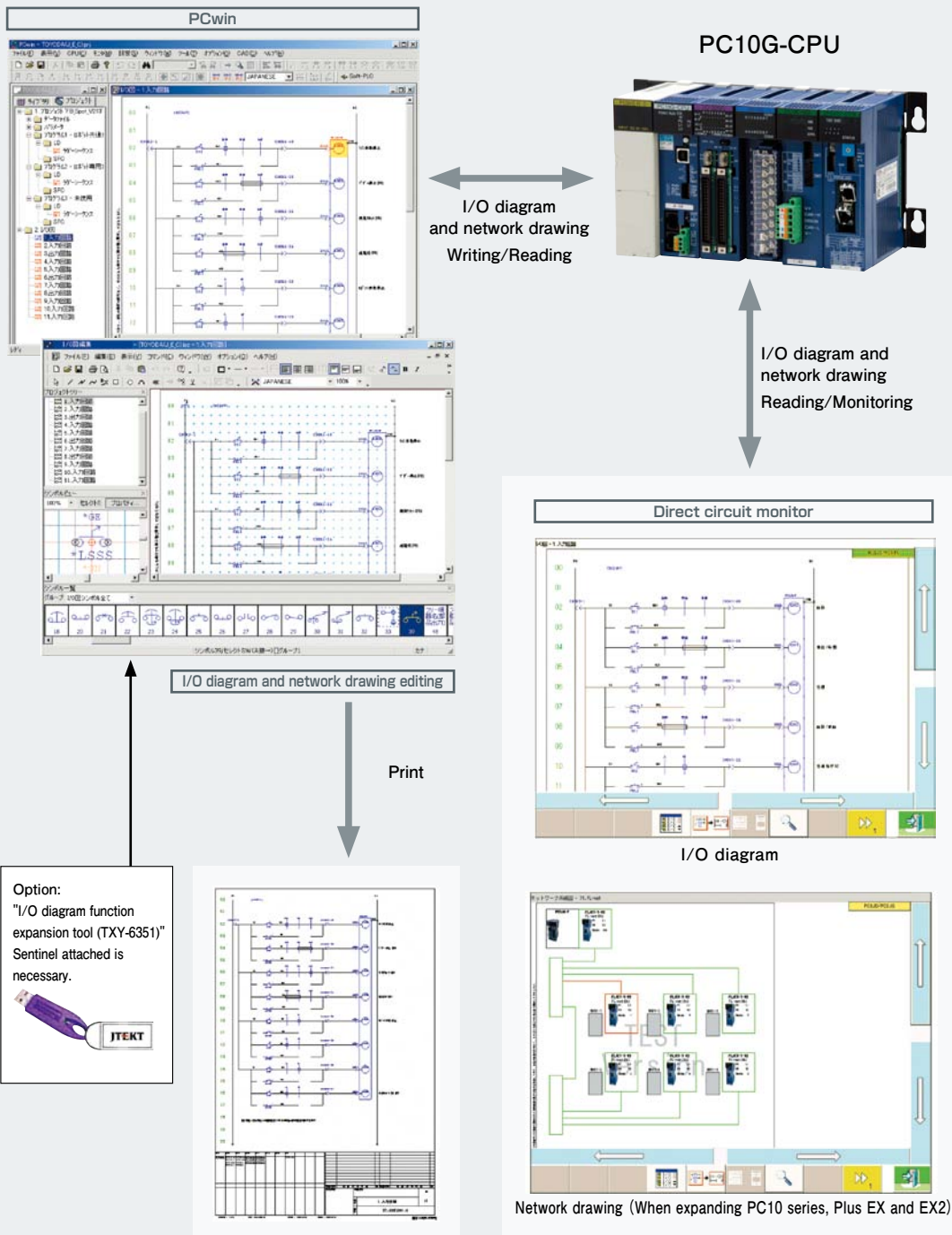
Rich convenient functions

Test mode function (PC10 series)

As for circuit modification with CPU carried out at test mode, the circuit can be reverted to the previous setting immediately. The modification which was done at the test mode can be applied also.

The function is available in PC10 series, but not with other CPU.

The function works only for a communication module named "CPU-USB".

PC10

USB communication cable

Previous circuit
Circuit A

Test mode: setting

Circuit A'

Circuit change: A→A'

Test mode

Circuit change: A'→A"

Circuit A"

Circuit change: A"→A'''

Circuit A'''

Previous circuit
Circuit A

Test mode: cancel

Revert to the previous setting immediately

If [Test mode] - [apply changing] is selected, circuit modification at the test mode is applied (hold to circuit A''').

PC10
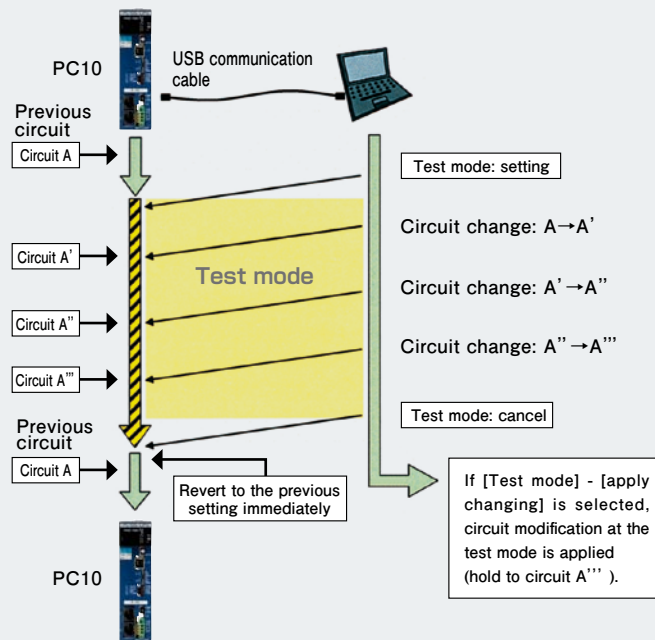
Printing of the drawing style function

A printing list with a frame of drawing style can be output by selecting [File]-[Printing of the drawing style].

A	Manufacturer
D	Drawing number
E	Designs change number
G	Diversion drawing number
H	Device class
I	Contents
J	Program number
M	Customer machine number
O	Note 1 (Writing)
P	Program name
Q	Renewal date
R	Page number

Block verification

Two circuit data are compared, and a difference block/symbol or only one exists block/symbol are displayed.

- Address difference
- Contact difference
- Verification source
- Difference block
- Verification object
- OR position difference
- Identical block
- Block verification result bar
- Color status and a difference block number are displayed.
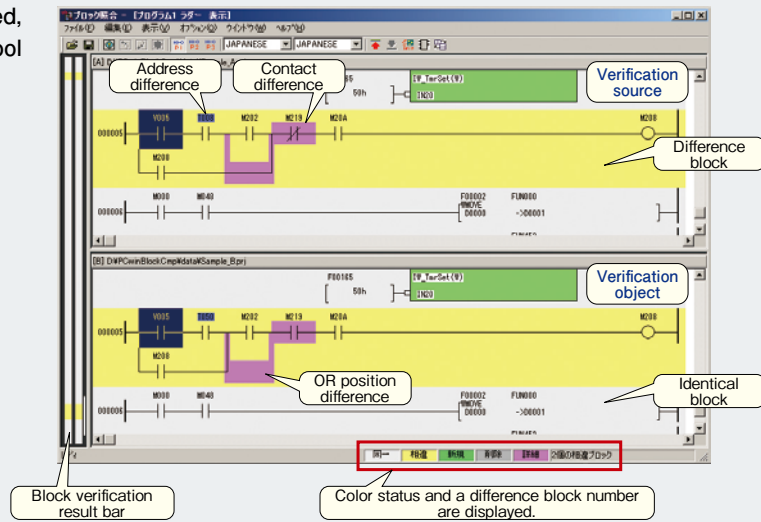
I/O operation panel

When actual input devices are not connected, but I/O operation is possible.
After an I/O operation setting can maintain I/O status.

- ON
- OFF
- I/O button
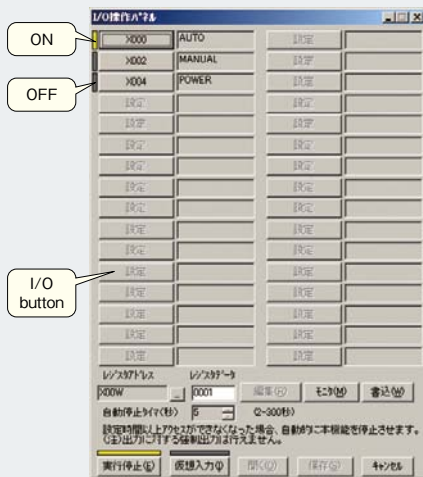
3 languages comment switching

Ladder circuits and I/O drawing comments can be displayed in a maximum of 3 languages from Japanese, English, Chinese, French, Czech, and Russian.
Three languages comments can be installed in PLC.
Also, a direct circuit monitor can display in three language .

- Japanese
- English
- Chinese
- Comment switching
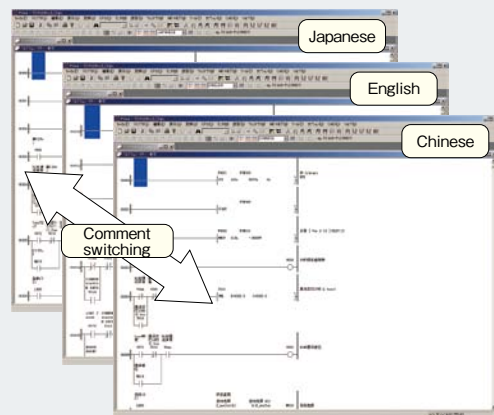
Required system

Basic software	Windows* 2000/XP 32 bit edition/Vista 32 bit edition/7 32 bit edition, 64 bit edition
Computer	Personal computer mounting more than Pentium*III 500MHz
Memory	512MB or more
Hard disk	200MB or more free space is required.
Disk unit	A CD-ROM drive is need.
Display unit	1,024x768 or more dot color display

＊Windows is a registered trademark of Microsoft Corporation in the U.S. and other countries.
＊Pentium is a registered trademark of Intel in the U.S. and other countries.
Note) After the version 7.0, it does not operate under Windows 95/98/NT.

DM Direct circuit monitor

JTEKT, who knows machine control, contributes to user's production availability improvement and machine safety .

Visualization of machine control is also realized.

● Visualization of control circuits   ● Visualization of safety circuits   ● Visualization of machine errors

The touch-panel display which displays necessary information of facilities directly

Direct circuit monitor

DM series mounted Windows* XP Embedded TM as OS, and, in addition to the control panel function, various facilities monitor software are mounted Safety circuits can be seen with a control panel.

Machine maintenance becomes very easy, because a personal computer and paper drawings is not necessary.

Main features

● SFC, FBD, and LD circuits display/monitor can be performed.
● Safety circuits display/monitor can be performed.
● I/O drawing can be displayed.
● When an error caused, trouble shooting can be performed by just screen menu manipulation.
  Therefore, MTTR*(Mean Time To Repair) can be shortened dramatically.
● A CF card is used instead of a hard disk . Hard disk-less is realized.
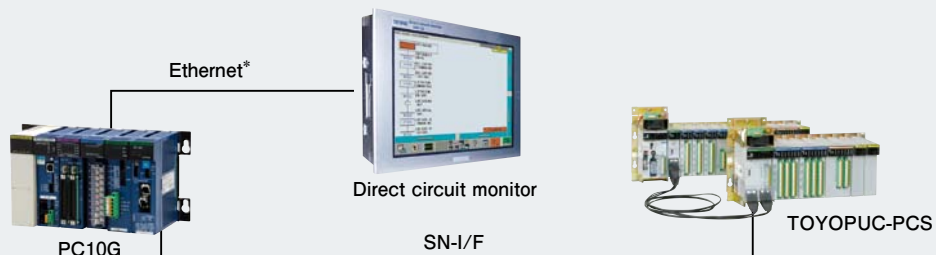
Ethernet*

Direct circuit monitor

PC10G   SN-I/F   TOYOPUC-PCS

∗MTTR(Mean Time To Repair): The average time needed to return a faulty component or system to its proper operation
∗Windows is a trademark of Microsoft Corporation, USA in the USA and other countries.
∗Ethernet is a registered trademark of Fuji Xerox.

"Circuit monitor" function, which can display/monitor SFC, FBD, and LD circuit.

PLC direct monitoring SFC ,which displays machine operation step as a flow chart.
Therefore, when machine stops, the stopping operation step can be known at a glance.
Touching the stopping operation step , a stop conditions is searched and relative FB and a relative ladder are displayed.
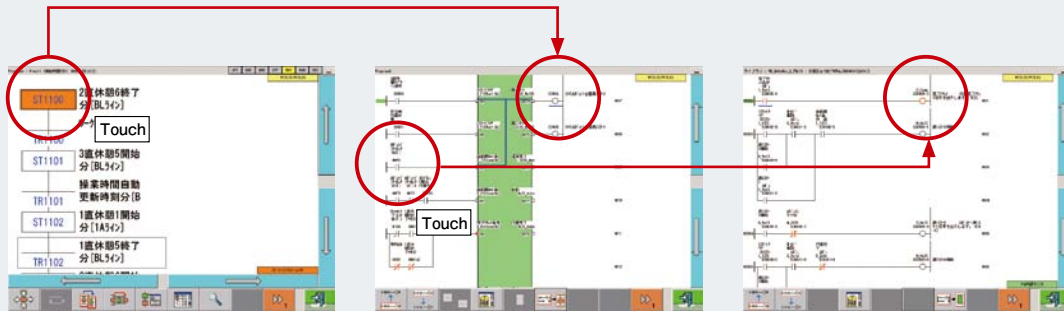
"Tracing monitor" function, which can locate a fault position at pinpoint from an error button to an I/O drawing

Touching an error button on an operation panel screen and search the error conditions in a ladder circuit, then the relative circuits are displayed.
Touching ladder circuit conditions, then the cause of error can be traced.
Furthermore, if error conditions are I/O, the error cause can be traced at I/O drawings, therefore the machine error place can be specified quickly and MTTR can be shortened.
A worker can be released from the stress of reading many circuit diagrams or l I/O drawings as before he did.

| Operating panel screen | Circuit monitor | I/O drawing display |
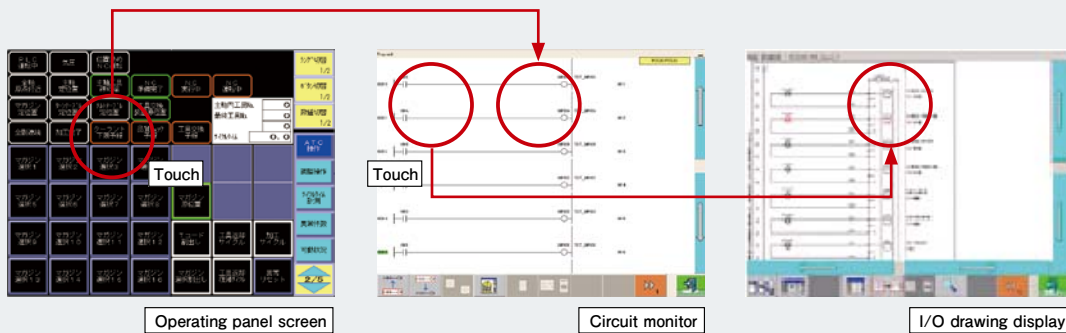
Trouble shooting time reduction

Dramatic MTTR shortening

Index

10

1

Conventional system   Traceing monitor
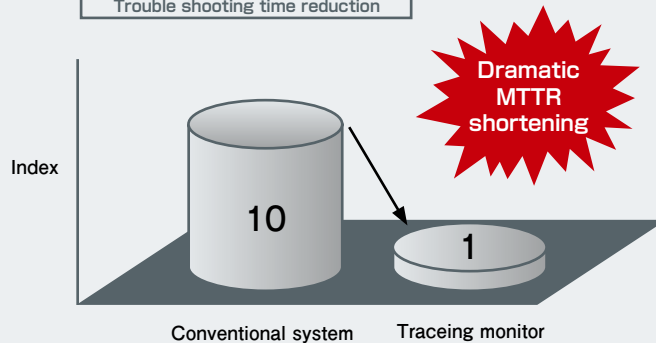
"Network diagnostic" function shows the failure place of a communication device or wiring place

Communication errors of devices or grounding and disconnection place are diagnosed and the error place can be pinpointed.
Functions are applicable for FL-net, DeviceNet* and FL remote.
Grounding and disconnection are applicable for DeviceNet* and FL remote.

Communication-system drawings memorize in a PLC/PCwin

FL-net

L1 Station number 1
L2 Station number 2
L3 Station number 3
R1 Station number 4
R2 Station number 5
R3 Station number 6

Operation panel / Direct circuit monitor

The devices are pointed on the communication-system drawing of the operation-panel screen.
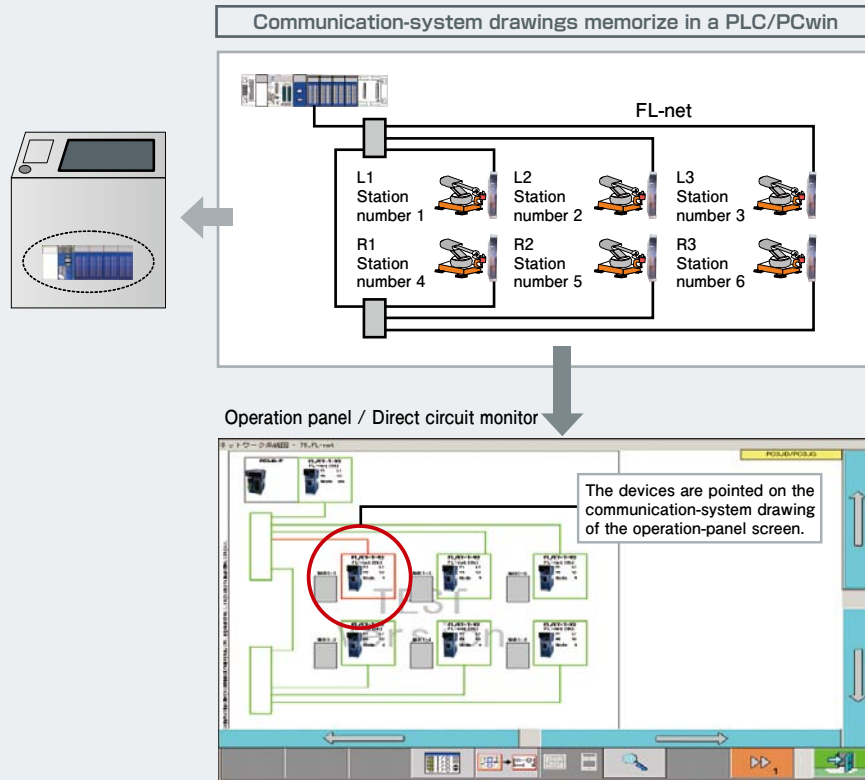
From record of the number of device operations, and record of usable years, the inspection time limit can be seen by "fixed-quantity and periodic maintenance" function

100 components for the fixed quantity maintenance and 100 components for periodic maintenance can be registered
A machine is always monitored, if a actual value exceeds an inspection period, an inspection advice message will be displayed on a screen.
Therefore, a maintenance plan like spare-parts preparation can be planned

Inspection advice and object components are displayed on a screen.

Fixed quantity maintenance

Periodic maintenance
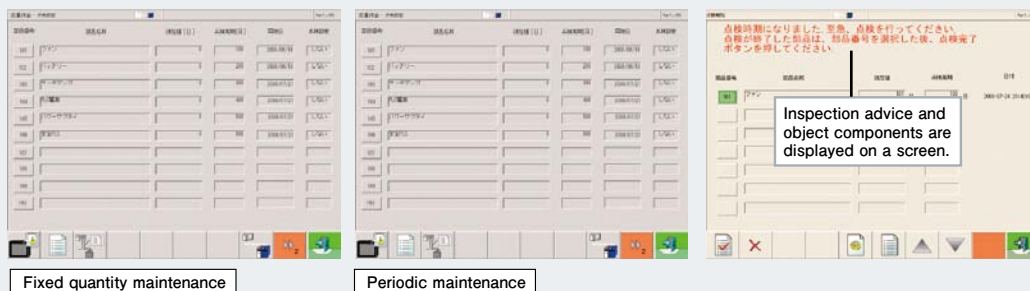
*DeviceNet is a registered trademark of Open DeviceNet Vendor Association Inc.

General specifications

Item \ Model	DM-12WK2B	DM-12WD4	DM-12WK2	DM-10WF	DM-7WS
Operating ambient temperature	0-55 degrees C	0-55 degrees C	0-55 degrees C	0-55 degrees C	0-50 degrees C
Operating ambient humidity	25~85%RH, no dew condensation.	10~90%RH, no dew condensation	25~85%RH, no dew condensation.	30~85%RH, no dew condensation.	5~85%RH, no dew condensation.
Storage temperature range	-10~70 degree C	-20~60 degree C	-10~70 degree C	-40~85 degree C	-20~60 degree C
Power supply	AC100V/240V	DC12/24V 56W	DC24V 50W以下	DC24V less than 30W	DC24V less than 32W
Grounding method	D class grounding	D class grounding	D class grounding	D class grounding	D class grounding
Protective construction	—	—	—	IP65f equivalent (when surface sheet attached)	IP20 (Compatible with IEC 60529)
External dimensions (mm)	315(W)×241(H)×70(D)	306(W)×260(H)×66.9(D)	306(W)×261(H)×55(D)	233.2(W)×213(H)×65.4(D)	214(W)×158(H)×79.6(D)
Panel-cut dimension (mm)	301.5(W)×227.5(H)	270(W)×206(H)	266(W)×203(H)	224.7(W)×174(H)	197(W)×141(H)
Cooling method	Natural air cooling	Natural air cooling	Natural air cooling	Natural air cooling	Natural air cooling
Weight (kg)	3.7	3.7	2.6	1.8	1.5

Performance specifications

Item \ Model	DM-12WK2B	DM-12WD4	DM-12WK2	DM-10WF	DM-7WS
OS	Enbedded STD 7	Enbedded STD 7	Enbedded STD 7	Windows Embedded Standard 2009	Windows Embedded Standard 2009
CPU	Intel Atom D425	Intel Atom E660	Intel Atom D425	Intel Atom N450 1.6GHz	Intel Atom E640 1.0GHz
Main memory (RAM)	1GB	2GB	1GB	1GB	1GB
System memory	4GB	16GB	4GB	5GB	4GB
Touch panel	Analog resistance film system	Analog resistance film system	Analog resistance film system	Resistance film (4-line type)	Analog resistance film system
Display	TFT 12.1 inches color LCD	TFT 12.1 inches color LCD	TFT 12.1 inches color LCD	TFT 10.4 inches color LCD	TFT 7 inches color LCD
Display resolution	1024×768(XGA)	1024×768(XGA)	1024×768(XGA)	1024×768 (XGA)	800×480 (WVGA)
Resume function	None (suspension function by battery OP)	—	—	—	—

Interface specifications

Item \ Model	DM-12WK2B	DM-12WD4	DM-12WK2	DM-10WF	DM-7WS
USB	None (suspension function by battery OP)	5 ports (for data communicaiton and for maintenance purposes)	4 ports (for data communicaiton and for maintenance purposes)	2 ports (for data communicaiton and for maintenance purposes)	3 ports (for data communicaiton and for maintenance purposes)
Serial port	1 ports	2 ports	2 ports	1 ports	1 ports
Ethernet	2 ports (LAN1 : for TOYOPUC connection, LAN2 : for upper PC connection)	2 ports (LAN1 : for TOYOPUC connection, LAN2 : for upper PC connection)	2 ports (LAN1 : for TOYOPUC connection, LAN2 : for upper PC connection)	2 ports (LAN1 : for TOYOPUC connection, LAN2 : for upper PC connection)	2 ports (LAN1 : for TOYOPUC connection, LAN2 : for upper PC connection)
PCI bus	Expansion unit (sold separately)	—	Expansion unit (sold separately)	—	—
CF card	2 slot (for system disc)	2 slot (for system disc)	2 slot (for system disc)	2 slot (for system disc)	1 slot (for system disc)
Analog RGB	Mini D-SUB15 pin (socket)	DVI-D (socket)	Mini D-SUB15 pin (socket)	Mini D-SUB15 pin (socket)	—

Type

Item \ Model		DM-12WK2B Name	DM-12WK2B Specifications	DM-12WD4 Name	DM-12WD4 Specifications	DM-12WK2 Name	DM-12WK2 Specifications	DM-10WF Name	DM-10WF Specifications	DM-7WS Name	DM-7WS Specifications
Main body		TYD-6964	Direct circuit monitor Main body	TYD-6961	Direct circuit monitor Main body	TYD-6959	Direct circuit monitor Main body	TYD-6745	Direct circuit monitor Main body	TYD-6797	Direct circuit monitor Main body
Main body		—	—	TYD-6962	Set with sheet (main unit, surface sheet, protective sheet)	TYD-6960	Set with sheet (main unit, surface sheet, protective sheet)	TYD-6754	Set with sheet (main unit, surface sheet, protective sheet)		
Optional parts	Battery unit	—	— (Option to be decided)	—	—	—	—	TYD-6871	Battery for clock 1	TYD-6869	Battery for clock 1
Optional parts	Back light for replacement	—	Refundable product	—	Refundable product	—	Refundable product	—	Refundable product	—	Refundable product
Optional parts	Surface sheet	—	—	TYD-6735	Surface sheet	TYD-6735	Surface sheet	TYD-6833	Surface sheet (for DM-10WF)	—	—
Optional parts	Protection sheet	—	(To be decided)	TYZ-5929	Protective sheet	TYZ-5929	Protective sheet	TYZ-6778	Protective sheet for screen 1 sheet (for DM-10WF)	TYD-6812	Protective sheet for screen 1 sheet (for DM-7WS)

Drawing tool type (Common to DM-12WK2B, DM-12WD4, DM-12WK2, DM-10WF, DM-7WS)

Item	Name	Specifications	OS
ScreenWorks-T	TJD-6183	Japanese version	Windows 2000/XP 32 bit edition/Vista 32 bit edition/7 32 bit edition Japanese version
ScreenWorks-TE	TJD-6184	English version	Windows 2000/XP 32 bit edition/Vista 32 bit edition/7 32 bit edition
Screen helper 12	TJD-6854	Japanese version	Windows 2000/XP/Vista/7 32 bit edition Japanese version Excel 2003/2007/2010

＊DM-12WK2B, DM-12WD4 and DM-12WK2 are scheduled for sale starting December 2015.
＊Windows 2000/XP/Vista/7,Windows XP Embedded,Windows Embedded Standard are the registered trademarks of U.S. Microsoft Corp.

General purpose operation panel

Contributes to startup time reduction for production equipment as well as moveable efficiency improvement with an array of operation panels optimum for equipment size

General purpose operation panel series

- FP-12XXGK (12-inch display)
- FP-07XXGS (7-inch display)
- FP-06CGK (6-inch display)

Employs a touch panel display (excluding FP-06CGK) which directly shows the desired equipment information.

High functionality operation panel with built-in support tools for all types of controllers as well as operation panel functions, with a mounted panel computer on the display.

Main features

1. Operation panel function
- Standardly equipped with the necessary button switches and lamps for equipment operation.
- Button switches and lamps can be added if needed.

2. PLC tool function
- SFC, FBD and LD circuits can be displayed and monitored.
- The safety circuit can be displayed and monitored.
- The I/O drawing can be displayed.
- If an error occurs, it can be tracked to each affected area using only screen operations.

3. Motion tool function
- Present value monitor and parameter settings can be performed for MCML, MC1K, etc.
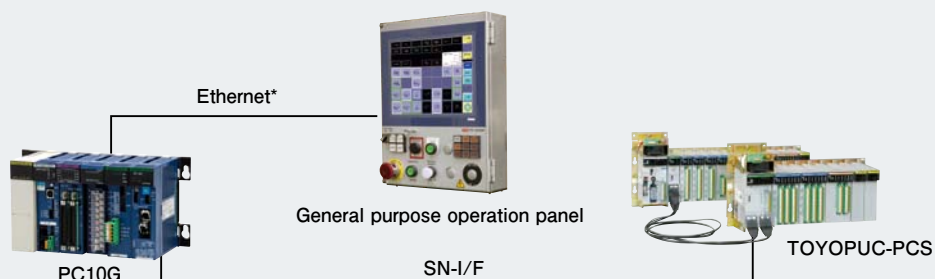
Ethernet*

General purpose operation panel

PC10G

SN-I/F

TOYOPUC-PCS

∗MTTR(Mean Time To Repair): The average time needed to return a faulty component or system to its proper operation
∗Ethernet is a registered trademark of Fuji Xerox.

FP-12XXGK specification list

		FP-12XXGK-S1 (General equipment specifications)	FP-12XXGK-S2 (Robot equipment specifications)
Buttons	Selection switch	○ (AUTO/MANU.)	○ (CONT./MANU.)
	START/ RESET START	Mounting when needed by customer (wiring only)	○
	CONT. OFF	Mounting when needed by customer (wiring only)	○
	EXECUTE	○	
	Buzzer button	Mounting when needed by customer (wiring only)	
	EMERGENCY STOP	○	
	MASTER ON	○	
	RETURN	Mounting when needed by customer (wiring only)	
	Operation power ON/OFF switch	Mounting when needed by customer (wiring only)	
Lamps	POWER	○	
	RUN	○	
	NO PART	Mounting when needed by customer (wiring only)	○
	FULL PARTS	Mounting when needed by customer (wiring only)	○
	DOOR OPEN	○	
	GENERAL FAULT	○	
	Returnable	NONE	
	Automatic robot operation	NONE	○
	TEACH-IN	NONE	○
Others	Buzzer	Mounting when needed by customer (wiring only)	
	Paint color	Cream color (C17)	

Type

Series name		How to operate	Language	Specifications
FP-12XXGK	—	R	E	S1

No symbol : Japanese
E : English
C : Chinese

R: Right-hand specification
L: Left-hand specification

FP-12XXGK: 12-inch general purpose operation panel with global compatibility, along with correspondence to emergency stop lockout

No symbol: machine specifications
S1: General equipment specifications
No MPG connector
No return button
No display power
S2: Robot equipment specifications
No MPG connector
No return button
No display power

External drawing
External dimensions: H430×W330×D100 mm

330
430

Drawing tool	TJD-6100	Helper 3 2002	Japanese
	TJD-6101		English
	TJD-1021	Screen mate 5	Japanese
	TJD-1022		English
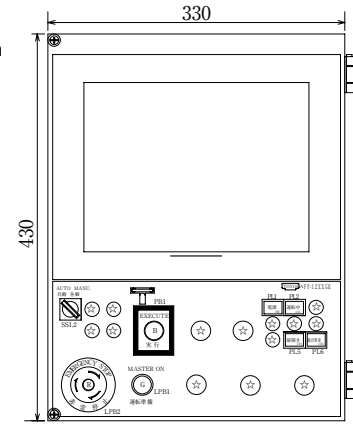
FP-07XXGS specification list

	Type	FP-07XXGS
Buttons	Selection switch (CONT./MANU.)	○
	START/RESET START (Illuminated type)	○
	CONT. OFF	○
	EXECUTE	○
	FAULT RESET	○
	EMERGENCY STOP (illuminated type)	○ (with lockout mechanism)
	MASTER ON (illuminated type)	○
Lamps	POWER	○
	RUN	○
	GENERAL FAULT	○
	DOOR OPEN	○
	NO PART	○
	FULL PARTS	○
Others	Paint color	Cream color (C17)

Type

Series name		Connection		Shape	How to operate	Language
FP-07XXGS	—	D	—	O	R	E

D: Device network specifications

No symbol: Box specifications
O: Open frame specifications

R: Right-hand specification
L: Left-hand specification

No symbol : Japanese
E : English
C : Chinese

External drawing
External dimensions: H330×W235×D100 mm

235
330

Drawing tool	TJD-6854	Screen helper 7/12	Japanese
	TJD-6183	ScreenWorks-T	Japanese
	TJD-6184		English
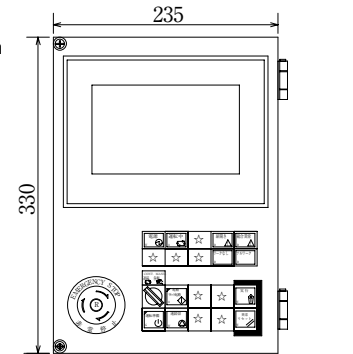
FP-06CGK specification list

		FP-06CGK-D-※
Buttons	Selection switch (AUTO/MANU.)	○
	START/RESET START	Mounting when needed by customer (wiring only)
	CONT. OFF	Mounting when needed by customer (wiring only)
	EXECUTE	○
	EMERGENCY STOP	○
	MASTER ON	○
	RETURN	Mounting when needed by customer (wiring only)
	Alarm buzzer	Mounting when needed by customer (wiring only)
Lamps	POWER	○
	RUN	○
	NO PART	Mounting when needed by customer (wiring only)
	FULL PARTS	Mounting when needed by customer (wiring only)
	DOOR OPEN	○
	GENERAL FAULT	○
	START/RESET	Mounting when needed by customer (wiring only)
	MASTER ON	○
	Returnable	Mounting when needed by customer (wiring only)
Others	Buzzer	Mounting when needed by customer (wiring only)
	Paint color	Cream color (C17)

Type

Series name		Connection		How to operate	Language
FP-06CGK	—	D	—	R	E

D: Device network specifications
IO: IO specifications

R: Right-hand specification
L: Left-hand specification

No symbol : Japanese
E : English
C : Chinese

External drawing
External dimensions: H255×W280×D120 mm

280
255

Drawing tool	TJD-6075	Screen helper 2 2002	Japanese
	TJD-6076		English
	TJD-1021	Screen mate 5	Japanese
	TJD-1022		English
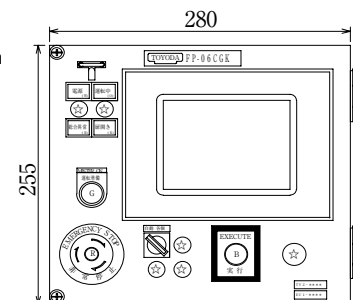
Safety PLC

Conformity to the international safety standards broadens and secures workshop safety dramatically

- Safety PLC ensures worker's safety and contributes to the productivity of a plant.
- Better machine productivity is achieved by safety circuit visualization by Safety PLC.
- Global standard level machine safety is realized by the international safety standards conformed safety PLC.
- Safety PLC TOYOPUC-PCS/PCS-J series covers large-sized to small machine.
- TOYOPUC-Plus Safety creates the optimal safety system through decentralized layout

What is safety ?

1.View of conventional safety

Safety is that an accident and disaster must not happen.
To pay attention and follow correct operations strictly.

→ Safety control

2.View of the present safety (Europe and the U.S.)

Safety is the status that "Hazard (risk) must be minimum status."
To estimate equipment risk and conduct safety processing.

→ Risk control

What is "Risk is controlled" ?

"Risk is controlled" means "There is no unacceptable risk"

```
Start
  ↓
Specify the scope of target machine
and specifications
  ↓
Hazard identification        Additional protection
  ↓                          measures
Estimate the Risk              ↑
  ↓                          Protection measures by
Evaluate the Risk            safety protection
  ↓                            ↑
There is no                  Inherently safe design
unacceptable risk?  NO ────────┘
  ↓ YES
Warning the user about
residual risk
  ↓
Completion
```
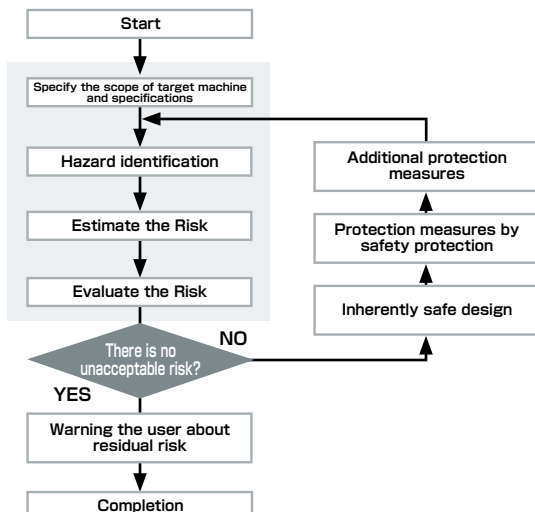
What is the International Safety Standards ?

The origin of International Safety Standards is the Machine Directive from European Union

1. Machinery Directive

In EU, if someone designs, manufactures, supplies, purchases or uses a machine, must observe the Directive.
(EU countries must match their lows to the Directive)

2. International Safety Standards about a Safety PLC

1 IEC61508 1-7 (2010)

Functional safety of electrical/electronic/ programmable electronic safety related system
Safety category   SIL1-4

2 IEC13849-1 (2008)

Safety of machinery Safety-related parts of control systems
Performance Level   a - e

→ A Safety PLC must conform to these two standards and acquire the certifications

What is Safety Integrity Leve (I SIL)? (IEC 61508)

IEC61508 specifies SIL (Safety Integrity Level) from 1 to 4.
About SIL, there are two-kinds, the low demand mode, and the high demand/continuous mode.
In FA field, usually use the high demand/continuous mode. In this case, SIL is specified by PFH (average of dangerous failure rate per hour).

SIL	Average of dangerous failure rate per hour
1	$10^{-6} \leqq \times < 10^{-5}$
2	$10^{-7} \leqq \times < 10^{-6}$
3	$10^{-8} \leqq \times < 10^{-7}$
4	$10^{-9} \leqq \times < 10^{-8}$

Fault probablity of the dange side is once every few thousand years

SIL4 is applicable for nuclear-power-station level.

Safety PLC architecture

1. Hardware and software are redundant (Redundant configuration like A+B)
2. Diagnostic function (System self-diagnosis and device connection diagnosis are always implemented)
3. Mutual check (operation check between A and B)
4. When an error detected, all outputs are shutdown instantly.

Basic configuration

PCwin

PCwin-Safe2

The same operation manners as a control PLC

TOYOPUC control PLC

TOYOPUC-PCS

TOYOPUC-PCS-J

TOYOPUC-Plus Safety
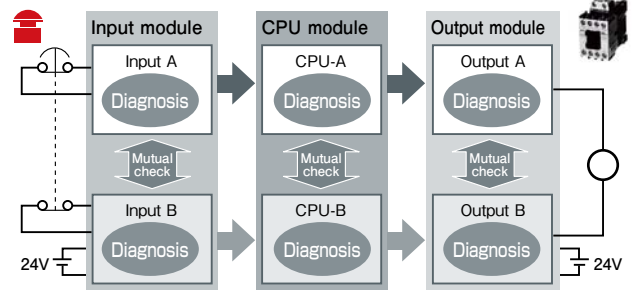
I/O signal transfer and receipt by communication
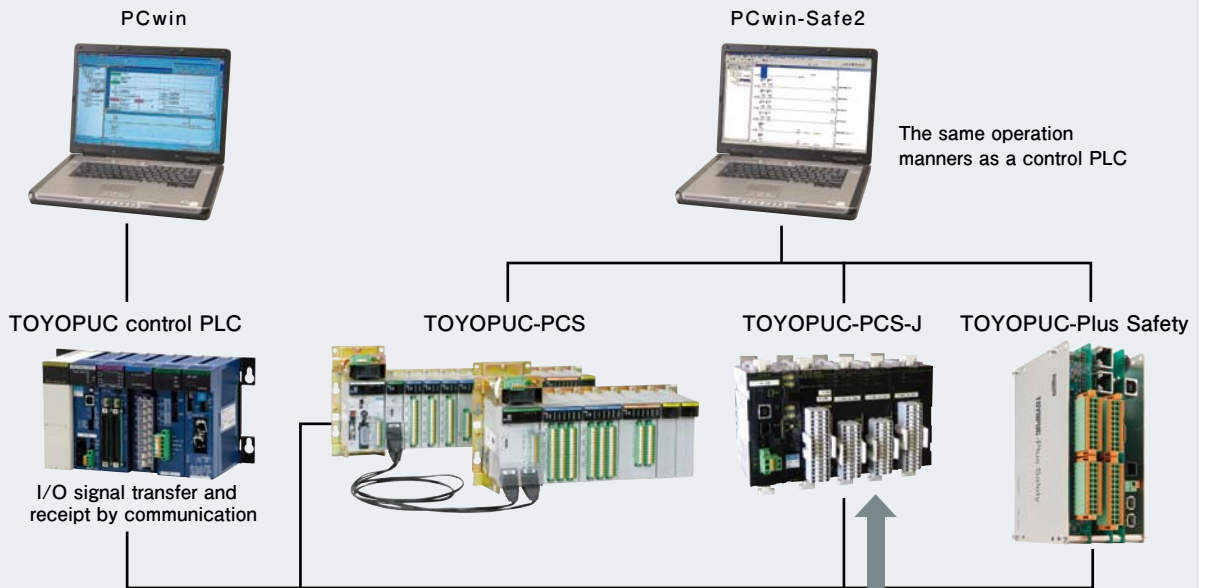
Zero wiring mistake

Wirings are changed to software programming, and circuit standardization by FBD
Signal transmission/reception by control PLC and communication (SN-IF)

Shorter design time and adjustment time

A program development by same manners as standard PLC programming

Function Block Digram for an emergency stop circuit

Emergency stop Function

E-Stop button input

Relay EDM Input
(Read back)
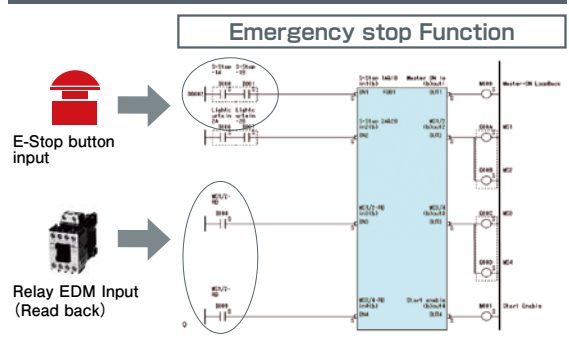
TOYOPUC-**PCS**

The Safety PLC "TOYOPUC-PCS"
realized the global top level processing
speed and user-friendly operations

- The safety software circuits has been realized by the redundancy logic circuits.
- Short E-Stop reaction time by hi-speed processing time and space saving has been realized.
- More reliable safety circuit program is available by fault detection function and shorten design lead time.
- Down-sizing of safety control circuit and standardization are realized by FBD function
- Field wiring reduction by Safety-networking and safety signal communication.
- MTTR improvement by employment of control visualization technology.
- A gateway module is provided to connect TOYOPUC-PCS to various opennetworks.
- Short-circuit protection and better noiseproofing thanks to electrical isolation by optical fiber communication

Scan and response time of TOYOPUC-PCS

High speed scanning

Realize the high speed Scan speed within a relay-circuit response time

Relay circuit

20～30ms
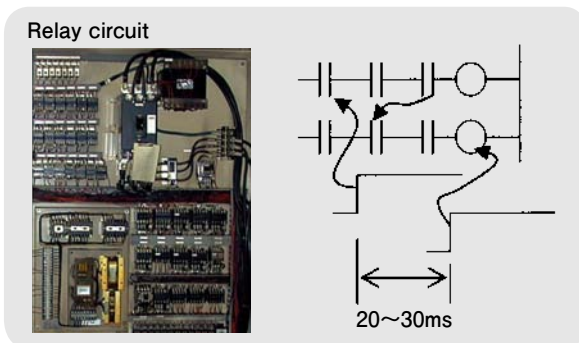
TOYOPUC-PCS scanning speed

TOYOPUC-PCS   9.5ms

TOYOPUC-PCS realizes the high speed Scan speed within a relay-circuit response time

High speed response

17ms response time from an emergency stop signal input to an output OFF.
(stand-alone system at semiconductor output)

E-Stop button

Light curtain

TOYOPUC-PCS component modules list

CPU, Remote I/O module

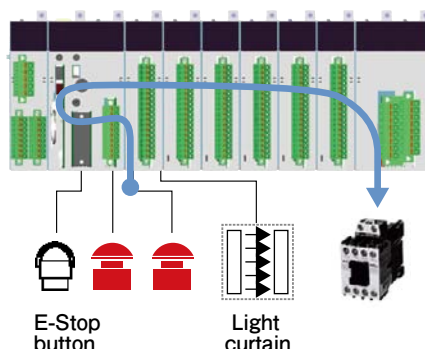| Name	Type		Item	Specifications	
CPU	TAC-6089	1	Program method	Stored program method	
Current, Weight 180mA, 400g		2	Program control method	Cyclic operation method	
		3	Input/Output control method	Image resister method	
		4	Scanning speed	At the standalone 9.5 ms / scan	At the networking 18ms / scan
		5	Program capacity	12K words (Internal memory : 64KB) (TIP-5426)	
		6	Memory device	·CMOS-RAM ·Flash ROM	
		7	Battery	Rechargeable (Lithium secondary battery : 5 years life)	
		8	External Input/Output	128 points	
		9	Internal Output	2048 points	
		10	Display unit	Dot-matrix LED display unit Displays are changed by MOD and INC switches	
S-BUS	TAU-6098	1	Physical layer	Optical fiber cable method	
Safety communication master Current Weight 155mA 150g		2	Commun. speed	6Mbps	
		3	Max. commun. length	100m (inter-station) 1km (Total commun. length of between stations)	
		4	Max. stations	24 st. (Master Slave)	16 st. (Master Slave)
RMT-S	TAU-6102	5	Max. communication — All station total	1472 points (184 byte) = (32 Input+32 Output)×23 stations	1920 points (240 byte) = (64 Input+64 Output)×15stations
Safety communication remote satellite station Current Weight 220mA 360g			I/O points per 1 slave Input/output	32 points (4 byte) /32 points (4 byte)	64 points (8 byte) /64 points (8 byte)
		6	Network topology	Ring	
		7	Network layer	1	
		8	Commun. format	HDLC flame conformity	
		9	Check manner	CRC-CCITT	

I/O Module

No	1	2	3	4	5
Name	DI001	DI003	SPM002	DO002	DO003
Current Weight	65mA 160kg	100mA 320g	65mA 150g	55mA 320g	70mA 340g
Type	TAK-6090	TAK-6104	TAK-6177	TAK-6093	TAK-6108
Device	Photo coupler	Photo coupler	Photo coupler	FET / Relay	FET
I/O pointsnumber	4 Sink (−common) 4 Source (+common)	12 Sink (−common) 12 Source (+common)	8 Sink (−common)	2 Sink (−common) 2 Source (+common) / 2	12 Sink (−common) 12 Source (+common)
Voltage /Current	24VDC 5mA / point	24VDC 5mA / point	24VDC 5mA / point	24VDC 0.25A / point / 3A / point	24VDC 0.25A / point
Remarks	Dry contact points Input	Dry contact points Input	For Light curtain Inputs (−)common Input	Relay and FET mix Output	FET Output

Gateway module (usable for TOYOPUC-PCS, PCS-J and Plus Safety)

Name	Type		Item	Specifications			
SNGW-DL	TAF-6291	1	Stations	Master (TOYOPUC-PCS, PCS-J, Plus Safety) 1:1 Slave (Gateway side)			
Gateway DeviceNet*		2	Physical layer	RS-485			
		3	Communication cable (SN-I/F)	0.5mm² Twisted pair wires			
SNGW-CL	TAF-6293	4	Communication method	288kbps Asynchronous timing			
Gateway CC-Link*		5	Data linkage area	Bit area: Input/output=32/32 byte, Register area: Input/output=32/32 byte			
SNGW-PF	TAF-6295	6	Communication byte number — Communication type	Bit		Register	
				Input	Output	Input	Output
Gateway PROFIBUS*			DeviceNet	Max. 32 byte	Max. 32 byte	32 byte	32 byte
			PROFIBUS	Max. 32 byte	Max. 32 byte	32 byte	32 byte
			CC-Link	Max. 8 byte	Max. 8 byte	Max. 32 byte	Max. 32 byte

＊DeviceNet is a trademark of Open DeviceNet Vendor Association Inc.   ＊CC-Link is a registered trademark of Mitsubishi Electric Corporation.
＊PROFIBUS is a trademark of PROFIBUS Association.

TOYOPUC-PCS-J

JTEKT, leader in the field of safety, now offers a small-sized safety PLC with ultimate user-friendliness.

- ■ Realize down-sizing and easier using.
- ■ Safety circuits visualization
- ■ Realize top level program capacity and rapid response time in compact size.

I/O built-in CPU modules

Smallest configuration saving space at 75mm

Smallest configuration = 2 modules (75mm)

POWER   CPU-OP（MON）

Input/output combined I/O module

The ideale I/O configuration

SUB MON : 8 points(input)/6 points(output)
S-STP(3 types) : 6 points(input)/4 points(output)

Monitor display of the safety circuit. MTTR is dramatically reduced as circuit drawings and a tester are no longer necessary.

MTTR

(index)

1

MTTR reduction
(Example : JTEKT machines)

0.1

Relay circuit   Safety PLC
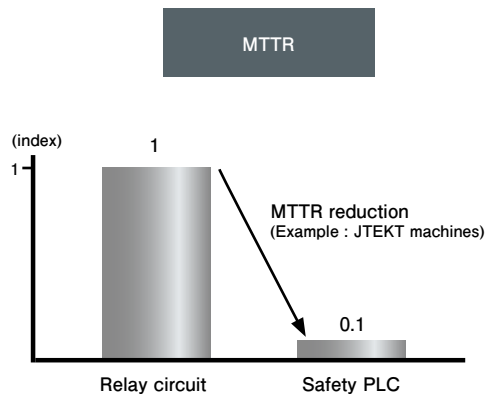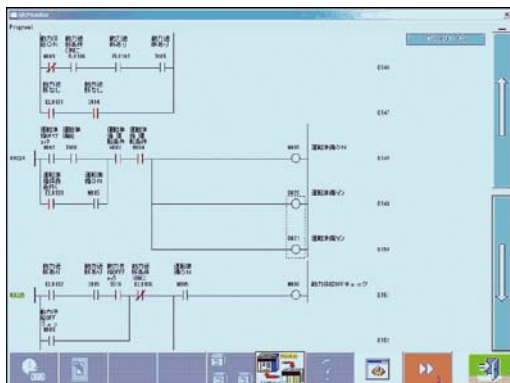
System component device list

CPU module (I／O built-in)

Part name	Model	Item			Specifications	
CPU-OP(MON)	TDC-6344	CPU section	1	Program method	Stored program method	
Consumption current：70mA Mass：260g			2	Program control method	Cyclic computing method	
			3	Input/output control method	Image register method	
			4	Scanning speed	15ms／scan	
			5	Program capacity	Source program size: max 16K words （Executed program size:64KB）	
			6	Hold memory	Program	Flash ROM
					Safety data	No memory held
			7	Battery	Rechargeable (Lithium secondary battery : 5 years life)	
			8	Maximum connection slot number	15-slot (including CPU-OP(MON))	
			9	External input/output points	256 points	
			10	Internal output points	2048 points	
			11	Display unit	7-seg LED display Display contents switch between MOD SW and INC SW operations	
		I／O section	1	Input/output format	Input	Photo coupler
					Output	FET
			2	I/O points	Input	2 points Source（＋common）
						6 points Sink（－common）
					Output	6 points Source（＋common）
			3	Voltage/Current	Input	24VDC,5mA／point
					Output	24VDC,0.5A／point
			4	Remarks	Double input 2 system（contact input×2） Double output 2 system	

I/O module

No		1	2	3
Part name		SUB MON	S-STP（E）	S-STP（LC）
Format Consumption current		TDK-6340 74mA	TDK-6346 68mA	TDK-6347 68mA
Input／output format	Input	Photo coupler	Photo coupler	Photo coupler
	Output	FET	FET	FET
I/O point	Input	2 points Source（＋common） 6 points Sink（－common）	2 points Source（＋common） 4 points Sink（－common）	6 points Sink（－common）
	Output	6 points Source（＋common）	4 points Source（＋common）	4 points Source（＋common）
Voltage/Current	Input	24VDC,5mA／point	24VDC,5mA／point	24VDC,5mA／point
	Output	24VDC,0.5A／point	24VDC,0.5A／point	24VDC,0.5A／point
Mass		200g	185g	185g
Remarks		Double input 2 system （connection input×2） Double output 2 system	Double input 2 system （connection input×2） Double output 2 system	Double input 2 system （light curtain input×2） Double output 2 system

No		4	5	6	7
Part name		S-STP（E/LC）	S-IN（E）	S-IN（LC）	S-OUT
Format Consumption current		TDK-6348 68mA	TDK-6356 62mA	TDK-6357 62mA	TDK-6358 74mA
Input／output format	Input	Photo coupler	Photo coupler	Photo coupler	－
	Output	FET	－	－	FET
I/O point	Input	1 points Source（＋common） 5 points Sink（－common）	8 points Source（＋common） 8 points Sink（－common）	16 points Sink（－common）	－
	Output	4 points Source（＋common）	－	－	16 points Source（＋common）
Voltage/Current	Input	24VDC,5mA／point	24VDC,5mA／point	24VDC,5mA／point	－
	Output	24VDC,0.5A／point	－	－	24VDC,0.3A／point
Mass		185g	190g	190g	250g
Remarks		Double input 2 system （connection input×2, light curtain input×2） Double output 2 system	Double input 8 system （connection input×2）	Double inaput 8 system （light curtain input×2）	Double output 8 system

TOYOPUC-Plus Safety

JTEKT, who holds the No.1 Safety PLC share in Japan, offers a smart board type safety PLC

- Creates optimal safety system by combining three types of units
- Achieves space-saving safety system through decentralized layout

Structure of TOYOPUC-Plus Safety

TOYOPUC-Plus Safety is comprised of 3 types of units.

Basic unit

Optional unit

IF unit
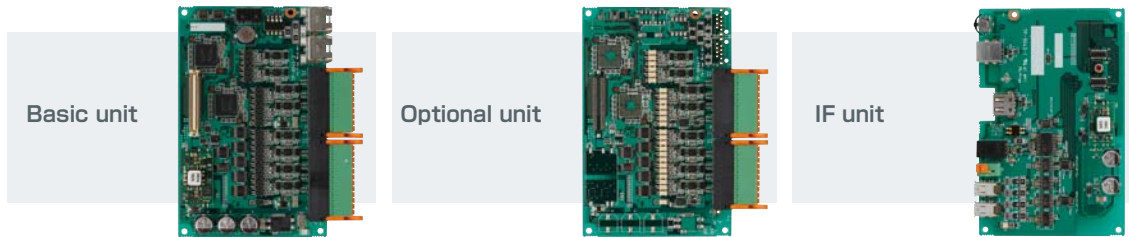
Example of separate placement using remote communication function of TOYOPUC-Plus Safety

■ Internal IO bus

Expandable up to max. 128 IO points. Communication distance has total extension of 50 m. Expansion IO module can be connected to up to max. 3 units.

Expansion IO module 3 | Expansion IO module 2 | Expansion IO module 1 | CPU module

OS+BS | OS+BS | OS+BS | OS+BS+IF
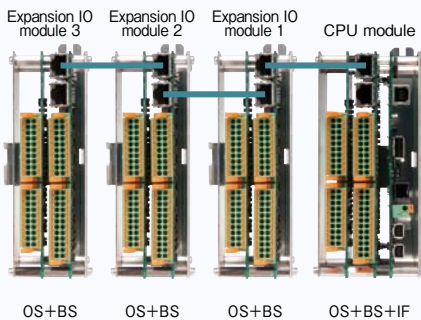
■ Remote IO: 2,048

Expandable up to max. 2,048 IO points. Communication distance is max. 50 m between stations. It can be expanded to max. 31 stations. Up to max. 31 remote satellite stations can be connected.

CPU | Remote satellite station 1 | Remote satellite station 2 | Remote satellite station 31

(OS+BS) + (OS+BS+IF) | BS+IF | (OS+BS) + (BS+IF) | OS+BS+IF
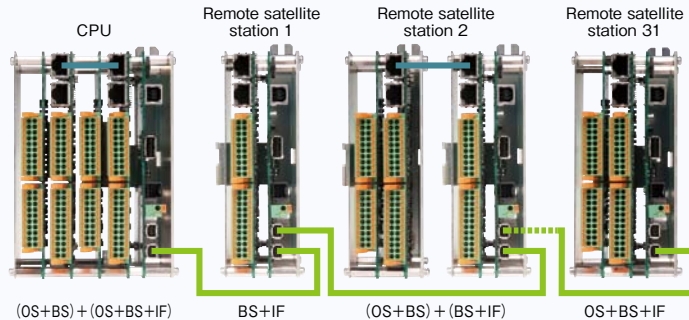
Easy wiring-saving using communication cables

Example of separate arrangement 1 (process wiring)

Possible to implement OKI-PON (just put down) around the device.

Realizes wiring-saving!

Process A

Control cabinet

Expansion IO CPU

Internal IO bus cable

Expansion IO

Occupied area reduction

Process B

Remote IO

Remote IO cable

to next process

Light curtain | E-Stop button

Easy wiring between equipment using communication cables!!
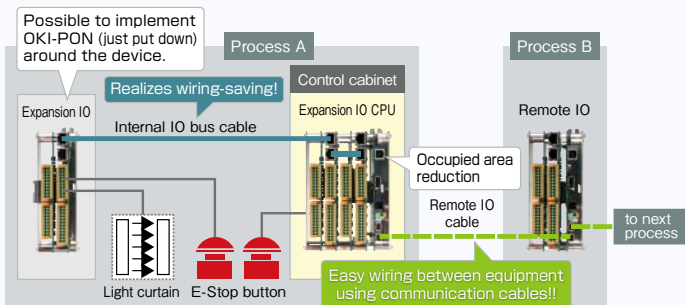
Example of separate arrangement 2 (wiring between control cabinet and operation panel)

Operation panel

Reduced amount of wiring through the installation of Plus Safety to the inside of the operation panel.

IO connection

Plus Safety Expansion IO

Internal IO bus cable

IO connection

Control PLC TOYOPUC-Plus + Plus Safety

Control cabinet
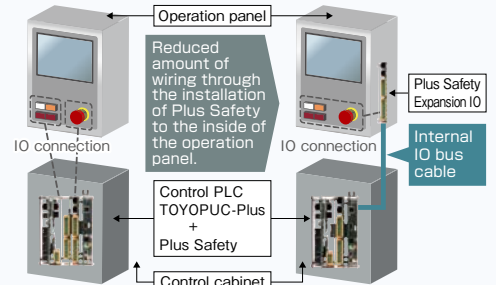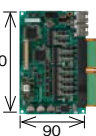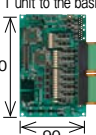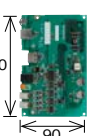
Performance specifications

No.	Item		Specifications
1	Safety category		ISO13849-1 PL e IEC61508 SIL3
2	Program method		Stored program method
3	Program control method		Cyclic calculation method
4	Input/Output control method		Image register method
5	Programming language		LD (+FBD)
6	Scanning time	Stand alone (No. of remote I/O satellite stations = 0 stations)	9.0ms (point <= 128 points)
		Remote 1 (No. of remote I/O satellite stations <= 3 stations)	10.5ms (point <= 256 points)
		Remote 2 (No. of remote I/O satellite stations <= 31 stations)	17.5ms (point <= 2048 points)
7	Response speed	Stand alone (No. of remote I/O satellite stations = 0 stations)	15.8ms (point <= 128 points)
		Remote 1 (No. of remote I/O satellite stations <= 3 stations)	18.8ms (point <= 256 point)
		Remote 2 (No. of remote I/O satellite stations <= 31 stations)	32.8ms (point <= 2048 point)
8	Program capacity (object size)	Safety	128KB (safety + general)
		General	
9	No. of input/output points (safety + general)		128 point (Stand alone)　2048 point (When using the remote)
10	Input specifications	Safety — Dry contact point input / Light curtain input / Semiconductor input	DC24V　Photo coupler input (-) common Input current: 5mA/point Dry contact point input depending on parameter, Selection of light curtain input and semiconductor input
		General	DC24V　Photo coupler input (-) common　Input current: 5mA/point
11	Output specifications	Safety	DC24V　FET output (+) common Output current: 0.5A/point, includes no-fuse short-circuit protection function
		General	DC24V　FET output (+) common Output current: 0.5A/point, includes no-fuse short-circuit protection function
12	General communication		Exclusive selection of SN-I/F and MODBUS*-RTU
13	Expansion IO bus	Internal IO bus	RS-485 3Mbps, Communication distance: total extension 50 m, LAN cable (Cat5), 8-core twisted pair cable Use shield cable for 1 m or more.　Expansion IO module: Max. 3 units
		Remote IO	RS-485 3Mbps, Communication distance: max. 50 m between stations Remote satellite station: max. 31 units
14	Peripheral unit I/F (connection to PCwin-Safe 2)		USB Full Speed（12 Mbps）
15	External Memory		USB flash memory
16	General communication		RS-485 total extension 1 km; however, use double shield cable for 3 m or more. SN-I/F (communication between TOYOPUC and Safety PLC 1: 1 communication) Conforms to MODBUS*-RTU (1: N communication correspondence)
17	Indicator (displayed with 3 original colors of LED)		Module display, status display, operation selection display
18	No battery needed	Clock	Holds for 15 days using super capacitor.
		Data backup	Backups of general register and fault history using FRAM

∗"MODBUS" is a registered trademark of Schneider Automation Inc.

Unit list

Unit name		Without stud or screw		With stud and screw		Specifications			Function				
		Name	Type	Name	Type	PNP	Input	Output	CPU	Remote satellite station*1	Expansion IO	Internal IO bus	Number that can be equipped with options
Basic unit	Safety	BS0016	TNC-6886	BS0016-01	BS0016-01	○	—	16 points	○(Motion is switched via settings)		Max. 3 units	1 unit
		BS0808	TNC-6887	BS0808-01	BS0808-01	○	8 points	8 points	○(Motion is switched via settings)		Max. 3 units	1 unit
		BS1204	TNC-6888	BS1204-01	BS1204-01	○	12 points	4 points	○(Motion is switched via settings)		Max. 3 units	1 unit
		BS1600	TNC-6889	BS1600-01	BS1600-01	○	16 points	—	○(Motion is switched via settings)		Max. 3 units	1 unit
	General	BN16-P	TNC-6894	BN16-P-01	BN16-P-01	○	16 points (No. of input/output points is set by the setting tool.)		○(Motion is switched via settings)		Max. 3 units	1 unit
Optional unit (possible to mount 1 unit to the basic unit)	Safety	OS0016	TNK-6890	OS0016-01	OS0016-01	○	—	16 points				
		OS0808	TNK-6891	OS0808-01	OS0808-01	○	8 points	8 points				
		OS1600	TNK-6892	OS1600-01	OS1600-01	○	16 points	—				
		OS1200	TNK-6893	OS1200-01	OS1200-01	○	12 points	—				
	General	ON16-P	TNK-6896	ON16-P-01	ON16-P-01	○	16 points (No. of input/output points is set by the setting tool.)					

IF unit	Name	Type	Name	Type	Mode SW	USB IF	USB memory	SN-I/F	Remote IO*1
	IF0000	TNF-6898	IF0000-01	IF0000-01	○	○	○	○	○
	IF00RS*2	TNF-6899	IF00RS-01	IF00RS-01	×	○	×	×	○
	IF00SA	TNF-6934	IF00SA-01	IF00SA-01	○	○	○	○	×
	IF00SJ	TNF-6935	IF00SJ-01	IF00SJ-01	○	○	×	○	×

Attached content of stud and screw attachment type

Unit name	Attached content of stud and screw attachment type
Basic unit	Metal stud 16 mm, male-female (STD 16x4) Metal stud 16mm, male-male (ST 16x4MM) Metal stud 8mm, male-female (ST 8x4MF) Metal stud 8mm, male-male (ST 8x4MM) 1 set each
Optional unit	Metal stud 16mm, male-female (STD 16x4) Metal stud 16mm, male-male (ST 16x4MM) 1 set each
IF unit	Metal stud 16mm, male-female (STD 16x4) Metal stud 16mm, male-male (ST 16x4MM) Metal stud 8mm, male-female (ST 8x4MF) 1 set each

∗1 It is necessary to select the IF unit that the remote IO port is mounted to.
∗2 IF unit only for remote satellite station.

Power source/base/parts

No	Name		Model	Specifications
1	Lithium battery		TIP-5426	CPU-OP（MON）rechargeable battery（spare parts）
2	BASE		TDR-6341	Base for connecting modules ※Bases do not come with each module. 　Make sure to purchase the base also if purchasing modules other than the power module.
3	POWER		TDV-6338	Power supply module Able to supply up to 9 modules including the CPU SN-I／F（ Interface with the control PLC） USB connection (for a programmer connection)
4	BOOSTER		TDV-6339	Auxiliary power supply module Needed, when using more than 9 sets of modules including the CPU Mounting between the 9th module and the 10th module

Programming tool PCwin-Safe2

No	Name	Model	Specifications
1	PCwin-Safe2 (Japanese)[CD-ROM]	TJA-2071	TOYOPUC-PCS/PCS-J/Plus Safety programming software （PCwin-Safe、PCwin-Safe-J integrated environment software） [CD-ROM Japanese version]
2	PCwin-Safe2 (English)[CD-ROM]	TJA-2073	TOYOPUC-PCS/PCS-J/Plus Safety programming software （PCwin-Safe、PCwin-Safe-J integrated environment software） [CD-ROM English version]
3	PCwin-Safe2 (Chinese) [CD-ROM]	TJA-6314	TOYOPUC-PCS/PCS-J/Plus Safety programming software （PCwin-Safe, PCwin-Safe-J integrated environment software） [CD-ROM Chinese version]
4	PCwin-Safe2 (French) [CD-ROM]	TJA-6287	TOYOPUC-PCS/PCS-J/Plus Safety programming software (PCwin-Safe, PCwin-Safe-J integrated environment software) [CD-ROM French version]

Safety-related conformed standards

TOYOPUC-PCS

No	Conformed standards	Outline
1	IEC 61508-1-7 : 2002	Functional safety of Electrical/Electronic/Programmable electronics safety-related system
2	ISO 13849-1 : 2008	Safety of Machinery Safety related parts of control system Part 1: General principles for design
3	EN 61131-2 : 2000	Programmable Controllers - Part 2 : Equipment requirements and tests
4	EN 50178 : 1998	Electronic Equipment for use in Power Installations
5	EN 61000-2-5/IEC 61000-2-5	Electromagnetic Compatibility (EMC)
6	NFPA79 : 2002	Electrical Standard for Industrial Machinery（NFPA :National Fire Protection Association ）

TOYOPUC-PCS-J, Plus Safety

No	Conformed standards	Outline
1	IEC 61508-1-7 : 2002	Functional safety of Electrical/Electronic/Programmable electronics safety-related system
2	ISO 13849-1 : 2008	Safety of Machinery Safety related parts of control system Part 1: General principles for design
3	EN 50178 : 1998	Electronic Equipment for use in Power Installations
4	EN 61000-2-5/IEC 61000-2-5	Electromagnetic Compatibility (EMC)
5	NFPA79 : 2006	Electrical Standard for Industrial Machinery（NFPA :National Fire Protection Association ）

General specifications

No	項　目	規　格	TOYOPUC-PCS	TOYOPUC-PCS-J	TOYOPUC-Plus Safety
1	Power supply		Rated : 24VDC　2.5A (tolerance : DC 21.6〜26.4V)	Voltage: 24VDC　Current:Max 1A (Allowable range: DC21.6〜26.V)	Voltage:24VDC Current:Max 0.3A (acceptable range:DC20.4〜28.8V)
2	Power consumption		60W	24W	7.2W (Total value of BS unit + IF unit + OS unit)
3	Ambient temperature		0〜50℃	0〜55℃	-10〜55℃
4	Relative humidity		30〜85%RH（No condensation allowed）		10〜95%RH（No dew accepts.）
5	Atmosphere		No corrosive gas allowed		
6	Vibration resistance	IEC 60068-2-6	Constant amplitude : 3.5 mm（peak） Constant accelelation : 9.8 m/s² （peak）Sweep:1 octave/min. 20 times in X,Y and Z directions		
7	Shock resistance	IEC60068-2-27	147m/s², 3 times in X, Y and Z directions		
8	Noise-proof	IEC61131-2 IEC61131-6 IEC61326-3-1	Signal line : ±1kV DC power line : ±1kV Function ground line : ±1kV		

TOYOPUC-PCS

400

40

100

Gateway Module

178

118

70

25

85

120

52

100

BASE5 TAR-6148 5slots 224

BASE8 TAR-6149 8slots 308

BASE12 TAR-6094 12slots 420

SNGW-DL
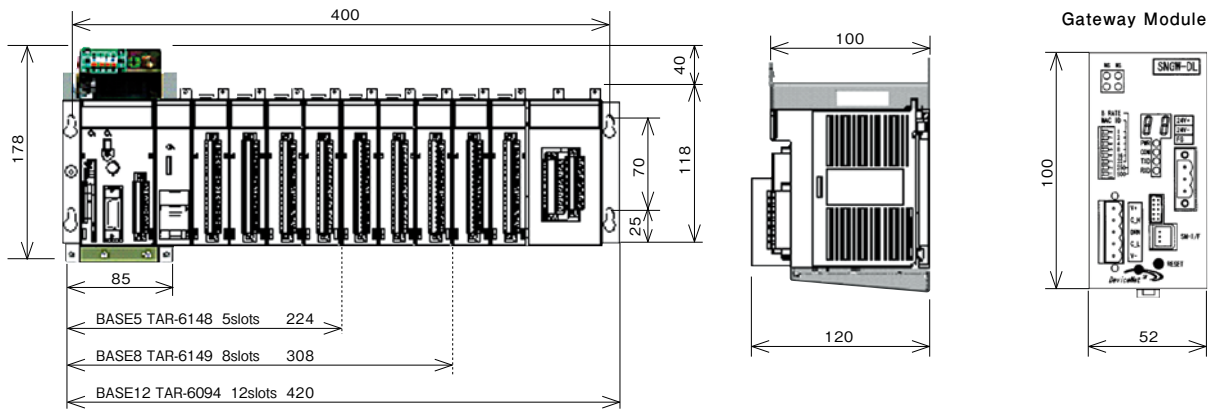
TOYOPUC-PCS-J

POWER	S-STP(LC)	CPU-OP(MON)
BOOSTER	S-STP(E/LC)	S-OUT
SUB MON	S-IN(E)	
S-STP(E)	S-IN(LC)	

30mm

45mm

Max.
28mm

80mm

100mm

TOYOPUC-Plus Safety

4

4

64

4-M3
Tapped hole

140

132

82

90

21

16mm 16mm 16mm 16mm 8mm 16mm

1.0mm 1.6mm 1.6mm 1.6mm 1.6mm 1.6mm

97.6mm

54
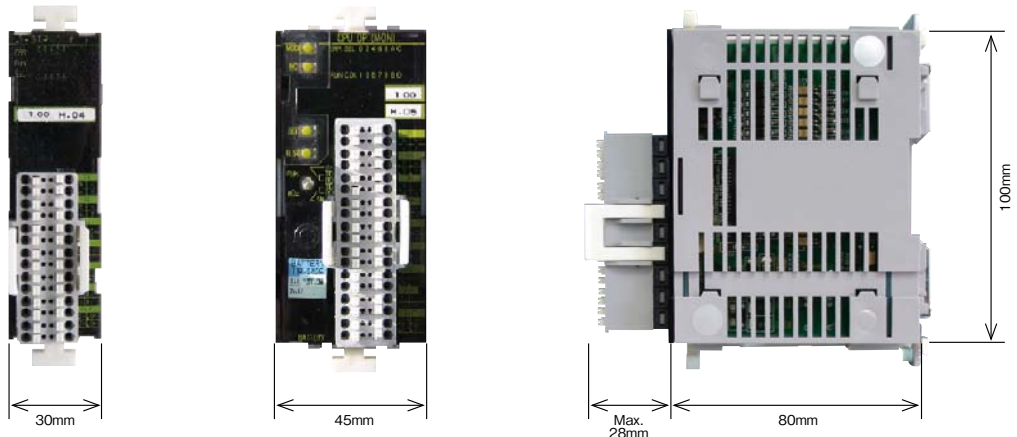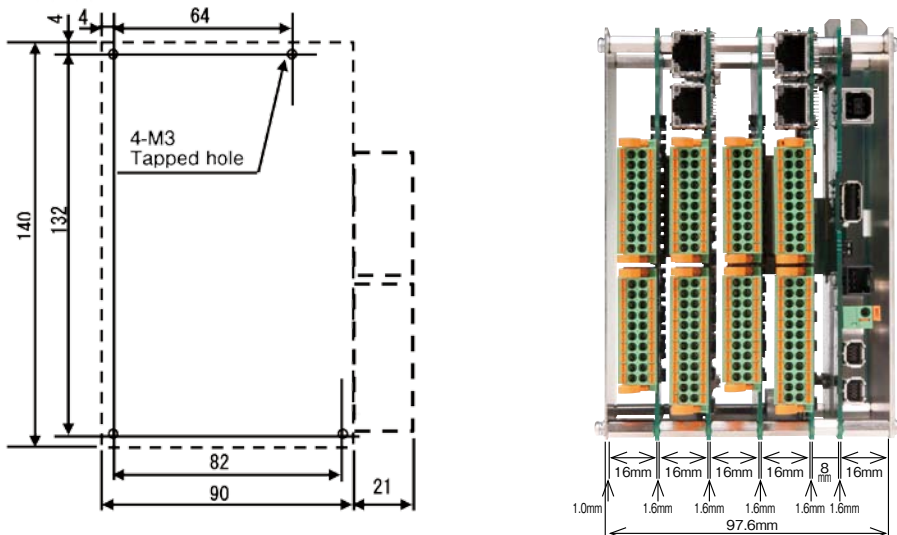
Motion controller

MCML/MCSSC

Motion system is best suited for multi-axis transfer and positioning

Application example 1

[Application] Workpiece transfer
[Structure] X,Y and Z 3 axes
+ turning 1 axis

Best suited for multi-axis positioning control, from small to large size.

Gantry loader

Application example 2

[Application] Pallet transfer
[Structure] X and Y 2 axes

Simplified teaching makes setting easy even when eventhere is a lot of positioning information
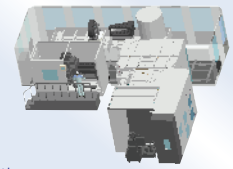
Transfer vehicle for FMS

	Item		Motion control
1	No. of control	Max. control axes	8 axes/module
		No. of modules	Max. 24 (MCML/MCSSC) Max. 2 (Plus MCML/Plus MCSSC)
2	Command type		SFC, ladder, FBD Possible to command from Plus-CPU
3	Control	Position control	○
		Speed control	○
		Torque control	○

＊FBD: Function Block Diagram ＊SFC: Sequential Function Chart

Motion system will solve the weak points of your current motions

Weak point 1

Both ladder circuits and motion programs are necessary for motion control.

Other company PLC and motion / Ladder circuit — Other company Amplifier / Motion program → MCML Plus MCML MCSSC Plus MCSSC — Ladder circuit only
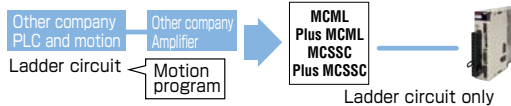
Solution1 Easy designing

Motion control can be realized just by using control circuits. Simpler PLC circuits due to an introduction of the function blocks. Motion control circuits using SFC allows movement of equipment to be expressed simpler and easier to-understand. Also, the movement can be changed with ease.

Weak point 2

Setting is necessary for controllers and servo amps.

Other company PLC and motion — Other company Amplifier → MCML Plus MCML MCSSC Plus MCSSC
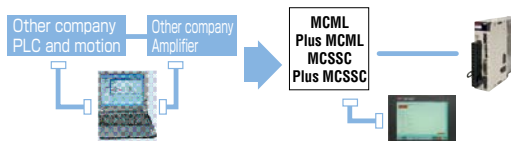
Solution2 Easy setup

All setup can be carried out on an operation panel (or peripheral tools). No need to switch computer specialty application tools or cables.

Weak point 3

Numerical values are necessary for setting position.

Other company PLC and motion — Other company Amplifier → MCML Plus MCML MCSSC Plus MCSSC

Position data 1253.5 setup
[1][2][5][3][.][5][Enter]

Capture
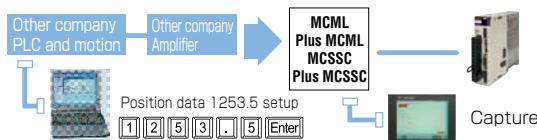
Solution3 Easy teaching

Thanks to the easy teaching function, just operate and press the read button. Current location can be easily set to a target location in one go.

Realizes motion control only using ladder circuits. In addition to this feature, being able to control with SFC and FBD allows you to design more easily.

PLC

Setting up controller in link parameters

MCML/Plus MCML/MCSSC/Plus MCSSC

Data held by the controller

| Position | Parameter |

MCML
Plus MCML
MCSSC
Plus MCSSC

Order of movement can be seen at a glance

circuit in question | Condition un-match can be known

Number Command place | Feed speed
POS1 PCOM 0043107 | FEED 0040000

Instructs movement in SFC (ladder)

Position setting

POS1 movement — Positioning FB

POS1

POS2 movement

Command sending
Positioning completion

Step execution complete flag (Select one of these)

Function block for MCML control reduces design processes

·At a glance where the equipment stops
·You can locate a cause of trouble on a screen with ease

When the equipment stops

No personal computers are necessary for setting up systems.
Easy setup from operation panel.

It is easy to set up motion from operation panel.

Operation panel

Manual pulse*1 generator

MCML
Plus MCML
MCSSC
Plus MCSSC

Servo amplifier

Servo motor

*1 MCML and MCSSC require [high speed counter] or [CT10].

It is easy to monitor motors; teaching of target position setting is also easily carried out through operation panel screens.

By operating in JOG mode or with a manual pulse generator, teaching can be done in one go.

Reading and modification of positioning information is possible

Move position with JOG operation from the operation panel

It is possible to read current value information with the "read" button

---
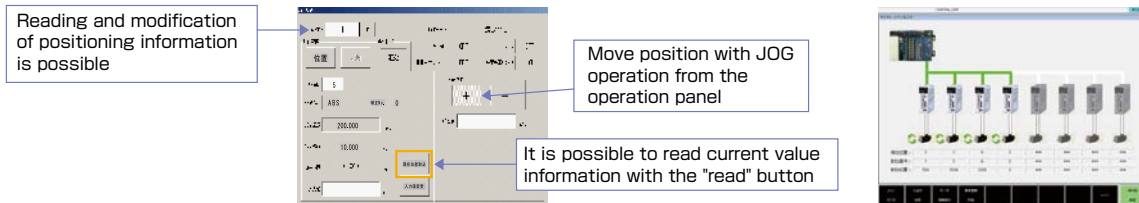
Functions		MCML	Plus MCML	MCSSC	Plus MCSSC
No. of control axes		1-8 axes			
Control mode		Positioning control			
		Speed control			
		Torque control			
Encoder method		Absolute type			
Positioning control	Positioning method	PTP control (each axis independent movement)			
	No. of points	700 points / axis, max. 5600 points (700x8 axes)			
Position command	Position command unit	mm, deg			
	Command setting unit	Can be set up by parameters from decimal 0 to 5 digits			
	Linear axis position command range	-2147483647 ~ 2147483647			
		-214748364.7 ~ 214748364.7			
		-21474836.47 ~ 21474836.47			
		-2147483.647 ~ 2147483.647			
		-214748.3647 ~ 214748.3647			
		-21474.83647 ~ 21474.83647			
Speed command	Speed command unit	mm/s, mm/min, deg/s, deg/min		mm/s, deg/s	
	Speed command range	0 ~ 2091752000			
Acceleration / deceleration setting	Acceleration / deceleration processing	Trapezoid acceleration / deceleration (setting can be made per acceleration/deceleration. 2-step changeable)			
	Acceleration / deceleration setting range	1 ~ 65535			
Setup data	Positioning control	Setting data (700 points/axis)			
	Position output	position output data (16 points/axis)			
	Control mode	Parameter (for controller and servo amplifier)			
Stroke		65536 rotations			
Communication	Method	MECHATROLINK-Ⅲ*		SSCNETⅢ*	
	Speed	100Mbps		50Mbps	
Compensation function		Index position compensation function			
Others		Unlimited long rotation function (endless operation function) / Jog feed function / Current restraint function			
Supported PLC		TOYOPUC-PC10G, PC10P, PC3JX・PC3JX-D, PC3J, PC3JL, PC3JD, PC3JG	TOYOPUC-Plus CPU	TOYOPUC-PC10G, PC10P, PC3JX・PC3JX-D, PC3J, PC3JL, PC3JD, PC3JG	TOYOPUC-Plus CPU
Motion setting tool		Motion Tool			

*MECHATROLINK is a registered trademark of MECHATROLINK Association.   *SSCNET is a registered trademark of Mitsubishi Electric Corporation.

TOYOPUC-PC10G／PC3J

Device	Name		Specification	Type	CSA/UL	CE	＊
PC10G	PC10G-CPU		Memory 180K words (60K×3), FL-net/Ethernet＊/FL remote (selected by a parameter) 2port, SN-1/F/PC-LINK/CMP-LINK (selected by a parameter) built-in 1port, peripheral port available for USB2.0	TCC-6353	○	○	
PC10P	PC10P		Memory 180K words (60K word x3), PCI bus, USB port for a peripheral device (PCwin) communication USB port for TOYOPUC BUS-EXP (EXPANSION BUS) communication, FL-net/Ethernet＊/FL remote 2 ports	TCC-6372	○	○	
FL remote I/O board	FL remote I/O board		FL remote I/O PNP Input/output 40/40	TCU-6421	○	○	
		Connecter terminal block	One set: 1 unit for input 50 pins and 1 unit for output 60 pins	TRS-5104			
Dedicated PC10P expansion module	BUS-EXP（EXPANDED BUS）		USB port for PC10P communication　SN-I/F, PC-LINK, CMP-LINK 1 port	TCU-6367	○	○	
	PlusBUS-EX		Special expansion module for PC10P. Supports use of Plus series options	TCU-6900	○	○	
PC3JX	PC3JX-CPU		Memory: 48K words (16K words×3)　PC/CMP/SN-IF/MODBUS/SIO (2 ports)	TCC-6901	○	○	
	PC3JX-D-CPU		Memory: 48K words (16K words×3)　PC/CMP/SN-IF/MODBUS/SIO (2 ports)　DeviceNet＊ (1 port)	TCC-6902	○	○	
PC3J CPU module	PC3J-CPU		Memory 48K-word(16K×3)+PC/CMP, 3 programs available	TIC-5339	○		＊
	Option	PC3J-CPU PC／CMP	CPU built-in option PC-link or CMP-link is available	TIU-5366			＊
	PC3JL-CPU		Memory 48K-word(16K×3)+PC/CMP(2port), 3 programs available	TIC-5783	○		＊
PC3JG	PC3JG-P-CPU		Memory 180K-word(60K×3) Input(-) common32points (5mA),output(+) common16points (0.3A)+output(+) common16points (0.05A), SN-I/F, PC, CMP(1port), DLNK-M2 function	TIC-6088	○	○	＊
	PC3JG-CPU		Memory 48K-word(16K×3) Input(+) common32points (5mA),output(-) common16points (0.3A)+output(-) common16points (0.05A), SN-I/F, PC, CMP(1port), DLNK-M2 function	TIC-6125	○	○	＊
Power module	POWER1		Input 85-264VAC, Output 5VDC 4A	THV-2747			
	POWER2H		Input DC24V Output DC5V 5A	THV-6374	○	○	
Selector module	SELECTOR		For setting of rack No. and I/O address	THU-2765	○	○	
Base			For mounting CPU or selector,				
	8 slot base		8 miseellaneous modules, 1 I/O connector	THR-2766	○	○	
	8 slot base (2)		8 miseellaneous modules, 2 I/O connectors	THR-2872	○	○	
	6 slot base		6 miseellaneous modules, 1 I/O connector	THR-2813	○	○	
	4 slot base		4 miseellaneous modules, 1 I/O connector	THR-2775	○	○	
	2 slot base		2 miseellaneous modules, 1 I/O connector	THR-2814	○	○	
Selector base	8-slot selector base		Base only for 8-slot expansion with built-in selector function, 2 I/O connectors	THR-5643	○	○	
	6-slot selector base		Base only for 6-slot expansion with built-in selector function, 2 I/O connectors	THR-5644	○	○	
	4-slot selector base		Base only for 4-slot expansion with built-in selector function, 2 I/O connectors	THR-5645	○	○	
I/O cable	I/O cable 0.5m		For connection between a CPU base or I/O base and another I/O base:0.5m	THY-2770	○		
	I/O cable 1m		For connection between a CPU base or I/O base and another I/O base:1m	THY-2771	○		
	I/O cable 1.5m		For connection between a CPU base or I/O base and another I/O base:1.5m	THY-5146	○		＊
	I/O cable 2m		For connection between a CPU base or I/O base and another I/O base:2m	THY-5045	○		＊
	I/O cable 2.5m		For connection between a CPU base or I/O base and another I/O base:2.5m	THY-5689	○		＊
	I/O cable 3m		For connection between a CPU base or I/O base and another I/O base:3m	THY-2995	○		＊
I/O branch module			For connection of 3 or more beses	THU-2774	○		
Input/Output module	Input	IN-11	100VAC input, 16 points	THK-2749			
		IN-12	24VDC input, 16 points	THK-2750	○	○	
		IN-22D	24VDC input, 32 points	THK-2871	○	○	
		IN-22H	24VDC input, 32 points, high speed input, free screw terminal stand	THK-6831	○	○	
		IN-SW	Switch input, 16 points	THK-5977	○	○	
	Output	OUT-1	Triac output 8 points, 1A/points, 4A/8 points, 100-115VAC	THK-2751			
		OUT-3	Independent relay contact 8 points (240VAC/24VDC), 2A/point	THK-2931	○		
		OUT-11	Triac output 16 points, 0.5A/point, 2A/8 point, 100-115VAC	THK-2795		○	
		OUT-12	Relay contact output 16 points, 2A/point, 5A/8 points (240VAC/24VDC)	THK-2752	○	○	
		OUT-15	MOS FET output (−) common, 16 points, 1A/point, 4A/8 points	THK-2790	○		
		OUT-16	MOS FET output (＋) common, 16 points, 1A/point, 4A/8 points	THK-2791	○	○	
		OUT-18	Transister output (−) common, 16 points, 0.5A/point, 2A/8 points	THK-2753	○	○	
		OUT-19	Transister output (＋) common, 16 points, 0.5A/point, 2A/8 points	THK-2754	○	○	
		OUT-28D	Transister output (−) common, 32 points, 0.2A/point, 2A/16 points	THK-2870	○	○	
		OUT-29D	Transister output (＋) common, 32 points, 0.2A/point, 2A/16 points	THK-5025	○	○	
	Input/Output	I/O-328G	Input 32 points (5mA), Output 16 points (0.3A) + Output 16 points (0.05A) (−) common	THK-6905	○	○	
		I/O-329G	Input 32 points (5mA), Output 16 points (0.3A) + Output 16 points (0.05A) (＋) common	THK-6410	○	○	
Flat cable for I/O-329G	IO 2 - 004M		Flat cable 0.4m	TXY-6573	○		＊
	IO 2 - 010M		Flat cable 1.0m	TXY-6576	○		＊
	IO 2 - 016M		Flat cable 1.6m	TXY-6579	○		＊
	IO 2 - 022M		Flat cable 2.2m	TXY-6583	○		＊
	IO 2 - 030M		Flat cable 3.0m	TXY-6587	○		＊
Unit for I/O-329	Connector conversion unit		40P flat cable → conversion of non-screw terminal block	TXU-6086			＊

＊Produced on special order

● Products circled in the CSA/UL column are qualified products by CSA. Products marked "UL" are qualified products by UL.
● ○ Marked at CE column are CE approved products.
● ＊Marked at the column are oder-made products. Please ask detail delivery when you order.

Device		Name		Specification	Type	CSA/UL	CE	∗
Communication module	Multi-link	ML10		Supports PC/CMP (Supports 2-wire and 4-wire), M-NET, SIO and MODBUS∗	TCU-6903	○	○	
	High-speed PC link	HPC-LINK		625kbps, 32 station, 2,048 points, 1,792 bytes	THU-2758	○		
	2PORT FL/ET/RMT	2PORT-EFR		FL-net/Ethernet/FL remote (2port)	THU-6404	○	○	
	FL-net Ethernet	FL/ET-T-V2H		FL-net (version2), Ethernet interface	THU-6289	○	○	
	High-speed remote I/O	Master	RMT-I/O M	Master station, 625kbps Max. 31 satellites	THU-2756	○		
		Satellite	RMT-I/O S	Satellite	THU-2757	○		
	DeviceNet∗		DLNK-M2	Master station, 500/250/125kbps, 63 stations, 4,096 points	THU-6099	○	○	
			DLNK-S	Satellite, I/O terminal type, 500/250/125kbps, 512 points	THU-5441	○	○	
			DLNK-S2	Satellite, between-PC link type, 500/250/125 kbps, input and output 512 points respectively	THU-5563	○	○	
	Serial I/O	SC10		RS-232C, 0.3～115.2kbps, 2ch	TCU-6904	○	○	
Special module	High-speed counter	CT10		200kpps（PC input） 8Mpps（differential input）	TCK-6856			
	Analogue input	AD-10		−10～10V, 0～10V, 0～5V, 1～5V, 0～20mA, 4～20mA 8 points	TCK-6529	○	○	
	Analogue output	DA-1		1−5V, 4−20mA 2 points	THK-7931	○	○	∗
		DA-2		0−10V 2 points	THK-7932	○	○	
	PULSE output	PULSE OUT		Pulse output 1-axis easy positioning	THK-5109			
	Motion controller	MCML		Max. 8-axis positioning, MECHATROLINK-Ⅲ∗	TCI-6721	○	○	
		MCSSC		Max. 8-axis positioning, SSCNETⅢ∗	TCI-6805	○	○	

∗Produced on special order

Parts

Device	Name	Specification	Type	CSA/UL	CE	∗
Lithium battery	For PC10/PC3J-CPU	For TOYOPUC-PC10/PC3J/MX/PCS/PCS-J CPU, Coin-type secondary cell	T I P-5426			
	For CPU	For TOYOPUC-PC2/PC2J/L2 CPU, PC2FS	TXP-2789			
Connector	External connector for PC3JG and I/O-329G	A 40-pin square shape connector of soldering type (with a 40-pin resin enclosure)	T I P-5867			

TOYOPUC-PCk

Device		Name	Specification	Type	CSA/UL	CE	∗
CPU		PCk05-CPU	Program capacity 2,048 words Input: Built-in 8 points Output: Built-in 6 points (relay output)	TKC-6471	UL	○	
		PCk06-P-CPU	Program capacity 7,679 words Input: Built-in 20 points Output: Built-in 16 points (source output)	TKC-6472	UL	○	
Input/output module	Input	IN-k93	Input (10 points, DC12-24V)	TKK-6473	UL	○	
		IN-k14	Input (16 points, DC20-28V)	TKK-6474	UL	○	
	Output	OUT-k12	Output (16 points, DC12-24V, source)	TKK-6475	UL	○	
		OUT-k81	Relay output (8 points, DC6-27V, AC6-240V)	TKK-6478	UL	○	
	Input-output	I/O-k831	Input-output (input 4 points DC12-24V, relay output 3 point)	TKK-6476	UL	○	
Communication module	Device net Slave	kDLNK	Device net Slave	TKU-6477			
Connector with a cable			Connector with a cable for a 16-point modules 1m	TKY-6486			

TOYOPUC-PC3JT

Device			Name	Specification	Type	CSA/UL	CE	∗
CPU			PC3JT-CPU	Memory 48K-word(16K×3), CX/CMP link and PC/CMP link built-in	TIC-5994	○		
	Option	DLNK		Master station, 500/250/125kbps, 63 stations, 2,048 points	TIU-5996	○		
	Option	AS-i M		AS-i I/F	TIU-6026	○		
Input/Output module			PC3JT-I/O(＋)	16 points DC24V input 16 points MOS-FET output(+) common,0.1A/point, 1A/16 points	TIU-6212	○		
			PC3JT-I/O(−)	16 points DC24V input 16 points MOS-FET output(-) common,0.1A/point, 1A/16 points	TIU-6213	○		
Communication	FL-net, Ethernet∗		PC3JT-FL/ET-V2	FL-net I/F, Ethernet I/F	TIU-6021	○		
	High-speed PC link High-speed remote I/O		PC3JT-HPC	PC link : 625 kbps, 32 stations, 2048 points, 1792 bytes, 1 : N communication. Remote I/O : Master station 625kbps, 2048 points, selection of max. 31satellites, built in 2 port	TIU-6022	○		
	S-LINK		PC3JT-S-LINK	S-LINK interface made by Sunx	TIU-6025	○		
Special	Serial I/O		PC3JT-SIO	RS-232C, 0.3−19.2Kbps, 2ch	TIU-6024	○		
Cover			PC3JT cover	The cover for PC3JT	TIU-6027			
Base			PC3JT base2	The base for PC3JT	TIU-6146			

∗DeviceNet is a registered trademark of Open DeviceNet Vendor Association Inc.
∗AS-i is an open network of AS-international (AS-i association).
∗MECHATROLINK is a registered trademark of MECHATROLINK Association.
∗SSCNET is a registered trademark of Mitsubishi Electric Corporation.
∗Ethernet is a registered trademark of Fuji Xerox.
∗MODBUS is a registered trademark of AEG Schneider Automation Inc.

Device list

PCDL

Device			Name	Specification	Type	CSA/UL	CE	*
CPU			PCDL	Memory　16K words Built-in communication I/F：RS232C(PCwin)/MODBUS*-RTU（Slave） L1：FL-net L2：CMP-LINK/MODBUS*-RTU（Slave）/ Serial I/O(SIO) /PC-LINK/SN-I/F	TKC-6688	UL	○	
Base module	AC power supply base		D2-03B-1J	2 module base (AC power supply)	TKR-6689	UL	○	
			D2-04B-1J	3 module base (AC power supply)	TKR-6690	UL	○	
			D2-06B-1J	5 module base (AC power supply)	TKR-6691	UL	○	
			D2-09B-1J	8 module base (AC power supply)	TKR-6692	UL	○	
	DC power supply base		D2-03BDC1-1J	2 module base (DC power supply)	TKR-6693	UL	○	
			D2-04BDC1-1J	3 module base (DC power supply)	TKR-6694	UL	○	
			D2-06BDC1-1J	5 module base (DC power supply)	TKR-6695	UL	○	
			D2-09BDC1-1J	8 module base (DC power supply)	TKR-6696	UL	○	
Input/ Output module	DC input		D2-08ND3	8 points DC12/24V (+/-)common	TKK-6697	UL	○	
			D2-16ND3-3J	16 points DC24V (+/-)common	TKK-6698	UL	○	
			D2-32ND3	32points DC24V (+/-)common (connector type)	TKK-6718	UL	○	
	DC output		D2-08TD2	8 points Open collector output DC12/24V (+) common	TKK-6699	UL	○	
			D2-16TD2-3J	16 points Open collector output DC12/24V (+) common	TKK-6700	UL	○	
			D2-32TD2	32 points Open collector output DC12/24V (+) common (connector type)	TKK-6719		○	
	AC output		D2-08TA	8 points SSR output AC100V/200V	TKK-6701	UL	○	
Analogue module	Analogue input	Current input	F2-08AD-1	8ch/common, 4～20mA	TKK-6705	UL	○	
		Voltage input	F2-08AD-2	8ch/common, 0～5V／0～10V／±5V／±10V	TKK-6706	UL	○	
	Analogue output	Current output	F2-08DA-1	8ch, single end, 4-20mA	TKK-6707	UL	○	
		Voltage output	F2-08DA-2	8ch, single end, 0-5V/0-10V	TKK-6708	UL	○	
Communication module	M-NET		D2-02RM	M-NET specifications (8 stations, 256 points)	TKU-6728	UL	○	
	CUnet		D2-HSIO	CUnet specifications（64 stations, 4096 points）	TKU-6832			
Other modules	Expansion controller		D2-CM	Mounted on a base module CPU slot.	TKU-6702	UL	○	
	Expansion controller		D2-EM	Mounted at the right side of a base module.	TKU-6703	UL	○	
	Dummy panel		D2-FILL	Covering for empty slots	TKU-6704			
Programmer	Programming tool		PCwin (Ver.12 or more)	PC10/3/2/1 series・MX・PCDL Programmer	TJA-2032			
	Connecting cable		PCk connecting cable	D-SUB 9P⇔RJ12 conversion connector and RJ12⇔RJ12 Programmer connecting cable (2m) set	TKY-6485			

TOYOPUC-Plus

Device	Name	Specification	Type	CSA/UL	CE	*
CPU	Plus CPU	16K/48K words, Ethernet* / FL-net / FL Remote (selected by a parameter) 1port, PC/CMP/SIO/MODBUS* 1port, peripheral port available for USB2.0	TCC-6740	○	○	
Additional functions	Plus EX	Plus expansion mode (enabled when EX board is implemented) Ethernet* / FL-net / FL Remote 10Mbps / 100Mbps, EtherCAT* 100Mbps PC / CMP / SIO（RS422 / RS232C）/ SN- I / F / MODBUS*	TCU-6741	○	○	
	Plus EX2	Plus expansion mode (enabled when EX2 board is implemented) Ethernet* / FL-net/FL Remote / EtherNetIP 10Mbps/100Mbps, EtherCAT* 100Mbps PC/CMP/SIO（RS422/RS232C）/SN-I/F/MODBUS*	TCU-6858	○	○	
Communication	Plus EFR	Etherne*t / FL-net / FL Remote 10Mbps / 100Mbps, EtherCAT* 100Mbps	TCU-6743	○	○	
	Plus EFR2	Ethernet* / FL-net/FL Remote / EtherNetIP 10Mbps/100Mbps, EtherCAT* 100Mbps	TCU-6859	○	○	
	Plus DLNK-M	DeviceNet* master	TCU-6744	○	○	
	Plus CLNK-M	CC Link* master Ver 2.00 compatible	TCU-6824		○	
	Plus CLNK-S	CC Link* slave Ver 2.00 compatible	TCU-6830	○	○	
Motion	Plus MCML	Positioning / torque / speed control max. 8-axis MECHATROLINK-III*	TCI-6819	○	○	
	Plus MCSSC	Positioning / torque / speed control max. 8-axis SSCNETⅢ*	TCI-6884			
Input/output	Plus IO24/16P	24 inputs (5mA/24V, (-) common) 16 outputs (0.5A/24V, (+) common)	TCU-6742	○	○	
Cover	Plus cover	Cover for Plus	TCU-6779			
Bracket	BRA-DIN	Bracket mounting the DIN rail for Plus				

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● *Marked at the column are oder-made products. Please ask detail delivery when you order.

Communication terminal

Device		Name	Specification		Type	CSA/UL	CE	*
Communication terminal	Device Net*	DLNK TERMINAL40/24	Input 40 points, output 24 points	Input current 7mA/point, output 0.3A/point, 2 A/common	TFU-5423	○	○	
		DLNK TERMINAL32/32	Input 32 points, output 32 points		TFU-5424	○	○	
		DLNK TERMINAL00/64	Output 64 points		TFU-5425	○		
		DLNK TERMINAL8/8	Input 8 points, output 8 points	Input current 7 mA/point, output 0.5A/point, 2 A/common	TFU-5440	○		
		DLNK TERMINAL16/0	Input 16 points		TFU-5442	○		
		DLNK TERMINAL0/16	Output 16 points	Output 0.5A/point, 4A/common	TFU-5834	○		
		DLNK TERMINAL24/16	Input 24 points, output 16 points	Input 7mA output 50mA, 0.8A/common	TFU-5777	○		
		DLNK TERMINAL24/16P	Input 24 points, output 16 points (+) common		TFU-5918	○	○	
		DRMT-32/00	Input 32 points	Input 6mA/point Output 0.5A/point 4A/common with diagnostic function	TFU-6120	UL	○	*
		DRMT-00/32	Output 32 points		TFU-6121	UL	○	*
		DRMT-16/16	Input 16 points, output 16 points		TFU-6122	UL	○	*
		DRMT-32/00P	Input 32 points (+) common		TFU-6110	UL	○	*
		DRMT-00/32P	Output 32 points (+) common		TFU-6111	UL	○	*
		DRMT-16/16P	Input 16 points, output 16 points (+) common		TFU-6112	UL	○	*
	FL remote I/O terminal with diagnostic function	FRMT-32/00P	Input 32 points PNP		TCU-6405	○	○	
		FRMT-00/32P	Output 32 points PNP		TCU-6406	○	○	
		FRMT-16/16P	Input 16 points / Output 16 points PNP		TCU-6407	○	○	
	Switching hub	FE-SWH05	5 port switching HUB		TCU-6414	UL	○	
		FE-SWH08	8 port switching HUB		TCU-6415	UL	○	
	EtherCAT*I/O terminal with diagnostic function	EC-32/00P	Input 32 points PNP		TCU-6922	○		
		EC-00/32P	Output 32 points PNP		TCU-6923	○		
		EC-16/16P	Input 16 points / Output 16 points PNP		TCU-6924	○		
	EtherCAT* Branching slave	EC-03JS	3-port branching slave		TCU-6925	○		
		EC-06JS	6-port branching slave		TCU-6926	○		

*Produced on special order

Peripheral equipment

Device			Name	Specification		Type	CSA/UL	CE	*
Programmer			PCwin/PCwin-PCk	A software which uses a Windows*2000/XP/Vista/7 personal computer as a programmer (System software for PC10/PC3 J/ PC2/L2/PC1/MX/PCk/PCDL) A personal computer is not included.	(Japanese) CD-ROM	TJA-2032			
					(Japanese) CD-ROM License 5	TJA-2051			
					(English) CD-ROM	TJA-2031			
					(English) CD-ROM License 5	TJA-2054			
					(Chinese) CD-ROM	TJA-6233			
					(Chinese) CD-ROM License 5	TJA-6234			
					(French)*1 CD-ROM	TJA-6285			
					(French)*1 CD-ROM License 5	TJA-6286			
	Software option		Option 1*2 [Symbolic・FBD]	Calling FBD is enabled	(required for French, Czech and Russian versions) FD	TJA-6036			
					(required for French, Czech and Russian versions) FD License 5	TJA-6039			
			Option 2*2 [printing of the drawing style]	Printing of the drawing style is enabled	(required for French, Czech and Russian versions) FD	TJA-6042			
					(required for French, Czech and Russian versions) FD License 5	TJA-6045			
			PCwin A set with I/O drawing function expansion tool	PCwin[TJA-2032]+I/O drawing expansion tool [TXY-6351]	(Japanese) CD-ROM	TJA-6365			
				PCwin[TJA-2031]+ I/O drawing expansion tool [TXY-6351]	(English) CD-ROM	TJA-6366			
			KPA EtherCAT*Studio	EtherCAT* setting tool	Sentinel USB	TJA-6927			
	Hardware option		I/O drawing function expansion tool	For locking of I/O drawing creation & editing	Sentinel USB	TXY-6351			
			USB I/F cable	Connection cable between TOYOPUC and PCwin 3m (TOYOPUC 15P male - PC USB)		TXY-6266			
			PCk connection cable	Connection cable between TOYOPUC-PCDL, PCk and PCwin 2m (TOYOPUC-PCk modular 6P male - PC 9P female)		TKY-6485			
Motion Tool			Motion Tool	A software which uses a Windows*2000/XP/Vista/7 personal computer as a setting tool	(Japanese) CD-ROM	TJA-6821			
					(Japanese) CD-ROM License 5	TJA-6825			
					(English) CD-ROM	TJA-6882			
					(English) CD-ROM License 5	TJA-6883			

*1 FBD call and printing drawing style functions are not included. And does not support PCk system software
*2 FD is required, when using function blocks or printing of the drawing style with the PCwin French , Czech and Russian version.
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TOYOPUC-PCS

Device	Name		Specification	Type	CSA/UL	CE	＊
CPU	CPU		Memory 12K words Built-in SN-I/F(Communication with TPYOPUC-PC3 JG/PC10)	TAC-6089	○	○	
Input /output module	Input module	DI001	8 points (for Cat.4 : 4 points). dry contact input 24VDC	TAK-6090	○	○	
		DI003	24 points (for Cat.4 : 12 points) dry contact input 24VDC	TAK-6104	○	○	
	Output module	DO002	4 points (for Cat.4 : 2 points). semiconductor output 24VDC 0.25A /point ＋	TAK-6093	○	○	
		DO003	4 points (for Cat.4 : 2 points). semiconductor output 24VDC 0.25A /point ＋	TAK-6108	○	○	
	Input module for a light curtain	SPM002	8 points (Cat.4 : 4 points) 24VDC (-) common type (PNP output type for light curtain connection)	TAK-6177	○	○	
Communication module	S-BUS		Safety communication Master	TAU-6098	○	○	
	RMT-S		Safety communication remote Slave	TAU-6102	○	○	
Base	BASE5		5 slot base	TAR-6148	○	○	
	BASE8		8 slot base	TAR-6149	○	○	
	BASE12		12 slot base	TAR-6094	○	○	
Power supply filter	P-FLT		Power supply filter for CPU, RMT-S	TAU-6207	○	○	
Fan unit 2	FAN2		Cooling fan for CPU, RMT-S	TAU-6208	○	○	
Cover	BLANK		Cover for empty slot protection	TAU-6211	○	○	

TOYOPUC-PCS-J

Device	Name		Specification	Type	CSA/UL	CE	＊
CPU	CPU-OP（MON）		Memory 16K words Built-in SN-I/F (Communication with TPYOPUC-PC3 JG/PC10) 8 points (Cat.4 : 4 points) dry contact input 24VDC 6 points (Cat.4 : 3 points) semiconductor output 24VDC 0.5A /point	TDC-6344	○	○	
Power module	POWER		System power input 24VDC System power supply to each module USB I/F (for peripheral devices) SN-I/F communication port (communication with TPYOPUC-PC3 JG/PC10)	TDV-6338	○	○	
	BOOSTER		24VDC auxiliary power module The module should be mounted when the 10 or more modules including CPU. Mounting between 9th module and 10th module	TDV-6339	○	○	
Input/output module	Input/output module	SUB-MON	8 points (Cat.4 : 4 points) dry contact input 24VDC 6 points (Cat.4 : 3 points) semiconductor output 24VDC 0.5A /point	TDK-6340	○	○	
		S-STP(E)	6 points (Cat.4 : 3 points) dry contact input 24VDC 4 points (Cat.4 : 2 points) semiconductor output 24VDC 0.5A /point	TDK-6346	○	○	
		S-STP(LC)	6 points (Cat.4 : 3 points) dry contact input 24VDC 4 points (Cat.4 : 2 points) semiconductor output 24VDC 0.5A /point	TDK-6347	○	○	
		S-STP(E/LC)	6 points (Cat.4 : 3 points) contact input 24VDC 4 points (Cat.4 : 2 points) semiconductor output 24VDC 0.5A /point	TDK-6348	○	○	
	Input module	S-IN(E)	16 points (Cat.4 : 8 points) dry contact input 24VDC	TDK-6356	○	○	
		S-IN(LC)	16 points (Cat.4 : 8 points) contact input 24VDC	TDK-6357	○	○	
	Output module	S-OUT	16 points (Cat.4 : 8 points) semiconductor output 24VDC 0.3A /point	TDK-6358	○	○	
BASE	BASE		Base	TDR-6341	○	○	

TOYOPUC-Plus Safety

機　器	名　　称		仕　　様	形　式	CSA/UL	CE	＊
Base unit	Safety	BS0016	Safety I/O input 0 point output 16 points	TNC-6886	TÜV＊¹	○	
		BS0808	Safety I/O input 8 points output 8 points	TNC-6887	TÜV＊¹	○	
		BS1204	Safety I/O input 12 points output 4 points	TNC-6888	TÜV＊¹	○	
		BS1600	Safety I/O input 16 points output 0 point	TNC-6889	TÜV＊¹	○	
	General	BN16-P	General I/O 16 points (input/output by setting tool)	TNC-6894	TÜV＊¹	○	
Optional unit	Safety	OS0016	Safety I/O input 0 point output 16 points	TNK-6890	TÜV＊¹	○	
		OS0808	Safety I/O input 8 points output 8 points	TNK-6891	TÜV＊¹	○	
		OS1600	Safety I/O input 16 points output 0 point	TNK-6892	TÜV＊¹	○	
		OS1200	Safety I/O input 12 points output 0 point	TNK-6893	TÜV＊¹	○	
	General	0N16-P	General I/O 16 points (input/output by setting tool)	TNK-6896	TÜV＊¹	○	
IF unit	IF0000		Mode SW：○ USB IF：○ USB memory：○ SN-IF：○ remote IO：○	TNF-6898	TÜV＊¹	○	
	IF00RS		Mode SW：× USB IF：○ USB memory：× SN-IF：× remote IO：○	TNF-6899	TÜV＊¹	○	
	IF00SA		Mode SW：○ USB IF：○ USB memory：○ SN-IF：○ remote IO：×	TNF-6934	TÜV＊¹	○	
	IF00SJ		Mode SW：○ USB IF：○ USB memory：× SN-IF：○ remote IO：×	TNF-6935	TÜV＊¹	○	

＊Add "-01"to the end of the name/type when attaching studs and screws.
＊1 Currently submitted for certification

- Products marked with a circle in the CSA/UL column are products qualified by CSA. Products marked "UL" are products qualified by UL. Products marked "TUV" are products qualified by NRTL.
- ○ Marked at CE column are CE approved products.
- ＊Marked at the column are oder-made products. Please ask detail delivery when you order.

SN-IF gateway module

Device	Name		Specification	Type	CSA/UL	CE	＊
SN-IF Gateway module	Devicenet*	SNGW-DL	Transmission speed: 125k/250k /500k bps Number of transfers: bit area input/output = maximum 32bytes/maximum 32bytes Register area input/output = 32byte/32byte	TAF-6291	○	○	
	CC-LINK*	SNGW-CL	Transmission speed: 156k/625k/2.5M/5.0M/10.0Mbps Number of transfers: bit area input/output = maximum 32bytes/maximum 32bytes Register area input/output = 32bytes/32bytes	TAF-6293	○	○	
	PROFIBUS*	SNGW-PF	Transmission speed: 9.6k/19.2k/45.45k/93.75k/187.5k 500k/1.5M/3.0M/6.0M/12.0Mbps Number of transfers: bit area input/output = maximum 8bytes/maximum 8bytes Register area input/output = maximum 32bytes/maximum 32bytes	TAF-6295	○	○	

Parts for TOYOPUC-PCS/PCS-J

Device	Name	Specification	Type	CSA/UL	CE	＊
Lithium battery	Battery for TOYOPUC-PCS/TOYOPUC-PCS-J	Coin type lithium rechargeable battery for TOYOPUC-PCS/TOYOPUC-PCS-J	TIP-5426		○	
SN-I/F cable	SN-I/F CABLE 0.5m	SN-I/F cable for TOYOPUC-PCS-J Cable length: 0.5m Terminal A: AMP connector/Terminal B: Phoenix contact AI 1-10RD	TXY-6670	-	○	
	SN-I/F CABLE 1.5m	SN-I/F cable for TOYOPUC-PCS-J Cable length: 1.5m Terminal A: AMP connector/Terminal B: Phoenix contact AI 1-10RD	TXY-6671	-	○	
	SN-I/F CABLE 3.0m	SN-I/F cable for TOYOPUC-PCS-J Cable length: 3.0m Terminal A: AMP connector/Terminal B: Phoenix contact AI 1-10RD	TXY-6672	-	○	
	SN-I/F CABLE 3.0m(Free)	SN-I/F cable for TOYOPUC-PCS-J Cable length: 3.0m Terminal A: Terminal A: AMP connector/Terminal B: No connector	TXY-6673	-	○	

Peripheral equipment for safety PLC

Device	Name	Specification	Type	CSA/UL	CE	＊
Programmer	PCwin-Safe2 (Windows2000/XP/7)*	TOYOPUC-PCS/TOYOPUC-PCS-J Programming software (PCwin-Safe and PCwin-Safe-J integrated software) [CD-ROM Japanese version]	TJA-2071	-	○	
		TOYOPUC-PCS/TOYOPUC-PCS-J Programming software (PCwin-Safe and PCwin-Safe-J integrated software) [CD-ROM English version]	TJA-2073	-	○	
		TOYOPUC-PCS/TOYOPUC-PCS-J Programming software (PCwin-Safe and PCwin-Safe-J integrated software) [CD-ROM Chinese version]	TJA-6314	-	○	
		TOYOPUC-PCS/TOYOPUC-PCS-J Programming software (PCwin-Safe and PCwin-Safe-J integrated software) [CD-ROM French version]	TJA-6287	-	○	
	PCwin-Safe (Windows2000/XP)*	Programming software for TOYOPUC-PCS [CD-ROM Czech version]	TJA-6254	-	○	
	Option 1 [symbolic・FBD]	Option 1 software [Floppy disk English version] (This option is necessary for using PCwin-Safe function blocks in Czech, French, and Russian version)	TJA-6049	-	○	
Communication cable	USB I/F cable	Between TOYOPUC-PCS and a peripheral devices (personal computer) connection	TXY-6266	○	○	

Motion controller

Device	Name	Specification	Type	CSA/UL	CE	＊
Motion controller	TOYOPUC-MCML	Motion controller for TOYOPUC-PC10G and PC3JG, MECHATROLINK-Ⅲ*	TCI-6721	○	○	
	TOYOPUC-Plus MCML	Motion controller for TOYOPUC-Plus, MECHATROLINK-Ⅲ*	TCI-6819	○	○	
	TOYOPUC-MCSSC	Motion controller for TOYOPUC-PC10G and PC3JG, SSCNETⅢ*	TCI-6805	○	○	
	TOYOPUC-Plus MCSSC	Motion controller for TOYOPUC-Plus, SSCNETⅢ*	TCI-6884			
Manual pulse generator	JHC1MCA-□□	Manual operation box at hand for the positioning adjustment for each axis. Possible to directly connect to Plus MCML				
Servo amplifier	JSGDV-□□□	Servo amplifier for JTEKT motion system.		○	○	
Servo motor	JSGMJV type (middle moment small capacity) JSGMAV type (low moment small capacity) JSGMSV type (low moment medium capacity) JSGMPS type (middle moment small capacity) JSGMGV type (middle moment medium capacity)	Servo motor for JTEKT motion system.		○	○	

Motion controller setting tool

Device	Name	Specification		Type	CSA/UL	CE	＊
Motion setting tool	MOTION Tool (Supports MCML / MCSSC)	Software using Windows 2000 / XP / Vista / 7* personal computers as a setup tool	(Japanese version) CD-ROM	TJA-6821			
			(Japanese version) CD-ROM Licenses 5	TJA-6825			
			(English version) CD-ROM	TJA-6882			
			(English version) CD-ROM Licenses 5	TJA-6883			

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Model Number : TOYOPUC