

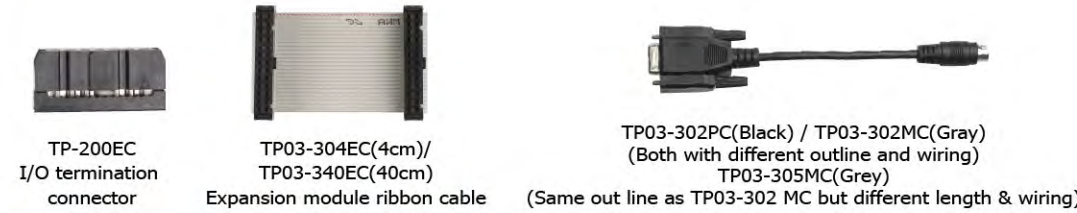
Unique Feature Unique Feature

1. Main units: 14/20/26/30/36/40/60 I/O's expandable to 256 digital I/O's and 60/10 (12 bit) analog I/O's.
2. Four programming languages: Ladder, IL (Instruction List), SFC and FBD are all available for TP03.
3. Program memory: 4 to 16k size, including basic and application instructions, such as : ADD/SUB/MUL/DIV, trigonometry as SIN/COS/TAN..., matrix input and 7-segment LED display output and PID control with floating-point calculations.
4. Three communication ports on the main unit, can be used to establish Networks up to a maximum distance of 1.2 Km as follows:
 - (1) Computer link: One PC as master can control up to 255 units of TP03 as slaves.
 - (2) Data Link: One TP03 as master can control other TP03, up to 15 units.
 - (3) Remote I/O: One TP03 as master can control up to 4 units of TP03 as slaves, each with max 36/24 I/O's.
5. PG port can be used to connect to other equipment or operator panels OP07/OP8.
- 6.2 high speed pulse output (Max 200KHZ) can be used easily to control servo drives.
7. Built-in high speed counter (Max 100KHZ) can be interfaced to encoders with precise pulses.
8. User program is stored in flash memory (M type) and EEPROM (H type). Battery back up for user data and RTC is included as standard.
9. TP03 series product have a standard height of 90mm.
10. Plugable terminals (H type) and DIN rail mounting enables simple installation and maintenance.
11. Profibus, Devicenet and Ethernet (TCP/IP) communication Facility with option cards.
12. TP02 expansion modules are suitable for use with TP03.
13. CE/UL certification.

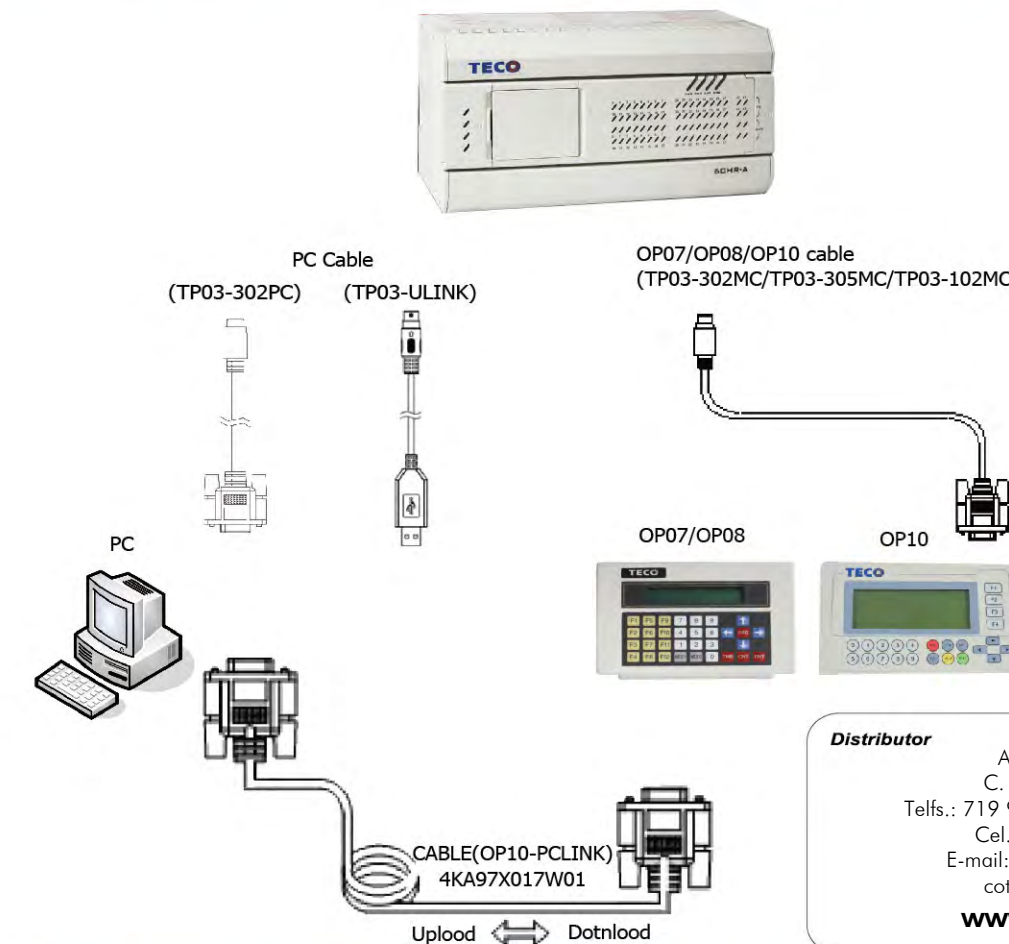
Interface & accessory list

Model	Accessory	Description	Type No.	Remark
Main module	included as standard	I/O termination connector	TP-200EC	install TP-200EC into the connector in the last expansion module in order to form a I/O loop for D-sub type for USB type
		Battery (for 5 years)		
		RS485 Built-in(H type only)		
		Standard cover for expansion card	TP03-0CV	
PC06	included as standard	Installation manual		
		1.8M cable(black)	TP03-302PC	
		1.8M cable(grey)	TP03-ULINK	
		Compact Disk	TP03-PC06	
OP07/OP08	included as standard	1.8M cable(grey)	TP03-302MC	
TP03 Expansion module	included as standard	4cm cable for expansion module	TP03-304EC	26 pins · only for TP03 expansion module
		PDA adapter	JNSWPDA	
OP08	Option	5M cable(grey)	TP03-305MC	Only for OP08
TP03 Expansion module	Option	40cm cable for expansion module	TP03-340EC	26 pins · only for TP03 expansion module
		1.8M cable(grey)	TP03-102MC	

Profile



System configuration



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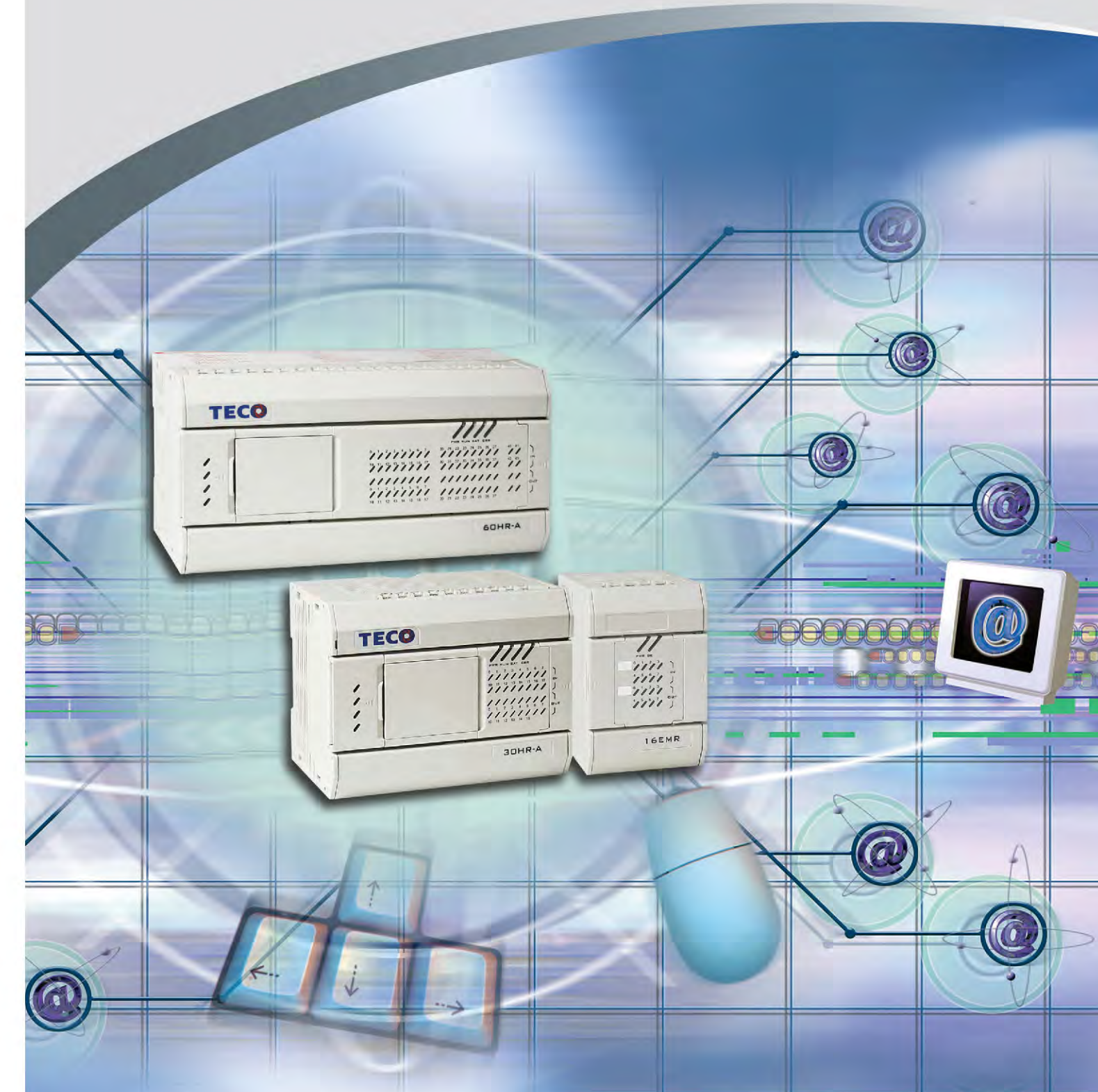
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Programmable Logic Controller

TP03 Series

TECO



TP03 Series

TP03 is the latest generation of PLC developed by TECO. The high-speed and high quality programmable logic controller has following features:

- Easy to install, maintain and program.
- Basic instructions scan time: 0.31 us /step (ANDB), 0.45 us/step (LD).
- High speed counters:(5-100KHZ) Single/Dual channel with Up/down, Set/Reset and Interrupt features.
- High speed communication ports.
- 1ms/10ms interrupt timer.
- Built-in RTC (Real Time Clock).(H type only).
- High speed pulse output function.
- RUN / STOP Switch.
- Two integrated external potentiometers on main unit.
- Various expansion modules such as A/D, D/A, Communication, etc.

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General specification

Item	Type	14S	20S	26S	36S	20M	30M	20H	30H	40H	60H		
Basic unit outline		Cyclic scanning of user program											
Operation control		Cyclic scanning of user program and input and output											
Input/ output		Ladder /IL(Instruction List)/SFC/FBD											
Program language		Ladder /IL(Instruction List)/SFC/FBD											
Digital I/O	Digital input	8	12	16	20	12	16	12	16	24	36		
	Digital output	6	8	10	10	8	14	8	14	16	24		
Expansion module	Digital module	Expandable to 80 points				Expandable to 128 points				Expandable to 256 points			
	Analog module	2x4AD+ & 1x2DA+ or 1x8AD & 1x2DA				1x4AD+ & 1x2DA+ & 7x8AD & 4x2DA				60 input channels /10 output channels			
Max Analog I/O		8 input channels /2 output channels											
Scan time	Basic instruction	ANB/ORB ...etc.: 0.62μs/ step				ANB/ORB ...etc.: 0.31μs/ step				ANB/ORB ...etc.: 0.36 ~0.45μs/ step			
		LD/AND/OR...etc.: 0.9μs/ step											
		Application instruction		126		134		144					
Digital I/O relay		X000~X377(256 points) / Y000~Y377(256 points)											
Relay and register	Auxiliary relay	General auxiliary relay: M0~M1535 (1536 points)				General auxiliary relay: M0~M7679 (7680 points) Data Link:M2000~M3023 Remote I/O:M4200~M4355,M4600~M4695 OP07/OP08:M1600~M1615							
		Special auxiliary relay: M8000~M8511 (512points)				Special auxiliary relay: M8000~M8511 (512points)							
		Step relay		S0~S1023 (1024 points)		S0~S4095 (4096 points)		S0~S4095 (4096 points)					
Relay and register	Timer	100 points (100ms:44 points ; 10ms: 46 points ; 1ms with accumulating function: 4 points ; 100 ms with accumulating function: 6)				512 points (100ms: 200 points ; 10ms: 46 points ; 1ms with accumulating function: 6 points ; 1ms: 256 points) . Analog potentiometer timer: 2 points							
		Counter		136 points (16 bit:100 points, 32bit: 36 points)		256 points (16 bit: 200 points, 32bit: 56 points)							
		Data register		D0~D511(512points)		General register:D0000~D7999(8000points); File register:D2000~D3299 (1300 points) OP07/OP08:D3300							
Relay and register	Stack pointer	Mark: N0~N7 (8points), pointerP0~P127(128points), input interruption pointer: I00~I30(4points), timer interruption pointer: I6**~I8** (3points),counter interruption pointer I010~I060 (6points)				Mark: N0~N7 (8points), pointer P0~P255 (256 points), input interruption pointer: I00~I50 (6points), timer interruption pointer: I6**~I8** (3points), counter interruption pointer I010~I060 (6points)							
		Index register		D0~D511(512points)		Special register: D8000~D8511 (512points) 32points: V000~V0015 / Z000~Z0015							
		Constant		decimal (K) Hex (H)		16 Bit : -32,768~32,768 ; 32 Bit : -2,147,483,648~2,147,483,648 16 Bit : 0~FFFFH ; 32 Bit : 0~FFFFFFFH							
RTC		N.A				Built-in: Second (D8013), Minute (D8014), Hour (D8015), Day(D8016), Month (D8017),Year (D8018), week(D8019) And with 30s offset							
Run/stop Switch		Built-in 2 points built-in and 6 points expansible (TP03-6AV optional)											
Potentiometer		N.A											
High speed input (X0~X5)	High speed counter	Single channel:4 points 10KHz max				Single channel : 4points 10KHz and 2 points 5KHz max.							
		Dual Channel: 2 points 10KHz											
High speed input (X0~X5)	Interrupt input	4points (corresponding to I00~I30): Minimum pulse width 50 μs		6points (corresponding to I00~I50): Minimum pulse width 50 μs		6points (corresponding to I00~I50): Minimum pulse width 5 μs							
		Pulse output		N.A		2 points: Y0/Y1 with acceleration/ deceleration							
Pulse output	PWM output	N.A		2 points: Y0/Y1									
		Frequency		N.A		1KHz max.							
Communication port	RS485	RS232, for upload/download program to/from TP03				Built-in 1 communication port for Data Link, Remote I/O or Computer Link, max. 307.2k bps							
		Expansion card		N.A		Either RS485 or RS232 communication card is available for the port and both have Modbus communication protocol, max. 307.2k bps.							
Self-diagnosis		Input/output inspection, system processing time out inspection, illegal instruction inspection, program language syntax inspection and password setting											
Supervise/ Troubleshoot		Display processing time, byte/bit character or device set											
Terminal block		Fixed, unremovable					Removable						
Dimension(WxDxH)(mm)		116 x 92 x 64 / 177 x 92 x 64				116 x 90 x 83				177 x 90 x 83			

Main modules

Type	Rated Voltage	User 24Vdc	Input point		Output point		Dimension		
			point	type	point	type			
TP03-14SR-A	100~240 VAC	250mA	8		6		116×92×64mm See Fig1		
TP03-20SR-A			12		8				
TP03-26SR-A			16		10				
TP03-36SR-A			20		16		177×92×64mm See Fig2		
TP03-20MR-A			12		8				
TP03-30MR-A			16		14				
TP03-20HR-A			500mA	24VDC	12	7mA	8	Relay	116×90×83mm See Fig3
TP03-30HR-A					16		14		
TP03-20HT-A					12		8		
TP03-40HR-A					24		16		
TP03-60HR-A	36	24							
TP03-40HR-D	16	14							
TP03-60HT-A	24VDC	N. A	24		16	Transistor	116×90×83mm See Fig3		
TP03-40HT-D			24		8				
TP03-20MT-A			12		8				
TP03-30MT-A			16		14				
TP03-20HT-A			12		8				
TP03-30HT-A			16		14				
TP03-40HT-A	100~240 VAC	300mA	24		16		177×90×83mm See Fig4		
TP03-60HT-A			36		24				

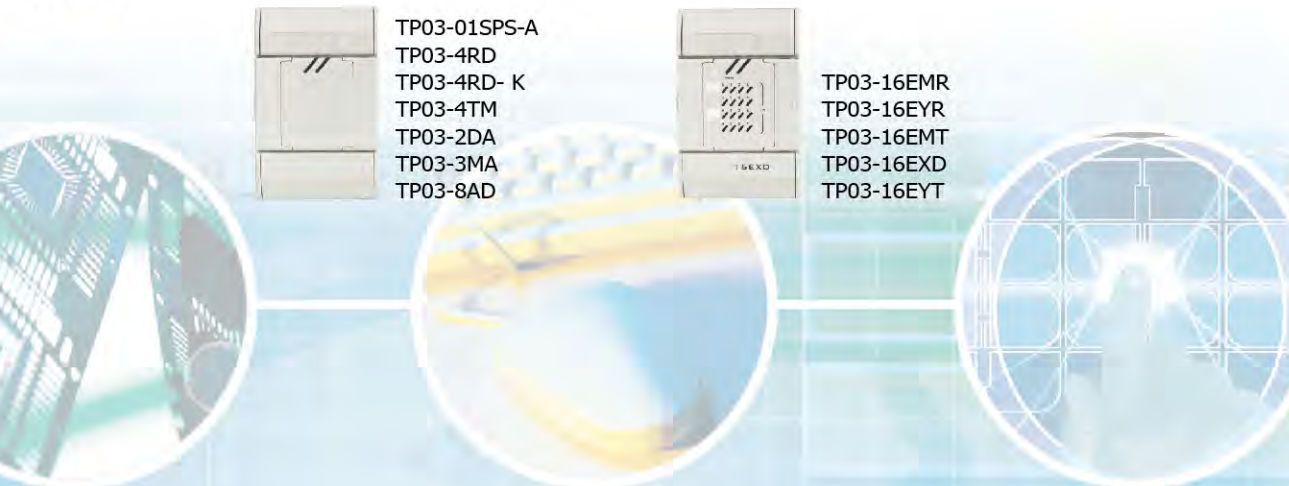
Profile



Expansion module

Type No.	Power	In/Out point	Description	Dimension
TP03-01SPS-A	100~240VAC	N.A	Power source for expansion modules	57 x 90 x 83 mm
TP03-4RD		4 / 0	PT-100 temperature input * 4 channel	
TP03-4RD-K		4 / 0	PT-1000 temperature input * 4 channel	
TP03-4TM		4 / 0	J/K temperature input * 4 channel	
TP03-3MA	24Vdc	2 / 1	0~10V/0~20mA analog input * 2 channel	57 x 90 x 83 mm
TP03-2DA		0 / 2	0~10V/±10V/0~20mA analog output * 2 channel	
TP03-8AD		8 / 0	0~10V/0~20mA analog input * 8 channel	
TP03-16EMR		8 / 8	8 points DC input & 8 points relay output	
TP03-16EMT	N.A	8 / 8	8 points input & 8 points Tr. output	
TP03-16EXD		16 / 0	16 points Digital input	
TP03-16EYR		0 / 16	16 points Digital relay output	
TP03-16EYT		0 / 16	16 points Tr. outputs	

Profile



Expansion Cards

Type No.	Description
TP03-OCV	Built-in Standard cover
TP03-485RS	Optional RS485 Multi-function communication port
TP03-2AI	Optional 0~10V analog input port*2(10bit)
TP03-2TI	Optional Timer(0~30s)input port*2
TP03-6AV	Optional Analog potential meter input port*6
TP03-1ME	Optional EEPROM memory

Profile



Expansion peripheral equipment

Type No.	Power	Description	Remark
OP07	N.A	2 line LCD ,timer and counter setting device	See Fig5
OP08	24Vdc	2 line LCD ,timer and counter setting device	See Fig5
OP10	24Vdc	4 line LCD ,timer and counter setting device	See Fig6
PC06	N.A	TP03 PLC PC software	
TP03-PDA06	N.A	TP03 PLC PDA software	

Profile



Communication module

Type No.	Power	Description	Dimension
TP03-DNet	24Vdc	DeviceNet slave	38 x 90 x 59mm
TP03-PBUS		Profibus - DP slave	
EN01		TCP/IP	

Profile



Basic programming instruction list

Mnemonic	Function	Component	Mnemonic	Function	Component
LD	Initial logical operation contact type (normal open)	X,Y,M,S,T,C	ANB	Serial connection of multiple contacts circuits	-
LDI	Initial logical operation contact type (normal closed)	X,Y,M,S,T,C	ORB	Parallel connection of multiple contacts circuits	-
AND	Serial connection of contacts (normal open)	X,Y,M,S,T,C	MPS	Stores the current result of the internal PLC operations	-
ANI	Serial connection of contacts (normal closed)	X,Y,M,S,T,C	MRD	Reads the current result of the internal PLC operations	-
OR	Parallel connection of contacts (normal open)	X,Y,M,S,T,C	MPP	Pops(recalls and removes)the currently stored result	-
ORI	Parallel connection of contacts (normal close)	X,Y,M,S,T,C	INV	Inverse	-
LDP	Initial logical operation Rising edge pulse	X,Y,M,S,T,C	MC	Denotes the start of a master control block	-
LDF	Initial logical operation Falling/trailing edge pulse	X,Y,M,S,T,C	MCR	Denotes the end of a master control block	-
ANDP	Serial connection of Rising edge pulse	X,Y,M,S,T,C	NOP	No operation	-
ANDF	Serial connection of Falling/trailing edge pulse	X,Y,M,S,T,C	END	Program end	-
ORP	Parallel connection of Rising edge pulse	X,Y,M,S,T,C	SMCS	Master control set	-
ORF	Parallel connection of Falling/trailing edge pulse	X,Y,M,S,T,C	SMCR	Master control reset	-
PLS	Rising edge pulse	-	JCS	Jump control set	-
PLF	Falling/Trailing edge pulse	-	JCR	Jump control reset	-
OUT			RST	Reset a bit device permanently OFF	-
OUTI					
OUTT	Driving timer or counter coils	X,Y,M,S,T,C			
OUT C					
OUT S					
SET	Sets a bit device permanently ON	-			

Advance insturction list

Instruction Type	Func. No.	Mnemonic	Function	Instruction Type	Func. No.	Mnemonic	Function
Program flow	00	CJ	Conditional Jump	Data operation	47	ANR	Annunciator reset
	01	CALL	Call subroutine		48	SQR	Square root
	02	SRET	Subroutine return		49	FLT	Float point
	03	IRET	Interrupt return		50	REF	Refresh
	04	EI	Enable interrupt		52	MTR	Input matrix
	05	DI	Disable interrupt		53	HSCS	High speed counter set
	06	FEND	First end		54	HSCR	High speed counter reset
	07	WDT	Watchdog timer		55	HSZ	High speed counter zone compare
	08	FOR	Start a for/next loop		56	SPD	Speed detect
	09	NEXT	End a for/next loop		57	PLSY	Pulse Y output
Move and compare	10	CMP	Compare	58	PWM	Pulse width modulation	
	11	ZCP	Zone compare	59	PLSR	Ramp pulse output	
	12	MOV	Move	60	IST	Initial state	
	13	SMOV	Shift move	61	SER	Search	
	14	CML	Compliment	62	ABSD	Absolute drum	
	15	BMOV	Block move	63	INCD	Incremental drum	
	16	FMOV	Fill move	64	TTMR	Teaching timer	
	17	XCH	Exchange	65	STMR	Special timer-definable	
	18	BCD	BCD binary coded decimal	66	ALT	Alternate state	
	19	BIN	BIN binary	67	RAMP	Ramp-variable value	
Arithmetic and logic operations	20	ADD	Addition	68	ROTC	Rotary table control	
	21	SUB	Subtraction	69	SORT	Sort data	
	22	MUL	Multiplication	70	TKY	Ten key input	
	23	DIV	Division	71	HKY	Hexadecimal input	
	24	INC	Increment	72	DSW	Digital switch	
	25	DEC	Decrement	73	SEGD	Seven segment decoder	
	26	WAND	Word and	74	SEGL	Seven segment with latch	
	27	WOR	Word or	75	ARWS	Arrow switch	
	28	WXOR	Word exclusive or	76	ASC	ASCII code	
	29	NEG	Negation	77	PR	Print to a display	
Rotation and shift	30	ROR	Rotation right	80	RS	RS communication	
	31	ROL	Rotation left	81	PRUN	Octal Transmission	
	32	RCR	Rotation right with carry	82	ASCI	HEX-ASCII	
	33	RCL	Rotation left with carry	83	HEX	ASCII-HEX	
	34	SFTR	Bit shift right	84	CCD	Check code	
	35	SFTL	Bit shift left	85	VRD	Volume read	
	36	WSFR	Word shift right	86	VRSC	Volume scale	
	37	WSFL	Word shift left	87	MBUS	MODBUS	
	38	SFWR	Shift register write	88	PID	PID control loop	
	39	SFRD	Shift register read	89	EPSC	Option card set	
Data operation	40	ZRST	Zinc reset	110	ECMP	Float compare	
	41	DECO	Decode	111	EZCP	Float zone compare	
	42	ENCO	Encode	112	EMOV	Float Move	
	43	SUM	Sum of active bits	118	EBCD	Float to scientific	
	44	BON	Check specified but status	119	EBIN	Scientific to float	
	45	MEAN	Mean	120	EADD	Float add	
	46	ANS	Timed annunciator set	121	ESUB	Float subtract	
				122	EMUL	Float multiplication	
				123	EDIV	Float division	
				124	EXP	Exponent arithmetic	