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XINJE

XCC Series PLC

User Manual

WUXI XINJE ELECTRIC CO., LTD.

Number: PC02 20100825 3.2

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The first Version

Number: PC02 20100825 3.2

This manual includes some basic precautions which you should follow to keep you safe and protect the products. These precautions are underlined with warning triangles in the manual. About other manuals that we do not mention, please follow basic electric operating rules.

Precautions



Please follow the precautions. If not, it may lead the control system incorrect or abnormal, even cause fortune lose.

**Correct
Application**



The models could only be used according to the manual, and an only be used along with the peripheral equipments recognized or recommended by Xinje Electronic. They could only work normally in the condition of be transported, kept and installed correctly, also please operate and maintain them according to the recommendation.

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Duty Declare

We have checked the manual, its content fits the hardware and software of the products. As mistakes are unavoidable, we couldn't promise all correct. However, we would check the data in the manual frequently, and in the next edition, we will correct the necessary information. Your recommendation would be highly appreciated

Dec.2010

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Preface

—— Specification of XCC series PLC

XCC Series PLC has following Specifications:

- **High Dispose Speed**
XCC series PLC has faster operation speed, equals 3-times of XC series PLC; behaved on floating operation speed.
- **Support 5CH Pulse Output**
XCC series PLC has 5CH high speed pulse output function, the frequency can reach 200 KHz, fulfill customer's requirements at maximum level;
- **Support 5CH AB phase count**
XCC series PLC has 5CH AB phase HSC function, the frequency can reach 80KHz
- **Can expand XC Series Digital I/O expansion、 Analogue module and BD cards**
Same with XC series PLC, XCC series can also expand with expansions and BD cards
- **Support Basic Motion Control Instructions**
Can realize 2-axis linkage, interpolation, follow-up, coordinate convert functions;
- **Compatible with XC series PLC basic functions**
Besides the above advantages, XCC series PLC also compatible with XC series PLC basic functions, including high speed pulse、 high speed counter、 interruption、 PID control etc (except frequency testing function)

XCC Series Model List:

- XCC-32T-E

Supplement explanation:

The instruction noted in this manual is motion control function instruction, for the rest instructions belong to XC series, such as generic order control, application or special function instruction, please see <<XC series PLC user manua>>.

Version Requirement:

Please use XCPPro V3.2 and above;

1. Summary of XCC Series PLC

In this Chapter we mainly introduce the general specifications, external size, terminal arrangement and communication interface of XCC series PLC;

2-1. Specifications and Parameters

2-2. External Dimension

2-3. Terminals Arrangement

2-4. Communication Interface

1-1. Internal Specifications

General Specifications

Items	Specifications
Isolate Voltage	Above DC 500V 2M ohm
Anti-noise	Noise voltage 1000Vp-p 1uS pulse per minute
Ambient Temperature	0°C~60°C
Ambient Humidity	5%~95% (no dew)
COM1	RS-232, connect with the host machine, HMI to program or debug
COM2	RS-232/RS-485, connect with net or intelligent instruments, inverters etc.
COM3	RS-232C/RS-485 expanded by BD card
Installation	Use M3 screws or DIN to fix ^{*5}
Grounding	The third type grounding (grounding is forbidden with the strong power system) ^{*6}

Performance

Items		Specifications
		32I/O
Program Executing Form		scanning loop form
Programming Form		Instruction、Ladder、C-Function block
Dispose Speed		0.3 us
Power Off Retentive		Use FlashROM and Li Battery
User's program space ^{*1}		256K
I/O points		18 DI/ 14DO
Internal Coils Nr.		8768
Timer (T)	Points	640
	Spec.	100mS timer: set time 0.1~3276.7sec. 10mS timer: set time 0.01~327.67sec. 1mS timer: set time 0.001~32.767sec.
Counter (C)	Points	640
	Spec.	16 bits counter: set value K0 ~32,767 32 bits counter: set valueK0 ~+2147483647
Data Register (D)		9024words
Flash ROM Register (FD)		1024 words
Expansion's internal registers (ED)		36864 words
High Speed Dispose Ability		HSC, pulse output, external interruption
Time scan interval setting		0~99mS
Password Protection		6 bits ASCII

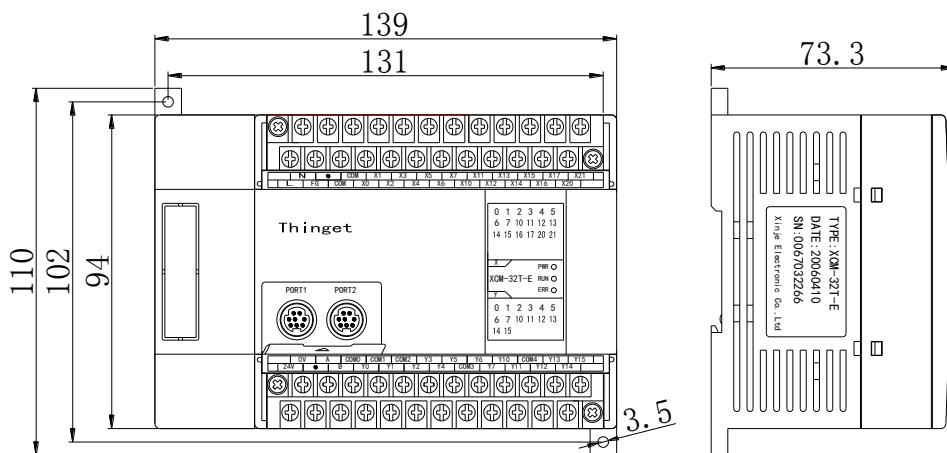
Self-diagnose Function	Power on self-check、 Timer monitor、 grammar check
------------------------	---

Note: the “User’s program memory” refers to the maximum memory in the form of “Secrete Download”

1-2. External Dimension

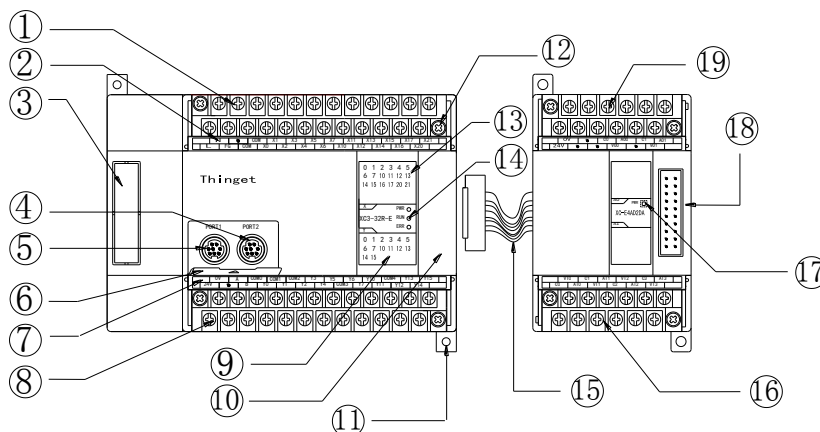
External Dimension (Unit: mm)

XCC- 32 CPU Unit



1-3. Terminal Arrangement

CPU Models



Each part's name is listed below:

Number	Name	Number	Name
1	Input & power supply terminals	11	Installation holes (2)
2	Input terminal label	12	Screws to install/remove the terminals
3	Port to install BD card	13	Input LED
4	COM2	14	Action LED: PWR (power); RUN (RUN); ERR (Error)
5	COM1	15	Expansion cable
6	Cover plate for COM port	16	Output terminals
7	Output terminal label	17	Action LED: PWR (power);
8	Output& 24V power terminals	18	Port to connect with expansion

9	Output LED	19	Input&power supply terminals
10	Port to connect with expansion		

XCC-32CPU 18 digital inputs/14 digital outputs

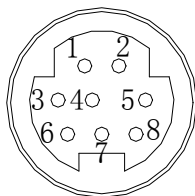
	N	•	COM	X1	X3	X5	X7	X11	X13	X15	X17	X21
	L	FG	COM	X0	X2	X4	X6	X10	X12	X14	X16	X20

	0V	B	CAN-	Y0	Y2	Y4	Y5	Y7	Y10	Y12	Y13	Y15
	24V	A	CAN+	COM0	Y1	Y3	COM1	Y6	COM2	Y11	COM3	Y14

1-4. COM Port

COM1:

Pin Definition of COM1:

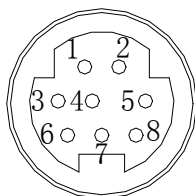


- 2: PRG
- 4: RxD
- 5: TxD
- 6: VCC
- 8: GND

Mini 8Pin female

COM2:

Pin Definition of COM2:



- 4: RxD
- 5: TxD
- 8: GND

Mini 8Pin female

Programmable Cable:

Programmable Cable:



Mini 8Pin Male

DB9 Female

2. Power Supply Specification, Input/Output Specification, External Wiring

In this chapter, we tell the structure, specification and external wiring of XCC series PLC.

2-1. Power Supply Specification

2-2. AC Power Supply、DC Input Type

2-3. Input Specification

2-4. DC Input Signal's Disposal (AC Power Supply type)

2-5. Output Specification And Output Circuit's Disposal

2-1. Power Supply Specification

For the power specification of XCC Series PLC basic units, please see the following table:

AC power type:

Rated voltage	AC100V~240V
Voltage allow bound	AC90V~265V
Rated frequency	50/60Hz
Allow momentary power-cut time	Interrupt time ≤ 0.5 AC cycle, alternation ≥ 1 sec
Impact current	Max 40A 5mS below/AC100V max 60A 5mS below /AC200V
Max power consumption	12W
Power for sensor use	24VDC $\pm 10\%$ max 400mA



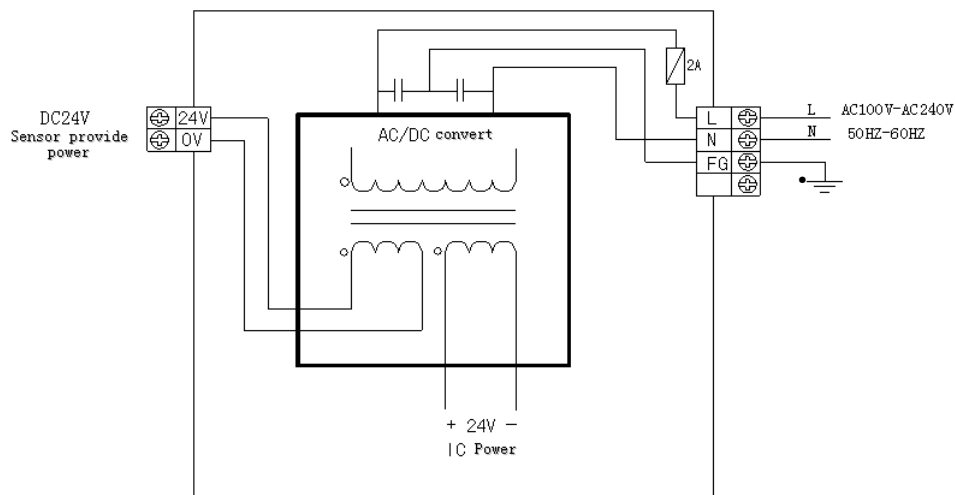
- To avoid voltage decrease, please use the power cable thicker than 2mm²
- Even appear power cut within 10ms, PLC can still go on working. But if long time power cut or abnormal power decrease, PLC will stop working, output will also appear OFF status, when recover power supply, the PLC will auto start to work.
- Connect the grounding terminals of basic units and extend modules together, then ground

DC power type:

Rated voltage	DC24V
Voltage allow bound	DC21.6V~26.4V
Input current (Only basic unit)	120mA DC24V
Allow momentary power-cut time	10mS DC24V
Impact current	10A DC26.4V
Max power consumption	12W
Power for sensor use	24VDC $\pm 10\%$ Max 400mA

2-2. AC power supply, DC input type

Constitution and Connection:

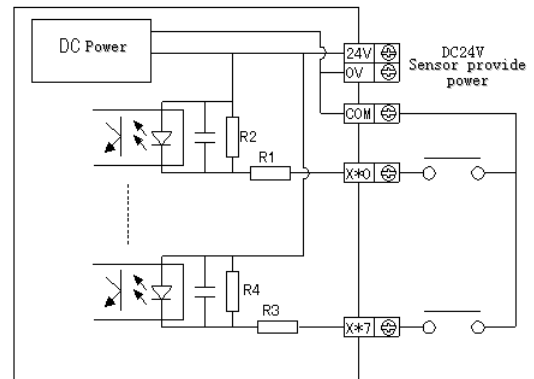


- The power is connected between L and N terminals.
- 24+ and COM terminals can be used as power 400mA/DC24V which supply sensor. Besides, this terminal can't be given power from outside.
- • terminal is vacant terminal, please don't go on exterior connection or use it as relay terminal.
- Please connect the basic unit with extend module's COM terminal.

2-3. Input specification

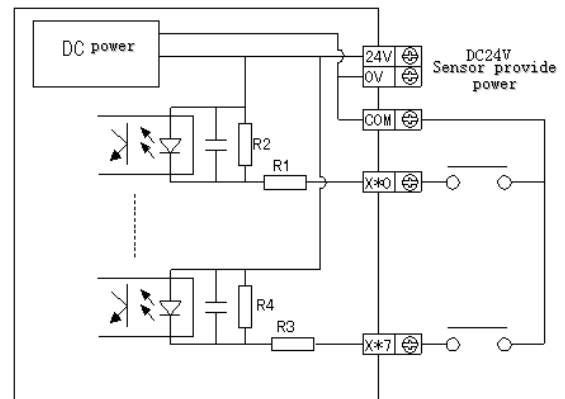
Basic Units:

Input signal's voltage	DC24V \pm 10%
Input signal's current	7mA/DC24V
Input ON current	Up to 4.5mA
Input OFF current	Low than 1.5mA
Input response time	About 10ms
Input signal's format	Contact input or NPN open collector transistor
Circuit insulation	Optical-coupled insulation
Input action's display	LED light when input ON



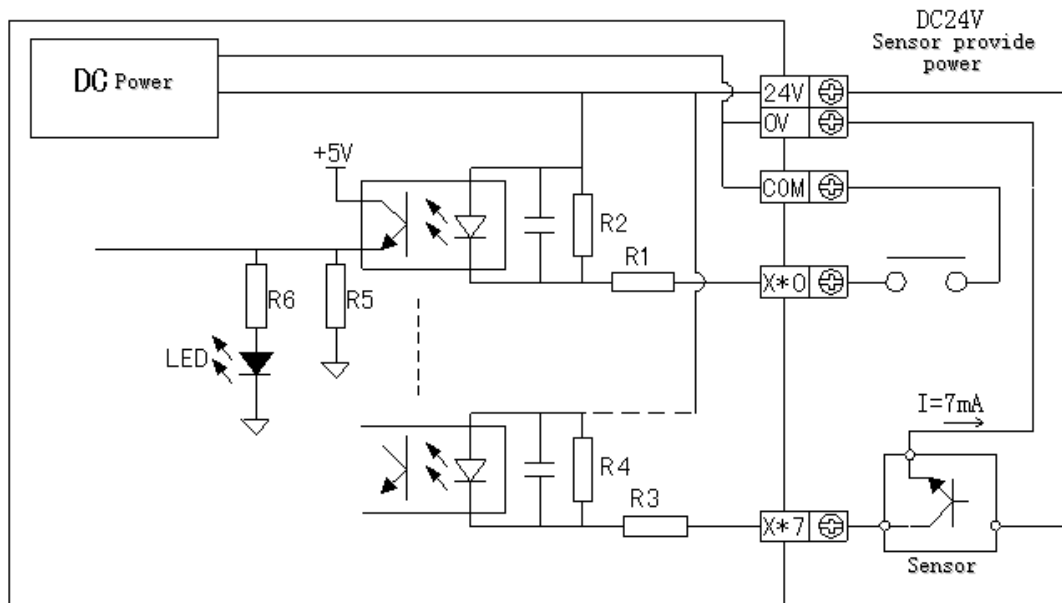
Expansions:

Input signal's voltage	DC24V \pm 10%
Input signal's current	7mA/DC24V
Input ON current	Up to 4.5mA
Input OFF current	Below 1.5mA
Input response time	About 10ms
Input signal's format	Contacts input or NPN open collector transistor
Circuit insulation	Optical-coupled insulation
Input action's display	LED light when input ON.



2-4. DC Input Signal's Disposal (AC Power Type)

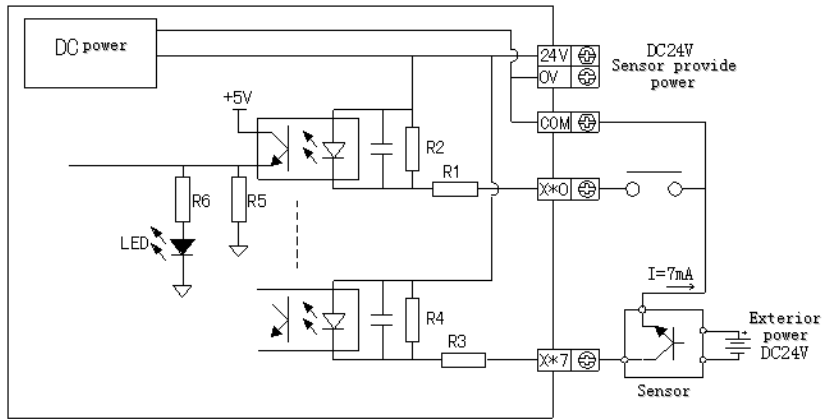
DC input signal:



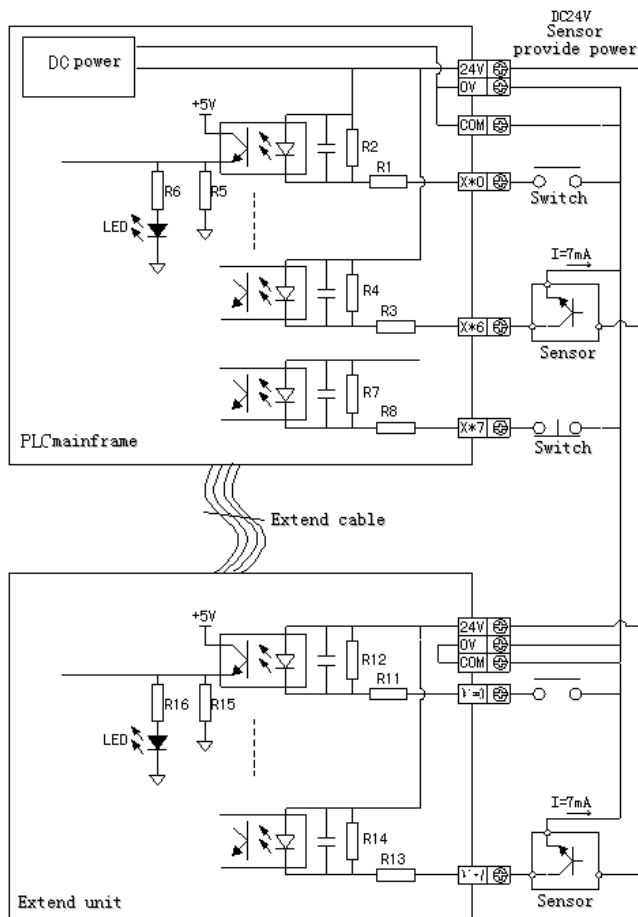
- **Input terminal**
When connect input terminal and **COM** terminal with contacts without voltage or NPN open collector transistor, if input is ON, LED lamp lights, which indicates input. There are many **COM** terminals to connect in PLC.
- **Input circuit**
Use optical coupling instrument to insulate the input once circuit and twice circuit, There's a C-R filter in the twice circuit. It is set to avoid wrong operation caused by vibration of input contacts or noise along with input signal. As the preceding reason, for the changing of input ON→OFF, OFF→ON, in PLC, the response time delays about 10ms. There's a digital filter inside X000~X015. This kind of filter can vary from 0~15ms according to the special register (D8020).
- **Input sensitive**
The PLC's input current is DC24V 7mA, but to be safe, it needs current up to 3.5mA when it's ON, lower than 1.5mA when it's OFF.

Exterior circuit used by sensors:

XCC series PLC's input power is supplied by its interior 24V power, so if use exterior power to drive optocoupler sensor etc., this exterior power should be $DC24V \pm 4V$, please use NPN open collector type for sensor's output transistor



Input Wiring:



2-5. Output Specification & Output circuit disposal

To XCC series motion control type PLC, all output are transistor type; and among these transistors, they have high-speed pulse output and normal transistor two types;

High speed pulse output:

Model	XCC-32T-E
High speed pulse output bit	Y0~Y4
External power	Below DC5~30V
Action denote	LED indicate lamp
Maximum current	50mA
The maximum pulse output frequency	200KHZ

Note: (1) Y0 can't use together with X7 on XCC-32T-E

(2) Y4 can't use together with BD

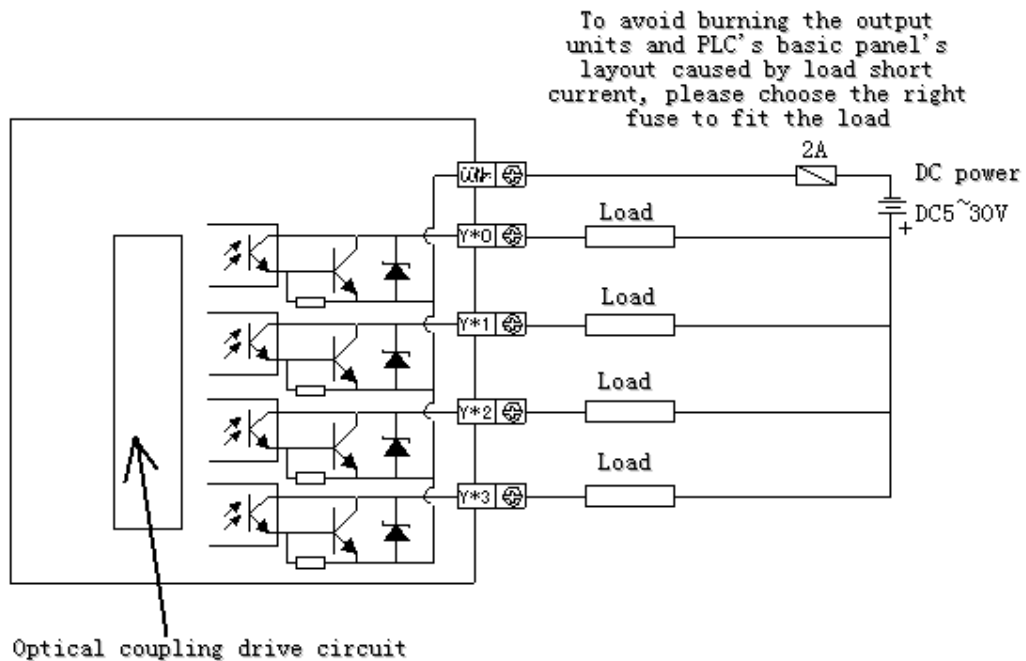
Generic transistor output:

Model	XCC-32T-E	
Transistor output bit	Y5~Y15	
External power	Below DC5~30V	
Circuit insulation	Optical-coupled insulation	
Action denote	LED indicate lamp	
Maximum load	Resistant load	0.8A
	Induce load	12W/DC24V
	Lamp load	1.5W/DC24V
Minimum load	DC5V 2mA	
Response time	OFF→ON	Below 0.2ms
	ON→OFF	Below 0.2ms

Generic transistor output circuit:

- Output terminal
The transistor of basic units has 1~4 public-end output.
- External power
Please use DC5~30V steady-voltage to drive load.
- Circuit insulation
Use the optocoupler to insulate the PLC internal circuit and output transistor. Beside, every public block is separated.
- Action denote
When driving optical-coupling, LED lights, output transistor is ON.
- Response time
From optocoupler device drive (or cut) to transistor ON (or OFF), the time PLC uses is below 0.2ms.

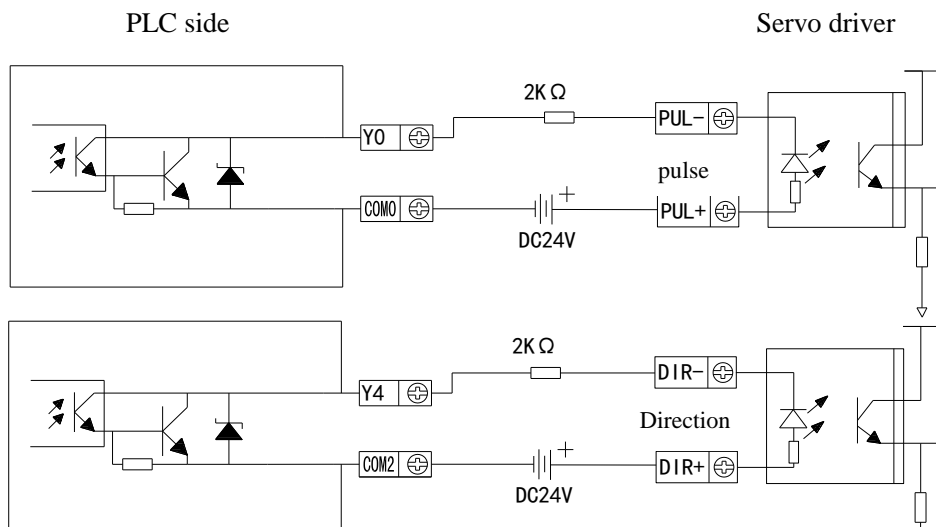
- Output current
The current is 0.5A per point. But as restrict of temperature rising, the current is 0.8A every four points.
- Open circuit current
Below 0.1mA.



(Note: When connecting the optical-couple point to connect with the power load, please use Y5~Y15)

Connect with servo driver

The following figure is a connection example of RT type PLC and servo driver.



(If external power supply is DC5V, then no need to connect 2KΩresistance.)

3. Soft Components, HSC, External Input Interruption

In this chapter we tell the motion control instructions, parameters, special registers and auxiliary register; at the end of the chapter we also give two samples for your reference;

3-1. Soft Components List

3-2. HSC Assignment

3-3. External Input Interruption Assignment

3-4. Application Examples

3-1. Soft Components List

XCC Series Soft Components ID List:

For the I/O Expansions, please refer to the operation manual;

ID	Name	Bound	Point
		32 Points	32 Points
X	Input Point	X000~X021 (octal)	18 Points
Y	Output Point	Y000~Y015 (octal)	14 Points
M	Internal Relay	M0~M2999 【M3000~M7999】 ^{※1}	8000
		For Special Usage: ^{※2} M8000~M8767	768
S	Flow	S0~S511 【S512~S1023】 ^{※1}	1024
T	Timer	T0~T99: 100ms Not Accumulation	640
		T100~T199: 100ms Accumulation	
		T200~T299: 10ms Not Accumulation	
		T300~T399: 10ms Accumulation	
		T400~T499: 1ms Not Accumulation	
		T500~T599: 1ms Accumulation	
		T600~T639: 1ms Precise Time	
C	Counter	C0~C299: 16bits clockwise counter	640
		C300~C599: 32bits clockwise/anti-clockwise counter	
		C600~C639: High Speed Counter	
D	Data Register	D0~D3999 【D4000~D7999】 ^{※1}	8000
		For Special Usage: ^{※2} D8000~D9023	1024
FD	FlashROM Register	FD0~FD1023	1024
		For Special Usage: ^{※2} FD8000~FD9023	1024
ED	Expansion's Internal Register	ED0~ED36863	36864

Note:

※1: Memory Area in 【 】 is default Power-Off Retentive Area; via setting D、M、S、T、C to change the Power-Off Retentive Area

※2: For Special Usage, refer the registers that are occupied by the system; they can't be used for other functions; for details, please refer to 《XC series PLC 【Instruction Part】》 Appendix 1.

◆ **Note:**

- ※1. Memory Area in **【 】** is default power-off memory area; via setting D、M、S、T、C to change the power-off memory area; below are the setting table;
- ※2. No need to set the power-off Retentive Area of FlashROM, the data inside won't lose in the term of no power-supply (no battery);
- ※3. Input coil, output relays are Octal, other register's are decimal;

Setting the “Power-Off Retentive Area”

ID	SETTING AREA	FUNCTION	Default Value	Power-off Retentive Bound
D	FD8202	Start Tag of D Power-off Retentive Area	4000	D4000~D7999
M	FD8203	Start Tag of M Power-off Retentive Area	3000	M3000~M7999
T	FD8204	Start Tag of T Power-off Retentive Area	620	Not Setting
C	FD8205	Start Tag of C Power-off Retentive Area	320	C320~C639
S	FD8206	Start Tag of S Power-off Retentive Area	512	S512~S1023
ED	FD8207	Start Tag of ED Power-off Retentive Area	0	ED0~ED36863

3-2. HSC Assignment

XCC-32T-E

	Increment Mode										AB-Phase Mode				
	C600	C602	C604	C606	C608	C610	C612	C614	C616	C618	C630	C632	C634	C636	C638
Max. Frequency	80K	80K	80K	10K	10K						80K	80K	80K	10K	10K
4-times Frequency											✓	✓	✓	✓	✓
Counter Interruption	✓	✓	✓	✓	✓						✓	✓	✓	✓	✓
X000	U										A				
X001											B				
X002		U										A			
X003												B			
X004			U										A		
X005													B		
X006				U										A	
X007														B	
X010					U										A
X011															B

3-3. External Input Assignment

XCC-24T-E:

Input Terminals	Pointer ID		Forbidden Interruption Instruction
	Rising Interruption	Falling Interruption	
X14	I0000	I0001	M8050
X15	I0100	I0101	M8051

XCC-32T-E:

Input Terminals	Pointer ID		Forbidden Interruption Instruction
	Rising Interruption	Falling Interruption	
X14	I0000	I0001	M8050
X15	I0100	I0101	M8051
X16	I0200	I0201	M8052
X17	I0300	I0301	M8053

4. Instruction List

In this chapter, we provide the basic instructions, application instructions, motion control instructions and some special instructions of XCC series PLC; please use XCPPro V3.2 and above for program;

4-1. Basic Instructions

4-2. Application Instructions

4-3. Motion Control Instructions

4-4. Special Instructions

4-1. Basic Instructions

Mnemonic	Function	Soft Components
LD	Initial logical operation contact type NO (normally open)	X、Y、M、S、T、C、Dn.m、FDn.m
LDD	Read the status from the contact directly	X
LDI	Initial logical operation contact type NC (normally closed)	X、Y、M、S、T、C、Dn.m、FDn.m
LDDI	Read the normally closed contact directly	X
LDP	Initial logical operation-Rising edge pulse	X、Y、M、S、T、C、Dn.m、FDn.m
LDF	Initial logical operation-Falling /trailing edge pulse	X、Y、M、S、T、C、Dn.m、FDn.m
AND	Serial connection of NO (normally open) contacts	X、Y、M、S、T、C、Dn.m、FDn.m
ANDD	Read the status from the contact directly	X
ANI	Serial connection of NC (normally closed) contacts	X、Y、M、S、T、C、Dn.m、FDn.m
ANDDI	Read the normally closed contact directly	X
ANDP	Serial connection of rising edge pulse	X、Y、M、S、T、C、Dn.m、FDn.m
ANDF	Serial connection of falling/trailing edge pulse	X、Y、M、S、T、C、Dn.m、FDn.m
OR	Parallel connection of NO (normally open) contacts	X、Y、M、S、T、C、Dn.m、FDn.m
ORD	Read the status from the contact directly	X
ORI	Parallel connection of NC (normally closed) contacts	X、Y、M、S、T、C、Dn.m、FDn.m
ORDI	Read the normally closed contact directly	X
ORP	Parallel connection of rising edge pulse	X、Y、M、S、T、C、Dn.m、FDn.m
ORF	Parallel connection of falling/trailing edge pulse	X、Y、M、S、T、C、Dn.m、FDn.m
ANB	Serial connection of multiply parallel circuits	none
ORB	Parallel connection of multiply parallel circuits	none

OUT	Final logic operation type coil drive	Y、M、S、T、C、Dn.m
OUTD	Output to the contact directly	Y
SET	Set a bit device permanently ON	Y、M、S、T、C、Dn.m
RST	Reset a bit device permanently OFF	Y、M、S、T、C、Dn.m
PLS	Rising edge pulse	X、Y、M、S、T、C、Dn.m
PLF	Falling/trailing edge pulse	X、Y、M、S、T、C、Dn.m
MCS	Connect the public serial contacts	none
MCR	Clear the public serial contacts	none
ALT	The status of the assigned device is inverted on every operation of the instruction	X、Y、M、S、T、C、Dn.m
TMR	Force the current program scan to end	T
END	Group	none
GROUP	Group End	none
GROUPE	Initial logical operation contact type NO (normally open)	none

Note: For details, please refer to 《XC series PLC user manual 【Software Part】》。

4-2. Application Instructions

Type	Mnemonic	Function
Program Flow	CJ	Condition jump
	CALL	Call subroutine
	SRET	Subroutine return
	STL	Flow start
	STLE	Flow end
	SET	Open the assigned flow, close the current flow
	ST	Open the assigned flow, not close the current flow
	FOR	Start a FOR-NEXT loop
	NEXT	End of a FOR-NEXT loop
	FEND	Main program END
	END	Program END
Data Compare	LD=	LD activates if (S1) = (S2)
	LD>	LD activates if (S1) > (S2)
	LD<	LD activates if (S1) < (S2)
	LD<>	LD activates if (S1) ≠ (S2)
	LD≤	LD activates if (S1) ≤ (S2)
	LD≥	LD activates if (S1) ≥ (S2)
	AND=	AND activates if (S1) = (S2)
	AND>	AND activates if (S1) > (S2)
	AND<	AND activates if (S1) < (S2)

	AND<>	AND activates if (S1) ≠ (S2)
	AND<=	AND activates if (S1) ≤ (S2)
	AND>=	AND activates if (S1) ≥ (S2)
	OR=	OR activates if (S1) = (S2)
	OR>	OR activates if (S1) > (S2)
	OR<	OR activates if (S1) < (S2)
	OR<>	OR activates if (S1) ≠ (S2)
	OR<=	OR activates if (S1) ≤ (S2)
	OR>=	OR activates if (S1) ≥ (S2)
Data Operation	CMP	Compare the data
	ZCP	Compare the data in certain area
	MOV	Move
	BMOV	Block move
	PMOV	Transfer the Data block
	FMOV	Multi-points repeat move
	EMOV	Flash ROM written
	FWRT	Zone set
	MSET	Zone reset
	ZRST	Swap the high and low byte
	SWAP	Exchange two values
	XCH	Compare the data
Data Operation	ADD	Addition
	SUB	Subtraction
	MUL	Multiplication
	DIV	Division
	INC	Increment
	DEC	Decrement
	MEAN	Mean
	WAND	Word And
	WOR	Word OR
	WXOR	Word exclusive OR
	CML	Compliment
	NEG	Negative

Data Shift	SHL	Arithmetic Shift Left
	SHR	Arithmetic Shift Right
	LSL	Logic shift left
	LSR	Logic shift right
	ROL	Rotation shift left
	ROR	Rotation shift right
	SFTL	Bit shift left
	SFTR	Bit shift right
	WSFL	Word shift left

	WSFR	Word shift right
Data Convert	WTD	Single word integer converts to double word integer
	FLT	16 bits integer converts to float point
	FLTD	32 bits integer converts to float point
	INT	64 bits integer converts to float point
	BIN	Float point converts to integer
	BCD	BCD converts to binary
	ASCI	Binary converts to BCD
	HEX	Hex. converts to ASCII
	DECO	ASCII converts to Hex.
	ENCO	Coding
	ENCOL	High bit coding
	GBY	Low bit coding
	GBIN	Single word integer converts to double word integer
Float Point Operation	ECMP	Float compare
	EZCP	Float Zone compare
	EADD	Float Add
	ESUB	Float Subtract
	EMUL	Float Multiplication
	EDIV	Float division
	ESQR	Float Square Root
	SIN	Sine
	COS	Cosine
	TAN	Tangent
	ASIN	Floating Sine
	ACOS	Floating Cosine
ATAN	Floating Tangent	
Clock Operation	TRD	Read RTC data
	TWR	Write RTC data

Note: For details, please refer to 《XC series PLC user manual 【Software Part】》。

4-3. Motion Control Instruction List

DRV	High speed positioning
LIN	Linear Interpolation Positioning
CW	Circular clockwise interpolation
CCW	Circular anticlockwise interpolation
DRVZ	Machine zero return
CHK	Servo end check
DRVR	Electrical zero return
SETR	Electrical zero settings
TIM	Delayed time
ABS	Absolute address
INC	Incremental address
SETP	Set reference frame
PLAN	Plane selection
FOLLOW	Following movement instruction

Note: For details, please refer to 《XCM series PLC user manual》

4-4. Special Instructions List

Type	Mnemonic	Function
Pulse Output	PLSY	Single segment pulse output without accelerate/decelerate
	PLSR	Single/multiple segment, with accelerate/decelerate, single/double way pulse output
	PLSF	Variable frequency pulse output
	PLSA	Absolute Position Multi-pulse Control
	PLSNEXT/PLSNT	Pulse segment switch
	PLSMV	Save pulse number into register
	STOP	Pulse stop
	ZRN	Zero point return
	DRVA	Absolute position
	DRVI	Opposite position
	PTO	Relative Multi-pulse Output
	PTOA	Absolute Multi-pulse Output
	PSTOP	Pulse Stop
PTF	Variable Frequency Pulse Output	
HSC	HSCR	32bits Read HSC
	HSCW	32bits Write HSC
Modbus Communication	COLR	Modbus Coil Read
	INPR	Modbus Input coil read

	COLW	Modbus Single coil write
	MCLW	Modbus Multi-coil write
	REGR	Modbus Register read
	INRR	Modbus Input register read
	REGW	Modbus Single register write
	MRGW	Modbus Multi-register write
Free Communication	SEND	Send data
	RCV	Receive data
Precise Time	STR	Precise Time
	STRR	Read Register of Precise Time
	STRS	Stop Precise Time
Interruption	EI	Enable Interruption
	DI	Disable Interruption
	IRET	Interruption Return
BLOCK	SBSTOP	Pause BLOCK Execution
	SBGOON	Continue BLOCK Execution
Others	PID	PID Operation Control
	NAME_C	C Language Function Block
	FRQM	Frequency Testing
	PWM	Pulse Width Modulation

Appendix

Here we mainly introduce the functions of special soft device, data register and FlashROM, and introduce the address of expansion. Users can scan fast.

Appendix 1. Special Auxiliary Relay List

Appendix 2. Special Data Register List

Appendix 3. Special Flash Register List

Appendix 1. Special Auxiliary Relay List

PC Status (M8000-M8003)

ID	Function	Description
M8000	Normally ON coil when running	
M8001	Normally OFF coil when running	
M8002	Initial positive pulse coil	
M8003	Initial negative pulse coil	

Clock (M8011-M8014)

ID	Function	Description
M8011	Shake with the cycle of 10ms	
M8012	Shake with the cycle of 100ms	
M8013	Shake with the cycle of 10sec	
M8014	Shake with the cycle of 1min	

Flag (M8020-M8029)

ID	Function	Description
M8020	Zero	The plus/minus operation result is 0
M8021	Borrow	“borrow” occurs in minus operation
M8022	Carry	When carry occurs in plus operation or overflow occurs in bit shift operation
M8023		
M8026	RAMP Mode	
M8029		

PC Mode (M8030-M8038)

ID	Function	Description
M8030	PLC initializing	
M8031	Non-retentive register reset	When driving this M, ON/OFF mapping memory of Y, M, S, TC and the current values of T, C, D are all reset to be 0
M8032	Retentive register reset	
M8033	Registers keep stopping	When PLC changes from RUN to STOP, leave all content in mapping registers and data registers
M8034	All output forbidden	Set PC's all external contacts to be OFF status
M8038	Parameter setting	Set communication parameters flag

Stepping Ladder (M8041-M8046)

ID	Function	Description
M8041		
M8045	All output reset forbidden	When shifting the mode, all outputs reset functions are forbidden
M8046	STL status activate	When M8047 activating, act when any device of S0~S999 turns to be ON

Interruption (M8050-M8059)

ID	Function	Description
M8050 I000□	Forbid the input interruption 0	After executing EI instruction, even the interruption is allowed, but if M acts at this time, the correspond input interruption couldn't act separately E.g.: when M8050 is ON, interrupt I000□ is forbidden
M8051 I010□	Forbid the input interruption 1	
M8052 I020□	Forbid the input interruption 2	
M8053 I030□	Forbid the input interruption 3	
M8054 I040□	Forbid the input interruption 4	
M8055 I050□	Forbid the input interruption 5	
M8056 I40□□	Forbid the time interruption 0	After executing EI instruction, even the interruption is allowed, but if M acts at this time, the correspond time interruption couldn't act separately
M8057 I41□□	Forbid the time interruption 1	
M8058 I42□□	Forbid the time interruption 2	
M8059	Forbid the interruption	Forbid all interruption

Error Testing (M8067-M8072)

ID	Function	Description
M8067	Operation error	happen when calculating
M8070	Scan time out	
M8071	No user program	Internal codes parity error
M8072	User program error	execution codes or configure table parity error

Communication (M8120-M8148)

	ID	Function	Description
COM1	M8120		
	M8121	Waiting to send via RS232	
	M8122	“sending by RS232” flag	
	M8123	“RS232 receiving finish” flag	
	M8124	RS232 receiving flag	
	M8125	“Receive incomplete” flag	acceptance ends normally, but the accepted data number is less than the required number
	M8126	Global signal	
	M8127	“Accept error” flag	

	M8128	“Accept correct” flag	
	M8129		
COM2	M8130		
	M8131	Waiting to send via RS232	
	M8132	“sending by RS232” flag	
	M8133	“RS232 receiving finish” flag	
	M8134	RS232 receiving flag	
	M8135	“Receive incomplete” flag	acceptance ends normally, but the accepted data number is less than the required number
	M8136	Global signal	
	M8137	“Accept error” flag	
	M8138	“Accept correct” flag	
	M8139		
COM3	M8140		
	M8141	Waiting to send via RS232	
	M8142	“sending by RS232” flag	
	M8143	“RS232 receiving finish” flag	
	M8144	RS232 receiving flag	
	M8145	“Receive incomplete” flag	acceptance ends normally, but the accepted data number is less than the required number
	M8146	Global signal	
	M8147	“Accept error” flag	
	M8148	“Accept correct” flag	
	M8149		

“High Speed Counter Interruption Finished” Flag (M8150-M 8169)

ID	Counter ID	Function	Description
M8150	C600	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8151	C602	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8152	C604	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8153	C606	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8154	C608	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8155	C610	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8156	C612	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8157	C614	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8158	C616	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8159	C618	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8160	C620	“Count Interruption Finished” Flag	Set flag ON when count interruption finish

M8161	C622	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8162	C624	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8163	C626	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8164	C628	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8165	C630	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8166	C632	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8167	C634	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8168	C636	“Count Interruption Finished” Flag	Set flag ON when count interruption finish
M8169	C638	“Count Interruption Finished” Flag	Set flag ON when count interruption finish

Pulse output (M8170~M8238)

ID	Pulse ID	Function	specification
M8170	PULSE_1	“sending pulse” flag	Being ON when sending the pulse,
M8171		overflow flag of “32 bits pulse sending”	When overflow, Flag is on
M8172		Direction flag	1 is positive direction, the correspond direction port is on
M8173	PULSE_2	“sending pulse” flag	Being ON when sending the pulse,
M8174		overflow flag of “32 bits pulse sending”	When overflow, Flag is on
M8175		Direction flag	1 is positive direction, the correspond direction port is on
M8176	PULSE_3	“sending pulse” flag	Being ON when sending the pulse,
M8177		overflow flag of “32 bits pulse sending”	When overflow, Flag is on
M8178		Direction flag	1 is positive direction, the correspond direction port is on
M8179	PULSE_4	“sending pulse” flag	Being ON when sending the pulse,
M8180		overflow flag of “32 bits pulse sending”	When overflow, Flag is on
M8181		Direction flag	1 is positive direction, the correspond direction port is on

Absolute, relative bit:

ID	function	specification	
M8190	C600 (24 segments)	1 is absolute, 0 is relative	
M8191	C602 (24 segments)	1 is absolute, 0 is relative	
M8192	C604 (24 segments)	1 is absolute, 0 is relative	
M8193	C606 (24 segments)	1 is absolute, 0 is relative	
M8194	C608 (24 segments)	1 is absolute, 0 is relative	
M8195	C610 (24 segments)	

M8196	C612 (24 segments)		
M8197	C614 (24 segments)		
M8198	C616 (24 segments)		
M8199	C618 (24 segments)		
M8200	C620 (24 segments)		
M8201	C622 (24 segments)		
M8202	C624 (24 segments)		
M8203	C626 (24 segments)		
M8204	C628 (24 segments)		
M8205	C630 (24 segments)		
M8206	C632 (24 segments)		
M8207	C634 (24 segments)		
M8208	C636 (24 segments)		
M8209	C638 (24 segments)		
M8210	Pulse alarm flag (frequency change suddenly)	1 is alarm, 0 is correct	PULSE_1
M8211	Neglect the alarm or not	When flag is 1, stop sending alarm	PULSE_1
M8212	Pulse alarm flag (frequency change suddenly)	1 is alarm, 0 is correct	PULSE_2
M8213	Neglect the alarm or not	When flag is 1, stop sending alarm	PULSE_2
M8214	Pulse alarm flag (frequency change suddenly)	1 is alarm, 0 is correct	PULSE_3
M8215	Neglect the alarm or not	When flag is 1, stop sending alarm	PULSE_3
M8216	Pulse alarm flag (frequency change suddenly)	1 is alarm, 0 is correct	PULSE_4
M8217	Neglect the alarm or not	When flag is 1, stop sending alarm	PULSE_4
M8218	Pulse alarm flag (frequency change suddenly)	1 is alarm, 0 is correct	PULSE_5
M8219	Neglect the alarm or not	When flag is 1, stop sending alarm	PULSE_5

Positive/negative count

ID	Counter Nr.	Function	Specification
M8238	C300~C498	Positive/negative counter control	0 is increment counter, 1 is decrement counter, default is 0

24 segments HSC interruption loop (M8270~M8289)

ID	Counter ID	Specification	
M8270	24 segments HSC interruption loop (C600)	if set it to be 1, then loop executing the interruption; or else execute only one time interruption;	
M8271	24 segments HSC interruption loop (C602)		
M8272	24 segments HSC interruption loop (C604)		
M8273	24 segments HSC interruption loop (C606)		
M8274	24 segments HSC interruption loop (C608)		
M8275	24 segments HSC interruption loop (C610)		
M8276	24 segments HSC interruption loop (C612)		
M8277	24 segments HSC interruption loop (C614)		
.....		
M8279	24 segments HSC interruption loop (C618)		
M8280	24 segments HSC interruption loop (C620)	if set it to be 1, then loop executing the interruption; or else execute only one time interruption;	
M8281	24 segments HSC interruption loop (C622)		
.....		
M8284	24 segments HSC interruption loop (C628)		
M8285	24 segments HSC interruption loop (C630)	if set it to be 1, then loop executing the interruption; or else execute only one time interruption;	
.....		
M8289	24 segments HSC interruption loop (C638)		

Read & Write the Expansions (M8340~M8341)

ID	Function	Specification
M8340	Read the expansion error flag (read instruction)	
M8341	Write the expansion error flag (write instruction)	

BLOCK Execution (M8630~M8730)

ID	Function	Specification
M8630		
M8631	BLOCK1 is running flag	
M8632	BLOCK2 is running flag	
.....
.....
.....
M8730	BLOCK100 is running flag	

Appendix 2. List of special memory and special data register**Clock (D8010-D8019)**

ID	Function	Specification
D8010	The current scan cycle	Unit:0.1ms
D8011	The min. scan time	Unit:0.1ms
D8012	The max. scan time	Unit:0.1ms
D8013	Second (clock)	0~59 (BCD code)
D8014	minute (clock)	0~59 (BCD code)
D8015	hour (clock)	0~23 (BCD code)
D8016	day (clock)	0~31 (BCD code)
D8017	month (clock)	0~12 (BCD code)
D8018	year (clock)	2000~2099 (BCD code)
D8019	week (clock)	0 (Sunday)~6 (Saturday) (BCD code)

Flag (D8021-D8029)

ID	Function	Specification
D8021	Model	Low byte
	Series number	High byte
D8022	Compatible system's version number	Low byte
	System's version number	High byte
D8023	Compatible model's version number	Low byte
	Model's version number	High byte
D8024	Model's information	Max 5 characters +“\0”
D8025		
D8026		
D8027		
D8028	Suitable program software version	
D8029		

Error check (D8067-D8098)

ID	Function	Specification
D8067	Operation error code's Nr.	The error of divide zero
D8068	lock the Nr. of error code	
D8069		
D8070	exceeded scan time	Unit 1ms
D8074	Nr. of offset registers D	
D8097		
D8098		

Communication (D8120-D8149)

Com 1	ID	Function	specification
	D8120		
	D8121		
	D8122	the left data RS232 should send	
	D8123	Data number RS232 received	
	D8126		
	D8127	Communication error code	7: hardware error 8: CRC Parity error 9: station number error 10: no start code 11: no end code 12: communication time out

	D8128	Modbus communication error (the replied message from slaves when the master send errors)	0: correct 1: don't support function ID 2: address error (overrun address) 3: Data error (the number of data) 8: saving data error (rewrite Flash)
	D8129		
Com2	D8130		
	D8131		
	D8132	the left data RS232 should send	
	D8133	Data number RS232 received	
	D8136		
	D8137	Communication error code	7: hardware error 8: CRC check error 9: station number error 10: no start sign 11: no end sign 12: communication time out
	D8138	Modbus communication error (the replied message from slaves when the master send errors)	0: correct 1: don't support function ID 2: address error(overrun address) 3: Data error (the number of data) 8: saving data error (rewrite Flash)
	D8139		
Com 3	D8140		
	D8141		
	D8142	the left data RS232 should send	
	D8143	Data number RS232 received	
	D8146		
	D8147	Communication error code	7: hardware error 8: CRC check error 9: station number error 10: no start sign 11: no end sign 12: communication time out
	D8148	Modbus communication error (the replied message from slaves when the master send errors)	0: correct 1: don't support function ID 2: address error(overrun address) 3: Data error (the number of data) 8: saving data error (rewrite Flash)
	D8149		

HSC Interruption Station (D8150-D8169)

ID	Counter ID	function	specification
D8150	C600	The current segment (No.n segment)	
D8151	C602	The current segment	
D8152	C604	The current segment	
D8153	C606	The current segment	
D8154	C608	The current segment	
D8155	C610	The current segment	
D8156	C612	The current segment	
D8157	C614	The current segment	
D8158	C616	The current segment	
D8159	C618	The current segment	
D8160	C620	The current segment	
D8161	C622	The current segment	
D8162	C624	The current segment	
D8163	C626	The current segment	
D8164	C628	The current segment	
D8165	C630	The current segment	
D8166	C632	The current segment	
D8167	C634	The current segment	
D8168	C636	The current segment	
D8169	C638	The current segment	

Pulse output (D8170-D8220)

ID	Pulse ID	function	specification
D8170	PULSE_1	The low 16 bits of accumulated pulse number	
D8171		The high 16 bits of accumulated pulse number	
D8172		The current segment (means Nr.n segment)	
D8173	PULSE_2	The low 16 bits of accumulated pulse number	
D8174		The high 16 bits of accumulated pulse number	
D8175		The current segment (means Nr.n segment)	
D8176	PULSE_3	The low 16 bits of accumulated pulse number	Only XC5-32RT-E (4PLS) model has
D8177		The high 16 bits of accumulated pulse number	
D8178		The current segment (means Nr.n segment)	
D8179	PULSE_4	The low 16 bits of accumulated pulse number	
D8180		The high 16 bits of accumulated pulse number	

D8181		The current segment (means Nr.n segment)	
D8190	PULSE_1	The low 16 bits of the current accumulated current pulse number	
D8191		The high 16 bits of the current accumulated current pulse number	
D8192	PULSE_2	The low 16 bits of the current accumulated current pulse number	
D8193		The high 16 bits of the current accumulated current pulse number	
D8194	PULSE_3	The low 16 bits of the current accumulated current pulse number	Only XC5-32RT-E (4PLS) model has
D8195		The high 16 bits of the current accumulated current pulse number	
D8196	PULSE_4	The low 16 bits of the current accumulated current pulse number	
D8197		The high 16 bits of the current accumulated current pulse number	

ID	Pulse ID	Function	Description
D8210	PULSE_1	Error segment number	PULSE_1
D8212	PULSE_2	Error segment number	PULSE_2
D8214	PULSE_3	Error segment number	PULSE_3
D8216	PULSE_4	Error segment number	PULSE_4
D8218	PULSE_5	Error segment number	PULSE_5
D8220	Frequency Testing Precision	indicate the bit Nr. Behind the decimal dot, 1 means *10 , 2 means *100	

Absolute Positioning/Relative Positioning/the Origin Return (D8230-D8239)

ID	Pulse	Function	Description
D8230	PULSE_1	Rising time of the absolute/relation position instruction (Y0)	
D8231		Falling time of the origin return instruction (Y0)	
D8232	PULSE_2	Rising time of the absolute/relation position instruction (Y1)	
D8233		Falling time of the origin return instruction (Y1)	
D8234	PULSE_3	Rising time of the absolute/relation position instruction (Y2)	
D8235		Falling time of the origin return instruction (Y2)	

D8236	PULSE_4	Rising time of the absolute/relation position instruction (Y3)	
D8237		Falling time of the origin return instruction (Y3)	
D8238	PULSE_5	Rising time of the absolute/relation position instruction	
D8239		Falling time of the origin return instruction	

Read/Write the Expansion (D8315-D8316)

ID	Function	Description
D8315	Read the expansion's error type	
D8316	Write the expansion's error type	

Sequential Function Block (D8630-D8730)

ID	Function	Description
D8630		
D8631	The current executing instruction of BLOCK1	The value is used when BLOCK is monitoring
D8632	The current executing instruction of BLOCK2	The value is used when BLOCK is monitoring
.....
.....
.....
D8730	The current executing instruction of BLOCK100	The value is used when BLOCK is monitoring

Error information of the Expansions (D8600-D8627)

ID	Function	specification	Expansion ID
D8600	Read the expansion's error times		Expansion 1
D8601	Read the expansion's error	<ol style="list-style-type: none"> 1. expansion's CRC parity error 2. expansion's address error 3. expansion's accepted data length error 4. expansion's accept buffer zone overflow 5. expansion's timeout error 6. CRC parity error when PLC is accepting data 7. unknown error 	
D8602	write the expansion's error		

	times		
D8603	write the expansion's error	
D8604	Read the expansion's times		Expansion 2
D8605	Read the expansion's error	
D8606	write the expansion's error times		
D8607	write the expansion's error	
D8608	Read the expansion's times		Expansion 3
D8609	Read the expansion's error	
D8610	write the expansion's error times		
D8611	write the expansion's error	
D8612	Read the expansion's times		Expansion 4
D8613	Read the expansion's error	
D8614	write the expansion's error times		
D8615	write the expansion's error	
.....
.....
D8624	Read the expansion's times		Expansion 7
D8625	Read the expansion's error	
D8626	write the expansion's error times		
D8627	write the expansion's error	

Appendix 3. Special Flash Register List

1. I filter

ID	Function	Initial Value	Description
FD8000	input filter time of X port	10	Unit: ms
FD8002		0	
FD8003		0	
.....		0	
FD8009		0	

2. I mapping

ID	Function	Initial value	Description
FD8010	X00 corresponds with I**	0	X0 corresponds with number of input image I**
FD8011	X01 corresponds with I**	1	Initial values are all decimal
FD8012	X02 corresponds with I**	2	

.....		
FD8073	X77 corresponds with I**	63	

3. O mapping

ID	Function	Initial value	Description
FD8074	Y00 corresponds with I**	0	Y0 corresponds with the number of output image O**
FD8075	Y01 corresponds with I**	1	Initial value are all decimal
FD8076	Y02 corresponds with I**	2	
.....		
FD8137	Y77 corresponds with I**	63	

4. I property

ID	function	Initial value	Description
FD8138	X00 property	all be 0	0: positive logic; others: negative logic
FD8139	X01 property		
FD8140	X02 property		
.....		
FD8201	X77 property		

5. power-off retentive area of soft components

ID	Function	Initial Value
FD8202	Start tag of D power off retentive area	4000
FD8203	Start tag of M power off retentive area	3000
FD8204	Start tag of T power off retentive area	640
FD8205	Start tag of C power off retentive area	320
FD8206	Start tag of S power off retentive area	512
FD8207	Start tag of ED power off retentive area	0
FD8209	Pulse director and pulse delay time setting	50ms

6. Communication

COM1	ID	Function	Initial	Description
	FD8210	Communicate Mode (station number)	1	255 (FF) is free mode, 1~254 is modbus station number
	FD8211	Communicate format	8710	Baud rate, Data bit, stop bit, parity
	FD8212	Judgment time of ASC timeout	3	Unit ms, if set to be 0, it means no timeout waiting
	FD8213	Judgment time of reply timeout	300	Unit ms, if set to be 0, it means no timeout waiting
	FD8214	Start ASC	0	High 8 bits invalid
	FD8215	End ASC	0	High 8 bits invalid

	FD8216	Free format setting	0	8/16 bits buffer; With/without start bit, With/without stop bit
COM2	FD8220	Communicate Mode (station number)	8710	255 (FF) is free mode, 1~254 is modbus station number
	FD8221	Communicate format	3	Baud rate, Data bit, stop bit, parity
	FD8222	Judgment time of ASC timeout	300	Unit ms, if set to be 0, it means no timeout waiting
	FD8223	Judgment time of reply timeout	0	Unit ms, if set to be 0, it means no timeout waiting
	FD8224	Start ASC	0	High 8 bits invalid
	FD8225	End ASC	0	High 8 bits invalid
	FD8226	Free format setting	8710	8/16 bits buffer; With/without start bit, With/without stop bit
COM3	FD8230	Communicate Mode (station number)	8710	255 (FF) is free mode, 1~254 is modbus station number
	FD8231	Communicate format	3	Baud rate, Data bit, stop bit, parity
	FD8232	Judgment time of ASC timeout	300	Unit ms, if set to be 0, it means no timeout waiting
	FD8233	Judgment time of reply timeout	0	Unit ms, if set to be 0, it means no timeout waiting
	FD8234	Start ASC	0	High 8 bits invalid
	FD8235	End ASC	0	High 8 bits invalid
	FD8236	Free format setting	8710	8/16 bits buffer; With/without start bit, With/without stop bit

※1: If you change special FLASH memory, it will take into effect after restart the PLC;

※2: If changing communication parameters of COM1 leads the PLC to be Offline, please try
“Stop PLC when Reboot” Operation;



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