1 Summary Of XC Series PLC

XC series PLC include diverse CPU units and expansions with powerful functions. This chapter will mainly tell the main specifications, the whole products range, each part's description and name template composing this four items.

1-1. Products Specifications

1-1-1. CPU Units

1 Diverse Models

XC series PLC's CPU units has many subsidiary products line, the combination can be make freely.

- I/O Points: 10、14、16、24、32、48、60 points
- Output Type: Transistor、Relay、R/T mixed type
- Input Type: PNP、NPN
- Power Supply Type: AC220V、DC24V
- Subsidiary※1 XC1、XC2、XC3、XC5、XCM

Series	Type	Description
XC1	Economic Type	Include 10I/O、16I/O、24I/O、32I/O Suitable for common simple applications which has less I/O requirement, Do not support free communication, expansion, BD cards.
XC2	Basic Type	Include 14I/O、16I/O、24I/O、32I/O、48I/O、60I/O Equipped XC series PLC's basic functions, the CPU unit can't work with expansions, but can work with BD card. Equipped with high speed operation ability.
XC3	Standard Type	Include 14I/O、24I/O、32I/O、48I/O、60I/O XC series standard models, equipped with full functions, fulfill the user's diverse requirements
XC5	Strength Type	Include 24I/O、32I/O、48I/O、60I/O Besides XC3 series functions, XC5 series PLC added following functions: 24I/O, 32I/O models have 4CH pulse output; 48I/O, 60I/O support CAN-bus, users can realize CAN bus network functions
XCM	Motion Control Type	Include 24I/O、32I/O Besides XC series basic functions, XCM models support powerful pulse output functions and rich motion control instruction. The models are designed especially for motion control.

- Special Type XC3-19AR-E (Combine analogue I/O with digital I/O in one body) ※2

※1：For each subsidiary series's model list and functions, please refer to Appendix 4;

※2： XC3-19AR is not included in this manual. For the using method, please refer to《XC3-19AR-E manual》.

2 Strong Functions

XC series PLC have abundant basic functions and diverse special functions. Each subsidiary series faces to different application field.

Abundant Basic Functions

- High Speed Operation
  Basic operation instruction 0.2 ～ 0.5us, the scan time is 10,000 steps per 5ms, the program space reaches to 160K.
- Abundant expansions
  The CPU units usually support 7 different expansions and 1 BD card.
- Multiple Communication Ports
  The CPU units have 1～4 communication ports, support RS232、RS485、CAN bus; can work with many peripheral devices like inverters, instruments, printers etc.
- Rich soft device space
  The five subsidiary series of XC series PLC are equipped with different internal resource to apply different requirements.
  The resource space reaches: 1024 points flow S、8768 points middle relayM、544 points input relay、544 points output relay、640 points Timer T、640 points counter C、9024 points data register D、2048 points FD、36864 points expansion register ED。
- 2 types of program form
  XC series PLC support 2 types of program form, i.e instruction list and ladder chart. The two types can switch to each other;
- Abundant instructions
  Abundant instructions, besides the basic order control, data transfer and compare, arithmetic, data loop and shift, the PLC also support pulse output, high speed counter, interruption, PID etc.
- Real time clock
  XC series PLC are equipped with real time clock, for time control;
- Compact size, convenient to install
  XC series PLC has compact size, convenient to install. User can choose DIN or screw installation style.

Strength Special Functions

- High Speed Pulse Counter can reach 80KHz
  The CPU units of XC2/XC3/XC5 are equipped with 3 channels, 2 phases high speed counter and high speed counter comparator; can realize single phase, pulse+direction, AB phase count, the frequency can reach 80KHz.
- Powerful communication&network ability
  With multiple communication port and diverse communication protocol like Modbus protocol、free communication protocol etc, it's easy to build the different network; In Modbus network, PLC can be master or slave; XC5 series can build CAN bus; via T-

BOX module can build Ether net; via G-BOX can work with GPRS network;

- High Speed Pulse Output can reach 400Hz
  XC series PLC※1 are generally equipped 2 pulse output terminals, can output 400KHz pulse; the special model※2 has 4 channels pulse output functions
- Interruption Function
  XC series PLC have interruption function, including external interruption, time interruption and high speed counter interruption; they can meet different requirements.
- Switch I/O points freely
  XC series PLC has special switch I/O points function, that is developed in case of terminals broken, there is no need to change the program;
- C language function block
  Write the function block with C language, the program is more secured. Meantime, with the abundant operation functions, the PLC can realize more functions, which saves great internal space, improve the program efficiency;
- PID function on CPU units
  The CPU units of XC series PLC※1 has PID control and auto tune function.
- Sequential Function Block (BLOCK)
  In sequential function Block, users can realize the sequential action of instructions. This function is suitable to apply on pulse output, communication, motion control, inverter's read/write etc. This function simplify the program editing greatly.
- 24 segments high speed counter interruption
  There are 24 segments 32 bits initial value in high speed counter of XC series PLC※1. Each segment can generate interruption with perfect real time ability, realize electric cam function;
- PWM pulse width modulation
  XC series PLC※1 have PWM pulse width modulation function, this function can apply to DC motor control;
- Frequency testing
  XC series PLC※1 can realize frequency testing
- Precise Time
  XC series PLC※1can realize precise time, the precise timer is a 32 bits timer of 1ms
- Motion Control
  XCM series PLC※1 为 are motion control models, can realize circular interpolation, position control etc.

※1：Here XC series PLC refer to the PLC which can realize the mentioned functions. That's to say, not all XC series PLC can realize the mentioned function. For details, please refer to Appendix 4.

※2：here the special model refers to XC5-32T-E

3	**Easy to Program**

When program the PLC via XCPPro, users can feel it Humanism and easy to get familiar.

- Switch ladder and instruction list freely
- Offer soft device comment, ladder comment, instruction hint functions etc.
- Offer many types of program interface for special instructions, convenient to write the instructions.
- Perfect monitor mode: ladder monitor, free monitor, soft devices monitor
- Many windows in one interface, convenient to manage.

※1：For the detailed XCP Pro software application, please refer to 《XC series PLC user manual【software】》.

1-1-2. Expansions

1 Expansion Modules

To fulfill the field control requirements better, XC series PLC can work with expansions, each CPU units can link 7 expansions.

- Diverse Types
  Digital I/O expansions, analogue I/O modules, temperature control modules and function mixed modules etc.
- Compact Size
- DC24V power supply (32I/O modules are AC220V power supply).
- Analogue、temperature modules all include PID tune function.

Digital I/O Modules	Analogue I/O Modules	Temperature Control Modules	Function Mixed Modules
Power Supply: DC24V AC220V Input points: 8-32 Output points: 8-32 Output Type: Relay Transistor	Power Supply: DC24V Type: DA、AD AD/DA DA channel Nr.：2、4 AD channel Nr.: 4、8	Power Supply: DC24V Temperature: PT100 thermocouple Temp. Channel Nr.: 6 PID Control: Included	Power Supply: DC24V AD: 3CH Temperature: 4CH PT100 DA: 2CH

2 BD Card

Besides the expansion modules, XC series PLC can also expand by the BD cards. The BD cards are small PCB cards which can insert into PLC from the BD port (on CPU unit), so this kind of expansion doesn't take extra space.

- Analogue and temperature type: XC-2AD2PT-BD
- Communication: XC-COM-BD

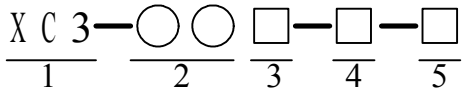
※1: User should install and configure before using the BD cards. For details, please refer to:《XC series BD cards user manual》.

1-2. Model Composing and Model List

1-2-1. Name Principle and Model list of CPU units

1	Name Principle of CPU units

Name principle of XC series PLC CPU units:



1：Series Name	XC1、XC2、XC3、XC5、XCM	
2：Input/Output Point	10、14、16、24、32、48、60	
3：If Input is NPN	R：Relay output	
	T：Transistor output	
	RT：Relay/Transistor mix output (Y0、Y1 are Transistor)	
If Input is PNP	PR：Relay output	
	PT：Transistor output	
	PRT：Relay/Transistor mix output (Y0、Y1 are Transistor)	
4：Power Supply	E：AC Power Supply（220V）	
	C：DC Power Supply（24V）	

※1： Generally, clock and RS485 are standard configuration on communication port. But some models are not included. Please refer to Appendix 4.

2 CPU Units List

- **XC1 Series Model List**

Model					Input points (DC24V)	Output points (R，T)
AC Power Supply			DC Power Supply			
Relay output		Transistor output	Relay output	Transistor output		
NPN	XC1-10R-E	XC1-10T-E	XC1-10R-C	XC1-10T-C	5	5
	XC1-16R-E	XC1-16T-E	XC1-16R-C	XC1-16T-C	8	8
	XC1-24R-E	XC1-24T-E	XC1-24R-C	XC1-24T-C	12	12
	XC1-32R-E	XC1-32T-E	XC1-32R-C	XC1-32T-C	16	16
PNP	XC1-10PR-E	XC1-10PT-E	XC1-10PR-C	XC1-10PT-C	5	5
	XC1-16PR-E	XC1-16PT-E	XC1-16PR-C	XC1-16PT-C	8	8
	XC1-24PR-E	XC1-24PT-E	XC1-24PR-C	XC1-24PT-C	12	12
	XC1-32PR-E	XC1-32PT-E	XC1-32PR-C	XC1-32PT-C	16	16

- **XC2 Series Model List**

Model							Input points (DC24V)	Output points (R，T)
AC Power Supply				DC Power Supply				
Relay output				Relay output	Transistor output	R/T Type		
NPN	XC2-14R-E	XC2-14T-E	XC2-14RT-E	XC2-14R-C	XC2-14T-C	XC2-14RT-C	8	6
	XC2-16R-E	XC2-16T-E	XC2-16RT-E	XC2-16R-C	XC2-16T-C	XC2-16RT-C	8	8
	XC2-24R-E	XC2-24T-E	XC2-24RT-E	XC2-24R-C	XC2-24T-C	XC2-24RT-C	14	10
	XC2-32R-E	XC2-32T-E	XC2-32RT-E	XC2-32R-C	XC2-32T-C	XC2-32RT-C	18	14
	XC2-48R-E	XC2-48T-E	XC2-48RT-E	XC2-48R-C	XC2-48T-C	XC2-48RT-C	28	20
	XC2-60R-E	XC2-60T-E	XC2-60RT-E	XC2-60R-C	XC2-60T-C	XC2-60RT-C	36	24
PNP	XC2-14PR-E	XC2-14PT-E	XC2-14PRT-E	XC2-14PR-C	XC2-14PT-C	XC2-14PRT-C	8	6
	XC2-16PR-E	XC2-16PT-E	XC2-16PRT-E	XC2-16PR-C	XC2-16PT-C	XC2-16PRT-C	8	8
	XC2-24PR-E	XC2-24PT-E	XC2-24PRT-E	XC2-24PR-C	XC2-24PT-C	XC2-24PRT-C	14	10
	XC2-32PR-E	XC2-32PT-E	XC2-32PRT-E	XC2-32PR-C	XC2-32PT-C	XC2-32PRT-C	18	14
	XC2-48PR-E	XC2-48PT-E	XC2-48PRT-E	XC2-48PR-C	XC2-48PT-C	XC2-48PRT-C	28	20
	XC2-60PR-E	XC2-60PT-E	XC2-60PRT-E	XC2-60PR-C	XC2-60PT-C	XC2-60PRT-C	36	24

- **XC3 Series Model List**

	Model						Input points (DC24V)	Output points (R，T)
	AC Power Supply			DC Power Supply				
	Relay output			Relay output	Transistor output	R/T Type		
NPN	XC3-14R-E	XC3-14T-E	XC3-14RT-E	XC3-14R-C	XC3-14T-C	XC3-14RT-C	8	6
	XC3-24R-E	XC3-24T-E	XC3-24RT-E	XC3-24R-C	XC3-24T-C	XC3-24RT-C	14	10
	XC3-32R-E	XC3-32T-E	XC3-32RT-E	XC3-32R-C	XC3-32T-C	XC3-32RT-C	18	14
	XC3-48R-E	XC3-48T-E	XC3-48RT-E	XC3-48R-C	XC3-48T-C	XC3-48RT-C	28	20
	XC3-60R-E	XC3-60T-E	XC3-60RT-E	XC3-60R-C	XC3-60T-C	XC3-60RT-C	36	24
PNP	XC3-14PR-E	XC3-14PT-E	XC3-14PRT-E	XC3-14PR-C	XC3-14PT-C	XC3-14PRT-C	8	6
	XC3-24PR-E	XC3-24PT-E	XC3-24PRT-E	XC3-24PR-C	XC3-24PT-C	XC3-24PRT-C	14	10
	XC3-32PR-E	XC3-32PT-E	XC3-32PRT-E	XC3-32PR-C	XC3-32PT-C	XC3-32PRT-C	18	14
	XC3-48PR-E	XC3-48PT-E	XC3-48PRT-E	XC3-48PR-C	XC3-48PT-C	XC3-48PRT-C	28	20
	XC3-60PR-E	XC3-60PT-E	XC3-60PRT-E	XC3-60PR-C	XC3-60PT-C	XC3-60PRT-C	36	24

- **XC5 Series Model List**

	Model						Input points (DC24V)	Output points (R，T)
	AC Power Supply			DC Power Supply				
	Relay output			Relay output	Transistor output	R/T Type		
NPN	-	XC5-24T-E	-	-	XC5-24T-C	-	14	10
	-	XC5-32T-E	-	-	XC5-32T-C	-	18	14
	XC5-48R-E	XC5-48T-E	XC5-48RT-E	XC5-48R-C	XC5-48T-C	XC5-48RT-C	28	20
	XC5-60R-E	XC5-60T-E	XC5-60RT-E	XC5-60R-C	XC5-60T-C	XC5-60RT-C	36	24
PNP	-	XC5-24PT-E	-	-	XC5-24PT-C	-	14	10
	-	XC5-32PT-E	-	-	XC5-32PT-C	-	18	14
	XC5-48PR-E	XC5-48PT-E	XC5-48PRT-E	XC5-48PR-C	XC5-48PT-C	XC5-48PRT-C	28	20
	XC5-60PR-E	XC5-60PT-E	XC5-60PRT-E	XC5-60PR-C	XC5-60PT-C	XC5-60PRT-C	36	24

- **XCM Series Model List**

Model						Input points (DC24V)	Output points (R，T)
AC Power Supply			DC Power Supply				
Relay output			Relay output	Transistor output	R/T Type		

NPN型	-	XCM-24T-E	-	-	XCM-24T-C	-	14	10
	-	XCM-32T-E	-	-	XCM-32T-C	-	18	14
	-	XCM-48T-E	-	-	XCM-48T-C	-	28	20
PNP型	-	XCM-24PT-E	-	-	XCM-24PT-C	-	14	10
	-	XCM-32PT-E	-	-	XCM-32PT-C	-	18	14
	-	XCM-48PT-E	-	-	XCM-48PT-C	-	28	20

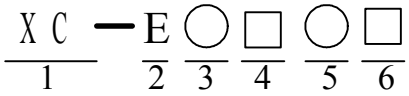
※1：XC1 can also have special 20I/O model

※2：XCM-48 is in developing

1-2-2. Expansion's name principle and module list

I/O Expansion

The I/O expansions' name principle:



1：Series name XC
2：For Expansion E
3：Input points 8、16、32
4：For Input NPN Type: X
PNP Type: PX
5：Output points 8、16、32
6：For output YR：relay output
YT：transistor output

- I/O expansions list:

Model				I/O Points	Input points (DC24V)	Output points (R, T)
	Input	Output				
		relay output	transistor output			
NPN	XC-E8X	-	-	8	8	-
	-	XC-E8YR	XC-E8YT	8	-	8
	-	XC-E8X8YR	XC-E8X8YT	16	8	8
	XC-E16X	-	-	16	16	-

	-	XC-E16YR	XC-E16YT	16	-	16
	-	XC-E16X16YR	XC-E16X16YT	32	16	16
	XC-E32X	-	-	32	32	-
	-	XC-E32YR	-	32	-	32
	XC-E8PX	-	-	8	8	-
	-	XC-E8YR	XC-E8YT	8	-	8
P	-	XC-E8PX8YR	XC-E8PX8YT	16	8	8
N	XC-E16PX	-	-	16	16	-
P	-	XC-E16YR	XC-E16YT	16	-	16
	-	XC-E16PX16YR	XC-E16PX16YT	32	16	16
	XC-E32PX	-	-	32	32	-
	-	XC-E32YR	-	32	-	32

2	**Analogue&Temperature Expansion**

Analogue、Temperature model name Principle:

XC －E 4AD 4DA 6PT 6TCA－P

① ② ③ ④ ⑤ ⑥

①	For Expansion	E
②	Analogue Input	4AD：4CH analogue input
		8AD：8CH analogue input
③	Analogue Output	2DA：2CH analogue output
		4DA：4CH analogue output
④	PT100 Temperature	6PT：6CH PT100
⑤	K type thermocouple	6TCA：6CH thermocouple input (V3.1or above)
⑥	P、I、D tune	P：with PID tune

Blank：without PID tune

- Analogue、temperature modules list:

Model		Description
Analogue Input	XC-E8AD	8CH analogue input
	XC-E4AD	4CH analogue input
	XC-E4AD2DA	4CH analogue input, 2CH analogue output
Analogue Output	XC-E2DA	2CH analogue output
	XC-E4DA	4CH analogue output
Temperature Testing	XC-E6PT-P	6CH PT100 testing with PID tune
	XC-E6TCA-P	6CH K type thermocouple testing, each channel's PID tune separately
	XC-E3AD4PT2DA	3CH analogue input, 4CH PT100 testing, 2CH analogue output
	XC-E2AD2PT2DA	2CH analogue input, 2CH PT100 testing, 2CH analogue output

3 BD Card

The BD card name principle:

XC －4AD 6PT 6TC– P– BD

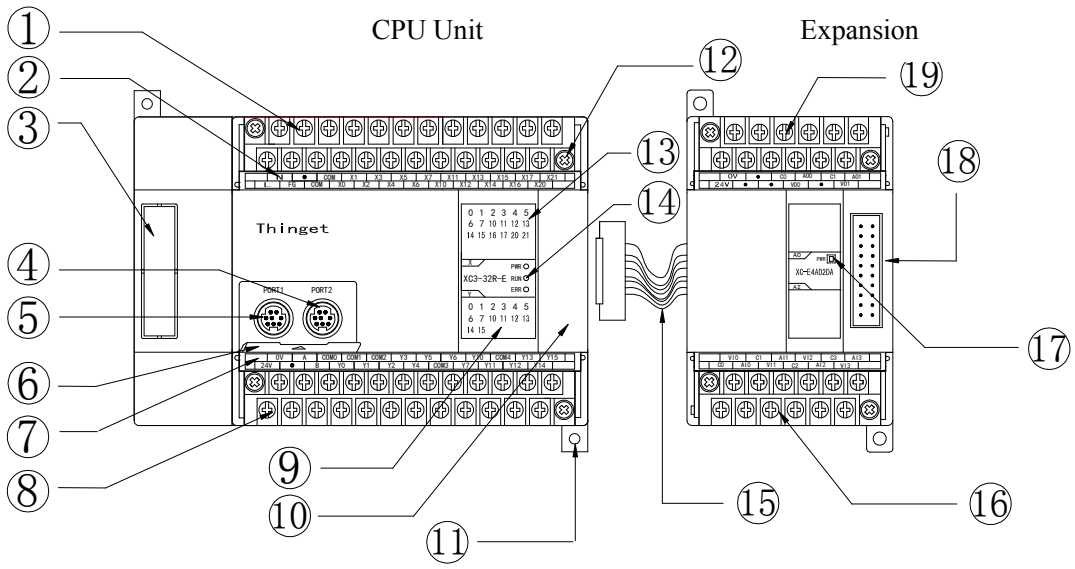
① ② ③ ④ ⑤

① Analogue Input　　4AD：4CH analogue input
　　8AD：8CH analogue input
② PT100 Temperature　　6PT：6CH PT100 temperature Testing
③ K Type thermocouple　　6TC：6CH thermocouple testing
④ P、I、D Tune　　P：with PID tune
　　Blank：without PID tune
⑤ For BD card　　BD

- BD card list

Model		Description
Temperature	XC-2AD2PT-BD	2CH analogue input, 2CH PT100 temperature testing
Communication	XC-COM-BD	RS-485/232 communication

1-3. Each Part's Description



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