Haiwell PLC
Programmable Logic Controller
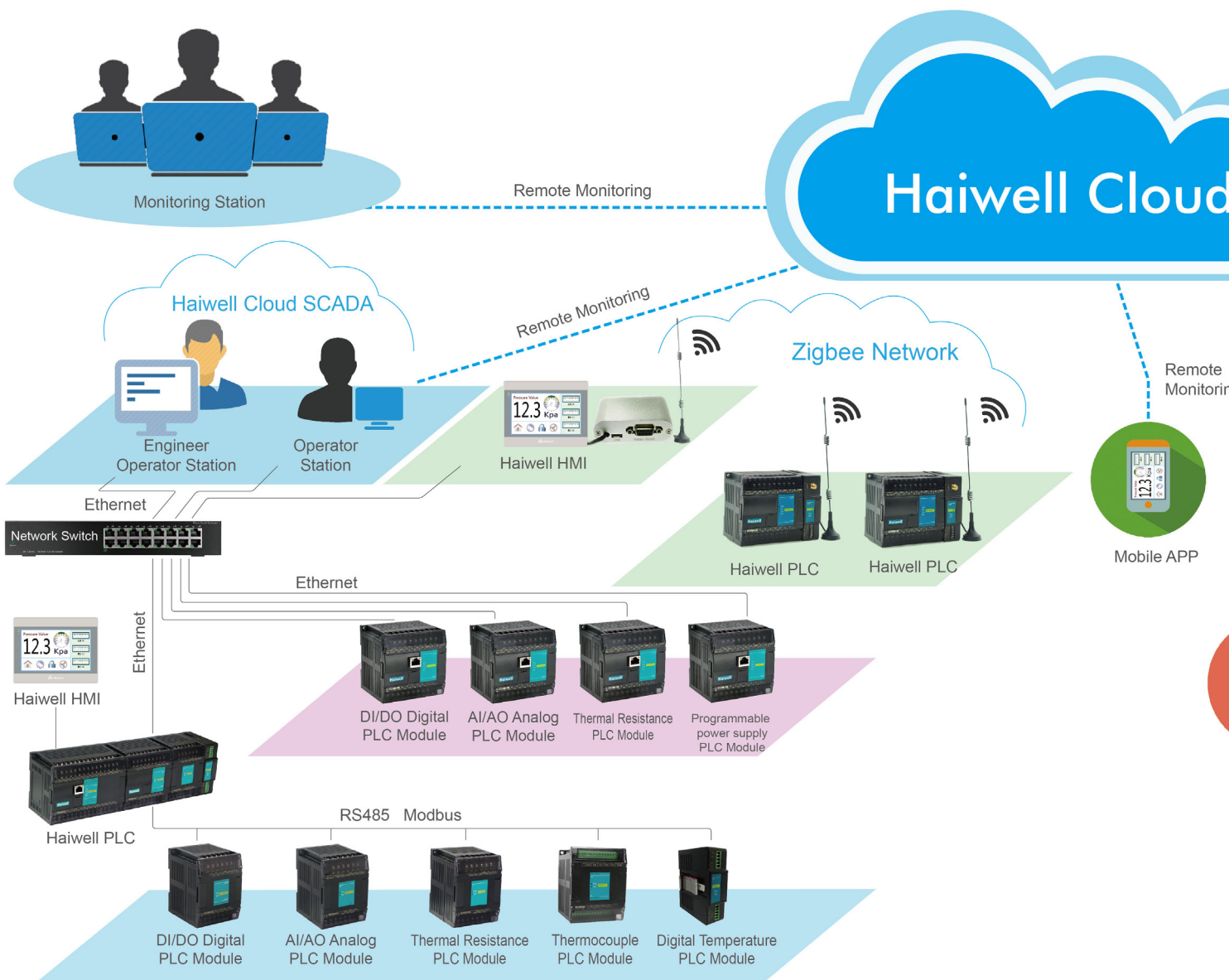
7 Characteristics

◆ **Quality Guarantee:** In accordance with IEC-61131 international standard develop

◆ **Radical innovation:** : First one built-in 100% simulator programming software, easy to study and easy to use

◆ **Remote control:** Support Haiwell cloud platform, can use Haiwell cloud to do remote programming for Haiwell PLC

◆ **Ethernet +:** Support Ethernet port and 5 other RS232/RS485 communication ports working simultaniously, support N:N network type

◆ **Communication Function:** Support Modbus TCP, Haiwellbus TCP, Modbus RTU/ASCII, Haiwellbus high speed protocol, freedom protocol

◆ **Motion Control:** Support linear interpolation, ARC interpolation, original point return, backlash compensation, electric original point redefine

◆ **Distributed IO:** Expansion modules with Ethernet port and RS458 port, can be remote IO unit by distributed installation
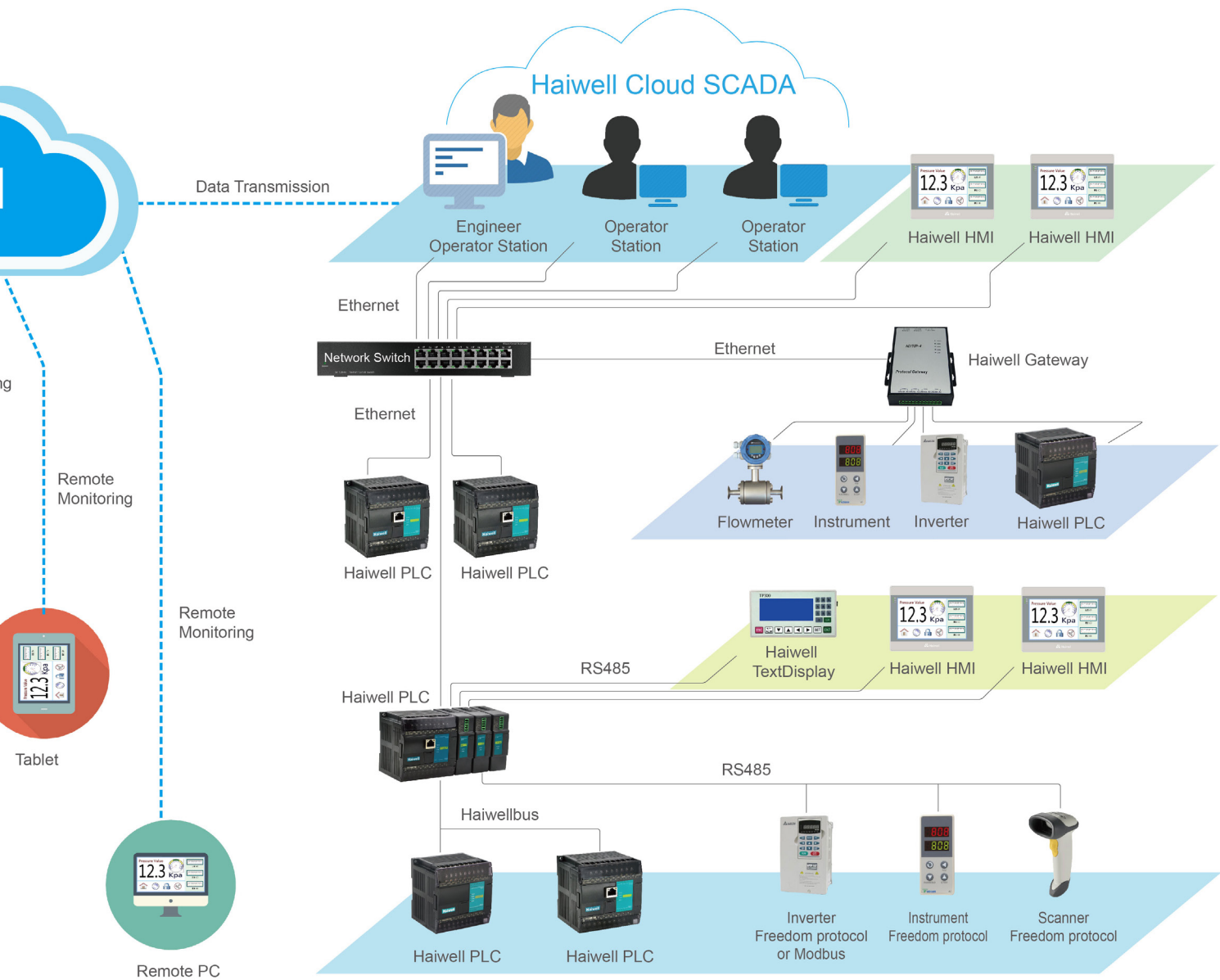
Haiwell Cloud Platform

Haiwell Cloud is a cross-platform IOT cloud platform. It supports PC, iPad, Android, IOS and other terminals. You can visit on-site equipments from a thousand miles away, and realize the remote monitoring and maintaining for HMI and PLC. It supports remote programming, firmware upgrades,monitoring and diagnosis ect.

Haiwell Cloud provides security mechanisms for communication. It is secured by the encryption mechanism of 128-bit SSL,which ensures the stable and safe data transfer. It also uses A-key and B-Key protection mechanism to enable secure remote access to the devices.

Haiwell Cloud Networking

Haiwell Cloud SCADA

Data Transmission

Engineer Operator Station
Operator Station
Operator Station
Haiwell HMI
Haiwell HMI

Ethernet

Network Switch
Ethernet
Haiwell Gateway

Ethernet

Remote Monitoring

Haiwell PLC
Haiwell PLC

Flowmeter
Instrument
Inverter
Haiwell PLC

Haiwell TextDisplay
Haiwell HMI
Haiwell HMI

RS485

Haiwell PLC

Tablet

Remote Monitoring

Haiwellbus

RS485

Remote PC

Haiwell PLC
Haiwell PLC

Inverter
Freedom protocol or Modbus
Instrument
Freedom protocol
Scanner
Freedom protocol
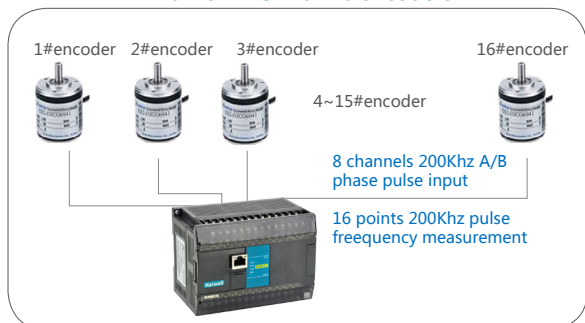
Haiwell PLC Introduction

Haiwell PLC is a versatile high-performance programmable logic controller, which is widely used in plastics, packaging, textiles, food, medical, pharmaceutical, environmental, municipal, printing, building materials, elevators, central air conditioning, numerical control machine tools and other fields of systems and control equipment. In addition to its own various peripheral interfaces (digital input, digital output, analog input, analog output, high-speed counter, high-speed pulse output channels, power supply, communication ports, etc.), it is also expandable with all types of expansion modules for flexible configuration.
Haiwell company owns the 100% independent intellectual property rights over both its hardware and software products, all products can be customized according to customer's requirements to meet the different needs of various industries.
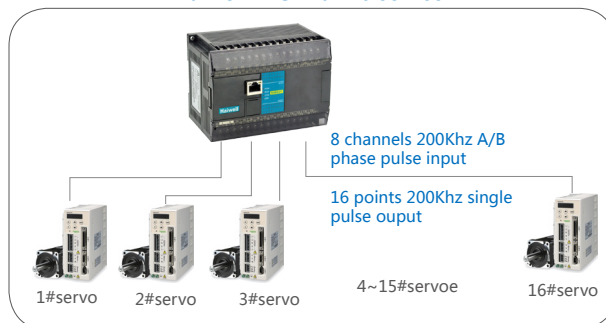
Haiwell PLC Features

- **Ethernet +:** Host plc and remote modules support ethernet communication, host plc support ethernet port and 5 other RS232/RS485 communication ports working simultaneously, support N:N network type,support remote programming,debug, monitoring and data exchange. Easy to network with other PLC modules,HMI and PC via ethernet port.

- **The firmware upgrade function:** Taking the lead in the function of realizing firmware upgrade in a small programmable controller. You can upgrade the system firmware through the firmware upgrade function free, therefore you bought the products previously can also have new features from Haiwell company.

- **Rich network communication function:** CPU host built two communication ports, which can be expandable to five communication ports, each port can be programmed and connects to network, and all of them can be used as masters or slaves. It can support 1: N, N: 1, N: N networking and a variety of man-machine interface and configuration software. It can also connect to network with any third-party devices which have communication capabilities (such as inverters, instruments, barcode readers, etc.).

- **Supporting for multiple communication protocols:** It has internally installed Modbus RTU / ASCII protocol, free communication protocol and the Haiwellbus high-speed communication protocols of Xiamen Haiwell Technology Co., Ltd. Owning to the most convenient communication instruction system, no matter what kind of communication protocols, it only simply needs a communication instruction when dealing with complex communication functions. You will no longer troubled by the problems, such as communications port's conflicts, sending and receiving control, communications interrupt handling issues and you can use a variety of protocols to exchange data easily by mixing them up in the program.

- **High-speed pulse counting function:** Supports 8-channel duplex high-speed (200KHz) pulse counting, counting mode supports 7 kinds (pulse / direction 1 octave, pulse / direction 2 octave, forward / reverse pulse 1 octave, forward / reverse pulse 2 octave, A / B phase pulse 1 octave, A / B phase pulse 2 octave, A / B phase pulse 4 octave), and three kinds of comparisons (single-stage comparison, the absolute mode comparison, the relative mode comparision), supports 8 segments comparision fixed value, with self-learning function.

- **High-speed pulse frequency measurement:** Supports 16-channel (200KHz) high-speed pulse frequency measurement, support the ways of time or pulses to measure the frequency

- **High-speed pulse output:** Supports 8-channel duplex high-speed (200KHz) pulse output, support for acceleration and deceleration pulse output, multi-segment envelope pulse output function, a unique sync pulse output function makes it easy to achieve precise synchronization control. Stand-alone support 16-channel pulse width modulation (PWM), can drive 16 servo or stepper motors.

- **Motion control function:** Each model support for 8-channel (200KHz) motion control, supports arbitrary 2-channel linear interpolation, circular interpolation, support follower pulse output, absolute address, relative address, backlash compensation, original point return, definition of electrical origin.

- **PID control function:** support 32 channels increment PID, support 32 channels auto tuning PID and 32 channels fuzzy temperature control, work with TTC temperature curve control, VC valve control and other instructions to easily control complicated objects in the industry site.

- **Powerful analog processing function:** AI register accesses the analog input directly, analog input support engineering conversion, sampling frequency settings, and zero correction. Available AQ registers control the analog output directly, analog output support engineering conversion and can be configured to maintain output.

- **Strong password protection function:** Three levels of password protection function (program files password, each block password, PLC hardware password) and prohibits the application to upload.

Haiwell PLC with 16 encoders

1#encoder 2#encoder 3#encoder   16#encoder
4~15#encoder
8 channels 200Khz A/B phase pulse input
16 points 200Khz pulse freequency measurement

Haiwell PLC with 16 servos

8 channels 200Khz A/B phase pulse input
16 points 200Khz single pulse ouput
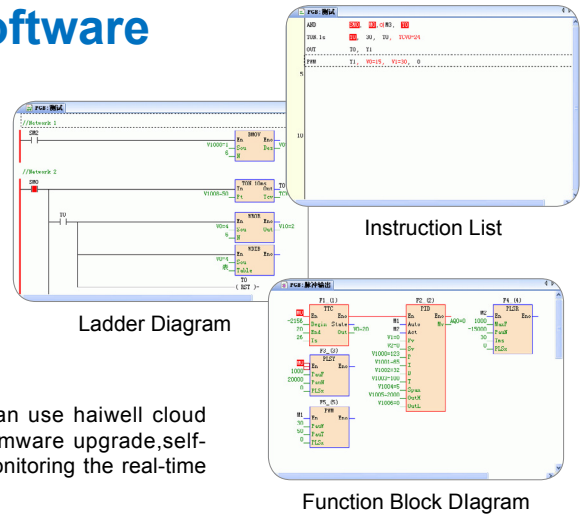1#servo   2#servo   3#servo   4~15#servoe   16#servo

HaiwellHappy Programming Software

HaiwellHappy is a programming software which is in accordance with IEC 61131-3 standard. It can be used for Haiwell PLC programming. Furthermore, it supports 100% built-in simulator and three kinds of programming languages (LD-Ladder Diagram, FBD-Function Block Diagram and IL-Instruction List). It can run on the systems of Windows 98, Windows 200X, Windows XP and the later Windows version.

Instruction List


Ladder Diagram

HaiwellHappy Features

- **Haiwell Cloud Programming :** Support haiwell cloud platform, can use haiwell cloud to do remote programming for haiwell PLC ,upload/download,firmware upgrade,self-diagnosis,monitor and debug. Easy for remote connection and monitoring the real-time data of the site.

- **Internal PLC simulator:** Haiwell PLC programming software is the first one with internal simulator in China, realizing the PLC program run in the simulation. During programming or the programming is completed, you can run PLC program in the simulation without online to check the program execution is correct or not. It can reduce on-site commissioning time greatly, reduce debugging difficult and improve debugging efficiency.

- **Communications simulator:** It is used to the debug communication instruction simulation tools. It can be manually input simulately response message returned from salve, or you can use the computer's serial port to communicate with salve really, Simulate the process that PLC executes communication instruction really and process the return data from the salve.

- **Interpolation simulator:** Track and draw the trajectory generated from motion control instructions such as the linear interpolation, circular interpolation, listing parameters of the pulse output channel of the motive plane and corresponding to each axis, display the current position of the channel, the mechanical home position, output mode, you can set shaft length, unit pulses.

- **Function of generate PLC executable file:** PLC program can be generated to executable file which is released and executed independently. So you do not need to send the PLC program to the user, it can be very easy, very safe to put the PLC excutable file to the user to download, but do not worry the user would can see the program content.

- **Modular project structure:** Create 31 blocks total (main program, sub program, interrupt program) and chose any programming language to program. The execution order of block can be adjusted at random. Each block can be imported and exported independently and has the same password protection of program projects. So we can fully realize the modular programming and program reuse dreams.

- **Instruction using table:** Provides multiple instruction tables. Use these tables can reduce the amount of programs, saving program space, such as initialization data. Each table can be imported and exported independently and has the same password protection of program project.
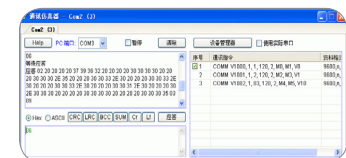

Function Block Diagram
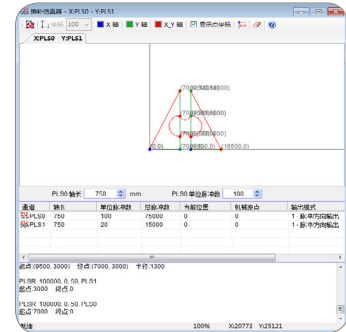
Interpolation Simulator
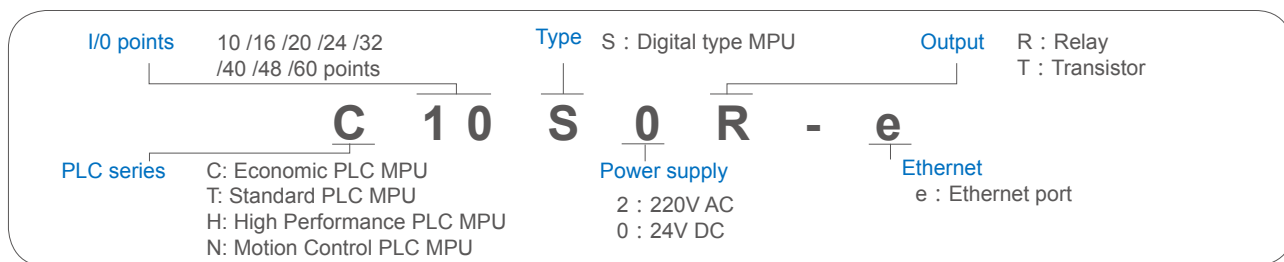

Communication Simulator

PLC Simulator

Component status table

Real-time curve

- **Powerful online features:** Search out all the PLC that connect with the PC. Show running status, fault status, RUN / STOP switch position, hardware configuration information, communication port parameters such detailed information of all the online PLC. Select any PLC for online monitoring, program download, firmware upgrade, controlling PLC stop, adjusting PLC real-time clock, modifying password protection, modifying communication port parameters, modifying the watching-dog time and PLC station names.

- **Online monitoring and debugging functions:** Provide 10 pages of component's monitoring table. It can choose in decimal, hexadecimal, binary, floating point and character to display data. Support component and register component monitoring hybridly and displaying component annotation at the same time. All instruction tables can be imported to the monitoring table.

- **Unique real-time curve function:** Monitor any of the register elements of its real-time curve, convenient to control and debug during the process.

- **Convenient annotation:** Provide the component comment, network comment, instruction comment, block comment, table comment, and project comment. After the component with "//" to input comments directly (e g.: X0 // motor start).Comments can choose to download to the PLC for reading or modification facilitately.

- **Hardware configuration, sub program parameter passing, local components, indirection, print, preview, debugging, CRC calculation, password protection, etc.**

Haiwell PLC Products List

I/0 points	10 /16 /20 /24 /32 /40 /48 /60 points		Type	S : Digital type MPU		Output	R : Relay

C 1 0 S 0 R - e

PLC series
C: Economic PLC MPU
T: Standard PLC MPU
H: High Performance PLC MPU
N: Motion Control PLC MPU

Power supply
2 : 220V AC
0 : 24V DC

Ethernet
e : Ethernet port

T : Transistor

C Series - Economic PLC MPU (-e : Built-in Ethernet port)

* R : Relay   T : Transistor

Ethernet Model		Model		Specification				Dimension
24V DC	220V AC	24V DC	220V AC	DI	DO	COM port	Max Expansion	
C10S0R-e	C10S2R-e	C10S0R	C10S2R	6	4R*	RS232 + RS485	N/A	93×95×82mm
C10S0T-e	C10S2T-e	C10S0T	C10S2T	6	4T*	RS232 + RS485	N/A	
C16S0R-e	C16S2R-e	C16S0R	C16S2R	8	8R	RS232 + RS485	N/A	
C16S0T-e	C16S2T-e	C16S0T	C16S2T	8	8T	RS232 + RS485	N/A	
C24S0R-e	C24S2R-e	C24S0R	C24S2R	16	8R	RS232 + RS485	N/A	131×95×82mm
C24S0T-e	C24S2T-e	C24S0T	C24S2T	16	8T	RS232 + RS485	N/A	
C32S0R-e	C32S2R-e	C32S0R	C32S2R	16	16R	RS232 + RS485	N/A	
C32S0T-e	C32S2T-e	C32S0T	C32S2T	16	16T	RS232 + RS485	N/A	
C48S0R-e	C48S2R-e	C48S0R	C48S2R	28	20R	RS232 + RS485	N/A	177×95×82mm
C48S0T-e	C48S2T-e	C48S0T	C48S2T	28	20T	RS232 + RS485	N/A	
C60S0R-e	C60S2R-e	C60S0R	C60S2R	36	24R	RS232 + RS485	N/A	
C60S0T-e	C60S2T-e	C60S0T	C60S2T	36	24T	RS232 + RS485	N/A	

T Series - Standard PLC MPU (-e : Built-in Ethernet port)

* R : Relay   T : Transistor

Ethernet Model		Model		Specification						Dimension
24V DC	22V AC	24V DC	220V AC	DI	DO	Pulse Input	Pulse Output	COM port	Max exp.	
T16S0R-e	T16S2R-e	T16S0R	T16S2R	8	8R*	2 Channels A/B phase (4 points) 200Khz		RS232 +RS485, Max 5 ports	7	93×95×82mm
T16S0T-e	T16S2T-e	T16S0T	T16S2T	8	8T*	2 Channels A/B phase (4 points) 200Khz	2 Channels A/B phase (4 points) 200Khzhz	RS232 +RS485, Max 5 ports	7	
T24S0R-e	T24S2R-e	T24S0R	T24S2R	16	8R	2 Channels A/B phase (4 points) 200Khz		RS232 +RS485, Max 5 ports	7	131×95×82mm
T24S0T-e	T24S2T-e	T24S0T	T24S2T	16	8T	2 Channels A/B phase (4 points) 200K	2 Channels A/B phase (4 points) 200Khz	RS232 +RS485, Max 5 ports	7	
T32S0R-e	T32S2R-e	T32S0R	T32S2R	16	16R	2 Channels A/B phase (4 points) 200Khz		RS232 +RS485, Max 5 ports	7	
T32S0T-e	T32S2T-e	T32S0T	T32S2T	16	16T	2 Channels A/B phase (4 points) 200Khz	2 Channels A/B phase (4 points) 200Khz	RS232 +RS485, Max 5 ports	7	

										Dimension
T48S0R-e	T48S2R-e	T48S0R	T48S2R	28	20R	2 Channels A/B phase (4 points) 200Khz		RS232 +RS485, Max 5 ports	7	
T48S0T-e	T48S2T-e	T48S0T	T48S2T	28	20T	2 Channels A/B phase (4 points) 200Khz	2 Channels A/B phase (4 points) 200Khz	RS232 +RS485, Max 5 ports	7	
T60S0R-e	T60S2R-e	T60S0R	T60S2R	36	24R	2 Channels A/B phase (4 points) 200Khz		RS232 +RS485, Max 5 ports	7	177×95×82mm
T60S0T-e	T60S2T-e	T60S0T	T60S2T	36	24T	2 Channels A/B phase (4 points) 200Khz	2 Channels A/B phase (4 points) 200Khz	RS232 +RS485, Max 5 ports	7	

H Series - High Performance PLC MPU (-e : Built-in Ethernet port)

* R : Relay   T : Transistor

Ethernet Model		Model		Specification						Dimension
24V DC	220V AC	24V DC	220V AC	DI	DO	Pulse Input	Pulse Output	COM port	Max exp.	
H16S0R-e	H16S2R-e	H16S0R	H16S2R	8	8R*	4 Channels A/B phase (8 points) 200Khz		RS232 +RS485, Max 5 ports	7	
H16S0T-e	H16S2T-e	H16S0T	H16S2T	8	8T*	4 Channels A/B phase (8 points) 200Khz	4 Channels A/B phase (8 points) 200Khz	RS232 +RS485, Max 5 ports	7	93×95×82mm
H24S0R-e	H24S2R-e	H24S0R	H24S2R	12	12R	4 Channels A/B phase (8 points) 200Khz		RS232 +RS485, Max 5 ports	7	
H24S0T-e	H24S2T-e	H24S0T	H24S2T	12	12T	4 Channels A/B phase (8 points) 200Khz	4 Channels A/B phase (8 points) 200Khz	RS232 +RS485, Max 5 ports	7	
H32S0R-e	H32S2R-e	H32S0R	H32S2R	16	16R	4 Channels A/B phase (8 points) 200Khz		RS232 +RS485, Max 5 ports	7	
H32S0T-e	H32S2T-e	H32S0T	H32S2T	16	16T	4 Channels A/B phase (8 points) 200Khz	4 Channels A/B phase (8 points) 200Khz	RS232 +RS485, Max 5 ports	7	131×95×82mm
H40S0R-e	H40S2R-e	H40S0R	H40S2R	20	20R	4 Channels A/B phase (8 points) 200Khz		RS232 +RS485, Max 5 ports	7	
H40S0T-e	H40S2T-e	H40S0T	H40S2T	20	20T	4 Channels A/B phase (8 points) 200Khz	4 Channels A/B phase (8 points) 200Khz	RS232 +RS485, Max 5 ports	7	
H60S0R-e	H60S2R-e	H60S0R	H60S2R	36	24R	4 Channels A/B phase (8 points) 200Khz		RS232 +RS485, Max 5 ports	7	177×95×82mm
H60S0T-e	H60S2T-e	H60S0T	H60S2T	36	24T	4 Channels A/B phase (8 points) 200Khz	4 Channels A/B phase (8 points) 200Khz	RS232 +RS485, Max 5 ports	7	

N Series - Motion Control PLC MPU (-e : Built-in Ethernet port)

T : Transistor

Ethernet Model		Model		Specification						Dimension
24V DC	220V AC	24V DC	220V AC	DI	DO	Pulse Input	Pulse Output	COM port	Max exp.	
N16S0T-e	N16S2T-e	N16S0T	N16S2T	8	8T*	4 Channels A/B phase (8 points) 200Khz	4 Channels A/B phase (8 points) 200Khz	RS232 +RS485, Max 5 ports	7	93×95×82mm
N24S0T-e	N24S2T-e	N24S0T	N24S2T	12	12T	6 Channels A/B phase (12 points) 200Khz	6 Channels A/B phase (12 points) 200Khz	RS232 +RS485, Max 5 ports	7	
N40S0T-e	N40S2T-e	N40S0T	N40S2T	20	20T	8 Channels A/B phase (16 points) 200Khz	8 Channels A/B phase (16 points) 200Khz	RS232 +RS485, Max 5 ports	7	131×95×82mm
N60S0T-e	N60S2T-e	N60S0T	N60S2T	36	24T	8 Channels A/B phase (16 points) 200Khz	8 Channels A/B phase (16 points) 200Khz	RS232 +RS485, Max 5 ports	7	177×95×82mm

Digital I/O expansion Modules (-e : Built-in Ethernet port)

* R : Relay   T : Transistor

Ethernet Model		Model		Specification			Dimension
24V DC	220V AC	24V DC	220V AC	DI	DO	Communication	
		H08DI		8			30×95×82mm
		H08DOR			8R*		
		H08DOT			8T*		
		H08XDR		4	4R		
		H08XDT		4	4T		
		H16DI		16		RS485,support remote function	70×95×82mm
		H16DOR			16R	RS485,support remote function	
		H16DOT			16T	RS485,support remote function	
		H16XDR		8	8R	RS485,support remote function	
		H16XDT		8	8T	RS485,support remote function	
H24DI-e	H24DI2-e	H24DI	H24DI2	24		RS485,support remote function	93×95×82mm
H24XDR-e	H24XDR2-e	H24XDR	H24XDR2	12	12R	RS485,support remote function	
H24XDT-e	H24XDT2-e	H24XDT	H24XDT2	12	12T	RS485,support remote function	
H40DI-e	H40DI2-e	H40DI	H40DI2	40		RS485,support remote function	131×95×82mm
H36DOR-e	H36DOR2-e	H36DOR	H36DOR2		36R	RS485,support remote function	
H36DOT-e	H36DOT2-e	H36DOT	H36DOT2		36T	RS485,support remote function	
H40XDR-e	H40XDR2-e	H40XDR	H40XDR2	20	20R	RS485,support remote function	
H40XDT-e	H40XDT2-e	H40XDT	H40XDT2	20	20T	RS485,support remote function	
H64XDR-e	H64XDR2-e	H64XDR	H64XDR2	32	32R	RS485,support remote function	177×95×82mm
H64XDT-e	H64XDT2-e	H64XDT	H64XDT2	32	32T	RS485,support remote function	

Analog I/O expansion Modules (-e : Built-in Ethernet port)

* R：Relay T：Transistor

Ethernet Model		Model		Specification				Dimension
24V DC	220V AC	24V DC	220V AC	AI	AO	Conversion Accuracy	Communication	
		H04DT		4 Channel DS18B20 temperature		9~12 bits		30×95×82mm
		H32DT		32 Channel DS18B20 temperature		9~12 bits	RS485, support remote function	
		S04AI	S04AI2	4		12 bits	RS485, support remote function	70×95×82mm
		S04AO	S04AO2		4	12 bits	RS485, support remote function	
		S04XA	S04XA2	2	2	12 bits	RS485, support remote function	
		H04RC	H04RC2	4 thermal resistance		16 bits	RS485, support remote function	
		H04TC	H04TC2	4 thermocouple		16 bits	RS485, support remote function	
		H08TC	H08TC2	8 thermocouple		16 bits	RS485, support remote function	
S08AI-e	S08AI2-e	S08AI	S08AI2	8		12 bits	RS485, support remote function	93×95×82mm
S08AO-e	S08AO2-e	S08AO	S08AO2		8	12 bits	RS485, support remote function	
S08XA-e	S08XA2-e	S08XA	S08XA2	4	4	12 bits	RS485, support remote function	
H08RC-e	H08RC2-e	H08RC	H08RC2	8 thermal resistance		16 bits	RS485, support remote function	
H02PW-e		H02PW		2 channels programmed control DC constant voltage / constant current output, with current and voltage measurement		12 bits	RS485, support remote function	

Communication expansion Modules

Model	Specification	Dimension
S01RS	With isolation ,1 RS232/RS485 communication port, Modbus RTU/ASCII protocol, freedom communication protocol, Haiwellbus high speed communication protocol, Baud rate 1200~57600bps	30×95×82mm
S01GL	With isolation ,Modbus RTU/ASCII protocol, freedom communication protocol, Haiwellbus high speed communication protocol, Baud rate 1200~115200bps	
H01ZB	Zigbee wireless communication	
PC2ZB	PC to Zigbee module	48x70x24mm

Haiwell PLC Specification

Performance Specification

Item		Specification	Declare
Program control model		Cycle scan model	
Input/output (I/O) control model		Refresh once each cycle scan, support immediately refresh instruction (MPU and expansion module)	
Execution speed of instruction		0.05us/basic instruction	
Program language		LD(ladder) + FBD(function block) + IL(instruction list)	Accord with IEC 61131-3
Program capacity		48K	
Storage way		Flash ROM permanent storage, dispense with backup battery	
X	External input	X0~X1023	Support edge catch and signal filtering set
Y	External output	Y0~Y1023	Power-off preserve output can be configured
M	Auxiliary relay	M0~ M12287	Power-off preserve area can be set freedom
		(default power-off preserve)M1536~M2047	
T	Timer(output coil)	T0~T1023	Power-off preserve area can be set freedom, time base: 10ms, 100ms, 1s be set freedom,T252~T255 1ms
		(default power-off preserve)T96~T127	
C	Counter(output coil)	C0~C255	Power-off preserve area can be set freedom
		(default power-off preserve)C64~C127	
S	Step state bits	S0~S2047	Power-off preserve area can be set Freedom
		(default power-off preserve)S156~S255	
SM	System state bits	SM0~SM215	
LM	Local relay	LM~LM31	
AI	Analog input register	AI0~AI255	Support quantities convert, sample times and zero point correct
AQ	Analog output register	AQ0~AQ255	Support quantities convert, power-off preserve output can be configured
V	Internal data register	V0~V14847	power-off preserve area can be set freedom
		(default power-off preserve)V1000~V2047	
TV	Timer(Current value register)	TV0~TV1023	Power-off preserve area can be set freedom, time base: 10ms, 100ms, 1s can be set freedom,T252~T255 1ms
		(default power-off preserve)TV96~TV127	
CV	Counter(Current value register)	CV0~CV255	Power-off preserve area can be set freedom,CV48~CV79 are 32 bits, Other are 16 bits
		(default power-off preserve)CV64~CV127	
SV	System register	SV0~SV900	
Lv	Local Register	Lv0~Lv31	
P	Indexed addressing point	P0~P29 ,use for indirect addressing	
I	Interrupt	I1-I52	
LBL	Lable	255,use for program skip	
Constant	10 Decimal	-32768~+32767(16 bits),-2147483648~+2147483647(32 bits)	
	16 Hexadecimal	0000~FFFF(16 bits),00000000~FFFFFFFF(32 bits)	

Item	Specification	Declare
Communication port	MPU built-in 2 communication port(RS232/RS485) ,Max 5 communication port (RS232/RS485) expansion	can be program or networking(master/slave)
Communication protocol	Modbus RTU/ASCII protocol, freedom communication protocol, Haiwellbus speed communication protocol, Baud rate 1200~115200bps	
PLC network capacity	PLC communication address can be set external set, Max 254,support 1: N, N: 1, N: N network	
Real time clock(RTC)	Display: year/month/day/hour/minute/second/week	built-in battery
High speed counter	8 Channel, 200K	Have teaching function,7 counting model: 1 - pulse/direction 1 times,2 - pulse/direction 2 times,3 - positive/ reversal pulse 1 times,4 - positive/ reversal pulse 2 times,5 - A/B phase pulse 1 times,6 - A/B phase pulse 2 times,7 - A/B phase pulse 4 times
High speed pulse output	8 Channel, 200K	5 output models: 1 - single pulse output,2 - pulse/direction output,3 - positive/reversal pulse output,4 - A/B phase pulse output,5 - Synchronism pulse output
Float point arithmetic instruction	support within 32 bits float point arithmetic, integer/float point convert arithmetic	
Password protection	Support three level password protection function(program file password, program block password, PLC hardware password) and upload prohibited function	
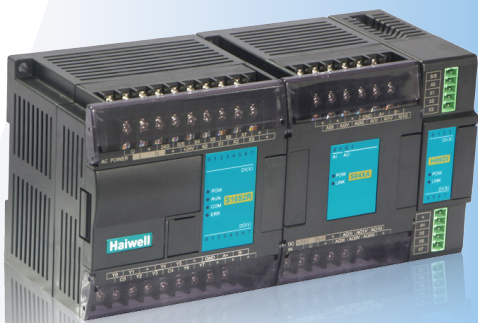
Power Specification

| Item	AC Supply	DC Supply
Input power supply	100~240VAC	24VDC -15%~+20%
Power supply frequency	50~60Hz	---
Instant surge	MAX 20A 1.5ms @220VAC	MAX 20A 1.5ms @24VDC
Power output	MAX 25VA	---
Permit Power supply lost	20ms within @220VAC	10ms within
Fuse capacity	2A,250V	2A,250V
Action (working) specification	When input power voltage rise to 95~100VAC, PLC will be run, when input power voltage drop down to 70VAC, PLC will be stopped.	---
Output power supply — 5VDC for CPU	5V,-2%~+2%,1.2A(maximum)	5V,-2%~+2%,1.2A(maximum)
Output power supply — 24VDC power supply for output and expansion modules	24V,-15%~+15%,500 mA(maximum)	24V,-15%~+15%,500mA(maximum)
Output power supply — 24VDC power supply for input and external device	24V,-15%~+15%,300mA(maximum)	Direct use the 24VDC input power supply
Isolation model	Transformer/photo electricity isolation,1500VAC/1 minute	No electrical isolation
Protect the power supply	24VDC output over the limit of the current	DC power input polar against, over voltage

Product Environment Specification

Item	Environment Specification
Temperature/Humidity	Working temperature: 0 ~ + 55 ℃ storage temperature: - 25 ~ + 70 ℃ and humidity: 5 ~ 95% RH, no condensation
Anti vibration	10~57Hz range 0.075mm,57Hz~150Hz acceleration 1G,X, Y, Z three axis 10 times each direction
Anti shock	15G,continue 11ms,X, Y, Z three axis 6 times each direction
Anti jamming	AC EFT: ± 2500V, surge: ± 2500V, DC EFT: ±2500V, surge: ±1000V
Over voltage capability	Between AC terminal and PE terminal 1500VAC,1min,Between DC terminal and PE terminal 500VAC,1min
Insulation impedance	Between AC terminal and PE terminal@500VDC,>=5MΩ(Between all input/output terminal and PE terminal@500VDC)
Earth	The third grounding(Cannot connect to the strong power system's earth)
Operation environment	Operated where no dust, moisture, corrosion, electrical shock and physical shock ,etc.

Digital Input (DI) Specification

Item	Digital Input DI
Input signal	Non-voltage contact or NPN/PNP contact
Action driving	ON: 3.5 mA above OFF: below 1.5 mA
Input impedance	About 4.3KΩ
Input maximum current	10mA
Response time	Default 6.4ms,Configurable 0.8~51.2ms
Isolation mode	Each Channel optical isolation
Input indication	LED light means ON, dark means OFF
Power supply	PLC internal power supply: DC power(sink or source)5.3mA@24VDC

Digital Input (DI) Wiring Diagram

PNP Internal power

PNP External power

NPN Internal power

NPN External power
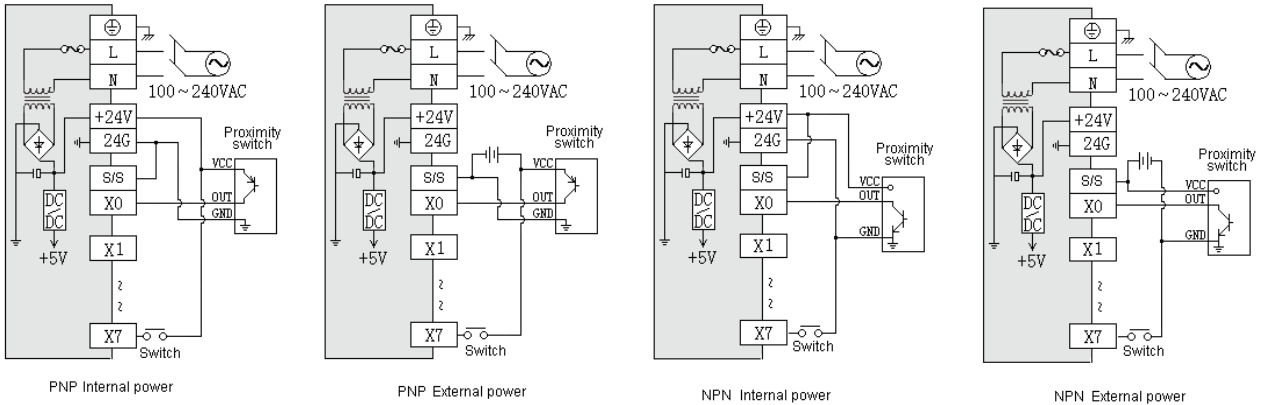
Digital Output (DO) Specification

| Item		Relay Output-R	Transistor Output NPN-T
maximum load	Resistance load	2A/1 point,8A/4 point per COM	0.5A/1 point,2A/4 point per COM
	Inductive load	50VA	5W/24VDC
	Light load	100W	12W/24VDC
Min. load		10mA	2mA
Voltage specification		Below 250VAC,30VDC	30VDC
Drive capability		Maximum 5A/250VAC	MAX 1A 10S
Response time		Off-on 10ms,On-off 5ms	Off→On 10us, On→Off 120us
Leakage current when route opened		---	Below 0.1mA
Isolation mode		Mechanical isolation	Each Channel optical isolation
Output indication		LED light means ON , dark means OFF	
Power supply		PLC internal power supply 24VDC	

Digital Output (DO) Wiring Diagram

AC/DC Relay output

DC NPN Transistor output
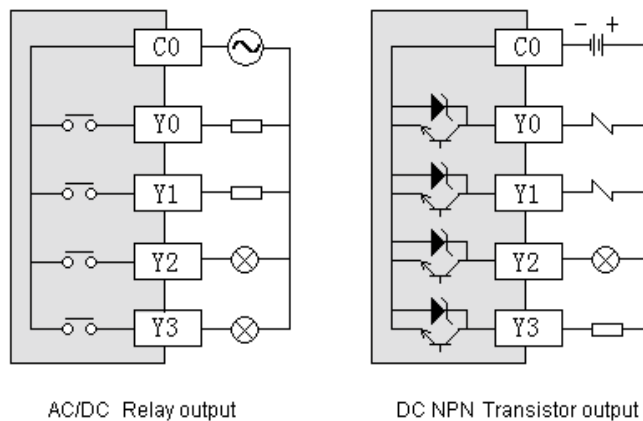
Analog Input (AI) Specification

Item	Voltage Input				Current Input		RTD Input	Thermocouple Input
Input range	-10V~ +10V	0V~ +10V	0V~ +5V	1V~ +5V	0~ 20mA	4~ 20mA	Pt100, Pt1000, Cu50, Cu100	S, K, T, E, J, B, N, R, Wre3/25, Wre5/26, [0-20]mV, [0-50]mV, [0-100]mV
Resolution	5mV	2.5mV	1.25mV	1.25mV	5uA	5uA	0.1℃	0.1℃
Input impedance	6MΩ				250Ω		6MΩ	6MΩ
Max input range	±13V				±30mA			±5V
Input indication	LED light means normal , dark means break OFF							
Response time	5ms/4 Channel						560ms/4 Channel ,880ms/8 Channel	
Digital input range	12 bits, Code range: 0~32000(H series module 16 bits A/D convert)						16 bits, Code range: 0~32000	
Precision	0.2% F.S						0.1% F.S	
Power supply	MPU use internal power supply, expansion module use external power supply 24VDC ±10% 5VA							
Isolation mode	Opto-electric isolation, Non-isolation between Channel ,between analog and digital is opto-electric isolation							
Power consumption	24VDC ±20%,100mA(Max)						24VDC ±20%,50mA(Max)	

Analog Input (AI) Wiring Diagram
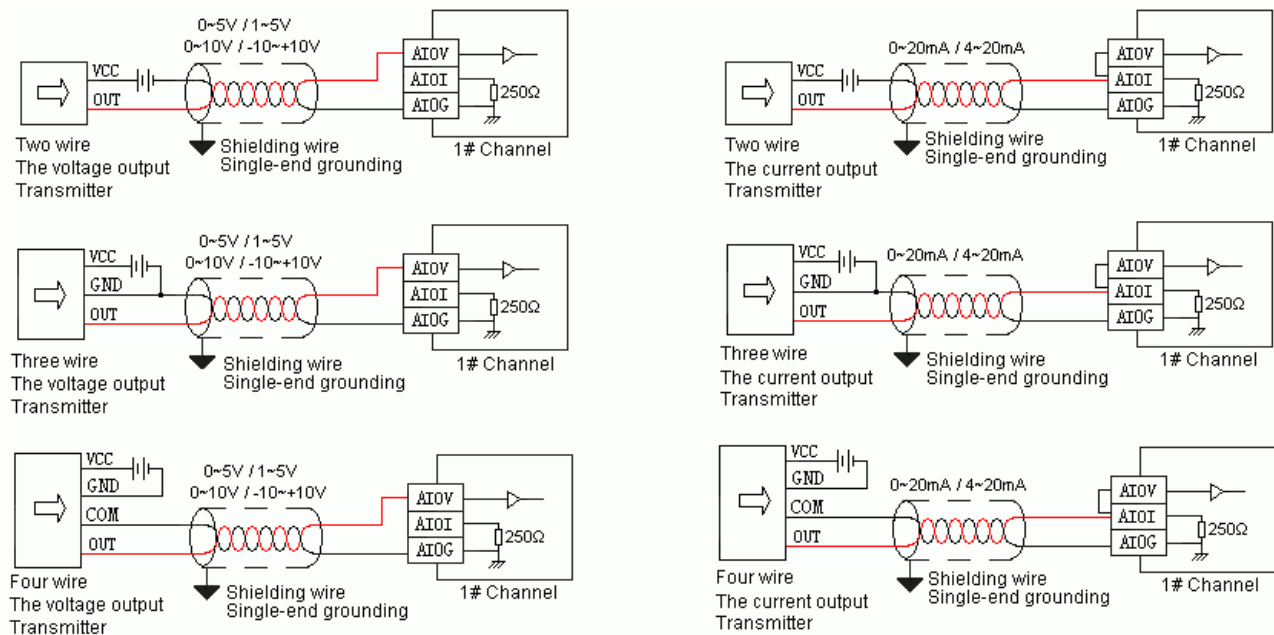
Thermocouple & RTD Input Wiring Diagram

Analog Output (AO) Specification

Item	Voltage Output				Current Output	
Output range	-10V~+10V	0V~ +10V	0V~+5V	1V~+5V	0~20mA	4~20mA
Resolution	5mV	2.5mV	1.25mV	1.25mV	5uA	5uA
Output load impedance	1KΩ@10V		≥500Ω@ 5V		≤500Ω	
Output indication	LED light means normal					
Drive capability	10mA					
Response time	3ms					
Digital output range	12 bits, Code range: 0~32000(H series module 16 bits D/A convert)					
Precision	0.2% F.S					
Power supply	MPU use internal power supply, expansion module use external power supply 24VDC ±10% 5VA					
Isolation mode	Opto-electric isolation, Non-isolation between Channel ,between analog and digital is opto-electric isolation					
Power consumption	24VDC ±20%,100mA(Max)					

Analog Output (AO) Wiring Diagram
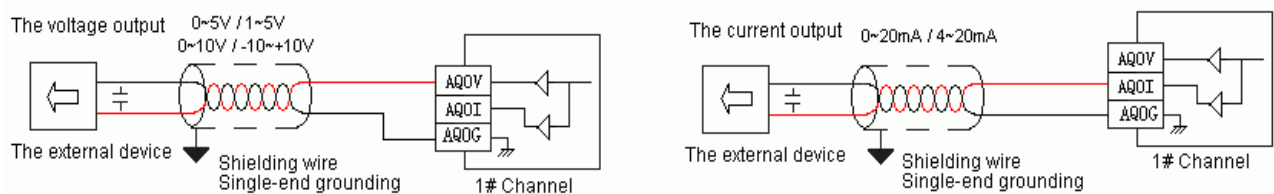
Analog Output (AO) Wiring Diagram
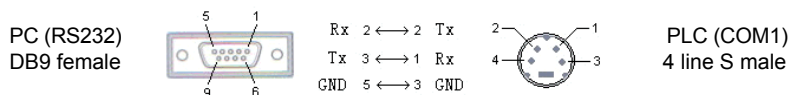
Haiwell PLC Instruction Table

Instruction Type	Instruction Name	8bit Model	32bit Model	Instruction Function
Compare switch	=	LB.= HB.=	D.=	Equal to compare switch ,have 16 bit/32 bit /low byte/high byte model
	<>	LB.<> HB.<>	D.<>	Unequal to compare switch ,have 16 bit/32 bit /low byte/high byte model
	>	LB.> HB.>	D.>	Greater than compare switch ,have 16 bit/32 bit /low byte/high byte model
	>=	LB.>= HB.>=	D.>=	Great than or equal to compare switch ,have 16 bit/32 bit /low byte/high byte model
	<	LB.< HB.<	D.<	Less than compare switch ,have 16 bit/32 bit /low byte/high byte model
	<=	LB.<= HB.<=	D.<=	Less than or equal to compare switch ,have 16 bit/32 bit /low byte/high byte model
	F.=			Floating-point number equal to compare switch
	F.<>			Floating-point number unequal to compare switch
	F.>			Floating-point number greater than compare switch
	F.>=			Floating-point number greater than or equal to compare switch
	F.<			Floating-point number less than compare switch
	F.<=			Floating-point number less than or equal to compare switch
Step instruction	STL			Step start
	SFROM			Step combine
	STO			Step jump
Bit instruction	AND			Logic AND
	OR			Logic OR
	XOR			Logic XOR
	OUT			Coil output
	SET			Setting
	RST			Reset
	ALT			ON/OFF alternately output
	ZRST			Batch reset
	ENO			Get ENO output
Timer	TON			Delay ON
	TOF			Delay OFF
	TP			Pulse timer
Counter	CTU		D.CTU	Increase counter
	CTD		D.CTD	Decrease counter
	CTUD		D.CTUD	Increase and Decrease counter
Special function instruction	GPWM			General pulse width modulation
	FTC			Fuzzy temperature control
	PID			PID control
	HAL		D.HAL	Upper limit alarm
	LAL		D.LAL	Lower limit alarm
	LIM		D.LIM	Range limitation
	SC		D.SC	Linear conversion
	VC			Valve control
	TTC			Temperature curve control
	APID			Self-tuning PID

Instruction Type	Instruction Name	8bit Model	32bit Model	Instruction Function
High speed control instruction	RESH			IO refresh
	SHC			Single high speed counter
	HHSC			High speed counter
	HCWR			Write high speed counter
	SPD			Speed detection
	PWM			Pulse width modulation
	PLSY		D.PLSY	Pulse output
	PLSR		D.PLSR	Accelerate and decelerate pulse output
	ZRN			Origin point return
	SETZ			Set electric origin point
	PPMR			Linear interpolation
	CIMR			Circular interpolation
	SPLS			Single pulse output
	MPTO			Multi-segment pulse output
	SYNP			Synchronization pulse output
	PSTOP			Stop pulse output
	DVIT			Interrupt positioning pulse output
	ECAM			The electronic CAM
	JOGP			Jog pulse output
Compare instruction	CMP		D.CMP	Compare instruction
	ZCP		D.ZCP	Regional comparison
	MATC		D.MATC	Numerical match
	ABSC		D.ABSC	Absolute cam comparison
	BON			ON bit determine
	BONC		D.BONC	ON bit numbers
	MAX		D.MAX	Maximum
	MIN		D.MIN	Minimum
	SEL		D.SEL	Selection of conditions
	MUX		D.MUX	Multi-choice
Shift instruction	LBST			Low byte evaluation
	HBST			High byte evaluation
	MOV		D.MOV	Move
	BMOV			Block move
	FILL			Fill
	XCH			Byte swap
	BXCH			Block swap
	SHL			Bit left shift
	SHR			Bit right shift
	WSHL			Word left shift
	WSHR			Word right shift
	ROL			Bit rotate left shift
	ROR			Bit rotate right shift
	WROL			Word rotate left shift
	WROR			Word rotate right shift
	BSHL			Byte left shift
	BSHR			Byte right shift
	ATBL			Append to array
	FIFO			First in first out
	LIFO			Last in first out
	SORT			Data sort

Category				Description
Data conversion instruction	ENCO			Encoder
	DECO			Decoder
	BTOW			Bit convert to word
	WTOB			Word convert to bit
	HEX	HEX.LB		ASCII convert to hexadecimal
	ASCI	ASCI.LB		Hexadecimal convert to ASCII
	BUNB			Discrete bit combination to continuous bit
	BUNW			Discrete bit combination to continuous word
	WUNW			Discrete word combination to continuous word
	BDIB			Continuous bit disperse to discrete bit
	WDIB			Continuous word disperse to discrete bit
	WDIW			Continuous word disperse to discrete word
	BCD		D.BCD	BIN convert to BCD
	BIN		D.BIN	BCD convert to BIN
	ITOL			Integer convert to long integer
	GRAY			BIN convert to GRAY code
	GBIN			GRAY code convert to BIN
Character instruction	GHLB			Obtain high low byte
	GETB			Capture byte string
	BCMP	BCMP.LB		Byte string comparison
	ITOC		D.ITOC	Integer convert to character
	CTOI			Character convert to integer
	FTOC			Floating point convert to character
	CTOF			Character convert to floating point
Arithmetical instruction	WNOT		D.WNOT	Negation
	WAND		D.WAND	AND operation
	WOR		D.WOR	OR operation
	WXOR		D.WXOR	XOR operation
	ADD		D.ADD	Addition
	SUB		D.SUB	Subtraction
	INC		D.INC	Increase 1
	DEC		D.DEC	Decrease 1
	MUL		D.MUL	Multiplication
	DIV		D.DIV	Division
	ACCU		D.ACCU	Accumulation
	AVG		D.AVG	Average
	ABS		D.ABS	Absolute value
	NEG		D.NEG	Two's complement
Interrupt instruction	ATCH			Interrupt binding
	DTCH			Interrupt release
	ENI			Enable interrupt
	DISI			Disable interrupt
Program control instruction	MC			Master control
	MCR			Master control clear
	FOR			Loop command
	NEXT			Loop end
	WAIT			Delay wait
	CALL			Call subroutine
	EXIT			Condition exit
	REWD			Scanning time reset
	JMPC			Condition jump
	LBL			Jump label

Category				Description
Floating point instruction	FCMP			Floating point comparison
	FZCP			Floating point regional comparison
	FMOV			Floating point move instruction
	FADD			Floating point addition
	FSUB			Floating point subtraction
	FMUL			Floating point multiplication
	FDIV			Floating point division
	FACCU			Floating point accumulation
	FAVG			Floating point average
	FMAX			Floating point maximum
	FMIN			Floating point minimum
	FTOI			Floating point convert to integer
	ITOF		D.ITOF	Integer convert to floating point
	FABS			Floating point absolute
	FSQR			Floating point square root
	FSIN			Sine
	FCOS			Cosine
	FTAN			Tangent
	FASIN			Arcsine
	FACOS			Arccosine
	FATAN			Arctangent
	FLN			Natural logarithm
	FLOG			The base-10 logarithm of a number
	FEXP			Nature exponential
	FRAD			Angle convert to radian
	FDEG			Radian convert to angle
	FXY			Exponent
Clock instruction	TCMP			Real time clock comparison
	TACCU			Time accumulative total
	SCLK			Setup system clock
	TIME			Time switch
	DATE			Date switch
	INVT			Count down
Communication instruction	SUM	SUM.LB		SUM verify
	BCC	BCC.LB		BCC verify
	CRC	CRC.LB		CRC verify
	LRC	LRC.LB		LRC verify
	COMM	COMM.LB		Serial communications
	MODR			Modbus read
	MODW			Modbus write
	HWRD			Haiwellbus read
	HWWR			Haiwellbus write
	RCV			Receive communication data
	XMT	XMT.LB		Sent communication data
	FROM			expansion module CR register read
	TO			expansion module CR register write
	TCPMDR			Modbus TCP read
	TCPMDW			Modbus TCP write
	TCPHWR			Haiwellbus TCP read
	TCPHWW			Haiwellbus TCP write

Haiwell PLC Communication Address Code Table

Haiwell PLC Bit Component

Equivalently Modbus address type 0, 1, support Modbus function code 1, 2, 5, 15

Component	Name	Component Range	Read/ Write	Modbus Communication Address Code		Declare
				Hexadecimal	Decimal	
X	External input	X0~X1023	R	0x0000~0x03FF	0~1023	
Y	External output	Y0~Y1023	R/W	0x0600~0x09FF	1536~2559	
M	Auxiliary relay	M0~M12287	R/W	0x0C00~0x3BFF	3072~15359	
T	Timer(output coil)	T0~T1023	R/W	0x3C00~0x3FFF	15360~16383	
C	Counter(output coil)	C0~C255	R/W	0x4000~0x40FF	16384~16639	
SM	System status bit	SM0~SM215	all be read, some be written	0x4200~0x42D7	16896~17111	
S	Step relay	S0~S2047	R/W	0x7000~0x77FF	28672~30719	

Haiwell PLC Register Component

Equivalently Modbus address type 3, 4, support Modbus function code 3, 4, 6, 16

| Component	Name	Component Range	Read/ Write	Modbus Communication Address Code		Declare
				Hexadecimal	Decimal	
CR	expansion module parameter	CR0~CR255	All can be read, some can be wrote	0x00~0xFF	0~255	Use Modbus protocol to access expansion module
AI	Analog input register	AI0~AI255	R	0x0000~0x00FF	0~255	
AQ	Analog output register	AQ0~AQ255	R/W	0x0100~0x01FF	256~511	
V	Internal data register	V0~V14847	R/W	0x0200~0x3BFF	512~15359	
TV	Timer(current value)	TV0~TV1023	R/W	0x3C00~0x3FFF	15360~16383	
CV	Counter(current value)	CV0~CV255	R/W	0x4000~0x40FF	16384~16639	16 bit register, among CV48~CV79 32 bit register
SV	System special register	SV0~SV900	All can be read, some can be written	0x4400~0x4784	17408~18308	

Declare:

Haiwell PLC use the stand Modbus protocol (support RTU and ASCII mode),can communicate to HMI and configuration soft which support Modbus protocol.

Haiwell PLC's Modbus addressing number from 0, Some HMI or configuration soft from 1,if HMI or configuration soft Modbus addressing from 0 then communicate direct, e.g. M0 is 0x3072,V0 is 4x0512. if HMI or configuration soft Modbus addressing from 1 then the address must add 1,e.g.M0 is 0x3073[3072+1],V0 is 4x0513[512+1].The first place address is the Modbus protocol component type(0/1 is bit relay ,3/4 is word register , 0/4 can read and write,1/3 read only)other places are the component address.
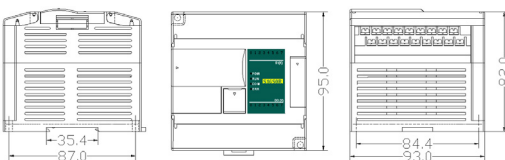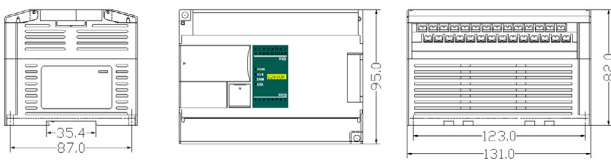
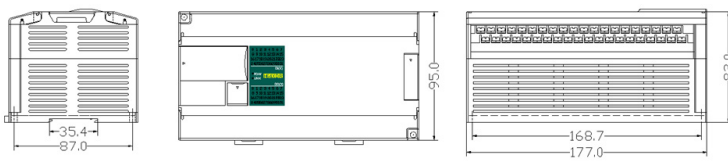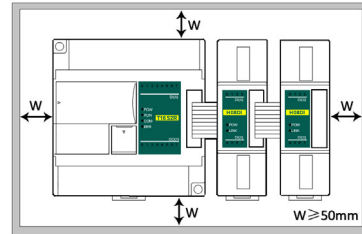# Haiwell PLC Dimension and Installation
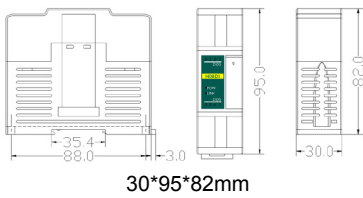
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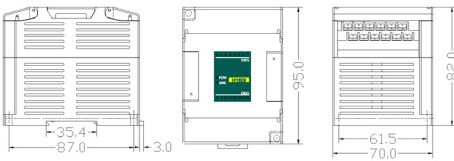
70*95*82mm

93*95*82mm

131*95*82mm

177*95*82mm

Mounting and installation

W≥50mm

The PLC should be secured to an enclosed cabinet while mounting. For heat dissipation, make sure to provide a minimum clearance of 50mm between the unit and all sides of the cabinet. (See the above figure.)

Rail Mounting: Use standard 35 mm rail.

Screw Mounting: Each MPU or extension module has two positioning screw holes, the diameter of the hole is 4.5mm. Please refer to the dimension figure for the location of the positioning holes and their spacing.

To avoid over temperature and for a better heat dissipation, do not mount PLC to a position near to the bottom/top of the cabinet. Do not mount PLC in vertical direction.

Extension Module Wiring: Connections between extension modules and connections between module and MPU are achieved through bus.An extension cable will be configured to every extension module, for the connection between two different modules.

Connection methods: turn the right side of extended interface(the last MPU or extension module) over, plug the extension cable in the extended interface, then press down the cover of the extended interface to reset the interface, the extended interface at the right side of the module will be reserved for extension of the next module. Connect all extension modules in turn in the same way.

Address Setting

Haiwell PLC with Ethernet port,the default IP address is : 192.168.0.111. Hardware DIP dial switch address range: 1-15, the default address is 1. If you need to set a bigger adress range, you can set on the software after connection with PLC, it can be set on the PLC parameter option in the software menu by checking on the "soft address" with the range of 1-254(the soft address is prior to the hardware dial address).
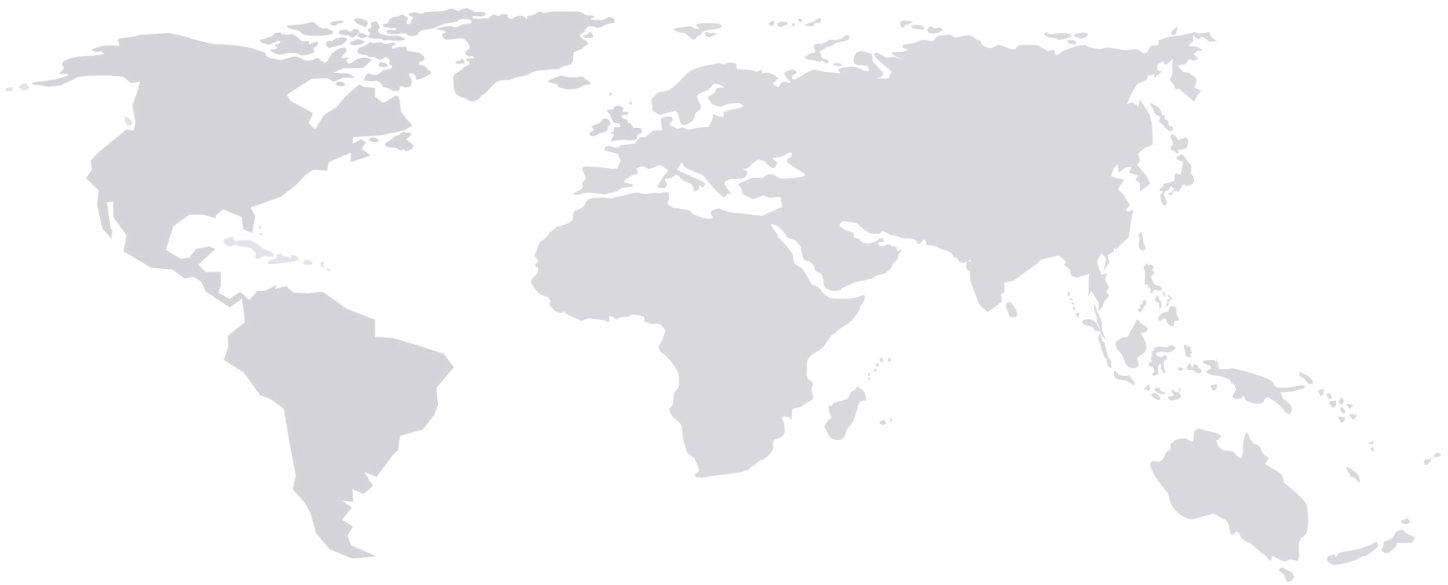
Haiwell Cloud

Haiwell Wechat

The parameters of product are subject to changes without prior notice.

(Ver. II - 201612)