

# MASTER-K Series



## Automation Equipment



## Leader in Industrial Electric Power and Automation creating environment-friendly and highly productive industrial society as Total-solution provider

LS Industrial Systems (LSIS), founded in 1974, as a leader in Korean industrial electric power and automation market is trying to be a global leader. LSIS will fulfill its mission providing total-solution as a forerunner of creating environment-friendly and productive industrial future society.





# MASTER-K Series

Programmable  
Logic  
Controller



## MASTER-K Series

Programmable Logic Controller

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# MASTER-K Series

Programmable  
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## MASTER-K Series

Programmable Logic Controller

**MASTER-K Series**  
*with open network support*

### Various series

According to control points, system optimization is realized.

### Fast processing time

Real-time control and monitoring is achieved.

### A wide variety of special modules

From analog to positioning module, various applications with diverse special modules.

### Powerful network from dedicated to open network

RS-232C/422/485, Fnet, Fast Ethernet, Profibus-DP, and DeviceNet.

### Windows-based software

Windows support and compatible with GSIKGL.  
(DOS-based S/W for MASTER-K)



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## Powerful and compact PLC

CPU, digital I/O and power part are embedded in block-type PLCs, which is easy to install in whatever area you want for system configuration. In case of module-type PLCs, system configuration is easily achieved by a variety of modules (CPUs, I/Os, special modules, network modules).







### MASTER-K10S1

- Micro block type: 120 × 80 × 65
- Program capacity: 800 steps
- I/O: 14 points (Input 8 points, Output 6 points)
- Built-in HSC (1-phase 8kpps)
- PLC communication and control by PC with RS-232C/RS-485



### MASTER-K80S/120S

- Compact and high-function block type
- Program capacity: 7k steps/10k steps
- Various main and expansion modules
- High-function built-in functions: Input filter, Positioning, PID, HSC, built-in Cnet
- Diverse special/network modules
- On-line edit support



### MASTER-K200S

- Small- and medium-scale control with 384 points
- Fast processing time: 0.5  $\mu$ s/step
- On-line edit support
- Powerful built-in functions with 3 types of CPUs
- Various special/network modules



### MASTER-K300S

- Small- and medium-scale control with 1,024 points
- High-speed processing time: 0.2  $\mu$ s/step
- On-line edit support
- Downsizing, high-performance and high-function modules
- Various special/network modules

## ■ General specifications

Item	Description				Standard
Ambient temperature	0~55℃ (32 ~131 ℉)				
Storage temperature	-25~70℃ (-13~158 ℉)				
Ambient humidity	5~95%RH (Non-condensing)				
Storage humidity	5~95%RH (Non-condensing)				
Vibration	Occasional vibration			10 times each direction (X, Y and Z)	IEC 61131-2
	Frequency	Acceleration	Pulse width		
	10 ≤ f < 57Hz	-	0.075mm		
	57 ≤ f ≤ 150Hz	9.8 $\frac{m}{s^2}$ (1G)	-		
	Continuous vibration				
	Frequency	Acceleration	Pulse width		
	10 ≤ f < 57Hz	-	0.035mm		
Shocks	57 ≤ f < 150Hz			4.9 $\frac{m}{s^2}$ (0.5G)	-
	<ul style="list-style-type: none"><li>• Peak acceleration: 147<math>\frac{m}{s^2}</math>(15G)</li><li>• Duration: 11ms</li><li>• Half-sine, 3 times each direction per each axis</li></ul>				
Impulse noise	Square wave impulse noise		±1,500Vp-p		LSIS Standard
	Electrostatic discharge		±4kV		IEC 61131-2/IEC 1000-4-2
	Radiated electromagnetic field noise		27~500MHz, 10V/m		IEC 61131-2/IEC 1000-4-3
	Fast transient/ burst noise	Power supply	Digital I/O (more than 24V)	Digital I/O (> 24V)	IEC 61131-2/IEC 1000-4-4
		2kV	1kV	Analog I/O, Comm.I/O 0.25kV	
Operation ambience	Free from corrosive gases and excessive dust				
Altitude	Up to 2,000m (6,562ft)				
Pollution degree	Less than or equal to 2 <sup>*</sup>				
Cooling method	Air-cooling				

\* Pollution degree 2 is nonconductive pollution of the sort where occasionally a temporary conductivity caused by condensation must be expected.

## ■ Technical specifications

Item		K10S1	K80S	K120S		K200S	K300S
				Economic	Standard		
Operation method		Cyclic execution of stored program					
I/O control method		Scan synchronized batch processing method (refresh method)					
Program language		Mnemonic, Ladder					
Number of instructions	Basic	30					
	Application	154	218	269	277	218	218
Max. I/O control points		14	100	70	120	384 (512 <sup>*1)</sup>	1,024 <sup>*2)</sup>
Programming memory capacity		800	7k	2k	10k	7k	15k
Processing speed (μs/step)		3.2~7.6	0.5	0.4	0.1	0.5	0.2
Data area	P (I/O relay)	P0000~P001F	P0000~P015F	P000~P63F		P000~P31F	P000~P63F
	M (Aux. relay)	M0000~M015F	M0000~M191F				
	K (Keep relay)	K0000~K007F	K000~K31F				
	L (Link relay)	L0000~L007F	L000~L63F				
	F (Special relay)	F0000~F015F	F000~F63F				
	T (Timer)	100ms	T000~T031	T000~T191			
		10ms	T032~T047	T192~T255	T192~T250		T192~T255
		1ms	-	-	T251~T255		-
	C (Counter)	C000~C015	C000~C255				
	S (Step controller)	S00.00~S15.99	S00.00~S99.99				
	D (Data register)	D0000~D0063	D0000~D4999				
Timer type		On-delay, Off-delay, Integration, Monostable, Retriggerable timer					
Counter type		Up, Down, Up-down, Ring					

\*1) When 32-point I/Os are used, max. I/O control points are 384 (P000~P23F) and the rest (P240~P31F) are available to use as internal memory.

\*2) If CPU version is less than 3.0, max. I/O control points are 512 points.

# Number of communication module installation



K80S	K80S (20, 30, 40 and 60 points)	K80S: 10 points
No. of total communication modules	1	1
Cnet only	1 You are not able to use built-in Cnet and comm. I/F module at the same time.	1 You are not able to use built-in RS-232C/485 at the same time. Comm. I/F unit is not available.
High-speed link modules (Cnet + HSL)	1	None

K120S	K120S (Standard)	K120S (E): 20/30 points	K120S (E): 10/14 points
No. of total communication modules	2 (built-in Cnet included)	1 (built-in Cnet included)	1 (built-in Cnet included)
Cnet only	2 (Built-in RS-485 included)	1 In case of K120S economic types, you are not supposed to use built-in RS-232C and Cnet I/F module at the same time. When you turn off the built-in Cnet dip S/W, you are able to use Cnet I/F module.	1 In case of 10-and 14-point base, you are not able to use built-in RS-232C/485 at the same time. But you can use Cnet I/F module when you do not use built-in RS-232C/485. In this case, built-in Cnet dip S/W should be on.
High-speed link modules (Cnet + HSL)	1 (HSL 1 + built-in RS-485)	None	None

## Network support in K80S/K120S

- Master (High-speed link): Fnet<sup>\*1)</sup>, Rnet<sup>\*2)</sup>
- Slave (High-speed link): Profibus-DP<sup>\*3)</sup>, DeviceNet<sup>\*3)</sup>
- Cnet: RS-232C, RS-422/485
- MODBUS (ASCII/RTU) as master/slave in parameter setting (KGLWIN)

K200S/300S	K300S	K200S
No. of total communication modules	4	4
Cnet only	4	4
High-speed link modules (Cnet + HSL)	4 (total 4)	2 (2+2)

## Network support in K200S/K300S

- Master (High-speed link): Fnet, Rnet, DeviceNet, Fast Ethernet, Profibus-DP
- Cnet: RS-232C, RS-422/485
- MODBUS (ASCII/RTU) as slave inserting MODBUS library into Cnet module

<sup>\*1)</sup> LS dedicated protocol for Fnet I/F modules  
<sup>\*2)</sup> LS dedicated protocol for SMART I/Os  
<sup>\*3)</sup> Slave only



# MASTER-K10S1

Programmable Logic Controller

## ■ Features

### Smallest block type

- K10S1: 14 points (Input 8/output 6), size: 120 × 80 × 65

### High-speed processing

- Processing speed: 3.2~7.6  $\mu$ s/step

### Simple positioning

- Built-in high-speed counter: max. 8kpps

### Serial interface

- Built-in RS-232C/RS-485 interface



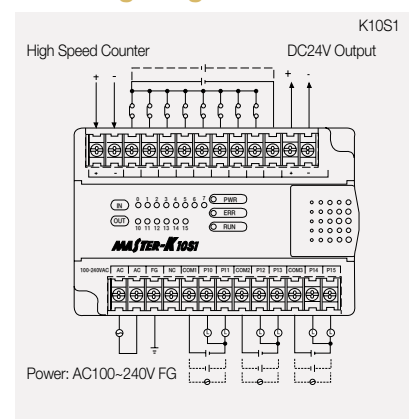
## ■ System specifications

Item		Specification	
		K10S1	
Control method		Cyclic execution of stored program	
I/O control method		Scan synchronized batch processing method (Refresh method)	
Program language		Mnemonic, Ladder	
Number of instruction	Basic	30	
	Application	154	
Processing speed		3.2~7.6 $\mu$ s/step	
Program capacity		800 steps	
Data memory	I/O relay (P)	P000~P01F (32 points)	
	Auxiliary relay (M)	M000~M015F (256 points)	
	Keep relay (K)	K000~K07F (128 points)	
	Link relay (L)	L000~L07F (128 points)	
	Special relay (F)	F000~F15F (256 points)	
	Timer (T)	100ms	T000~T031 (32 points)
		10ms	T032~T047 (16 points)
	Counter (C)	C000~C015 (16 points)	
	Step controller (S)	S00.00~S15.99 (16 × 100 step)	
Data register (D)		D000~D063 (64 words)	
Timer (5 Types)		On delay, Off delay, Accumulation, Monostable, Retriggerable timer	
Counter (4 Types)		Up, Down, Up-down, Ring counter	
Serial interface		RS-232C: 9,600bps, RS-485: 300~19,200 bps, 32 stations, 500m	

## ■ I/O Specifications

Item		Input	Output
Power supply		AC 100~240V (Free)	
I/O point		8	6
Rated voltage	Input	DC24V	-
	Output	-	AC110~220V, DC24V
Rated current	Input	7 $\pm$ 2mA	-
	load	-	1A/point, 3A/COM
Response time	Off $\rightarrow$ On	5ms or less	10ms or less
	On $\rightarrow$ Off	7ms or less	10ms or less
Common		8 points/COM	2 points/COM
Type		-	Relay
Insulation method		Photocoupler insulation	
Operating		LED	

## ■ Wiring Diagram



# MASTER-K80S

Programmable Logic Controller

## ■ Features

### Compact and high-function block type

- Base: 10, 20, 30, 40, 60 points
- Expansion: 10, 20 points

### Various built-in functions for applications

- HSC 1 point, Pulse output 1 point
- PID (Max. 8 loops), Pulse catch 8 points
- Built-in RS-232C I/F 1Ch: 4 (Rx), 7 (Tx), 5 (SG)

### Various applications with special/comm. modules

- Analog input/output: G7F-ADHA
- Analog input: G7F-AD2A
- Analog timer: G7F-AT2A
- Cnet I/F: RS-232C, RS-422
- Fnet (Master)/Rnet (Master)
- Profibus-DP (Slave)/DeviceNet (Slave)
- RTC/Memory pack

### On-line edit in KGLWIN



## ■ System specifications

Item		Specifications
Program control method		Cyclic operation of stored program, Interrupt task operation, Time-driver operation
I/O control method		Refresh method, Direct I/O method by command
Program languages		Mnemonic, Ladder diagram
No. of instructions	Basic	30
	Application	218
Processing speed		0.5 $\mu$ s/step
Program capacity		7k steps
Data memory	I/O relay (P)	P0000~P015F (If not used, it can be used as aux. relay)
	Auxiliary relay (M)	M0000~M191F (3,072 points)
	Keep relay (K)	K0000~K031F (512 points)
	Link relay (L)	L0000~L063F (1,024 points)
	Special relay (F)	F0000~F063F (1,024 points)
	Timer (T)	100ms: T000~T191 (192 points: variable by parameter setting) 10ms : T192~T255 (64 points: variable by parameter setting)
	Counter (C)	C000~C255 (256 points)
	Step control area (S)	S00.00~S99.99 (100 × 100 step)
	Data register (D)	D0000~D4999 (5000 words)
Built-in special function	PID control	Controlled by instruction, Auto tuning, Forward/Reverse action, Forced output, Operation scan time setup
	Cnet I/F function (RS-232C) *1)	Dedicated protocol, MODBUS protocol, User-defined protocol
	High speed counter	Counting speed
		1 Phase: 16kHz (1 channel) 2 Phase: 8kHz (1 channel)
		3 Counting modes
	Counting mode	• 1Phase, up/down count with program Input • 1 Phase, up/down count with B-phase Input • 2 Phase, up/down count with phase difference
		1, 2, or 4
	Multiplication	1, 2, or 4
	Pulse catch	Pulse width: 0.2ms, 8 points
	Pulse output	2kHz (Transistor output only)
	External interrupt	8 points, 0.4ms
	Input filter	0~15ms (Setting by 1ms)

\*1) Built-in RS-232C signal: 4(Rx), 7 (Tx), 5 (SG)

K7M-DR10S/(DC), K7M-DT10S: Built-in RS-232C and RS-485 port. Simultaneous use is not allowed and a communication module is not available to use. Built-in Cnet dip switch: ON (RS-232C), OFF (RS-485)

## Input/output specifications

### ■ Input part

Type		Main					Expansion	
		K7M-DR10S (/DC) K7M-DT10S	K7M-DR20S(/DC) K7M-DT20S	K7M-DR30S (/DC) K7M-DT30S	K7M-DR40S (/DC) K7M-DT40S	K7M-DR60S (/DC) K7M-DT60S	G7E-DR10A	G7E-DR20A
Power supply for main module		K7M-DR□□S, K7M-DT□□S: AC100~240V (50/60Hz), K7M-DR□□S/DC: DC24V						
Input point		6	12	18	24	36	6	12
Insulation method		Photocoupler						
Rated input voltage		DC24V						
Rated input current		7mA (P000~P002: 16mA)						
Operation voltage range		DC20.4V~28.8V (Ripple rate< 5%)						
Max. simultaneous input		100% Simultaneous ON						
On voltage/current		DC19V or higher/5.7mA or higher (P000~P002: 12.7mA or higher)						
Off voltage/current		DC6V or lower/1.8mA or lower (P000~P002: 4mA or lower)						
Input impedance		3.3kΩ						
Response time	Off → On	15ms or less*						
	On → Off	15ms or less*						
Operating indicator		LED						

\* It is available to set from 1ms to 15ms in parameter of KGLWIN (unit: ms)

### ■ Relay output part

Type		Main					Expansion	
		K7M-DR10S (/DC)	K7M-DR20S (/DC)	K7M-DR30S (/DC)	K7M-DR40S (/DC)	K7M-DR60S (/DC)	G7E-DR10A	G7E-DR20A
Output point		4	8	12	16	24	4	8
Insulation method		Relay insulation						
Rated load voltage/current		DC24V/2A (Resistive load), AC220V/2A (COS ϕ =1)/point, 5A/COM						
Min. load voltage/current		DC5V/1mA						
Max. load voltage		AC250V, DC110V						
Off leakage current		0.1mA or less (AC220V, 60Hz)						
Max. on/off frequency		1,200 times/hr						
Surge absorber		-						
Service life	Mechanical	20million times or more						
	Electrical	100,000 times or more (Rated voltage/current load)						
		AC200V/1.5A, AC240V/1A (COS ϕ =0.7) 100,000 times or more						
		AC200V/1A, AC240V/0.5A (COS ϕ =0.35) 100,000 times or more						
Response time	Off → On	DC24V/1A, DC100V/0.1A (L/R=7ms) 100,000 times or more						
	On → Off	10ms or less						
Operating indicator		12ms or less						
		LED						

### ■ Transistor output part

Type Item		Main					Expansion
		K7M-DT10S	K7M-DT20S	K7M-DT30S	K7M-DT40S	K7M-DT60S	G7E-TR10A
Output point		4	8	12	16	24	10
Insulation method		Photocoupler					
Rated load voltage		DC12/24V					
Operating load voltage		DC10.2~26.4V					
Rated load current		0.5A/point, 3A/COM					
Off leakage current		0.1mA or less					
On voltage drop		1.5V or less (Max.load)					
Surge absorber		Clamp diode					
Common		4 points/COM Sink type	8 points/COM Sink type	8 points/COM 4 points/COM Sink type	8 points/COM (×2) Sink type	8 points/COM (×3) Sink type	10 points/COM Sink type
Response time	Off → On	2ms or less					
	On → Off	2ms or less					
Operating indicator		LED					



# MASTER-K120S

Programmable Logic Controller

## Economic type

### ■ Features

#### High-performance and various block type

- Economic type: 10/14/20/30 points  
(10/14 points: 2points built-in Analog Timer)
- Standard type: 20/30/40/60 points
- Various expansion modules: input, output, mixed modules
- P area extended for SMART I/O application (P000~P63F)
- High-speed processing speed: 0.1  $\mu$ s/step (standard type)
- Battery-less backup
  - Program backup: EEPROM backup while online editing
  - Data backup: Super capacitor
- Various input handing: Input filter, pulse catch

#### Enhanced communication functions

- Built-in RS-232C (Ch0) and RS-485 (Ch1) support \*1)
- Transmitting data monitoring support: KGLWIN
- Various option modules
  - Cnet (RS-232C, RS-422) Fnet/Rnet (master module)
  - Profibus-DP/DeviceNet (slave module)



### ■ Specifications

Item		Specifications				Remark
		K7M-DR10UE (/DC)	K7M-DR14UE (/DC)	K7M-DR20UE (/DC)	K7M-DR30UE (/DC)	
Operation method		Cyclic execution of stored program, Time-driven interrupt, Process-driven interrupt				
I/O control method		Refresh method, Direct method by command				
Program language		Instruction list, Ladder diagram				
Number of instructions		Basic: 30, Application: 269				
Processing speed		0.1~0.9 $\mu$ s/step				
Programming memory capacity		10k steps				
I/O points	Input	6	8	12	18	
	Output	4	6	8	12	
Data area	P	P000~P63F				I/O relay
	M	M000~M191F				Auxiliary relay
	K	K000~K31F				Keep relay
	L	L000~L63F				Link relay
	F	F000~F63F				Special relay
	T	100ms: T000~T191 (192 points), 10ms: T192~T250 (59 points), 1ms: T251~T255 (5 points), Adjustable by parameter setting				Timer
	C	C000~C255				Counter
	S	S00.00~S99.99				Step controller
	D	D0000~D4999				Data register
Operation mode		Run, Stop, Pause				
Self-diagnostic function		Scan time, memory, I/O, and power supply error detection				
Data back-up method		Program: EEPROM, Data: Super-capacitor				
Max. expansion stage		Up to 2 stages (external memory or RTC module can be connected as 3rd expansion)				
Built-in function	Cnet I/F function		Dedicated protocol, MODBUS protocol, User-defined protocol, No protocol RS-232C: 1 port			RS-485 only in K7M-DR(10/14)UE
	HSC	Speed	1-phase 2 channels: 10kHz, 2-phase 1 channel: 5kHz			
		Mode	4-different counter modes: 1-phase operation mode, 2-phase CW/CCW mode 1-phase pulse+direction mode, 2-phase multiplication mode			
		Additional function	Internal/external preset, Latch counter, RPM, Comparison output			
	Pulse catch		Minimum pulse width: 50 $\mu$ s (4 points)			
	External interrupt		50 $\mu$ s (4 points)			
	Input filter		0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)			

\* In case of K7M-DR10UE (/DC) and K7M-DR14UE (/DC), you are not able to use built-in RS-232C/485 at the same time. When you want to use built-in Cnet, you have to select either built-in RS-232C (Cnet dip switch on) or built-in RS-485 (Cnet dip switch off). In these two types, if you are going to use Cnet I/F module, you cannot use any built-in Cnet channels while built-in Cnet dip switch is on.

\* In other economic types, you are not supposed to use built-in RS-232C and Cnet I/F module at the same time. When you turn off Cnet dip switch, you can use Cnet I/F module.

## Standard type

### ■ Features

#### Powerful built-in functions

- High-speed counter: 32-bit signed operation,
  - Counter range: -2,147,483,648 ~ 2,147,483,647
  - Function: ring counter, latch counter, comparison (equal/zone/task), RPM
- Positioning function (DRT/DT type)
  - Control axis: 2 axes (100kHz)
  - Operation method: single, repeat
  - Operation mode: end, keep, continuous
  - Additional functions: return to origin, JOG operation, PWM output
- PID operation function
  - Relay/PRC auto-tuning, SV ramp, delta MV, PWM output, position/velocity algorithm

#### Various expansion modules

- 7 Digital I/O modules: G7E-DR(08/10/20)A, G7E-TR10A, G7E-DC08A, G7E-RY(08/16)A
- 9 Analog I/O modules: G7F-ADHA(B/C), G7F-AD2A(B), G7F-DA2I(V), G7F-AT2A, G7F-RD2A
- 6 Comm. modules: G7L-CUEB(C), G7L-DBEA, G7L-PBEA, G7L-FUEA, G7L-RUEA
- 2 Option modules: G7E-RTCA, G7M-M256B

### ■ Specifications

Item		Specifications				Remark
		K7M-DR/DRT/DT20U/(DC)	K7M-DR/DRT/DT30U/(DC)	K7M-DR/DRT/DT40U/(DC)	K7M-DR/DRT/DT60U/(DC)	
Operation method		Cyclic execution of stored program, Time-driven interrupt, Process-driven interrupt				
I/O control method		Refresh method, Direct method by command				
Program language		Instruction list, Ladder diagram				
Number of instructions		Basic: 30, Application: 277				
Processing speed		0.1 $\mu$ s/step				
Programming memory capacity		10k steps				
I/O points	Input	12	18	24	36	
	Output	8	12	16	24	
Data area	P	P000~P63F				I/O relay
	M	M0000~M191F				Auxiliary relay
	K	K000~K31F				Keep relay
	L	L000~L63F				Link relay
	F	F000~F63F				Special relay
	T	100ms: T000~T191 (192 points), 10ms: T192~T250 (59 points), 1ms: T251~T255 (5 points), Adjustable by parameter setting				Timer
	C	C000~C255				Counter
	S	S00.00~S99.99				Step controller
	D	D0000~D4999				Data register
Operation mode		Run, Stop, Pause, Debug				
Self-diagnostic function		Scan time, memory, I/O and power supply error detection				
Data back-up method		Program: EEPROM, Data: Super-capacitor				
Max. expansion stage		Up to 3 stages (External memory or RTC module can be connected as 4th expansion)				
Built-in function	PID function		<ul style="list-style-type: none"><li>• Controlled by command, Relay and PRC auto-tuning</li><li>• PMM/Manual output, Adjustable operation scan time</li><li>• Anti-windup, SV ramp, Delta MV, Position and velocity algorithm</li></ul>			
	Cnet I/F function		Dedicated protocol, MODBUS protocol, User-defined protocol, No protocol RS-232C: 1 port, RS-485: 1port			
	HSC	Speed	1-phase 2 channels: 100kHz, 1-phase 2 channels: 20kHz 2-phase 1 channel: 50kHz, 2-phase 1 channel: 10kHz			
		Mode	4-different counter modes: 1-phase operation mode, 2-phase CW/CCW mode 1-phase pulse+direction mode, 2-phase multiplication mode			
		Additional function	Internal/external preset, Latch counter, RPM, Comparison output			
	POS	Function	No. of control axis: 2, Control method: PTP/speed control, Control unit: pulse Positioning data: 20/axis (operation step no. 1~20)			DRT/DT type only
		Positioning	<ul style="list-style-type: none"><li>• Position method: absolute/incremental, Operation method: Single/Repeat</li><li>• Operation mode: End/Keep/Continuous, Address range: -2,147,483,648~2,147,483,647</li><li>• Speed: Max. 100kpps (Setting range: 5~100,000)</li><li>• Acceleration/Deceleration method: Trapezoidal method</li></ul>			
		Return to origin JOG	Origin detection: DOG/HOME (ON), DOG/HOME (OFF), approximate origin Setting range: 5~100,000 (high/low speed)			
		Pulse catch	Minimum pulse width: 10 $\mu$ s (2 points), 50 $\mu$ s (6 points)			
	External interrupt		10 $\mu$ s (2 points), 50 $\mu$ s (6 points)			
	Input filter		0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)			

# MASTER-K120S

Programmable Logic Controller

## Input/output specifications

### Input part

Item	Type	Main					
		K7M-DR10UE (/DC)	K7M-DR14UE (/DC)	K7M-DR20UE (/DC) K7M-DR20U (/DC) K7M-DT20U (/DC) K7M-DRT20U (/DC)	K7M-DR30UE (/DC) K7M-DR30U (/DC) K7M-DT30U (/DC) K7M-DRT30U (/DC)	K7M-DR40U (/DC) K7M-DT40U (/DC) K7M-DRT40U (/DC)	K7M-DR60U (/DC) K7M-DT60U (/DC) K7M-DRT60U (/DC)
Power supply		K7M-DR□□UE, K7M-DR□□U, K7M-DT□□U, K7M-DRT□□U: AC100~240V (50/60Hz), K7M-DR□□UE/DC, K7M-DR□□U/DC, K7M-DT□□U/DC, K7M-DRT□□U/DC: DC12/24V					
Input point		6	8	12	18	24	36
Insulation method		Photocoupler					
Rated input voltage		DC24V					
Rated input current		7mA (Standard type: P0~P3 [9mA], Economic type: P0~P1 [9mA])					
Operating voltage range		DC20.4V~28.8V (Ripple rate <5%)					
Max. simultaneous input		100% simultaneous ON					
On voltage/current		DC19V or higher/5.7mA or higher					
Off voltage/current		DC6V or lower/1.8mA or lower					
Input impedance		About 3.3k $\Omega$ (Standard type: P0~P3 [2.7k $\Omega$ ], Economic type: P0~P1 [2.7k $\Omega$ ])					
Response time	Off $\rightarrow$ On	0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)					
	On $\rightarrow$ Off	0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)					
Operating indicator		LED					

### Relay output part

Item	Type	Main					
		K7M-DR10UE (/DC)	K7M-DR14UE (/DC)	K7M-DR20UE (/DC) K7M-DR20U (/DC)	K7M-DR30UE (/DC) K7M-DR30U (/DC)	K7M-DR40U (/DC)	K7M-DR60U (/DC)
Output point		4	6	8	12	16	24
Insulation method		Relay insulation					
Rated load voltage/current		DC24V/2A (Resistive load), AC220V/2A (COS $\phi$ =1)/point, 5A/COM					
Min. load voltage/current		DC5V/1mA					
Max. load voltage		AC250V, DC110V					
Off leakage current		0.1mA or less (AC220V, 60Hz)					
Max. on/off frequency		1200 times/hr					
Surge absorber		None					
Service life	Mechanical	20 million times or more					
	Electrical	100,000 times or more (rated load voltage)					
Response time	Off $\rightarrow$ On	10ms or less					
	On $\rightarrow$ Off	12ms or less					
Operating indicator		LED					

### Transistor/mixed output part

Item	Type	Main			
		K7M-DT20U (/DC) K7M-DRT20U (/DC)	K7M-DT30U (/DC) K7M-DRT30U (/DC)	K7M-DT40U (/DC) K7M-DRT40U (/DC)	K7M-DT60U (/DC) K7M-DRT60U (/DC)
Output point	DT-type output point	8	12	16	24
	DRT-type Tr. output point	4	4	4	4
	DRT-type relay output point	4	8	12	20
Insulation method		Photocoupler (Tr. output points), Relay insulation (Relay output points)			
Rated load voltage		DC12V/24V			
Operation load voltage		DC10.2~26.4V			
Max. load voltage		0.5A/point (DRT type: P40~43(0.1A/point), DT type: P40~41 (0.1A/point))			
Off leakage current		0.1mA or less			
Voltage drop		Less than DC0.3V			
Surge absorber		Zener diode			
Inrush current		Less than 4A, 10ms			
Response time	Off $\rightarrow$ On	0.2ms or less (Tr)			
	On $\rightarrow$ Off	0.2ms or less (Tr)			
Operating indicator		LED			

\* For the characteristics of relay outputs in a DRT-type module, please refer to the output part (relay) in the above.



## Expansion specifications

### ■ Input part

Item \ Type		Expansion			
		G7E-DC08A *	G7E-DR08A *	G7E-DR10A	G7E-DR20A
Input point		8	4	6	12
Insulation method		Photocoupler			
Rated input voltage		DC24V			
Rated input current		7mA			
Operating voltage range		DC20.4V~28.8V (Ripple rate <5%)			
Max. simultaneous input		100% simultaneous ON			
On voltage/current		DC19V or higher/5.7mA or higher			
Off voltage/current		DC6V or lower/1.8mA or lower			
Input impedance		About 3.3k $\Omega$			
Response time	Off $\rightarrow$ On	0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)			
	On $\rightarrow$ Off	0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)			
Operating indicator		LED			

### ■ Relay output part

Item \ Type		Expansion				
		G7E-RY08A *	G7E-RY16A	G7E-DR08A *	G7E-DR10A	G7E-DR20A
Output point		8	16	4	4	8
Insulation method		Relay insulation				
Rated load voltage/current		DC24V/2A (Resistive load), AC220V/2A (COS $\phi$ =1)/point, 5A/COM				
Min. load voltage/current		DC5V/1mA				
Max. load voltage		AC250V, DC110V				
Off leakage current		0.1mA or less (AC220V, 60Hz)				
Max. on/off frequency		1200 times/hr				
Surge absorber		None				
Service life	Mechanical	20 million times or more				
	Electrical	100,000 times or more (rated load voltage)				
Response time	Off $\rightarrow$ On	10ms or less				
	On $\rightarrow$ Off	12ms or less				
Operating indicator		LED				

### ■ Transistor output

Item \ Type		Expansion	
		G7E-TR10A	
Output point		10	
Insulation method		Photocoupler	
Rated load voltage		DC12/24V	
Operation load voltage		DC10.2~26.4V	
Max. load voltage		0.5A/points, 4A/COM	
Off leakage current		0.1mA or less	
Inrush current		Less than 4A, 10ms	
Voltage drop		Less than DC1.5V	
Surge absorber		Clamp diode	
Response time	Off $\rightarrow$ On	2ms or lower	
	On $\rightarrow$ Off	2ms or lower	
Operating indicator		LED	

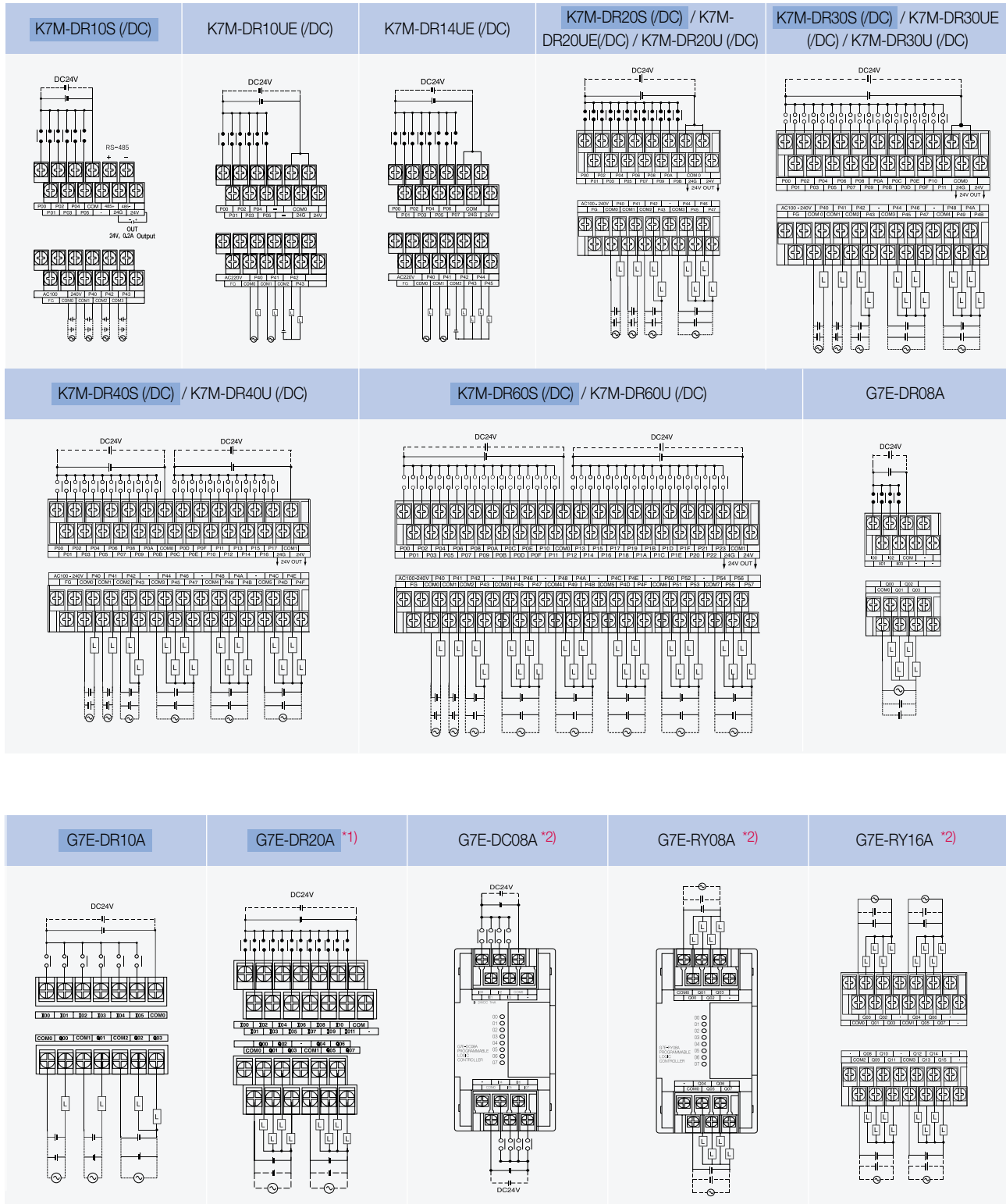
\* Slim type

# MASTER-K80S/120S wiring diagram

Programmable Logic Controller

## Wiring diagram

### ■ Input/Output (Relay output) & Input/Output (Expansion)



\*1) In case of K80S, its O/S should be 1.7 or later for its usage.

\*2) K120S only

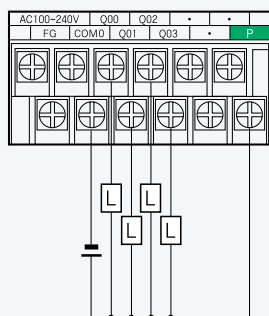
\* All the /DC types need DC24V for their operation and they don't supply DC24V output.

\* stands for K80S series

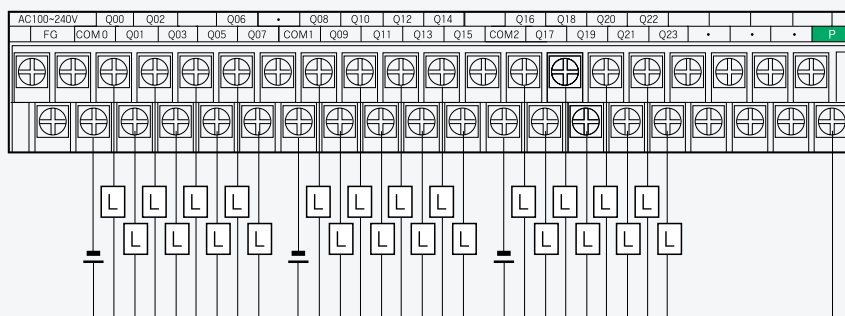
\* Refer to user's manual for wiring.

## ■ K80S DT Output

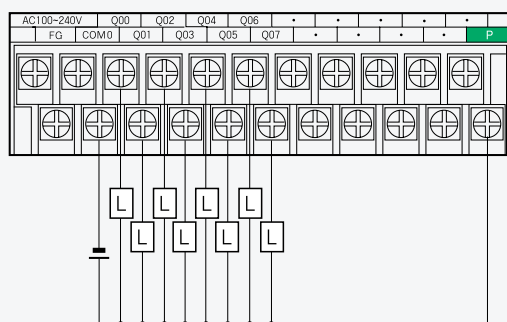
K7M-DT10S



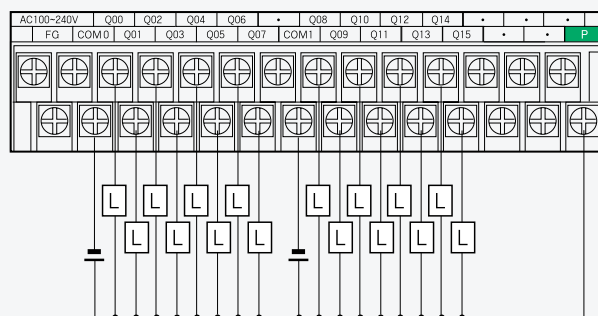
K7M-DT60S



K7M-DT20S



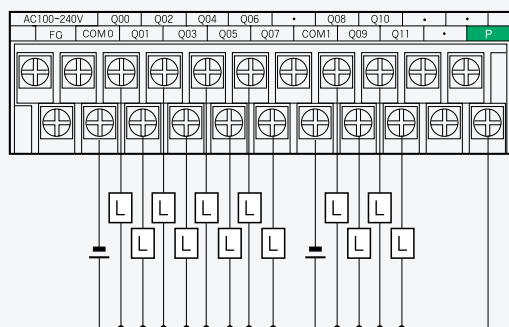
K7M-DT40S



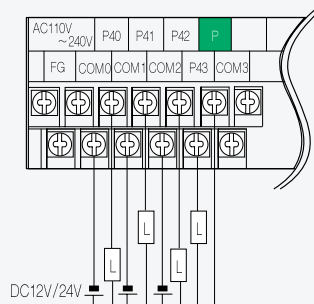
## ■ K120S DT/DRT output

## ■ Output expansion unit

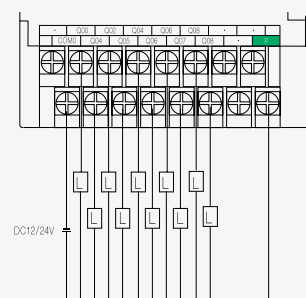
K7M-DT30S



K7M-DRTxxU



G7E-TR10A \*1)



\*1) In case of K80S, its O/S should be 1.7 or later for its usage.

\* Input terminal of transistor output modules is identical to that of relay output.

You should connect DC24V to P terminal when you use an external power supply for load operation.

\* Refer to user's manual for wiring.



# MASTER-K80S/120S expansion unit

Programmable Logic Controller

## Analog input/output unit

Item			A/D・D/A Hybrid module		A/D Module	D/A Module			
			G7F-ADHA (C) *1)	G7F-ADHB *2)	G7F-AD2A (B) *3)	G7F-DA2I *4)	G7F-DA2V *2)		
Analog input	Input range	Voltage	DC 0~10V (Input resistance: More than 1 MΩ)						
		Current	DC 0~20mA (Input resistance 250 Ω) DC 4~20mA (Input resistance 250 Ω) Classified by parameter						
	Digital output		12 bits (0~4,000)						
	Voltage/current selection		Set by jumper pin for V/I selection upper part of product (Up: V, down: I)	Set by dip S/W for V/I selection on left side of product (Left: V, right: I)	Set by input terminal (When current input is used, short the V and I terminal)				
			V/I selected by KGLWIN parameter Short V and I terminal when current input is used.						
	No. of channel		2Ch/module		4Ch/module				
	Absolute max. Input	V	DC+12V		DC±15V				
I		DC+24mA		DC±25mA					
Analog output	Output range	V	DC 0~10V (External load resistance 2 kΩ~1 MΩ)						
		I	DC 0~20mA (External load resistance 510 Ω) DC 4~20mA (External load resistance 510 Ω) Classified by parameter						
	Digital input		12 bits (0~4,000)						
	Voltage/current selection		Separated from terminal						
	No. of channel		1Ch/module	2Ch/module	4Ch/module				
	Absolute max. output	V	DC +12V					DC +24mA	DC +12V
		I	DC +24mA						
Common	Max. resolution	V	DC 0~10V: 2.5mV (1/4000) DC 0~20mA: 5μA (1/4000)			DC 0~20mA: 5μA (1/4000)	2.5mV (1/4000)		
		I	DC 4~20mA: 6.25μA (1/3200)			DC 4~20mA: 6.25μA (1/3200)			
	Accuracy		±0.5% (Full scale)			0.5%			
	Max. conversion speed		1ms/Ch + scan time (K120S), 2ms/Ch + scan time (K80S)			500μs*5) + scan time	1ms*5) + scan time		
	Insulation		Photocoupler insulation between I/O terminal and PLC power supply (Non-insulation between channels).						
	Connect terminal		9 points 2 terminals	8 points 2 terminals	2 points/16 points terminals	16 points terminal	8 points 2 terminals		
	Internal current consumption		20mA	20mA	100mA	20mA	15mA		
	External power supply		DC 21.6~26.4V						
	Weight	V	80mA	95mA	100mA	80mA	90mA		
		I	240g	180g	300g	280g	160g		

※ Caution for wiring • 2-core, shielded twisted pair cable is recommended. Size: AWG22 (0.3mm) or higher.

• Wiring with high voltage or generation line, it makes induction failure which may cause malfunction or be out of order.

\*1) Input voltage range of G7F-ADHC is DC 0 ~ 1V and the rest features are equal to those of G7F-ADHA.

\*2) K120S only: G7F-ADHB, G7F-DA2V and G7F-RD2A

\*3) G7F-AD2B is a slim type

\*4) To use in K80S, CPU OS should be 1.7 or later.

\*5) 500 μs G7F-DA2I is for all channels. So is 1ms in G7F-DA2V.

■ Slim type: G7F-ADHB, G7F-AD2B, G7F-DA2V, G7F-RD2A

### ■ G7F-RD2A

Item	Specifications
Connectable RTD	• Pt100 (JIS C1604-1989, DIN 43760-1980) • JPt100 (KS C1603-1991, JIS C1604-1981)
Temperature input range	• Pt100: -200~600°C (18.48 to 313.59 Ω) • JPt100: -200~600°C (17.14 to 317.28 Ω)
Digital output	• Digital conversion value: 0~4,000 • Detected temperature value: -2000~6000 (10-time scaled up value)
Burnout detection	Each of three wires at every channel has detection function
Accuracy	±0.5% (Full scale)
Maximum conversion speed	40scan/module
Number of temperature input device points	4 channels/module
Insulation method	Photocoupler insulation between the input terminal and PLC power supply (Non-insulation between channels)
Connection terminal block	Two 8-point terminal blocks
Internal current consumption	25mA
External power supply	V
	I
DC 21.6~26.4V	
70mA	
Weight	240g

### ■ G7F-AT2A

Item	Specification
Channels	4
Output value range	8 bits (0 ~ 200)
Setting type	Setting by variable resistance
Accuracy of timer	±2.0% (Accuracy about max. value)
Internal current consumption	50mA
Weight	200g

## ■ Data register table

• The table for special modules and their corresponding data register are as follows.

Data register	Expansion	Item						
		A/D • D/A Hybrid module		A/D Conversion module	D/A Conversion module		Analog timer	RTD input module
		G7F-ADHA	G7F-ADHB	G7F-AD2A	G7F-DA2I	G7F-DA2V	G7F-AT2A	G7F-RD2A
D4980	#1	CH0 A/D value	CH0 A/D value	CH0 A/D value	CH0 D/A value	CH0 D/A value	CH0 A/T value	CH0 Temperature
D4981		CH1 A/D value	CH1 A/D value	CH1 A/D value	CH1 D/A value	CH1 D/A value	CH1 A/T value	CH1 Temperature
D4982		CH0 D/A value	CH0 D/A value	CH2 A/D value	CH2 D/A value	CH2 D/A value	CH2 A/T value	CH2 Temperature
D4983		-	CH1 D/A value	CH3 A/D value	CH3 D/A value	CH3 D/A value	CH3 A/T value	CH3 Temperature
D4984	#2	CH0 A/D value	CH0 A/D value	CH0 A/D value	CH0 D/A value	CH0 D/A value	CH0 A/T value	CH0 Temperature
D4985		CH1 A/D value	CH1 A/D value	CH1 A/D value	CH1 D/A value	CH1 D/A value	CH1 A/T value	CH1 Temperature
D4986		CH0 D/A value	CH0 D/A value	CH2 A/D value	CH2 D/A value	CH2 D/A value	CH2 A/T value	CH2 Temperature
D4987		-	CH1 D/A value	CH3 A/D value	CH3 D/A value	CH3 D/A value	CH3 A/T value	CH3 Temperature
D4988	#3	CH0 A/D value	CH0 A/D value	CH0 A/D value	CH0 D/A value	CH0 D/A value	CH0 A/T value	CH0 Temperature
D4989		CH1 A/D value	CH1 A/D value	CH1 A/D value	CH1 D/A value	CH1 D/A value	CH1 A/T value	CH1 Temperature
D4990		CH0 D/A value	CH0 D/A value	CH2 A/D value	CH2 D/A value	CH2 D/A value	CH2 A/T value	CH2 Temperature
D4991		-	CH1 D/A value	CH3 A/D value	CH3 D/A value	CH3 D/A value	CH3 A/T value	CH3 Temperature

• In case RTD input module, a digital conversion value for temperature is stored in the following data register.

Expansion	Temperature				Digital conversion value			
	CH0	CH1	CH2	CH3	CH0	CH1	CH2	CH3
#1	D4980	D4981	D4982	D4983	4780	D4781	D4782	D4783
#2	D4984	D4985	D4986	D4987	4784	D4785	D4786	D4787
#3	D4988	D4989	D4990	D4991	4788	D4789	D4790	D4791

\* You are not supposed to change offset/gain values; they are fixed

\* Analog signal for special modules is set as current when manufactured.

\* You are able to expand up to 3 stages.

# MASTER-K80S/120S expansion unit

Programmable Logic Controller

## Communication unit

### ■ Cnet modules (G7L-CUEB, G7L-CUEC)



Item		Specifications
Interface		G7L-CUEB: RS-232C (Modem), G7L-CUEC: RS-422/485
Communi- cation mode	Dedicated mode	Supports 1:1, 1:N and high-speed link
	KGLWIN mode	Supports remote programming and mounting via KGLWIN
	Modbus mode	Supports master and slave function with Modbus protocol (ASCII, RTU)
	User-defined mode	Supports user-defined communication
Data structure	Data bit	7 or 8
	Stop bit	1 or 2
	Start bit	1 or 2
	Parity bit	EVEN/ODD/NONE
Synchronization		Asynchronous method
Transmission speed		1,200 / 2,400 / 4,800 / 9,600 / 19,200 / 38,400 / 57,600bps
Setting method		Communication parameter setting in KGLWIN
Distance		Max. 15m (CUEB), Max. 500m (CUEC)
Max. number of stations		Max. 32 stations
Weight		180g

### ■ Fnet/Rnet module (G7L-FUEA/RUEA) \*1)



Item		Specifications
Transmission speed		1Mbps
Communi- cation	Segment	Max. 750m
	Repeater (Up to 6)	Max. 5.25km
Max. number of stations		Max. 64 stations
Setting method		Communication parameter setting in KGLWIN
Cable		Shielded twisted pair cable
Weight		220g

\*1) Rnet is a dedicated protocol for LSIS SMART I/Os.

### ■ Pnet module (G7L-PBEA)



Item		Specifications
Network type		Profibus-DP (Slave)
Protocol		EN50170/DIN19245
Media access		Token passing & Poll
Transmission and speed		1200m (9.6~187kbps) / 400m (500kbps) / 200m (1.5Mbps) / 100m (3~12Mbps)
Max. Node	Network	127 stations
	Segment	32 stations
Interface		RS-485 (electric)
Setting method		Communication parameter setting in KGLWIN
Cable		Shielded twisted pair cable
Weight		210g

### ■ Dnet module (G7L-DBEA)



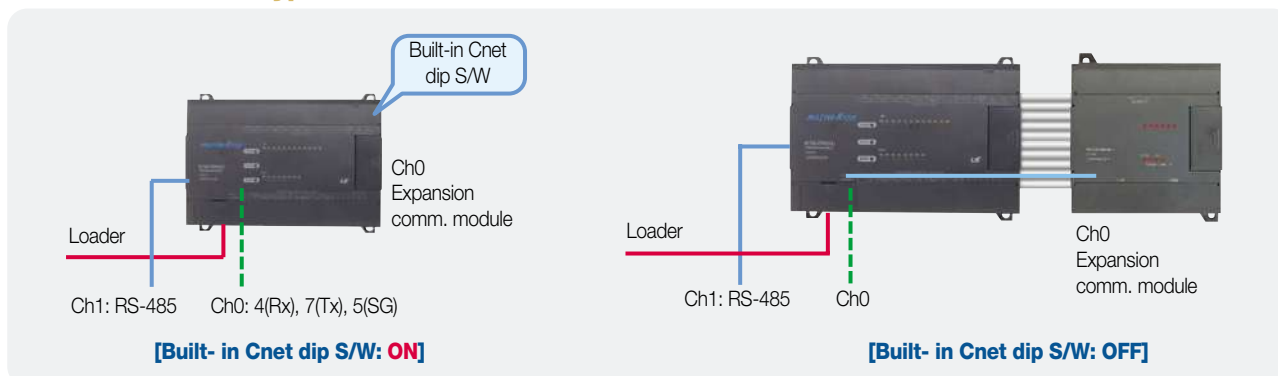
Item		Specifications			
Network structure		Trunk/drop line			
Protocol		Peer explicit message, Predefined explicit message			
		Predefined I/O message (Poll, bit strobe, COS, cyclic)			
Max. extension & speed	Speed	Network distance	Drop cable	Total drop cable	
	500kbps	100m or less	6m or less	39m or less	
	250kbps	250m or less	6m or less	78m or less	
	125kbps	500m or less	6m or less	156m or less	
Channel		64 stations			
Diagnosis function		CRC error check/Scan list			
Setting method		Communication parameter setting in KGLWIN			
Cable		5 lines (signal 2 lines, power 2 lines, shield 1 line)			

\* 1) In case of K80S, only 1 communication module is available and you are not able to use a communication module and built-in Cnet at the same time because they are set as CH0 in KGLWIN parameter. You are not able to connect a communication module to K7M-DR10S (/DC) and K7M-DT10S, which support either RS-232C or RS-485, and you can select a communication channel using a dip switch (built-in). If it is on, RS-232C is enabled and if it is off, RS-485 is activated.

\* 2) In case of K120S, only 1 communication module is available and you are not able to use a communication module and built-in RS-232C at the same time because they are set as CH0 in KGLWIN parameter. Besides you are able to use both CH0 and built-in RS-485 (CH1) simultaneously. For more information, refer to P1 and P14.

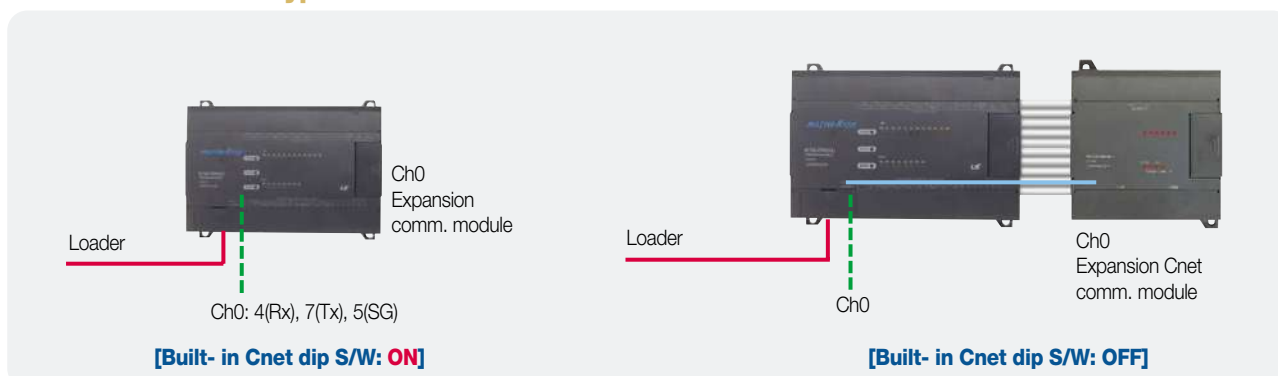


### ■ K120S standard type



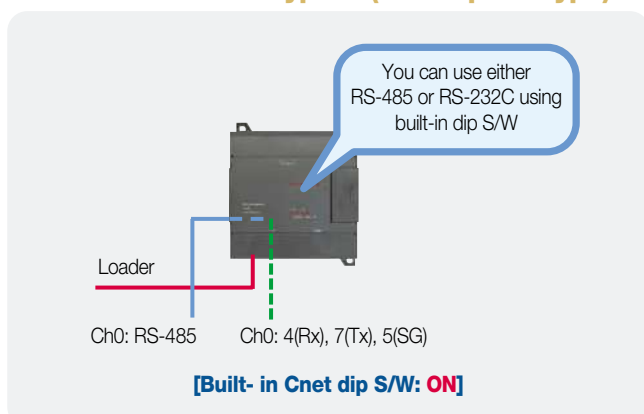
When built-in dip S/W is on, you are not supposed to use an expansion communication module while the built-in Cnet port is enabled, and if it's off, you can use an expansion communication module but the built-in Cnet port is disabled.

### ■ K120S economic type I



1. Only one channel (Ch0) for communication except the loader port is available in economic types.
2. When the built-in dip S/W is on, you are not supposed to use an expansion Cnet module while the built-in Cnet port is enabled, and if it's off, you can use an expansion communication module but the built-in Cnet port is disabled.

### ■ K120S economic type II (10/14-point type)



1. If the built-in Cnet dip S/W is on, you are able to use RS-232C (4, 7, 5 pins) as Ch0 and if it is off, RS-485 is enabled as Ch0.
2. With these modules you are not supposed to connect a modem to RS-232C for download/upload, monitoring or controlling. To use a dedicated/dial-up modem, you are required to use G7L-CUEB as expansion comm. module and before applying a modem, please contact LSIS.
3. You are able to use an expansion Cnet module when you do not use built-in Cnet (RS-232C/485) after turning off the built-in Cnet dip switch. In this case, no other device is connected to the built-in RS-485 port.

# Block type PLC configuration

Programmable Logic Controller

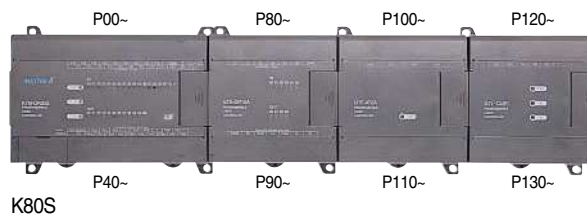
## ■ System configuration for K10S1 and K80S

Item	System configuration
K10S1	Separate
K80S	<ul style="list-style-type: none"> <li>• Available system (max. 3 units in total)</li> <li>• Digital I/O: max. 2 units</li> <li>• Analog I/O: max. 2 units</li> <li>• Analog timer: max. 3 units</li> <li>• Communication I/F: 1 unit</li> </ul>

## ■ System configuration



K10S1



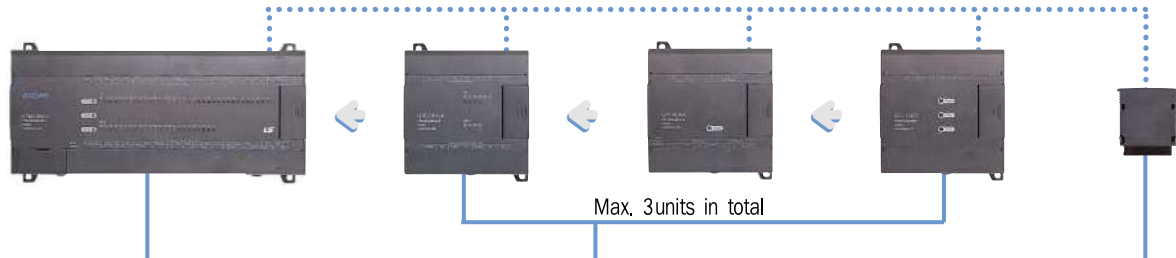
K80S



Option pack

\* I/O assignment applies to digital expansion module. For example, if an analog module is used at the 1st expansion and digital I/O is used at the 2nd expansion, then, the input of 2nd expansion module is from P80 and the output is from P90. And I/O assignment of K120S and K80S is equal

## ■ System configuration (K80S)



### Base unit

- Processing speed: 0.5  $\mu$ s
- Program capacity: 7k steps
- Type:
 

K7M-DR10S	K7M-DR10S/DC
K7M-DR20S	K7M-DR20S/DC
K7M-DR30S	K7M-DR30S/DC
K7M-DR40S	K7M-DR40S/DC
K7M-DR60S	K7M-DR60S/DC
K7M-DT10S	K7M-DT40S
K7M-DT20S	K7M-DT60S
K7M-DT30S	

### Expansion unit

- Digital I/O \*1)
  - G7E-DR10A: DC in 6 points/relay out 4 points
  - G7E-DR20A: DC in 12 points/relay out 8 points
  - G7E-TR10A: Tr. output 10 points
- Special unit
  - G7E-ADHA: Analog I/O(Input 2 channels, output 1 channel)
  - G7E-AD2A, G7F-AD2B: Analog input (4 channels)
  - G7E-DA2I: Analog output (4 channels)
  - G7E-AT2A: Analog timer (4 points)
- Communication unit \*2)
 

- Cnet: RS-232C, RS-422	- Fnet (Master)	- Rnet (Master)
- DeviceNet (Slave)	- Profibus-DP (Slave)	

### Option pack

- G7E-RTCA: RTC (Real time clock) pack
- G7E-M256: Memory pack (For program back-up)

### Available system (3 units in total) \*3)

- Digital I/O: Max. 2 units
- Analog I/O: Max. 2 units
- Analog Timer: Max. 3 units
- Communication I/F: Max. 1 unit

### Option pack

- Base unit used: Connect to the expansion connector of the basic unit.
- Expansion unit connected: Connect to the expansion connector of the last connected one.
- You are able to use only one option pack.

\*1) When digital I/Os are used, the 1st expansion input is assigned from P80 and its output from P90. The 2nd expansion input is from P100 and its output from P110 and so on. I/O allocation does not apply to other expansion modules. It does only to digital expansion modules.

\*2) You are not able to connect a communication module to K7M-DR10S/DC and K7M-DT10S while you can do a communication module to other types of K80S. Built-in Cnet and a communication module shares the same communication port and you are not able to use them at the same time.

\*3) Option pack is not included.

## ■ System configuration for K120S

### Base unit for economic type

- Processing speed: 0.4  $\mu$ s
- Program capacity: 2k steps
- 8 types:
  - K7M-DR10UE (/DC), K7M-DR14UE (/DC)
  - K7M-DR20UE (/DC), K7M-DR30UE (/DC)

### Base unit for standard type

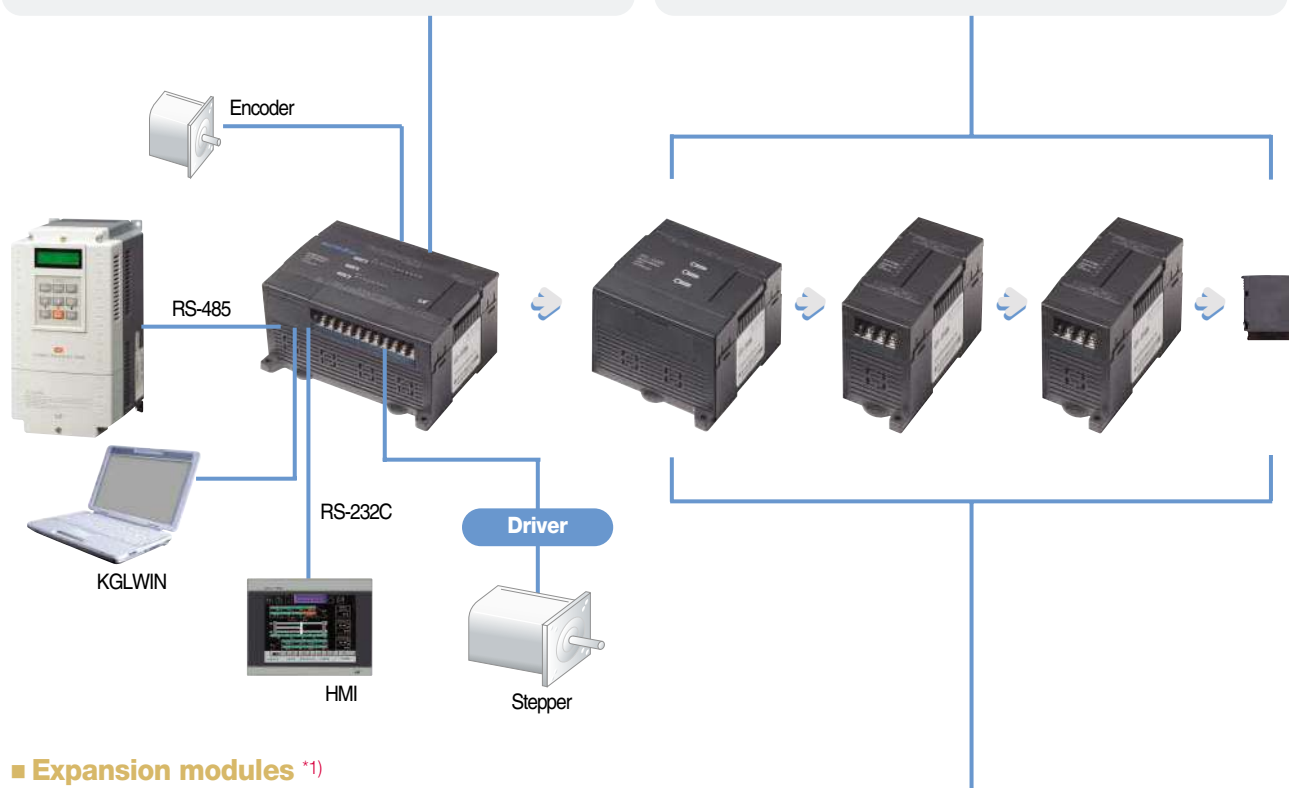
- Processing speed: 0.1  $\mu$ s
- Program capacity: 10k steps
- 24 types:
  - K7M-DR/DRT/DT20U (/DC), K7M-DR/DRT/DT30U (/DC)
  - K7M-DR/DRT/DT40U (/DC), K7M-DR/DRT/DT60U (/DC)

### Max. number of expansion unit installation

- Standard: max. 3 units in total
- Economic: max. 2 units in total

Installation	Max. number of installation	Remark
Digital I/O	3	2 in economic type
Analog I/O	3	Not available in economic type
Analog timer	3	
Communication I/F	1	

- You are able to connect an option pack to the connector of the last expansion module



## ■ Expansion modules \*1)

### Digital I/O modules

- Input
  - G7E-DC08A \*2): DC input 8 points
- Output
  - G7E-TR10A: Tr output 10 points
  - G7E-RY08A \*2): Relay output 8 points
  - G7E-RY16A \*2): Relay output 16 points
- Input/Output
  - G7E-DR08A \*2): DC in 4 points / relay out 4 points
  - G7E-DR10A: DC in 6 points / relay out 4 points
  - G7E-DR20A: DC in 12 points / relay out 8 points

### Special modules

- A/D
  - G7F-AD2A, G7F-AD2B : Analog input (4 channels)
- D/A
  - G7F-DA2V \*2): Voltage output (4 channels)
  - G7F-DA2I: Current output (4 channels)
- A/D, D/A
  - G7F-ADHA: Analog (in 2 channels, out 1 channel)
  - G7F-ADHB \*2): Analog (in 2 channels, out 2 channels)
  - G7F-ADHC \*2): Analog (in 2 channels, out 1 channel)
- RTD
  - G7F-RD2A \*2): RTD 4 channels
- Analog timer
  - G7F-AT2A: Analog timer (4 points)

### Communication unit \*3)

- G7L-CUEB: RS-232C 1 channel
- G7L-CUEC: RS-422 1 channel
- G7L-FUEA: Fieldbus I/F (Fnet master)
- G7L-RUEA: Fieldbus I/F (Rnet master)
- G7L-DBEA: DeviceNet (slave)
- G7L-PBEA: Profibus-DP (slave)

### Option pack

- G7E-RTCA: RTC (Real timer clock) pack
- G7E-M256B: Memory pack (for program back-up)

\*1) I/O assignment is the same as that of K80S.

\*2) K120S only. And  stands for a slim type

\*3) You are not able to connect a communication module to K7M-DR10UE (/DC) and K7M-DR14UE (/DC) while you can do a communication module to other types of K80S. Built-in RS-232C and a communication module shares the same communication port (CH0) and you are not able to use them at the same time. In case of a standard type, you are able to use built-in RS-485 (CH1) and a comm. module (CH0) at the same time.

■ Features

- Small- and medium-scale control with 384 points
  - High-speed processing: 0.5 $\mu$ s/step
  - On-line editing
  - Change I/O value by force
  - Small- and medium-sized manufacture line control by network
  - Various special modules: analog, HSC, positioning, etc
  - Built-in flash memory
- 3 types of CPU
  - System monitoring function
  - Trigger function
  - Network support: Cnet, Fast Ethernet, Fnet, Rnet, DeviceNet, and Profibus-DP



■ Specifications

Items			K3P-07AS	K3P-07BS	K3P-07CS
Operation method			Cyclic execution of stored program, Time-driven operation, Interrupt task operation		
I/O control method			Scan synchronized batch processing method (Refresh method), Direct method by program		
Program language			Ladder diagram, Mnemonic		
Number of instructions	Basic		30		
	Application		218		
Processing speed	Basic instructions		0.5 $\mu$ s/Step		
Program memory capacity			7k steps		
Max. I/O points			384		
Memory device	P (I/O Relay)		P0000~P031F (512 points) *1)		
	M (Auxiliary relay)		M0000~M191F (3,072 points)		
	K (Keep relay)		K0000~K031F (512 points)		
	L (Link relay)		L0000~L063F (1,024 points)		
	F (Special relay)		F0000~F063F (1,024 points)		
	T (Timer)	100ms	T000~T191 (192 points): available to change by parameter		
		10ms	T192~T255 (64 points): available to change by parameter		
	C (Counter)		C000~C255 (256 points)		
	S (Step controller)		S00.00~S99.99 (100X100 step)		
D (Data register)		D0000~D4999 (5,000 words)			
Timer type			On-delay, Off-delay, Integration, Monostable, Retriggerable timer		
Counter type			Up, Down, Up-down, Ring counter		
Special function			On-line editing, Change I/O value by force		
Operation mode			Run, Stop, Pause, Debug		
Max. expansion stage			Main base only		
Self-diagnostic functions			Watchdog timer, Memory error, I/O error, Battery error, Power supply error		
Base type			4/6/8/12 slot *2)		
Built-in functions			Cnet (RS-232C) *3)	PID control Cnet (RS-422/485) RTC function	PID control Cnet (RS-232C) *3) HSC (50kHz) RTC function
Internal current consumption			170mA	210mA	170mA

\*1) With a 32-point I/O installation, P area is P0000~P023F and the rest of it is available to use as internal memory.

\*2) The suitable power module for GM6-B12M is GM6-PAFC, which can't support an analog module. For analog modules or TC module, you are supposed to use GM6-PAFB or GM6-PDFB considering internal current consumption of each module. Communication modules are not to be installed in after slot number 7.

\*3) Built-in RS-232C port: 4(Rx), 7 (Tx), 5 (SG)

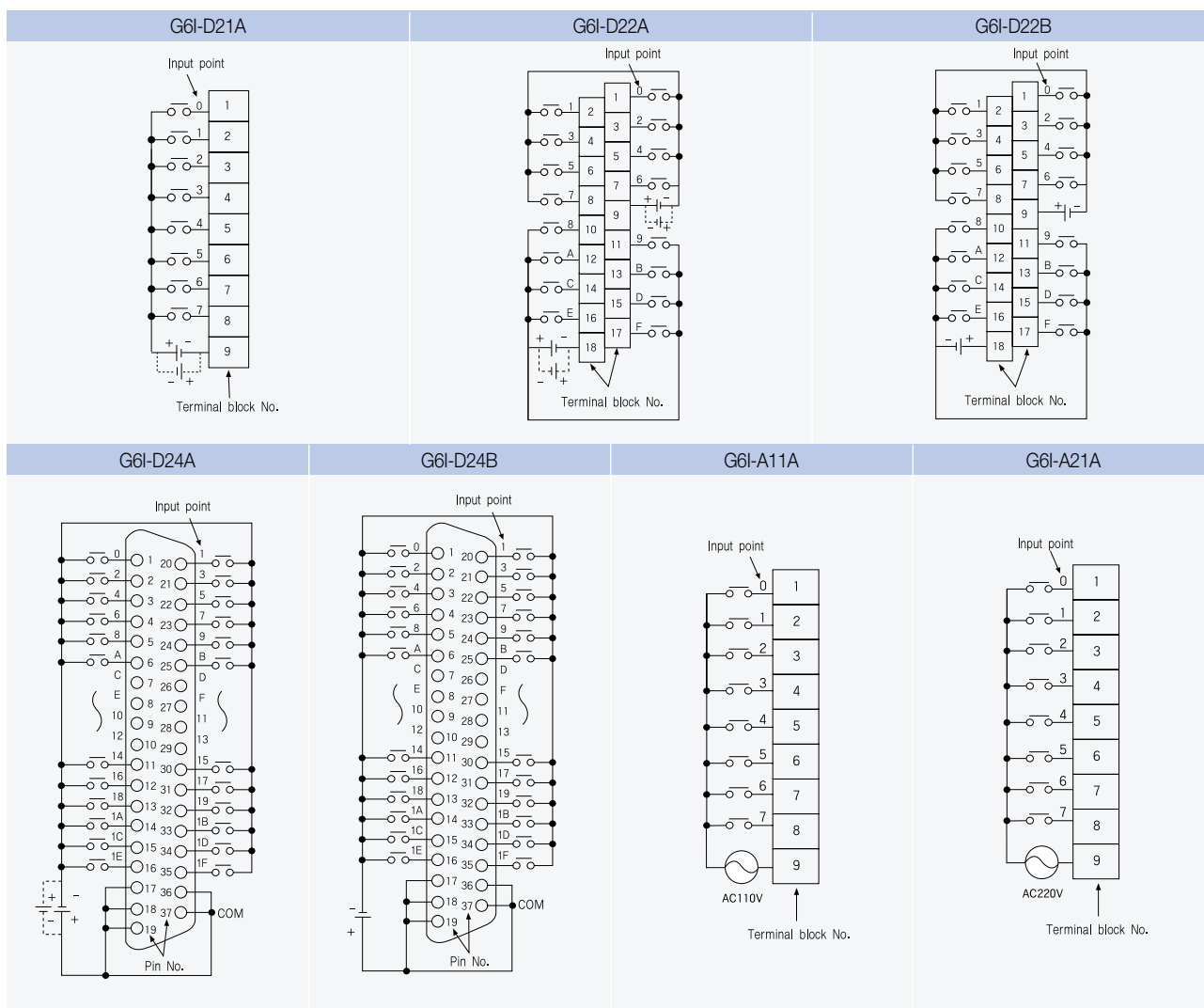


## Input modules

### Input module specifications

Input type		DC Input					AC Input *1)	
Part number		G6I-D21A	G6I-D22A	G6I-D22B	G6I-D24A	G6I-D24B	G6I-A11A	G6I-A21A
Input point		8 points	16 points		32 points		8 points	
Rated input voltage		DC12/24V	DC12/24V	DC24V	DC12/24V	DC24V	AC100~120V	AC200~240V
Rated input current		3/7mA	3/7mA	7mA	3/7mA	7mA	7mA	11mA
On voltage/current		DC9.5V or more/ 3.5mA or more	DC9.5V or more/ 3.5mA or more	DC15V or more/ 4.3mA or more	DC9.5V or more/ 3.5mA or more	DC15V or more/ 4.3mA or more	AC80V or more/ 5mA or more	AC80V or more/ 5mA or more
Off voltage/current		DC5V or less/ 1.5mA or less	DC5V or less/ 1.5mA or less	DC5V or less/ 1.7mA or less	DC5V or less/ 1.5mA or less	DC5V or less/ 1.7mA or less	AC30V or less/ 2mA or less	AC30V or less/ 2mA or less
Response time	Off → On	5ms or less	5ms or less	5ms or less	5ms or less	5ms or less	15ms or less	15ms or less
	On → Off	5ms or less	5ms or less	5ms or less	5ms or less	5ms or less	25ms or less	25ms or less
Common		8 points/COM			32 points/COM		8 points/COM	
Operating indicator		LED						
Insulation method		Photocoupler insulation						
Current consumption (DC5V)		40mA	70mA		75mA		35mA	

\*1) AC input modules: 50/60Hz



\* Refer to user's manual for wiring.



# MASTER-K200S

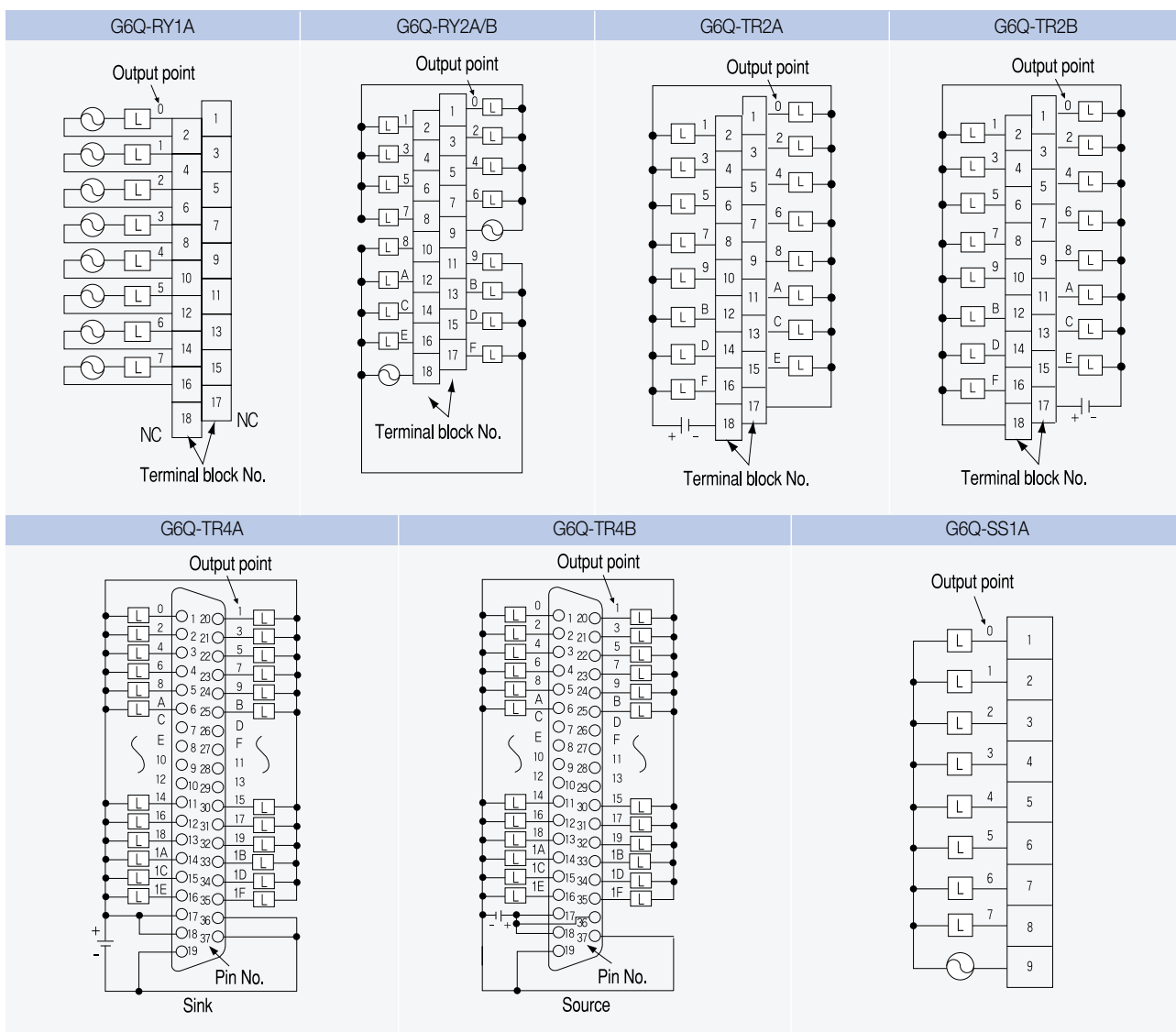
Programmable Logic Controller

## Output modules

### ■ Output module specifications

Output module type		Relay output			Transistor output				Triac output
Part number		G6Q-RY1A	G6Q-RY2A	G6Q-RY2B	G6Q-TR2A	G6Q-TR2B	G6Q-TR4A	G6Q-TR4B	G6Q-SS1A
Output point		8 points	16 points		16 points	16 points	32 points	32 points	8 points
Rated load voltage		DC12/24V, AC110/220V (50/60Hz)			DC12/24V				AC110/220V (50/60Hz)
Off leakage current					0.1mA or less				2.5mA or less
On voltage drop		-			DC1.5V or less		DC2.5V or less	DC3V or less	AC1.5V or less
Rated load current	1 Point	2A			0.5A		0.1A		1A
	1 Common	-	5A		3A		2A		4A
Response time	Off → On	10ms or less			2ms or less				1ms or less
	On → Off	12ms or less			2ms or less				0.5cycle+1ms or less
Common		1 point/COM	8 points/COM		16 points/COM		32 points/COM		8 points/COM
Operating indicator		LED							
Insulation method		Relay			Photocoupler				
Surge absorber		-	Varistor		Clamp diode				Varistor, CR absorber
Current consumption (DC5V)		210mA	400mA		180mA	170mA	140mA	145mA	190mA
External power supply		-			DC24V				-

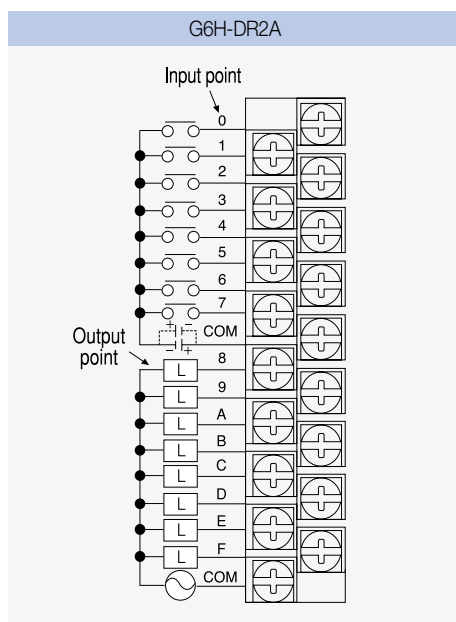
\* G6Q-TR2A/TR4A: Sink type, G6Q-TR2B/TR4B: Source type



\* Refer to user's manual for wiring.

## I/O hybrid module specifications

G6H-DR2A					
Input			Output		
Input point		8 points	Output point		8 points
Insulation method		Photocoupler	Insulation method		Relay
Rated input voltage		DC 12/24V	Rated load voltage/current		DC 24V, 2A (Resistance)/1 point, 4A/COM AC 220V, 2A (COS ϕ =1)/1 point, 4A/COM
Rated input current		3/7mA	Min. load voltage/current		DC 5V/1mA
Operating voltage range		DC 10.2~28.8V (Ripple rate < 5%)	Max. load voltage		AC 250V, DC 125V
Max. simultaneous input		8 points (100% simultaneous ON)	Off leakage current		0.1mA (AC 220V, 60Hz)
On voltage/current		DC 9.5V/3.5mA or more	Max. switching frequency		1,200 times/hour
Off voltage/current		DC 5V/1.5mA or less	Surge absorber		-
Input impedance		About 3.3kΩ	Service life	Mechanical	20 million times or more
Response time	Off → On	5ms or less	Response time	Electrical	100,000 times or more (Rated load V/C)
	On → Off	7ms or less		Off → On	10ms or less
-		-		On → Off	12ms or less
Common		8 points/COM	Common		8 points/COM
Operating indicator		LED	Operating indicator		LED
External connection		18-point terminal block connector (M3 × 6 screws)			
Current consumption (DC 5V)		250mA			
Weight		200g			



\* Refer to user's manual for wiring.



# MASTER-K300S

Programmable Logic Controller

## ■ Features

- Small- and medium-scale control with 1,024 points <sup>\*1)</sup>
- High-speed processing: 0.2 $\mu$ s/step
- On-line editing
- Change I/O value by force
- Small- and medium-sized manufacture line control by network
- Downsizing and high performance
- Various special modules: analog, HSC, PID, positioning, etc
- Network support: Cnet, Fast Ethernet, Fnet, Rnet, DeviceNet, Profibus-DP
  - CPU version 3.0 or later: max. 4 modules in total
  - CPU version 2.9 or less: max. 2 modules in total



## ■ Specifications

Items		K4P-15AS
Operation method		Cyclic execution of stored program, Time-driven operation, Interrupt task execution
I/O control method		Scan synchronized batch processing method (Refresh method), Direct method by program
Program language		Ladder diagram, Mnemonic
Number of Instructions	Basic	30
	Application	218
Processing speed	Basic instructions	0.2 $\mu$ s/Step
Program memory capacity		15k steps
Max. I/O points		1,024
Memory device	P (I/O relay)	P0000~P063F (1,024 points)
	M (Aux. relay)	M0000~M191F (3,072 points)
	K (Keep relay)	K0000~K031F (512 points)
	L (Link relay)	L0000~L063F (1,024 points)
	F (Special relay)	F0000~F063F (1,024 points)
	T (Timer)	T000~T191 (192 points): available to change by parameter
		T192~T255 (64 points): available to change by parameter
	C (Counter)	C000~C255 (256 points)
	S (Step controller)	S00.00~S99.99 (100X100 step)
	D (Data register)	D0000~D4999 (5,000 words)
Timer type		On-delay, Off-delay, Integration, Monostable, Retriggerable timer
Counter type		Up, Down, Up-down, Ring counter
Special functions		RTC, On-line editing, Change I/O value by force
Operating mode		Run, Stop, Pause, Debug
Max. expansion stage		3 <sup>*2)</sup>
Self-diagnostic functions		Watchdog timer, Memory error, I/O error, Battery error, Power supply error
Data retention at power failure		Latch area setting in parameter (Basic)
Base type		4/6/8/12 <sup>*3)</sup> slot
Internal current consumption		130mA

<sup>\*1)</sup> CPU version 2.9 or less: max. number of I/Os is 512 points.

<sup>\*2)</sup> Max. length of the expansion cable: 3m

<sup>\*3)</sup> No expansion is available in the 12-slot base



## Input/output modules

### ■ Features

- 16/32/64 points
- Operation status monitoring by LED
- Insulated by Photocoupler
- Easy maintenance with terminal block & one touch installation

### ■ Input module specifications

Input type		DC Input				
Part number		G4I-D22A/C *1)	G4I-D22B	G4I-D24A/C *1)	G4I-D24B	G4I-D28A *2)
Input point		16 points		32 points		64 points
Rated input voltage		DC 12/24V *1)				
Rated input current		5/11mA		3/7mA		3/6mA
On voltage/current		DC 9.5V or more/4mA or more		DC 9.5V or more/3mA or more		
Off voltage/current		DC 6V or less/1.0mA or less				
Response	Off → On	10ms or less				
time	On → Off	10ms or less				
Common		8 points/COM		32 points/COM		
Type		Source/Sink	Source (+COM)	Source/Sink	Source (+COM)	Source/Sink
Operating indicator		LED				
Insulation method		Photocoupler insulation				
Current consumption (DC 5V)		70mA		75mA		250mA

Input type		AC Input		Interrupt
Part number		G4I-A12A	G4I-A22A	G4F-INTA
Input point		16 points		8 points
Rated input voltage		AC 100~120V (50/60Hz)	AC 200~240V (50/60Hz)	DC 24V
Rated input current		11mA		10mA
On voltage/current		AC 80V or more/6mA or more	AC 150V or more/4.5mA or more	DC 15V or more
Off voltage/current		AC 30V or less/3mA or less	AC 50V or less/3mA or less	DC 5V or less
Response	Off → On	15ms or less		0.5ms or less
time	On → Off	25ms or less		0.5ms or less
Common		8 points/COM		1 point/COM
Operating indicator		LED		
Insulation method		Photocoupler insulation		
Current consumption (DC 5V)		70mA		

### ■ Output module specifications

Output type		Transistor output				
Part number		G4Q-TR2A	G4Q-TR2B	G4Q-TR4A	G4Q-TR4B	G4Q-TR8A
Output point		16 points		32 points		64 points
Rated load voltage		DC 12/24V				
Rated load	1 Point	0.5A		0.1A		
current	1 Common	3A/COM		2A/COM		
Response	Off → On			2ms or less		
time	On → Off			2ms or less		
Common		8 points/COM		32 points/COM		
Operating indicator		LED				
Type		Sink (-COM)	Source (+COM)	Sink (-COM)	Source (+COM)	Sink (-COM)
Insulation method		Photocoupler insulation				
Surge absorber		Varistor		-		
Current consumption (DC 5V)		100mA		160mA		250mA
External power supply		DC 24V				

Output type		Relay output	Triac output		
Part number		G4Q-RY2A *3)	G4Q-SS2A	G4Q-SS2B	
Output point			16 points		
Rated load voltage		DC 12/24V, AC 110/220V (50/60Hz)		AC 100~240V (50/60Hz)	
Rated load	1 Point	2A	1A	0.6A	
current	1 Common	4A/COM	5A/COM	2.4A/COM	
Response	Off → On	10ms or less		0.5cycle + 1ms or less	
time	On → Off	12ms or less		0.5cycle + 1ms or less	
Common			8 points/COM		
Operating indicator			LED		
Type			-		
Insulation method			Photocoupler insulation		
Surge absorber		-		Varistor, CR absorber	
Current consumption (DC 5V)		100mA		330mA	
External power supply		DC24V		-	

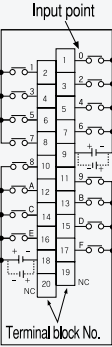
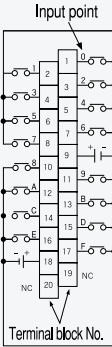
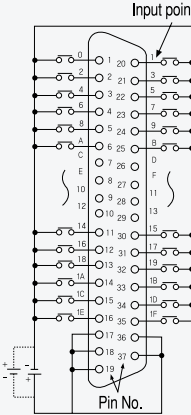
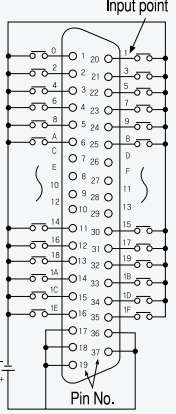
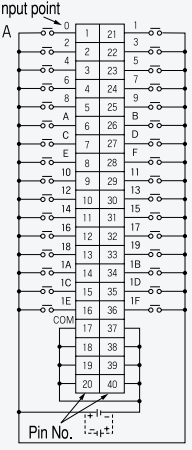
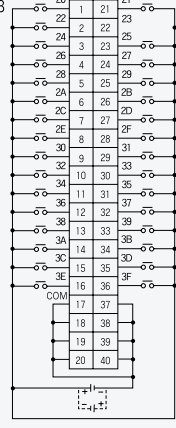
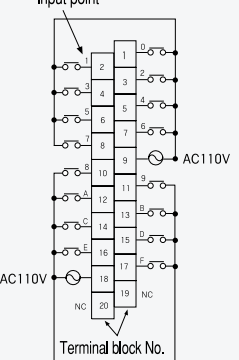
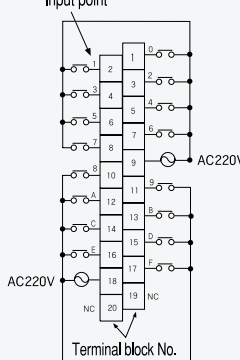
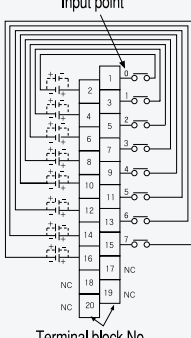
\*1) Rated input voltage for G4I-D2XC is DC24V and on voltage is 19.6V

\*2) G4I-D28A and G4Q-TR8A are connector-type modules

\*3) For G4Q-RY2A operation, you need to supply DC24V.

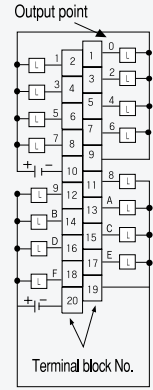
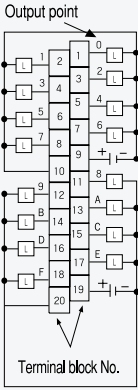
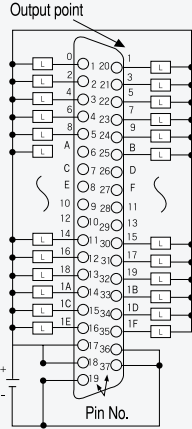
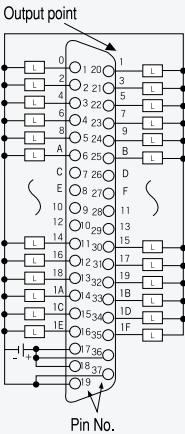
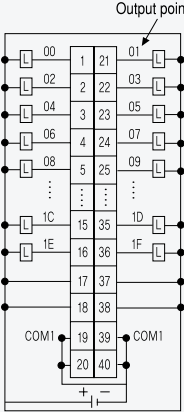
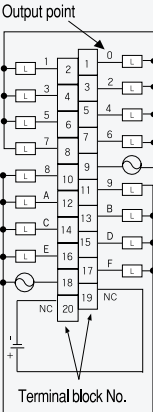
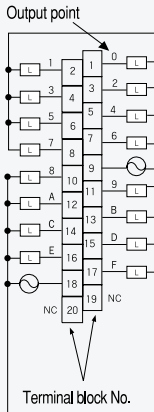
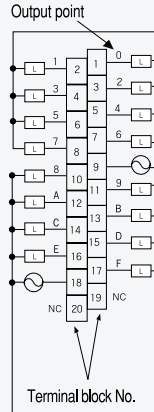
Input/output modules

■ Wiring diagram for input modules

<p>G4I-D22A/C *1)</p> 	<p>G4I-D22B</p> 	<p>G4I-D24/ *1)</p> 
<p>G4I-D24B</p> 	<p>G4I-D28A *2)</p> <div>   </div>	
<p>G4I-A12A</p> 	<p>G4I-A22A</p> 	<p>G4F-INTA</p> 

\*1) Rated input voltage for G6I-D2XC is DC24V and on voltage is 19.6V.  
\*2) G4I-D28A is a connector-type module.  
\* Refer to user's manual for wiring.

## ■ Wiring diagram for output modules

G4Q-TR2A	G4Q-TR2B	G4Q-TR4A
		
G4Q-TR4B	G4Q-TR8A *1)	
		
G4Q-RY2A *2)	G4Q-SS2A	G4Q-SS2B
		

\*1) G4Q-TR8A is a connector. type module.  
 \*2) For G4Q-RY2A operation, you need to supply DC24V.  
 \* Refer to user's manual for wiring.



# MASTER-K300S

Programmable Logic Controller

### I/O hybrid module specifications

Input type		DC Input			
Part number		G4H-DT2A		G4H-DR2A *1)	
Input point		8 points			
Rated input voltage		DC 12V	DC 24V	DC 12V	DC 24V
Rated input current		5mA	11mA	5mA	11mA
On voltage/current		DC 9.5V or more/4.0mA or more			
Off voltage/current		DC 6V or less/1.0mA or less			
Response time	Off → On	10ms or less			
	On → Off	10ms or less			
Common		8 points/1COM			
Operating indicator		LED			
Insulation method		Photocoupler insulation			
Current consumption(DC 5V)		100mA			

Output type		Transistor output	Relay output
Part number		G4H-DT2A	G4H-DR2A
Output point		8 points	
Rated load voltage		DC 12/24V	DC 24V/AC 220V (50/60Hz)
On voltage drop		DC 1.5V or less	-
Off leakage current		0.1mA or less	
Rated load current		0.5A/1 point	2A/1 point
		3A/COM	5A/COM
Response time	Off → On	2ms or less	10ms or less
	On → Off	2ms or less	10ms or less
Common		8 points/1COM	
Operating indicator		LED	
Insulation method		Photocoupler insulation	
Surge absorber		Varistor	-

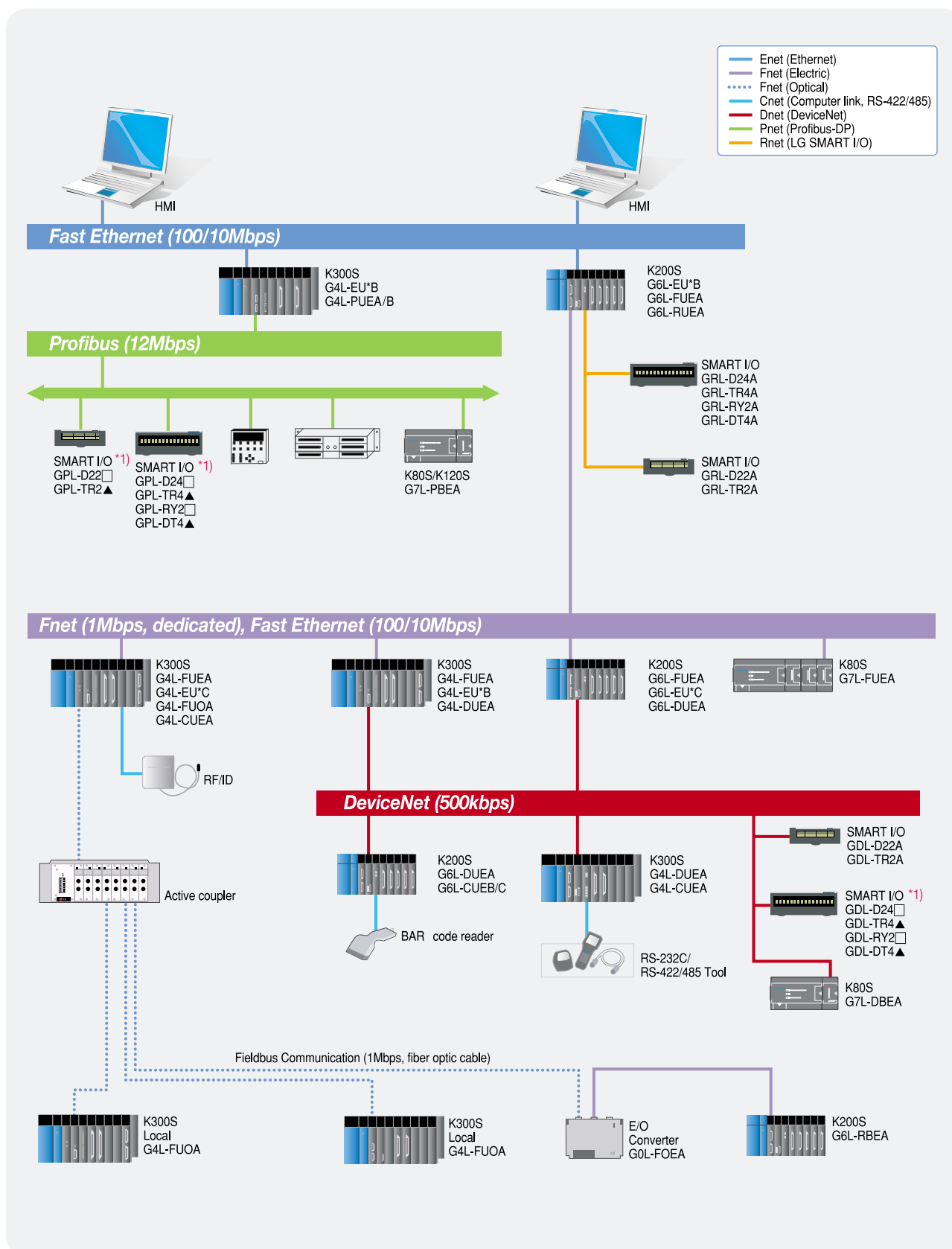
### Wiring diagram

G4H-DT2A	G4H-DR2A

\*1) For G4H-DR2A operation, you need to supply DC24V.  
\* Refer to user's manual for wiring.



## System configuration



\*1) Refer to P37, please.

# MASTER-K Fast Enet (Ethernet) system

Programmable Logic Controller

## ■ Features

- 10/100BASE-TX, 100BASE-FX (optical), 10BASE-5 support
- High reliability and performance with 32-bit processor
- Open (Information level) Ethernet and LSIS dedicated (Between LS PLCs) Ethernet: 2 types
- User-defined protocol editing and connection to other system using function block: Open-type (-EUxB) only
- KGLWIN service for remote programming, remote monitoring and PLC mode control



## Specifications

### ■ Open Ethernet

Item		GxL-EUTB	GxL-EUFB *1)	GxL-EU5B
Network		10/100BASE-TX, UTP (TP)	100BASE-FX, Fiber optic	10BASE-5, AUI
Support protocol		TCP/IP, UDP/IP		
Service	With LS PLCs	High-speed link, Command service		
	With other devices	Command service		
	Application	KGLWIN service, Dedicated protocol service		
Communication data		60 words/block or 200 words/block, 1446 bytes/frame		
Number of channels		16		
Usage		Communication between LS PLC and other devices (PC), High-speed link between LS PLCs		
Applicable type		K200S/K300S		K300S

### ■ Dedicated Ethernet

Item	Master	GxL-EUTC	GxL-EUFC *1)	GxL-EU5C
	Slave	GxL-ERTC	GxL-ERFC *1)	GxL-ER5C
Network		10/100BASE-TX, UTP (TP)	100BASE-FX, Fiber optic	10BASE-5, AUI
Support protocol		Token passing		
Service	With LS PLCs	High-speed link, Command service		
	With other devices	-		
	Application	KGLWIN service		
Communication data		200 words/block		
Number of connecting stations		64		
Usage		High-speed link between LS PLCs		
Applicable type		K200S/K300S		K300S

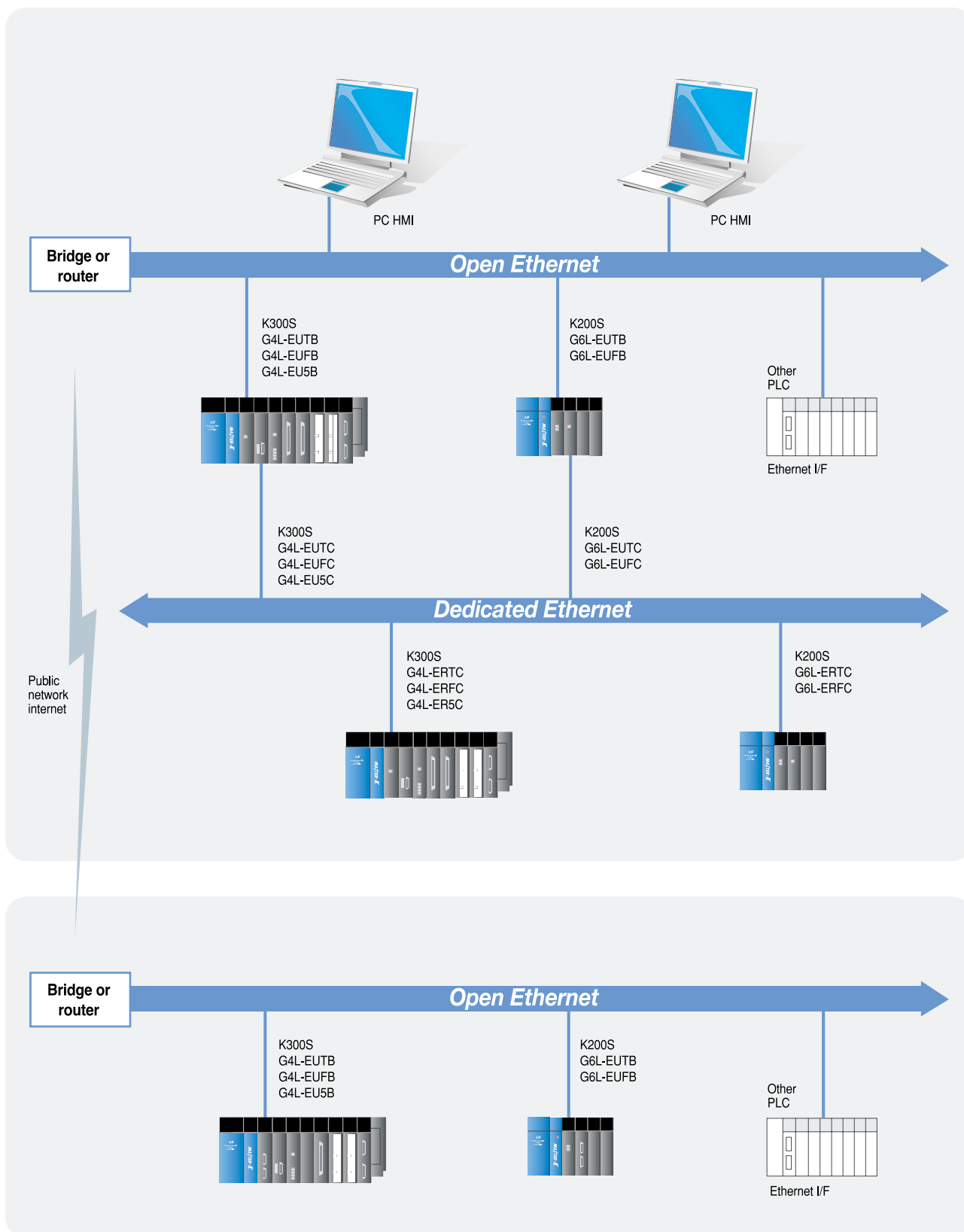
\*1) SC-type connector is used.

# MASTER-K Ethernet system configuration

Programmable Logic Controller

MASTER-K Series

## System configuration



# MASTER-K Fnet system configuration

Programmable Logic Controller

## ■ Features

- Transmission speed: 1Mbps, transmission distance: 750m (Electric) <sup>\*1)</sup>
- Communication available up to 5.25km with repeaters (Max.: 6): Electric <sup>\*1)</sup>
- High-speed link capacity: Max. 61,440 points
- Convenient to configure various multi-drop network systems with remote I/O modules (G4L-RBEA/G6L-RBEA)

<sup>\*1)</sup> In case of fiber optical cable, transmission distance is 3km and max. distance is 21km with 6 repeaters.

## ■ Specifications

Item		Electrical module	Optical module	
Transmission speed		1Mbps		
Encoding type		Manchester Biphas-L		
Transmission distance (per segment)		Max. 750m	Max. 3km	
Max. extension distance		Max. 5.25km (6 repeaters)	Max. 21km (6 EOCs)	
Transmission medium		Twisted pair cable	Optical cable	
Number of nodes		64		
Communication method		Circulated token passing, Address prove method		
High-speed link	Max. data size/station	61,440 points (3840 words)		
	Max. sending data size	30,720 points (1920 words)		
	No. of data block in transmission	64 blocks		
	Data block size in transmission	60 words		
Comm. module	Local	K300S	G4L-FUEA	G4L-FUOA
		K200S	G6L-FUEA	-
		K80S/K120S	G7L-FUEA *1)	-
	Remote	K300S	G4L-RBEA	-
		K200S	G6L-RBEA	-
Others		<ul style="list-style-type: none"><li>• Local module is to be set in the I/O slot of the main base.</li><li>• Remote module is to be set in the CPU slot of the main base.</li><li>• K300S: Up to 4 modules</li><li>• K200S: Up to 2 modules *2)</li><li>• K80S/K120S: 1 module</li></ul>		

<sup>\*1)</sup> You are not able to use the built-in Cnet or other communication unit when you use G7L-FUEA.

<sup>\*2)</sup> K200S: Up to 2 Fnet modules, K80S/K120S: Only 1 communication module

<sup>\*3)</sup> G0L-FREB: AC 110~220V, G0L-FREC: DC 24V



Fieldbus active coupler (G0L-FACA)	
Transmission speed	1Mbps
Cable	Optical cable
Transmission distance	3km
Function of signal regeneration	Regenerating, Reshaping function
On reception of abnormal data	Error data transmission
Frame error check	CRC 16
Max.number of coupling station	8
Power supply	AC110V/220V, DC24V
Coupling optic card	Rack type (Branch off/ select the number of stations)

Fieldbus repeater (G0L-FREB, FREC) <sup>*3)</sup>	
Transmission speed	1Mbps
Cable	Shielded twisted pair cable
Max. extension distance	750m per module
Max. number of repeaters	6 units between stations
Max. distance	5.25km between stations (when 6 repeaters used)
On reception of abnormal data	Error data transmission
Frame error check	CRC 16

Fieldbus electric/optical converter (G0L-FOEA)	
Transmission speed	1Mbps
Cable	Optical cable, Shielded twisted pair cable
Max. transmission distance	3km
Function of signal regeneration	Regenerating, Reshaping
On reception of abnormal data	Error data transmission
Frame error check	CRC 16

## ■ Network cable

Item	Specifications	Maker
Shielded twisted pair cable	LIREV-AMESB 2 × 1mm, 18 AWG	LS CABLE CO., LTD
	LIREV-AMESB 2 × 0.64mm, 22 AWG	
Optical cable	Y220909, Multi-mode, ST type	LS CABLE CO., LTD
	OJC-DP-MM-XX-ST-ST (XX = Number in meter), Multi-mode, ST type	LS CABLE CO., LTD
Terminal resistance	110 Ω, 1/2 Watt	-

<sup>\*</sup> The above cables are used in development and performance test.

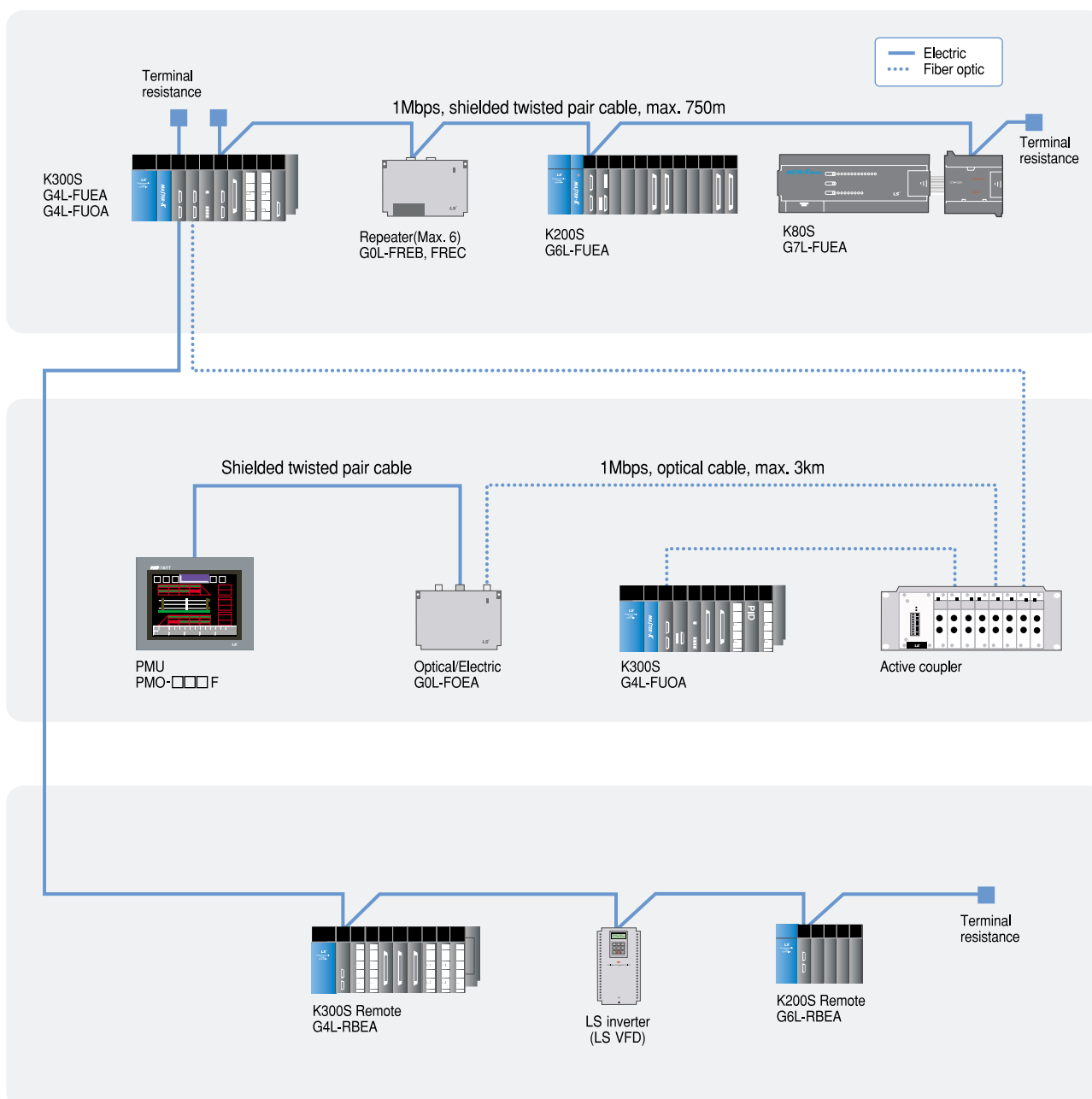
And we can't guarantee system performance as is shown in user's manual, if you use other cables.



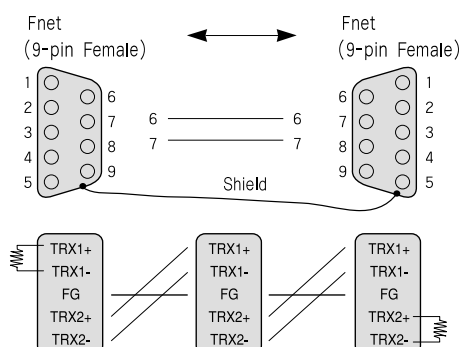
# MASTER-K Fnet system configuration

Programmable Logic Controller

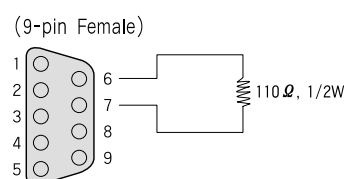
## System configuration



### Fnet cable connection



### Terminal resistance



# MASTER-K Cnet (Computer link system)

Programmable Logic Controller

## ■ Features

- Various protocol communication thanks to Frame Editor and command
- Easy to make a communication program
- KGLWIN connection via phone line using an external modem connection
- Long-distance communication via phone line using a dedicated line modem connection
- Up to 32 stations connectable: Multi-drop service of LSIS dedicated protocol
- RS-232C/RS-422 communication port (Interlocking/Standalone mode)
- Various communication speed setting (300~76,800bps) <sup>\*1)</sup>
- Parameter setting in Frame Editor
- Full duplex and half duplex support
- K300S: Up to 4 modules
- K200S: Up to 4 modules
- K80S/K120S: Only 1 communication module
- Remote operating mode change in online mode
- Easy interface with other PLCs due to AB DF1/MODBUS communication driver support (Slave)
- Easy upgrade using flash memory: Cnet version 2.0 or later



## ■ Operation mode

Operation mode	Remark
KGLWIN mode	Program download, upload by KGLWIN protocol (RS-232C)
Dedicated protocol	Data communication using LSIS dedicated protocol
User-defined protocol	Data communication using user-defined frame and command
Test mode	Self-diagnosis (except K80S/K120S)

## ■ Specifications

Item		G4L-CUEA	G6L-CUEB	G6L-CUEC	G7L-CUEB	G7L-CUEC
Interface		RS-232C, RS-422/485	RS-232C	RS-422/485	RS-232C	RS-422/485
Comm. mode	Dedicated	1:1 or 1:N communication using LSIS dedicated mode				
	KGLWIN	Program download, upload and remote control using KGLWIN protocol (RS-232C, 1:1)				
	User-defined	Communication using user-defined protocol by Frame Editor (Interface with other PLCs)				
Data form	Start bit	1 *2)				
	Data bit	7 or 8 *2)				
	Stop bit	1*2) or 2				
	Parity bit	Even / odd / none				
Channel selection		By mode switch	-			
Synchronization		Asynchronous				
Transmission speed		300/600/1,200/2,400/4,800/9,600/19,200/38,400/76,800 *1)			1,200~57,600	
Network configuration		1:1, 1:N, N:M available (N≤31)	1:1	1:1, 1:N	1:1	1:1, 1:N
Modem communication		Available through RS-232C	Available	-	Available	-
Transmission	RS-232C	15m (Extendible using a modem)	15m	-	15m	-
	RS-422/485	500m	-	500m	-	500m
Max. number of installation		4 in total			1 *3)	
Diagnostic function		Loop-back test mode			-	-
Current consumption (DC 5V)		160mA			100mA	

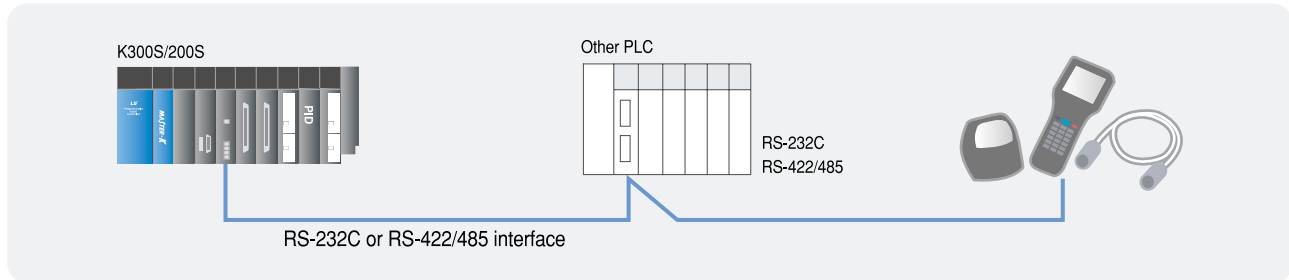
<sup>\*1)</sup> Default value

<sup>\*2)</sup> RS-232C: 300~38,400bps, RS-422/485: 300~76,800bps, In case of MODBUS communication, baud rate is 2,400~38,400bps

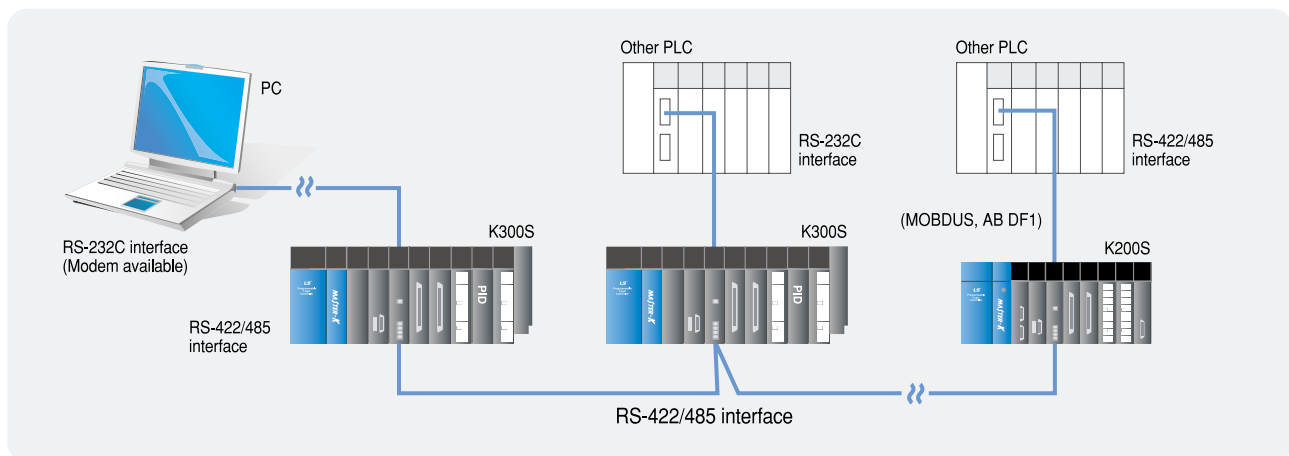
<sup>\*3)</sup> If you use G7L-CUEB or G7L-CUEC, which is not available to use in K7M-DR10S(DS), K7M-DT10S, K7M-DR10UE(DC) or K7M-DR14UE(DC), you are not able to use built-in Cnet or any other communication module.

# MASTER-K Cnet (Computer link) system configuration

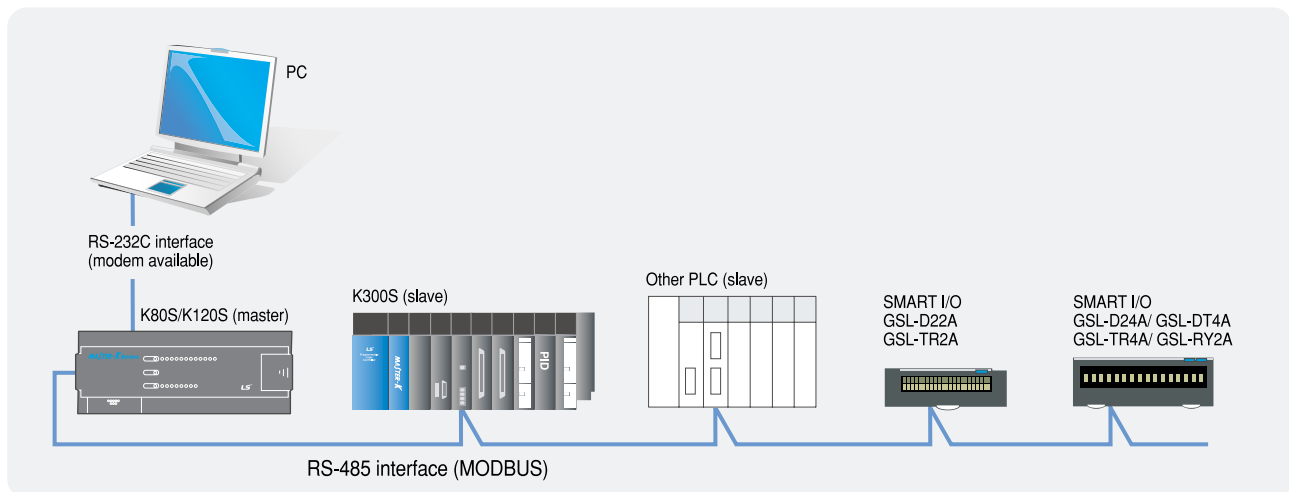
## ■ Communication with RS-422/485 devices



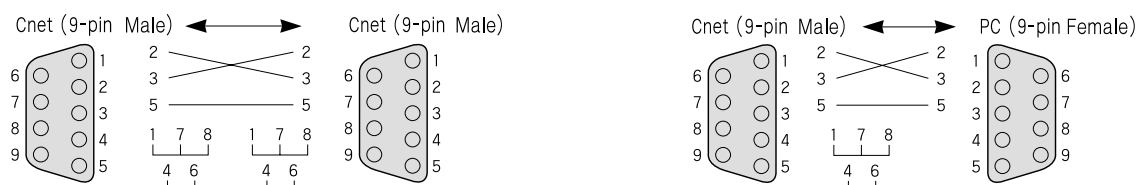
## ■ 1:1 and N:M connection (dedicated + user-defined)



## ■ MODBUS (K80S/K120S: master/slave, K200S/K300S: slave)



## ■ Cnet cable connection (RS-232C)



# MASTER-K Dnet (DeviceNet system)

Programmable Logic Controller

## ■ Features

- Real time control of various I/O devices in network system
- Max. 63 slave modules control with one master module
- Flexibility in network configuration: Multi-drop and T branch connection
- Connectable to other master module and various slave modules
  - Communication with other slave modules as master
  - Communication with other master module as slave  
(Mode change by mode switch in master module)
- K300S: 4 in total, K200S: 2 in total
- K80S/120S: 1 slave module
- Master/slave communication as predefined master/slave connection communication using scan list enabling high-speed link without other configuration tool



## ■ Specifications

Item	G4L-DUEA	G6L-DUEA	G7L-DBEA
Module type	Master/Slave (setting by dip switch)		Slave
Protocol	CAN		
Transmission distance and speed *1)	Communication speed	Max. network length (Drop cable)	Max. extension length
	500kbps	100m	39m
	250kbps	250m	78m
	125kbps	500m	156m
Max. number of stations	64		
Cable	DeviceNet cable: 5 wires (Signal: 2 wires, power: 2 wires, shield: 1 wire)		
Bus type	Multi slave / Multi casting		
	1:1 (Peer-to-peer type)		
	Poll, Strobe, COS/Cyclic type *2)		
Max. node number	Max. 64 MAC ID (Max. 2,048 points)		
System features	Available to insert/remove a node when power is on		
Diagnostic function	Duplicated station/CRC error check, Abnormal station detection, Usage of scan list, LED (operation)		
Current consumption (DC5V)	285mA	230mA	250mA

\*1) In case of thin cable, the max. distance is within 100m regardless of transmission speed.

\*2) The type of Strobe, COS/Cyclic on bus type will be served later.

\* Maximum transmission distance when thick and thin cables coexist.

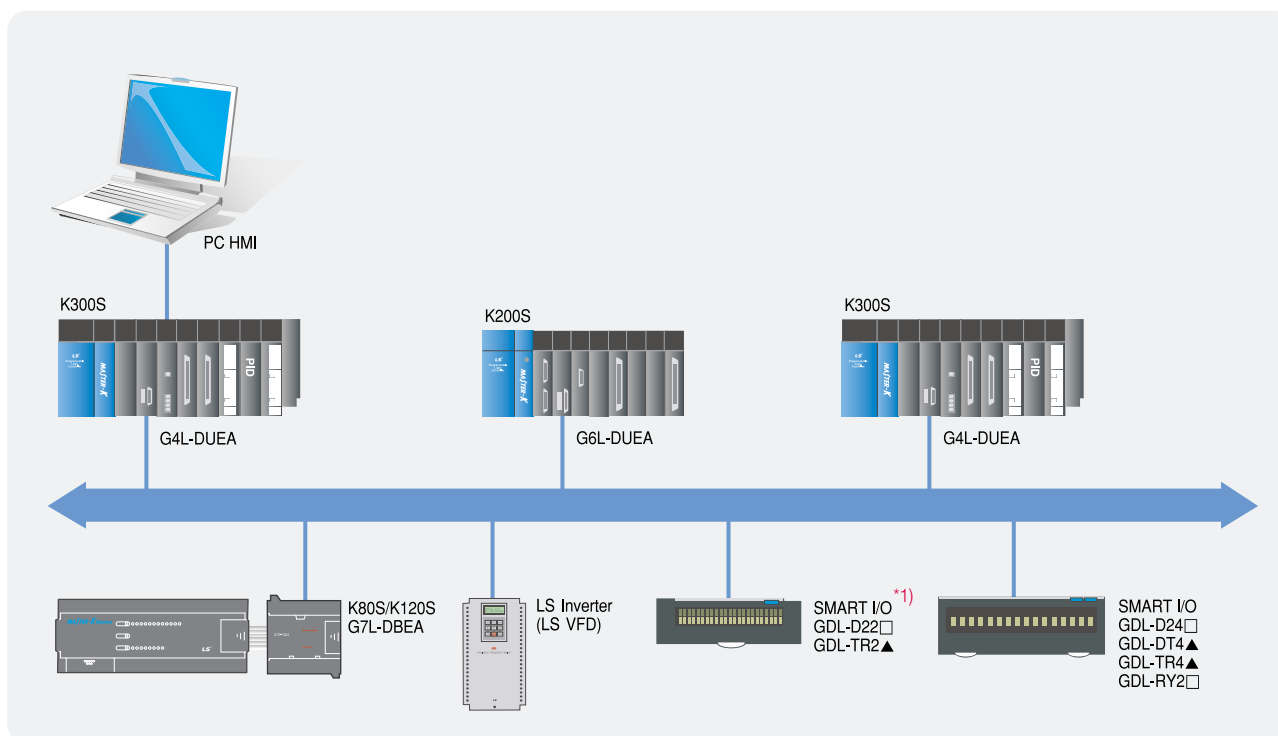
The table below lists both the maximum transmission distance when thick and thin cables coexist.

Communication speed	Maximum transmission distance of trunk line when thick and thin cables coexist
125kbps	Thick cable length + 5 × thin cable length ≤ 500m
250kbps	Thick cable length + 2.5 × thin cable length ≤ 250m
500kbps	Thick cable length + thin cable length ≤ 100m

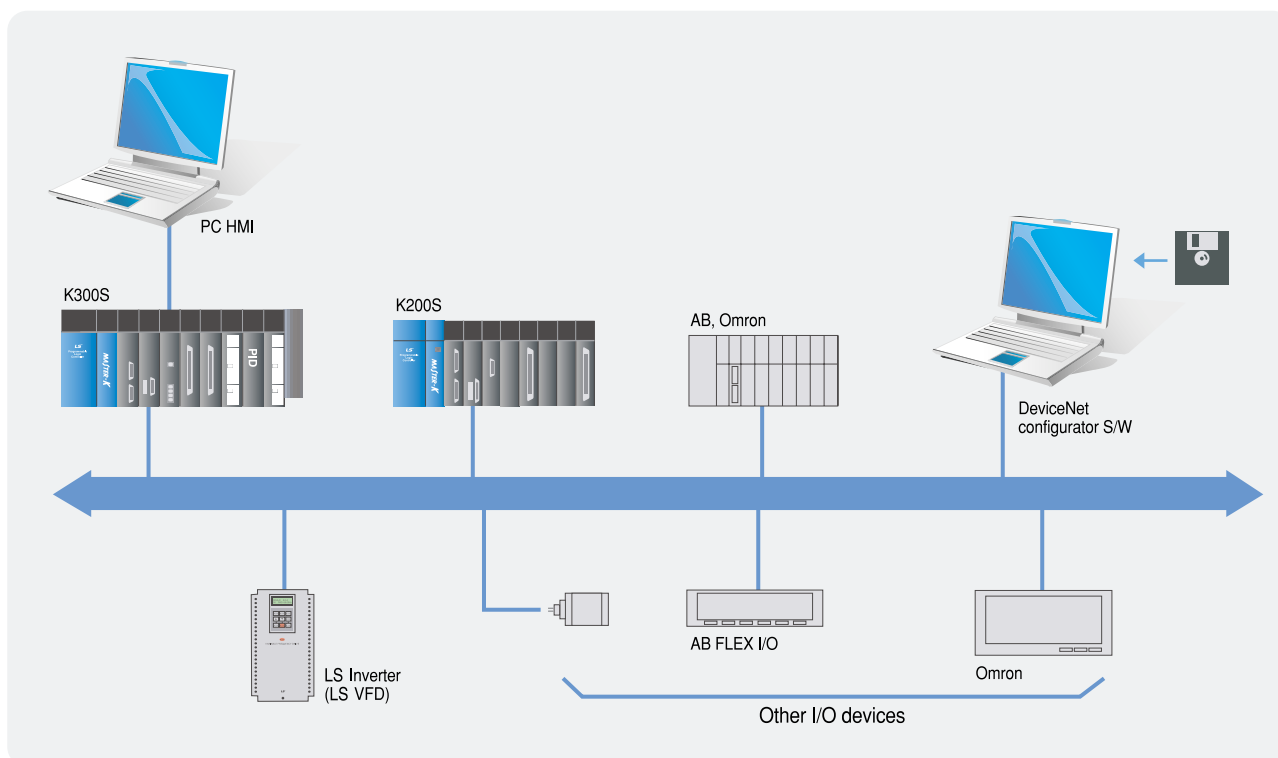
# MASTER-K Dnet system configuration

Programmable Logic Controller

## System configuration



## ■ System configuration with other products



\*1) Refer to P37, please.



# MASTER-K Pnet (Profibus-DP system)

Programmable Logic Controller

## ■ Features

- Profibus-DP (Decentralized periphery)
- Low cost network appropriate to field level
- Proper to communicate among a master automation device and distributed slave I/O devices
- Master slave network
- Fast slave communication omitting application layer
- Based on RS-485 communication as transmission medium
- Communication speed: 9.6kbps~12Mbps
- Communication distance: 100~1,200m
- Max. 126 stations (32 stations/segment) support
- Network setup using Sycon (Configuration tool)
- Transmission data of master: 1K~7K
- Communication using high-speed link parameter



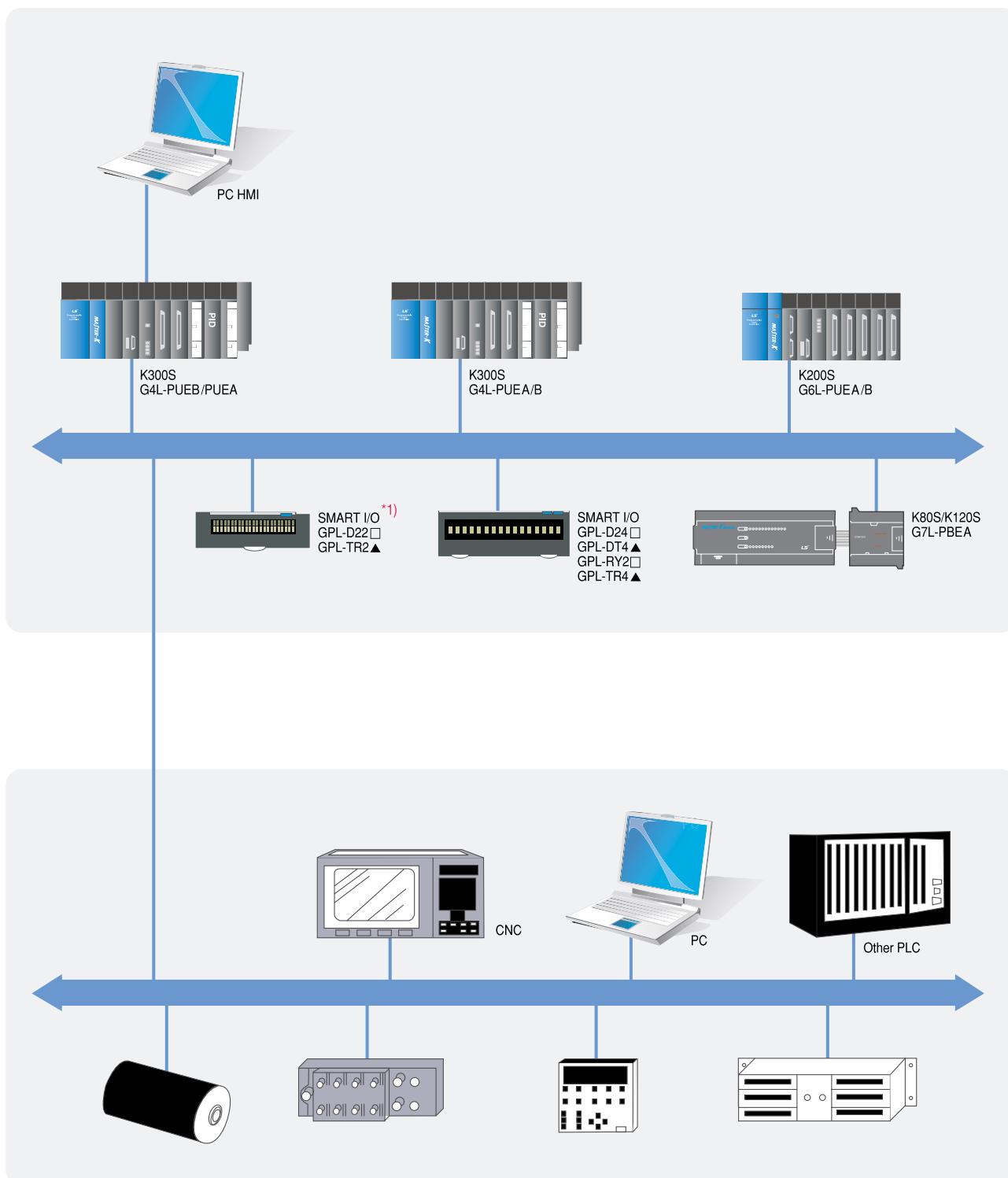
## ■ Specifications

Item	G4/6L-PUEA	G4/6L-PUEB	G7L-PBEA	Remark
Module type	Master		Slave	Class 1
Network	Profibus-DP			
Protocol	EN 50170/DIN 19245			
Interface	RS-485 (Electric)			
Medium access	Token passing & poll		Poll	
Topology	Bus			
Modulation	NRZ			Asynchronous
Cable	Shielded twisted pair cable			
Transmission distance	1,200m (9.6kbps~187kbps)			
	400m (500kbps)			
	200m (1.5Mbps)			
	100m (3M~12Mbps)			
Max. number of slave/network	126			
Max. number of slave/segment	32			
Dual port memory size	1K	7K	128 bytes	
Max. I/O data	In: 512 bytes	In: 3584 bytes	In: 64 bytes	
	Out: 512 bytes	Out: 3584 bytes	Out: 64 bytes	
Communication parameter setting	High-speed link parameter in KGLWIN		KGLWIN	
Configuration tool	Sycon-PB			
Configuration port	RS-232C Configuration port support		-	
Current consumption (DC 5V)	560/520mA	670/700mA	350mA	

# MASTER-K Pnet system configuration

Programmable Logic Controller

## System configuration



\*1) Refer to P37, please.

# SMART I/O

Programmable Logic Controller

## ■ Features

- Wiring reduction and real time control of distributed I/O
- Supporting Rnet, DeviceNet, Profibus-DP, MODBUS (RS-422/485)
- Various I/O (DC/TR/Relay) modules with the unit of 16/32 points



## ■ Digital I/O specifications

Item	Input		Output			Mixed module	
	DC (Sink/Source)		Transistor (Sink)		Relay	DC (Sink/Source)	Transistor (Sink)
No. of point	16	32	16	32	16	16	16
Rated input (Load voltage)	DC 24V		DC 24V		DC 24V/AC 110V/220V	DC 24V	DC 24V
Input current (Load current)	7mA		0.1A/2A, 0.5A/3A		2A/5A	7mA	0.1A/2A, 0.5A/3A
Response time	Off → On	3ms or less	3ms or less		3ms or less	3ms or less	3ms or less
	On → Off	3ms or less	3ms or less		3ms or less	3ms or less	3ms or less
Common	16 points/COM		16 points/COM		16 points/COM	16 points/COM	16 points/COM
Current consumption	200mA	300mA	280mA	380mA	550mA	350mA	
Network	Rnet	GRL-D22A	GRL-D24A	GRL-TR2A	GRL-TR4A	GRL-RY2A	GRL-DT4A
	Profibus-DP	GPL-D22A●	GPL-D24A●	GPL-TR2A▲	GPL-TR4A▲	GPL-RY2A●	GPL-DT4A▲
	DeviceNet	GDL-D22A●	GDL-D24A●	GDL-TR2A▲	GDL-TR4A▲	GDL-RY2A●	GDL-DT4A▲
	MODBUS	GSL-D22A	GSL-D24A	GSL-TR2A	GSL-TR4A	GSL-RY2A	GSL-DT4A

\*1) Specification stated in the table is specification of type A. Refer to XGT user's manual.

● A, C ▲ A, A1, B, C, C1

A Sink, Rated current: 0.1A, terminal fixed type  
A1 Sink, Rated current: 0.5A, terminal fixed type

B Source, Rated current: 0.5A, terminal fixed type  
C Source, Rated current: 0.5A, terminal separated type  
C1 Sink, Rated current: 0.5A terminal separated type

## ■ Analog I/O specifications

Item	GPL-AV8C	GPL-AC8C	Item	GPL-DV4C	GPL-DC4C
Input channels	8 channels		Output channels	4 channels	
Analog input	DC 1~5V, 0~5V, 0~10V, -10~+10V	0~20mA, 4~20mA, - 20~20mA	Digital input	0~4000, 0~8000, -8000~8000	0~8000
Digital output	0~4000, 0~8000, -8000~8000	0~4000, -8000~8000	Analog output	DC 1~5V, 0~5V, 0~10V, -10~+10V	0~20mA, 4~20mA
Input impedance	1MΩ	250 Ω	Load impedance	1KΩ or more (0~5V or 1~5V) 2KΩ or more (0~10V or -10~10V)	500 Ω or less
Max. resolution	±15V 1.25mV	±30mA 2.5μA	Resolution	1.25mV	2.5μA
Accuracy	±0.3% (full scale, Ta=0~55°C)	±0.3% (full scale, Ta=23°C±5°C) ±0.4% (full scale, Ta=0~55°C)	Accuracy	±0.3% (full scale, Ta=0~55°C)	±0.3% (full scale, Ta=23°C±5°C) ±0.4% (full scale, Ta=0~55°C)
Conversion speed	10ms or less / 8 channel		Conversion speed	10ms or less / 4 channel	
Response period	10ms or less / 8 channels + Transmisson period (ms)		Response period	10ms or less / 8 channels + Transmisson period (ms)	
Insulation method	Analog input/output terminal with FG → Insulation		Insulation method	Analog input/output terminal with FG → Insulation	
	Analog input/output terminal with Communication terminal → Insulation			Analog input/output terminal with Communication terminal → Insulation	
	Analog input/output terminal with each channel → No insulation			Analog input/output terminal with each channel → No insulation	
External power supply	DC24V (21.6 ~ 26.4)		External power supply	DC24V (20.4 ~ 28.8)	
External current consumption	DC24V: 220mA		External current consumption	210mA	240mA
Weight (kg)	0.313	0.313	Weight (kg)	0.314	0.322

## ■ Communication specifications

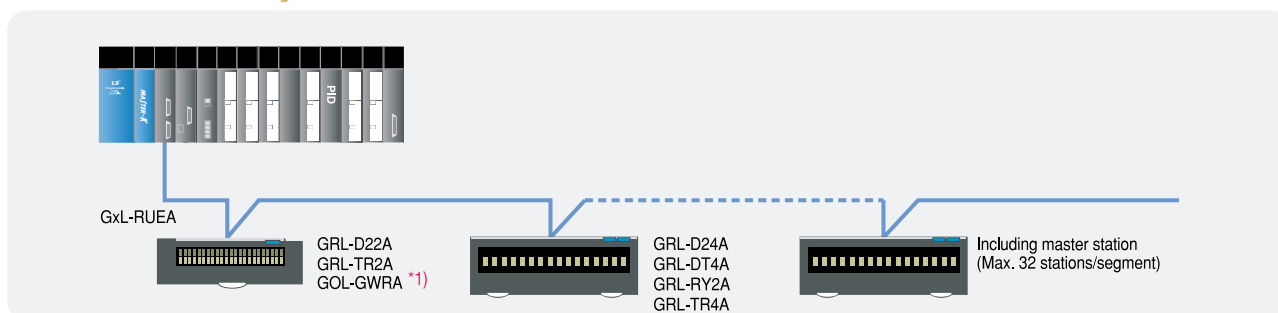
Item	Rnet (Dedicate network for LSIS Smart I/O)	Profibus-DP	DeviceNet	MODBUS
Protocol	LSIS dedicated protocol (Fnet for Remote)	Profibus-DP (RS-485/EN50170)	DeviceNet (CAN)	MODBUS (RS-422/485)
Transmission speed	1Mbps	9.6kbps ~ 12Mbps	125/250/500Kbps	2.4Kbps ~ 38.4Kbps
Transmission distance	750m/segment	100m ~ 1.2Km	500/250/125m (Thin cable: 100m)	500m
Topology	Bus Token	Bus	Trunk & Drop	Bus
Transmission	Pass & Broadcast	Token Pass & Master/Slave (Poll)	CSMA/NBA (Poll, Cyclic, COS, BitStrobe)	Master/Slave (Poll)
No. of stations	32/segment (Input: 32, Output: 32)	32/segment, 99/network	64	32
Link capacity	2,048 points/master (64 stations × 32 points)	7Kbyte/master	2,048 points/master	64 points/station

\*1) Smart I/O supports Poll type currently, but is supposed to support Cyclic, COS and Strobe later on.

# SMART I/O system configuration

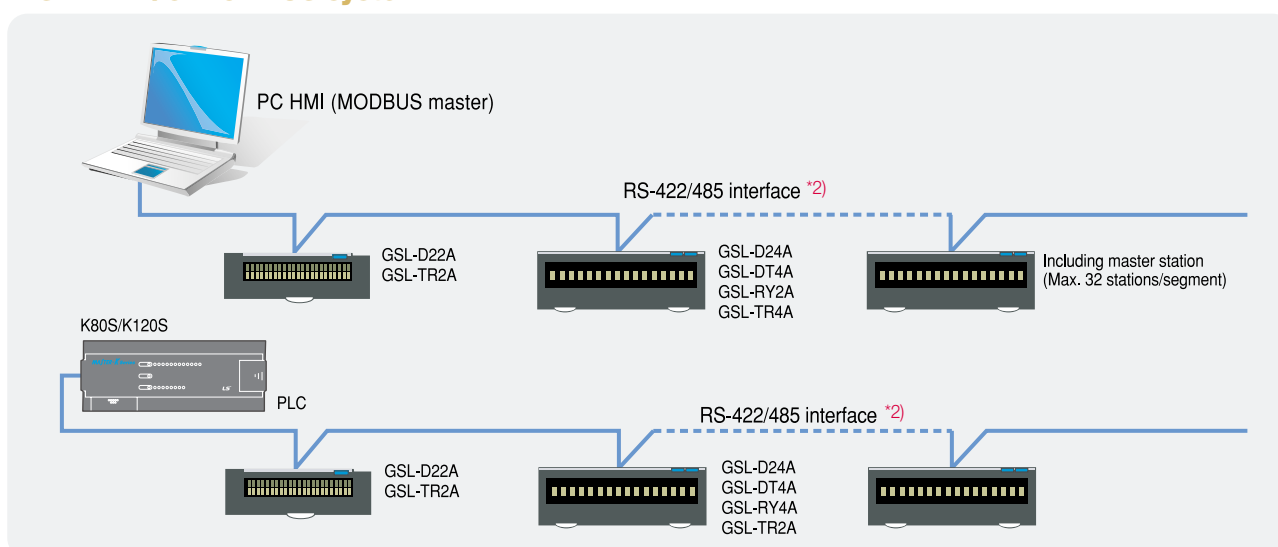
Programmable Logic Controller

## ■ SMART I/O Rnet system



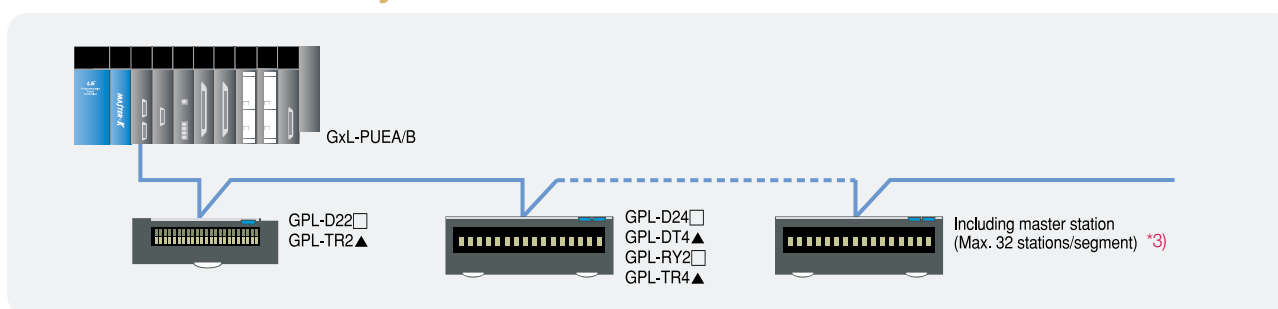
\*1) GOL-GWRA: Rnet remote connection module

## ■ SMART I/O MODBUS system



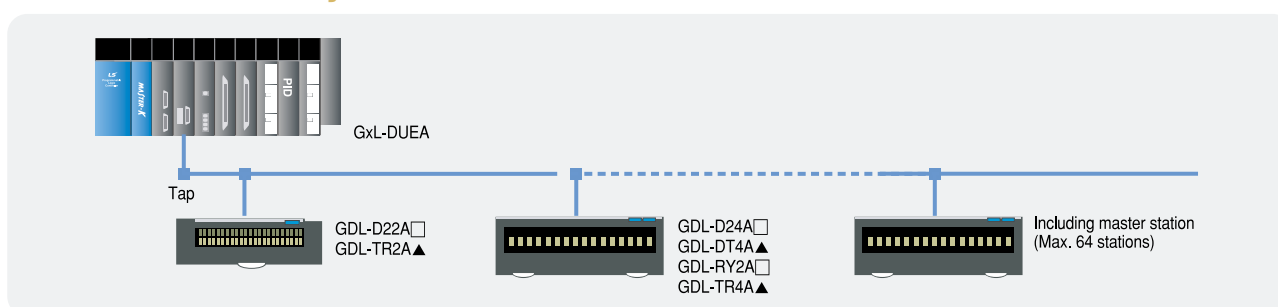
\*2) RS-485 is available at SMART I/O version 1.1 or later.

## ■ SMART I/O Profibus-DP system



\*3) Segment: communication section where a repeater or other master station is not used.

## SMART I/O DeviceNet system



# Analog input module (K200S/300S)

Programmable Logic Controller

## ■ Features

- 4-/8-channel analog input per module
- Voltage/Current selection by dip switch/terminal
- Digital range selection (-8,192~8,191 or -192~16,191): G4F-AD2A
- High resolution (1/16,000, 1/4,000)



## ■ Specifications

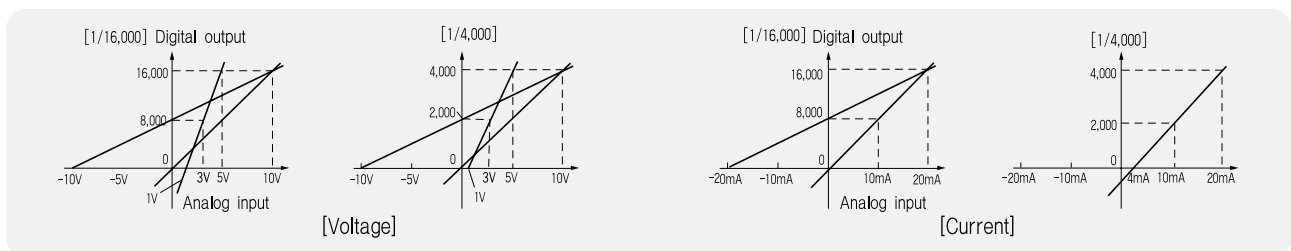
Item		G4F-AD2A *1)	G4F-AD3A	G6F-AD2A *2)
Analog input	Voltage	DC -5~+5 DC -10~+10V	DC 1~5V DC 0~10V	DC 1~5V DC 0~10V, -10~+10V
	Current *3)	DC -20~+20mA	DC 4~20mA	DC 4~20mA
	Voltage/Current select	Input terminal connection	Input selection switch	Input terminal connection
	Voltage range select	Input range selection switch	Program	Input range selection switch
	Digital output		0~16,000 -8,000~8,000	0~4,000
Resolution	DC 1~5V	-	1.0mV (1/4,000)	1.0mV (1/4,000)
	DC 0~10V	-	2.5mV (1/4,000)	2.5mV (1/4,000)
	DC -5~5V	0.625mV (1/16,000)	-	-
	DC -10~10V	1.25mV (1/16,000)	-	5mV (1/4,000)
	DC -20~20mA	2.5μA (1/16,000)	-	-
	DC 4~20mA	-	4μA (1/4,000)	4μA (1/4000)
Accuracy		±0.5% (Full scale) ±0.3% at 25°C	±0.5% (Full scale) ±0.3% at 25°C	±0.5% (Full scale) ±0.3% at 25°C
Max. conversion speed		5ms/Ch	5ms/Ch	5ms/Ch
Max. absolute output	Voltage		±12V	
	Current		±25mA	
Analog input point		4 Channels	8 Channels	4 Channels
Offset/gain		Available	Not available	
Insulation method		Between input terminal and PLC power supply: Photocoupler, Between channels: No insulation		
Current consumption		400mA (5V)	500mA (5V)	40mA (+5V), 50mA (+15V), 20mA (-15V)
I/O occupation point			16 points	

\*1) You are able to adjust offset and gain value in G4F-AD2A so that you can adjust input range.

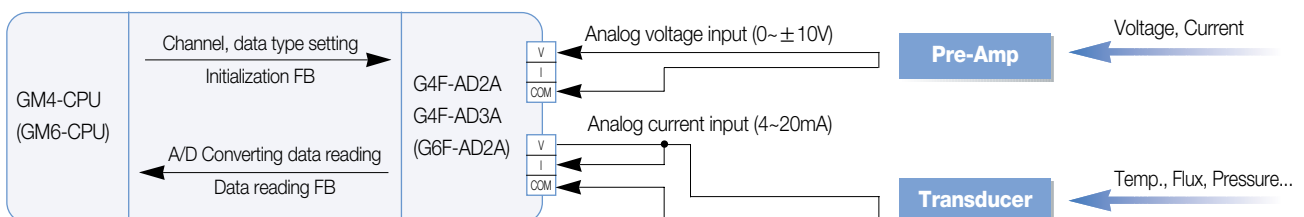
\*2) If you use analog modules in K200S, you are supposed to use GM6-PAFB or GM6-PDFB for power module.

\*3) For current input, connect V and I terminal.

## ■ A/D conversion characteristics



## ■ Configuration





# Analog output module (K200S/300S)

Programmable Logic Controller

## ■ Features

- 2-/4-/8-channel analog output per module
- Analog voltage/current output when CPU stops (set in FB)
  - medium, previous, max., min. value: G4F-DA1A
- Various modules according to output types



## ■ Specifications

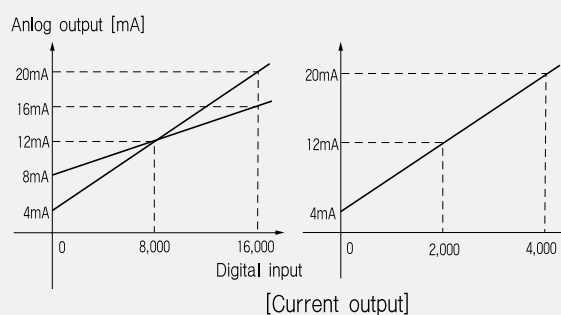
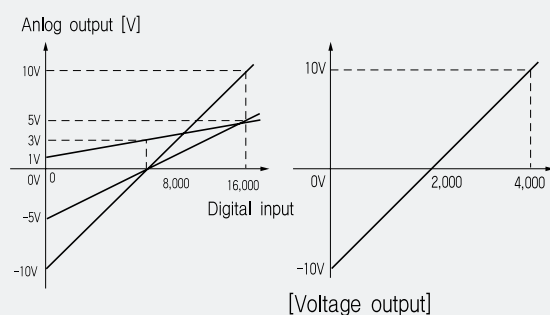
Item		G4F-DA1A *1)	G4F-DA2V	G4F-DA3V	G4F-DA2I	G4F-DA3I *2)	G6F-DA2V *3)	G6F-DA2I *3)
Digital input		0~16,000	0~4,000					
		-8,000~8,000						
Analog output	Voltage	DC -10~10V	DC -10~10V		-	-	DC -10~10V	-
	Current	DC 4~20mA	-	-	DC 4~20mA		-	DC 4~20mA
	V/C selection	Output terminal	-	-	-	-	-	-
Resolution	DC 10V~10V	1.25mA (1/16000)	5mV (1/4000)		-	-	5mV (1/4000)	-
	DC 4~20mA	2.5μA (1/6000)	-	-	4μA (1/4000)		-	4μA (1/4000)
Accuracy		±0.3% (Full scale)	±0.5% (Full scale)					
Max. conversion speed		3ms/module	10ms/module	15ms/module	10ms/module	15ms/module	10ms/module	
Max. absolute output	Voltage	DC 15V			-	-	DC 15V	-
	Current	DC 24mA	-	-	DC 24mA		-	DC 24mA
Analog output point		2 Channels	4 Channels	8 Channels	4 Channels	8 Channels	4 Channels	
Insulation		Between input terminal and PLC power supply: Photocoupler, Between channels: No insulation						
External power supply	Voltage	-	-	-	-	DC 21.6~26.4V	-	-
	Current	-	-	-	-	230mA	-	-
Current consumption		450mA (5V)	400mA (5V)	700mA (5V)	680mA (5V)	70mA	5V (40mA)	5V (40mA)
							5V (80mA)	15V (120mA)
							-15V (60mA)	-15V (25mA)
I/O occupation point		16point						

\*1) You are able to adjust offset and gain value in G4F-DA1A so that you can adjust output range.

\*2) If you use G4F-DA3I, you are supposed to supply external DC 24V for its operation.

\*3) If you use analog modules in K200S, you are supposed to use GM6-PAFB or GM6-PDFB for power module.

## ■ A/D conversion characteristics



# Thermocouple module (K200S/300S)

Programmable Logic Controller

## ■ Features

- 5 thermocouple types available (KS, JIS, ANSI, DIN, BS)
- Automatic reference junction compensation
- Burn-out detection in every channel



## ■ Specifications

Item	G4F-TC2A			G6F-TC2A *1)	
Thermocouple	K, J, E, T, B, R, S (Setting per channel available)				
TC input point	4 Channels				
Digital input	Digital conversion value: 0~16,000				
	Temperature conversion value: (Measuring temperature range of thermocouple) × 10				
Temperature input range	Thermocouple type	DIN specification	BS specification	Measuring temperature range (°C)	Measuring voltage range (μV)
	K	NiCr-Ni	NiCr-NiAl	-200.0~1200.0	-5,891~48,828
	J	-	Fe-CuNi	-200.0~800.0	-7,890~45,498
	E	-	NiCr-CuNi	-150.0~600.0	-7,279~45,085
	T	-	Cu-CuNi	-200.0~400.0	-5,603~20,869
	B	-	PtRh30-PtRh6	400.0~1,800.0	786~13,585
	R	-	PtRh13-Pt	0.0~1,750.0	0~21,006
	S	PtRh-Pt	PtRh10-Pt	0.0~1,750.0	0~18,612
Reference junction compensation	Automatic compensation				
Max. conversion speed	50ms/Channel				
Burn-out detection	Every channel				
Accuracy	± [Full scale × 0.3%+1°C (Reference junction compensation error)]				
Current consumption	450mA			5V/100mA, 15V/40mA, -15V/20mA	
I/O occupation point	16 points				

\*1) If you use an analog module (G6F-TC2A) in K200S, you are supposed to do GM6-PAFB or GM6-PDFB for its operation.

# RTD\* module (K300S)

## ■ Features

- Burn-out detection in every channel



## ■ Specifications

Item	G4F-RD2A	
Connectable RTD	Pt100 (JIS C1640-1989, DIN 43760-1980)	
	JPt100 (KS C1603-1991, JIS C1604-1981)	
Input channel	4 Channels	
Digital output	Digital conversion value: 0~16,000, Detected temperature conversion value: -2,000~6,000	
Temperature input range	Pt100: -200.0~600.0°C (18.48~313.59 ℔)	
	JPt100: -200.0~600.0°C (17.14~317.28 ℔)	
Burn-out detection	Every channel	
Max. conversion speed	50ms/Channel (Full scale)	
Accuracy	±0.5% (Full scale)	
Current consumption	420mA	
I/O occupation point	16 points	

\* RTD: Resistance thermometer device.

# PID control module (K300S)

Programmable Logic Controller

## ■ Features

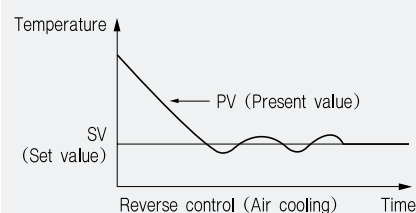
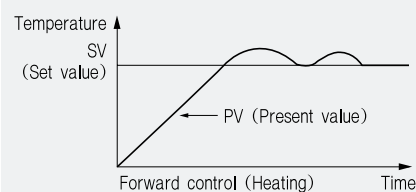
- PID control: Max. 16 loops
- Forward/Reverse control selectable
- Manually manipulated value output available
- Measured-value derivative type
- LED display for an error and operation condition of each loop
- Autotuning function

## ■ Specifications

Item		G4F-PIDB
PID control loops		16
PID constant	P value (P)	0.01~100.00 (%)
	I value (I)	0.0~3,000.0 (sec)
	D value (D)	0.0~3,000.0 (sec)
Setting range (SV)		0~16,000
Input range (PV)		0~16,000
Output range (MV)		0~16,000
LED function	Run/Stop	LEDs of corresponding loops ON if they run
	Error	LED flickering
Control action		Forward/Reverse action control available
Control cycle		0.01~99.99s
Processing type		Measured-value derivative (Pre-derivative) type
Internal current consumption (DC 5V)		600mA
Output point/COM		16 points/COM
I/O occupation point		16 points



## ■ PID control operation



# Analog timer module (K300S)

## ■ Features

- Setting and adjusting time (Highly precise range) available
- Max. 8 points of Analog Timer per module applicable
- Various range of setting time (0.1~600sec)
- Easy timer setting with switch manipulation
- LED display for timer operation status
- Timer setting available in run mode

## ■ Specifications

Item		G4F-AT3A
Point		8 points
Timer setting value range (sec)		0.1~1.0, 1~10, 10~60, 60~600 Setting can be done for each point
Setting method		Set the operation mode selection SW to TEST side
Backup method		Setting by adjustment volume
Accuracy		±2.0% (Full-scale)
LED function	Operation LED	8 points
	Contact LED	8 points
Operation		CR analog type (On-delay) operation
Internal current consumption (DC 5V)		200mA
I/O occupation point		16 points



# Positioning module (APM): (K200S/300S)

Programmable Logic Controller

## ■ Features

- Highly reliable position control with LSIS ASIC-embedded processor
- Enhanced control with fast control processing speed
- High-speed motor control (Max. pulse output: 1Mbps)
- Arc/linear interpolation, separate/synchronous operation
- Trapezoidal & S-curve acceleration/deceleration function
- Easy and quick to control through external input (JOG operation included)
- Encoder input support
- Self-diagnosis, monitoring and test by APM
  - Diagnosis for I/O signal line
  - Easy to set position control parameters
  - Monitoring/tracking/simulation
  - Information and solution for each error provided
  - Available to edit operation parameter data in EXCEL



## ■ Specifications

Item		Open collector type			Line drive type		
Number of axes		1	2	3	1	2	3
CPU type	K300S	G4F-PP1O	G4F-PP2O	G4F-PP3O	G4F-PP1D	G4F-PP2D	G4F-PP3D
	K200S	G6F-PP1O	G6F-PP2O	G6F-PP3O	G6F-PP1D	G6F-PP2D	G6F-PP3D
Output signal		Pulse					
Interpolation		2- and 3-axis linear interpolation/2-axis arc interpolation					
Speed (Position) control		Yes					
Positioning data		400/axis					
Setting unit		mm, inch, degree, pulse					
Data backup		Flash memory					
Position address range		-2,147,483,648~2,147,483,647					
Positioning speed range <sup>*1)</sup>		0.01~20,000,000.00 (mm/min)					
		0.001~2,000,000.00 (inch/min)					
		0.001~2,000,000.00 (degree/min)					
		1~200,000 (pulse/s)			1~1,000,000 (pulse/s)		
Max. output pulse		200kbps			1Mbps		
Output frequency/distance		200kbps/2m			1Mbps/10m		
Acceleration/		Trapezoidal & S-curve acceleration/deceleration					
Deceleration pattern and time		1~65,535ms					
Origin point return method		Approximate origin point (DOG (ON)/HOME, DOG (OFF)/HOME, DOG), Upper/Lower limit					
High-speed return to origin		Yes (Floating point)					
Manual operation		JOG/MPG <sup>*2)</sup> /Inching operation					
M code		1~65,535					
Synchronous operation		Yes					
Backlash compensation		Yes					
Others		Speed change during operation					
		Position address change during operation					
		Speed/position switching					
		Zone output <sup>*2)</sup> : 3 ranges settings available (K300S only)					
		Simultaneous operation					
Current consumption (DC 5V)		730mA	760mA	770mA	700mA	720mA	740mA
		480mA	490mA	500mA	630mA	750mA	840mA
I/O occupation point		32					

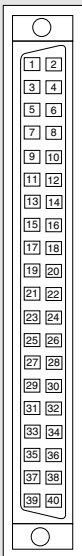
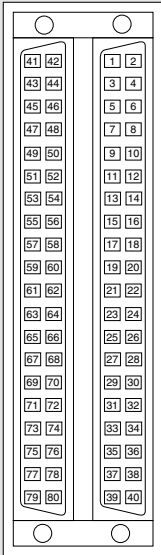
<sup>\*1)</sup> In case of mm, inch or degree, speed limit varies according to pulse per rotation, transfer distance per rotation and unit multiplier.

<sup>\*2)</sup> Available at K300S. MPG operation and zone output are not available at K200S.

# I/O interface with external equipment

Programmable Logic Controller

## ■ Pin layout for (G4F-PP□O, G4F-PP□D)

Pin layout	For	Pin number			Signal name	Signal direction APM - Ext. device	Condition
		X	Y	Z			
 <p>1 axis</p>	A x i s	21	41	61	FP+	Pulse output (Differential +)	→
		22	42	62	FP-	Pulse output (Differential -)	→
		23	43	63	RP+	Pulse sign (Differential +)	→
		24	44	64	RP-	Pulse sign (Differential -)	→
		25	45	65	OV+ *	High limit	←
		26	46	66	OV- *	Low limit	←
		27	47	67	STOP	External stop signal	←
		28	48	68	DOG	Approximate origin	←
		29	49	69	VTP	Speed/Position switching signal	←
		30	50	70	ECMD	External command signal	←
					Start	←	→
					Skip	←	→
					JOG+(Forward)	←	→
		31	51	71	JOG-	JOG reverse operation	←
		32	52	72	COM	Common (OV+, OV-, STOP, DOG, VTP, ECMD, JOG-)	↔
		33	53	73	DRVIN *	Drive unit ready signal	←
		34	54	74	DRVIN COM	Drive unit ready signal common	↔
		35	55	75	HOME +24V	Zero signal (+24V)	←
		36	56	76	NC	Not used	
		37	57	77	HOME +5V	Zero signal (+5V)	←
 <p>2/3 axes</p>	C o m m o n	38	58	78	HOME COM	Zero signal (+24V, +5V) Common	↔
		39	59	79	NC	Not used	
		40	60	80	NC	Not used	
		1			MPG A+	Manual pulse generator/Encoder A+ Input	←
		2			MPG A-	Manual pulse generator/Encoder A- Input	←
		3			MPG B+	Manual pulse generator/Encoder B+ Input	←
		4			MPG B-	Manual pulse generator/Encoder B- Input	←
		5			MPG Z+	Encoder Z+ Input	←
		6			MPG Z-	Encoder Z- Input	←
		7			CON	External simultaneous start	←
		8			EMG *	Emergency stop	←
		9			NC	Not used	
		10			COM	(CON, EMG) Common	↔
		11			Out 1	Transistor output of Zone 1	→
		12			Out 2	Transistor output of Zone 2	→
		13			Out 3	Transistor output of Zone 3	→
		14			COM	ZONE Common	↔
		15, 16, 17, 18, 19, 20			NC	Not used	

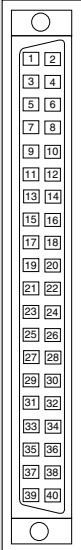
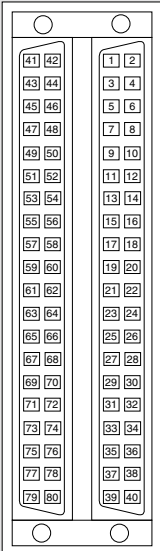
\* High/low limit, drive unit ready signal, emergency stop signal should be connected to DC 24V.



# I/O interface with external equipment

Programmable Logic Controller

## ■ Pin layout for (G6F-PP□O, G6F-PP□D)

Pin layout	For	Pin number			Signal name	Signal direction APM - Ext. device	Condition
		X	Y	Z			
 <p>1 axis</p>	A x i s	21A	1B	21B	FP+	Pulse output (Differential +)	→
		22A	2B	22B	FP-	Pulse output (Differential -)	→
		23A	3B	23B	RP+	Pulse sign (Differential +)	→
		24A	4B	24B	RP-	Pulse sign (Differential -)	→
		25A	5B	25B	OV+ *	High limit	←
		26A	6B	26B	OV- *	Low limit	←
		27A	7B	27B	STOP	External stop signal	←
		28A	8B	28B	DOG	Approximate origin	←
		29A	9B	29B	VTP	Speed/Position switching signal	←
		30A	10B	30B	ECMD	External command signal	←
						Start	←
						Skip	←
						JOG+(Forward)	←
		31A	11B	31B	JOG-	JOG reverse operation	←
		32A	12B	32B	COM	Common (OV+, OV-, STOP, DOG, VTP, ECMD, JOG-)	↔
		33A	13B	33B	DRVIN *	Drive unit ready signal	←
		34A	14B	34B	DRVIN COM	Drive unit ready signal common	↔
		35A	15B	35B	HOME +24V	Zero signal (+24V)	←
		36A	16B	36B	HOME COM	Zero signal (+24V, +5V) Common	↔
		37A	17B	37B	HOME +5V	Zero signal (+5V)	←
		38A	18B	38B	P COM	External 5V, 24V GND (Not used in case of line drive output)	↔
		39A	19B	39B	5V	External 5V Power input (Not used in case of line drive output)	←
		40A	20B	40B	24V	External 24V Power input (Not used in case of line drive output)	←
 <p>2/3 axes</p>	C o m m o n	1A			MPG A+	Manual pulse generator/Encoder A+ Input	←
		2A			MPG A-	Manual pulse generator/Encoder A- Input	←
		3A			MPG B+	Manual pulse generator/Encoder B+ Input	←
		4A			MPG B-	Manual pulse generator/Encoder B- Input	←
		5A			NC	Not used	
		6A			NC	Not used	
		7A			CON	External simultaneous start	←
		8A			EMG *	Emergency stop	←
		9A			NC	No use	
		10A			COM	(CON, EMG) Common	↔
		11A, 12A, 13A, 14A, 15A, 16A, 17A, 18A, 19A, 20A			NC	Not used	

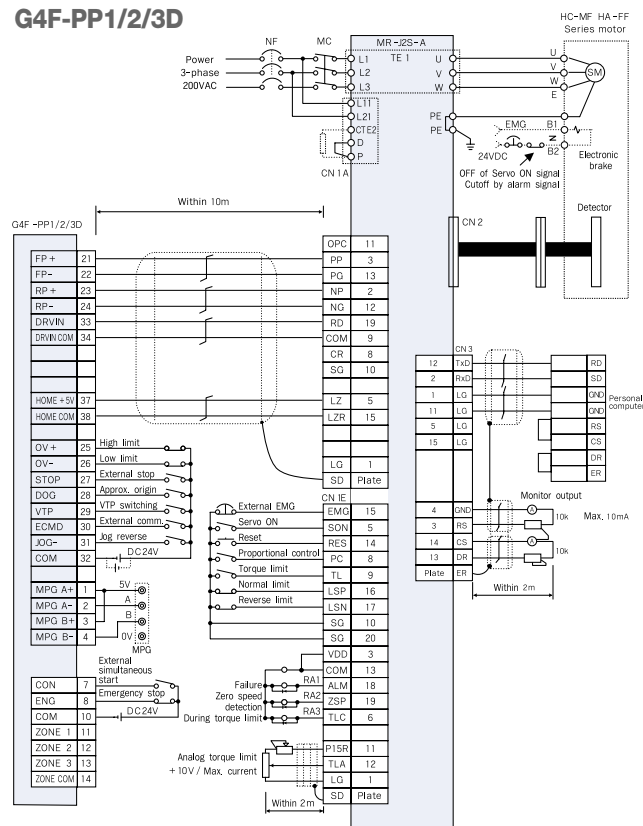
\* High/low limit, drive unit ready signal, emergency stop signal should be connected to DC 24V.

# Example of connection with drivers

Programmable Logic Controller

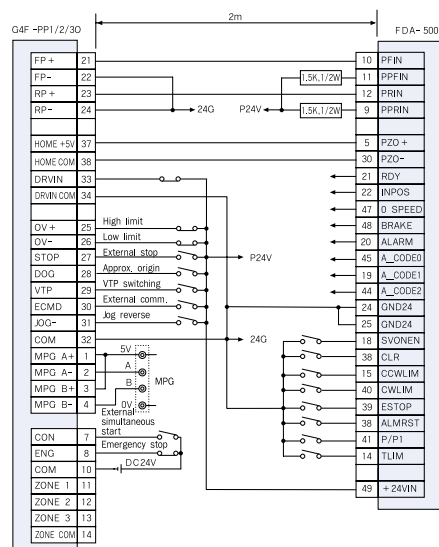
## ■ MR-J2/J2S-□A connection (line drive)

G4F-PP1/2/3D



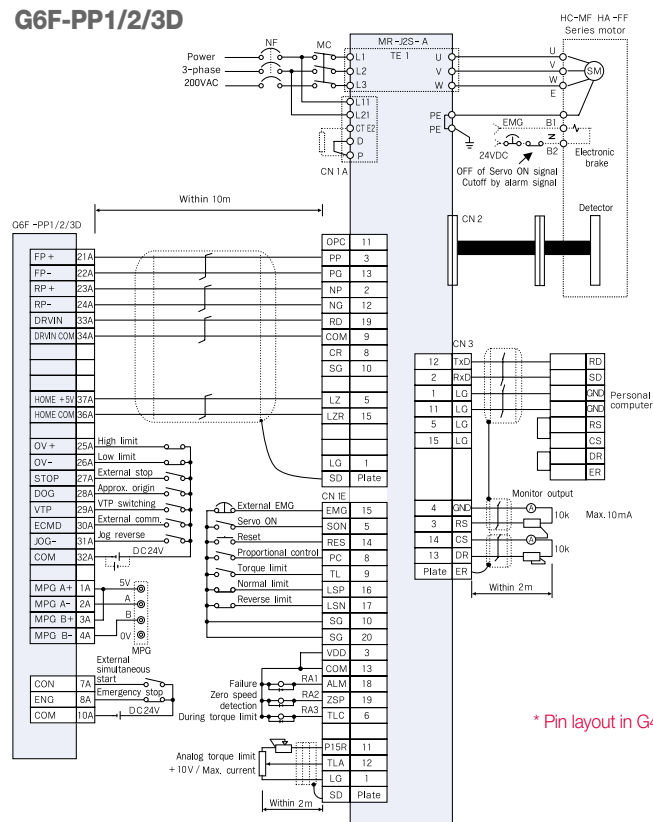
## ■ FDA-5000 AC Servo driver connection (open collector)

G4F-PP1/2/3O



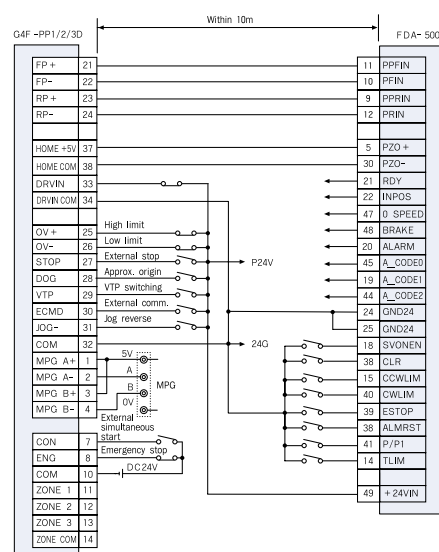
## ■ MR-J2/J2S-□A connection (line drive)

G6F-PP1/2/3D



## ■ FDA-5000 AC Servo driver connection (line drive)

G4F-PP1/2/3D



\* Pin layout in G4F-PP□D(O) and G6F-PP□D(O) is different.

# High speed counter module (GM4/6)

Programmable Logic Controller

## ■ Features

- Pulse input support (5V, 12V, 24V)
- Counting range from -2,147,483,648 to 2,147,483,647
- Max. counting speed: 500kpps
- Coincidence output selection (Max. 4 points)
- Various multiplication (1/2/4-multiplication phase up/down counter)
- Phase input (A, B and Z phase)
- External preset input  
(G4F-HO1A, G4F-HD1A, G6F-HO1A, G6F-HD1A, G6F-HSCA)
- Incremental encoder available to use  
(Absolute encoder: Not available)



## ■ Specifications

Item		New type			G6F-HSCA
		G4F-HSCA	G4F-HO1C G6F-HO1C	G4F-HD1C G6F-HD1C	
Number of channel(s)		1	2		1
Counter input signal	Phase	A, B, Z (phase)	A, B (phase)		A, B, Z (phase)
	Level	DC 5V, 12V, 24V		EIA RS-422A standard (DC5V)	DC 5V, 12V, 24V
	Type	Voltage input			
Counting range		0~16,777,215 (Binary 24bits)	-2,147,483,648~2,147,483,647 (Binary 32bits)		0~16,777,215 (Binary 24bits)
Counting speed		50kpps	200kpps	500kpps	50kpps
Up/down counter setting	1-phase input	Program or B phase			
	2-phase input	Phase difference			
Multiplication	CW/CCW	-	A-phase: Up count, B-phase: Down count		-
		-	1/2 multiplication (Program)		-
External input	1-phase input	1/2/4 multiplication (DIP S/W)	1/2/4 multiplication (Program)		1/2/4 multiplication (DIP S/W)
	2-phase input	-	DC 5V, 12V, 24V		DC 24V
External output	Preset	-	-		DC 24V
	Limit switch	DC 24V	DC 5V, 12V, 24V		-
Additional functions	Gate	-	OUT1, OUT2		OUT1, OUT2
	Type	OUT1, OUT2 (Select: >, =, <)	(Select: >, =, <, section)		(Select: >, =, <)
Current consumption		Tr output DC 24V, 200mA	Tr. output DC 24V		Tr. output DC 24V, 200mA
Additional functions		-	Count clear, Count latch, Sampling count, Pulse frequency count, Periodic pulse count		-
Current consumption		250mA	270mA	330mA	180mA

# MASTER-K program S/W (KGLWIN)

Programmable Logic Controller

## ■ Features

### Compatibility among Windows operating systems

- KGLWIN supports Windows series (95 or later).

### Program conversion

- Program conversion from GSIKGL (DOS program) to KGLWIN (Windows program)

### User-friendly interface

- Easy and useful interface for creating, editing and monitoring program
- PLC connection: local, remote

### On-line editing

- Real-time editing is available in on-line mode. Program edited in on-line mode can be downloaded automatically without stopping PLC.

### Various monitoring function

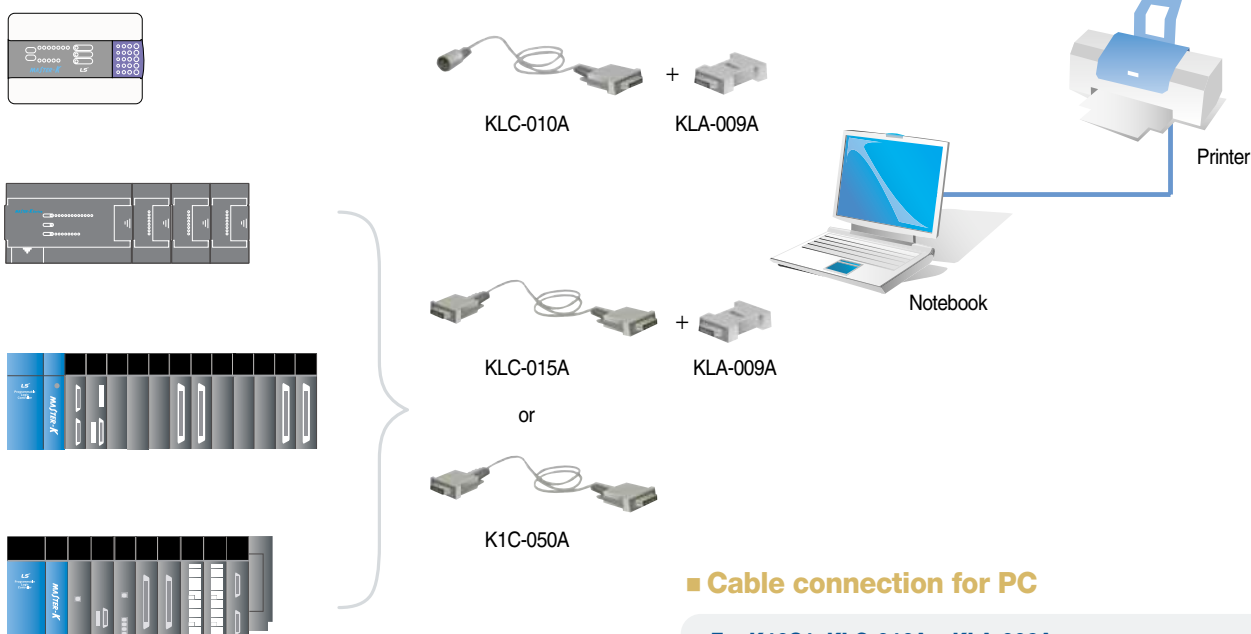
- PLC status, network information, error status and so on.

### Debugging and self-diagnosis

- Trigger, forced I/O enable, debugging (Step run, scan run, value break, etc) are available

### Remote connection

- Program editing, modifying, and monitoring by remote connection.

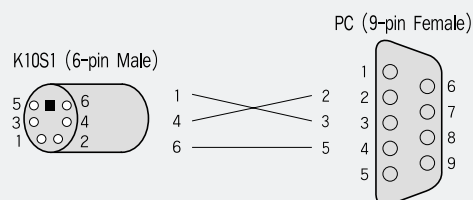


## ■ General Specification

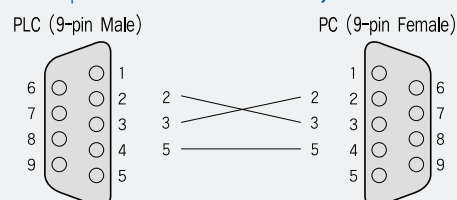
Items	Specifications
OS	Windows 95 or later
PC	IBM compatible PC (50MHz or higher)
Memory	8MB or more
HDD	40MB or more
Serial port	RS-232C needed. If you have a USB port only, you need to use USB-RS232C converter.
Printer/mouse	Compatible with Windows 95 or later

## ■ Cable connection for PC

### For K10S1: KLC-010A + KLA-009A



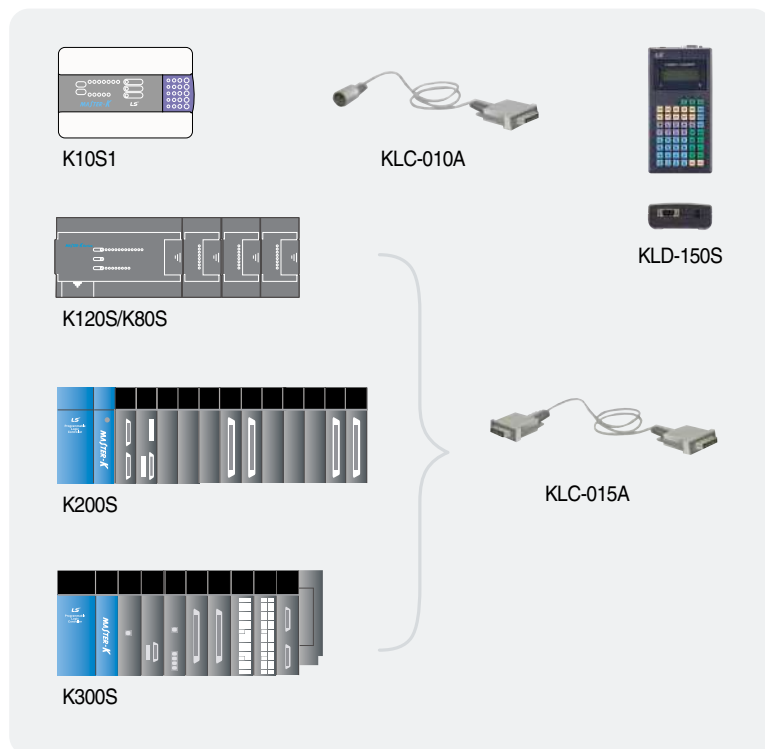
### For K80S ↑ : KLC-015A + KLA-009A, K1C-050A



# Handy loader (KLD-150S)

Programmable Logic Controller

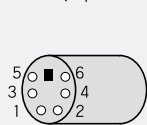
## ■ Cable connection for PC



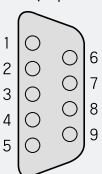
## ■ Cable connection for handy loader

### For K10S1: KLC-010A

K10S1 (6-pin Male)

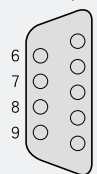


KLD-150S (9-pin Female)

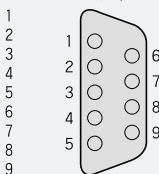


### For K80S ↑ : KLC-015A

PLC (9-pin Male)



KLD-150S (9-pin Female)



## ■ General Specifications

Items	Specifications
Storage temperature range	-10°C ~ 50°C
Operating temperature range	0°C ~ 40°C
Ambient humidity range	5~95% (Non-condensing)
Operating condition	Free from corrosive gases
Dimensions(mm)	90 × 175 × 36
Weight	420g
Cooling method	Air cooling

## ■ Technical specifications

Items	Specifications
PLC	MASTER-K only
Power supply	by PLC Connection (DC5V 0.6A)
Connection to PLC	by connection cable (RS-232C) 9.6kbps (K101S1), 38.4kbps (K80S, K120S, K200S, K300S)
LCD Display	16 Characters, 2-line dot matrix LCD LCD back light: on/off by key operation
Key Panel	3-mode selection by mode keys, 48 operation keys

\* For K120S, its ROM version should be 4.3 or later



## Instruction code list (KLD-150S ver. 4.3)

0	0	1	2	3	4	5	6	7	8	9
00X	NOP	END	STC	CLC	RET	MPUSH	MLOAD	MPOP	STOP ●	CLE ●
01X	MCS	MCSCLR	JMP	JME	CALL	CALLP	SBRT	D	D NOT	
02X	INC	INCP	DINC	DINP	DEC	DECP	DDEC	DDECP	LD= ●	LDD= ●
03X	ROL	ROLP	DROL	DROLP	ROR	RORP	DROR	DRORP	LD> ●	LDD> ●
04X	RCL	RCLP	DRCL	DRCLP	RCR	RCRP	DRCR	DRCRP	LD< ●	LDD< ●
05X	CMP	CMPP	DCMP	DCMPP	TCMP	TCMPP	DTCMP	DTCMPP	LD>= ●	LDD>= ●
06X	BCD	BCDP	DBCD	DBCDP	BIN	BINP	DBIN	DBINP	LD<= ●	LDD<= ●
07X	WSFT	WSFTP	MULS ●	MULSP ●	BSFT	BSFTP	DMULS ●	MULSP ●	LD<> ●	LDD<> ●
08X	MOV	MOVP	DMOV	DMOVP	CMOV	CMOVP	DC MOV	DC MOVP	DIVS ●	DIVSP ●
09X	GMOV	GMOVP	FMOV	FMOVP	AND= ●	ANDD= ●	AND> ●	ANDD> ●	AND< ●	ANDD< ●
10X	BMOV	BMOVP	XCHG	XCHGP	DXCHG	DXCHGP	AND>= ●	ANDD>= ●	AND<= ●	ANDD<= ●
11X	ADD	ADDP	DADD	DADDP	SUB	SUBP	DSUB	DSUBP	AND<> ●	ANDD<> ●
12X	MUL	MULP	DMUL	DMULP	DIV	DIVP	DDIV	DDIVP	DDIVS	DDIVSP ●
13X	ADDB	ADDBP	DADDB	DADDBP	SUBB	SUBBP	DSUBB	DSUBBP	PIDTUN ▼	PIDCAL
14X	MULB	MULBP	DMULB	DMULBP	DIVB	DIVBP	DDIVB	DDIVBP	PID8AT ♠	PID8 ♠
15X	WAND	WANDP	DWAND	DWANDP	WOR	WORP	DWOR	DWORP	RCV SWAP *	SEND SWAPP *
16X	WXOR	WXORP	DWXOR	DWXORP	WXNR	WXNRP	DWXNR	DWXNRP	RCV	SND ●
17X	BSUM	BSUMP	DBSUM	DBSUMP	SEG	SEGP	ENCO	ENCOP	DECO	DECOP
18X	FILR	FILRP	DFILR	DFILRP	FILW	FILWP	DFILW	DFILWP	OR=	ORD= ●
19X	ASC	ASCP	UNI	UNIP	DIS	DISP	OR>	ORD> ●	OR<	ORD< ●
20X	IORF	IORFP	WDT	WDTP	FALS	DUTY	FOR	NEXT ●	OUTOFF	
21X	HSCNT ■	DIN	DINP ■	DOUT ■	DOUTP ■	HSC	OR>= ●	ORD>= ●	OR<= ●	ORD<= ●
22X	BREAK ●	EI	DI	BEST ●	BRST	IRET	TDINT ●	INT	OR<>	ORD<> ●
23X	GET ●	GETP ●	RGET ●	RPUT ●	PUT	PUTP ●	BOUT ●	SR	EI n	DI ●
24X	NEG ●	NEGP ●	DNEG ●	DNEGP ●	READ ●	WRITE ●	CONN ●	STATUS ●	BLD ●	BLDN ●
25X	BAND ●	BANDN ●	BOR ●	BORN ●	PLSOUT ▼	SND8 ▼	MODBUS ▼			

## ■ Note

● K1000S, K300S, K200S only

■ K10S, K10S1, K30S, K60S only

♠ K200S (K3P-07BS, K3P-07CS only)

◆ K10S, K10S1, K30S, K60S and K200S (K3P-07CS) only

▼ K80S only

\* K80/120S only

# XGT Panel XP Series

Programmable Logic Controller

## ■ Features

- High and vivid distinction with 65,536 colors
- Various vector symbols and high quality raster symbols
- Support diverse file types including BMP, JPG, GIF, and WMF, etc
- Simple movie clip effects with GIF animation
- 10/100 BASE-T Ethernet interface
- Convenient and easy screen editing
- Strengthened data management (Logging, Recipe, and Alarm)
- Read function of a controller's state information (Monitoring and maintenance)
- Multi-lingual display up to 4 languages and easy switching
- Offline program simulation
- Tag function of the HMI S/W (Easy to change the address of the graphic objects)
- USB host for the use of peripheral devices (Mouse, keyboard, printer, etc)
- Sufficient memory space for screen saving (10MB)



## ■ Specifications

Item		XP30-BTE/DC	XP30-BTA/DC	XP30-TTA/DC	XP50-TTA/DC	XP70-TTA/AC XP70-TTA/DC	XP80-TTA/AC XP80-TTA/DC	XP90-TTA/AC		
		Mono			Color					
Display description		Mono Blue LCD			TFT Color LCD					
Display Size (inch)		14cm (5.7")			21cm (8.4")	26cm (10.4")	31cm (12.1")	38cm (15")		
Resolution		320×240			640×480		800×600	1024×768		
Color		8-bit Gray Scale			320×240					
Backlight		LED			CCFL (whole LCD), auto On/Off (50,000hr)	CCFL (whole LCD), auto On/Off (50,000hr)				
Contrast		Adjustable			Fixed					
Luminance		230cd/m²			400cd/m²	480cd/m²	430cd/m²	400cd/m²	450cd/m²	
Viewing angle	Up/Down(Degree)	20/40	20/40	70/50	60/50	65/45	75/45	60/50		
	Left/Right(Degree)	45/45	45/45	70/70	65/65	65/65	65/65	75/75		
Touch panel		4-wire system, analog			8-wire system, analog					
LED		Green: Run (Monitoring, download drawing data) Red: Error (Communication error, drawing data error)								
Processor		ARM920T(32bit RISC), 200MHz								
Memory	Display data	3MB	10MB					20MB		
	Backup data	128KB	512KB (Logging, alarm data saving)							
Ethernet		-		1ch, IEEE802.3, 10/100Base-T						
USB interface		USB Host×1		USB Host×2						
Serial	RS-232C	2ch (1 port for PC communication)								
	RS-422/485	1ch, 422/485								
CF memory card interface		-	CF memory card (TYPE-1)×1							
AUX interface		-	Optional							
Certification		CE, UL, KCC								
Protection		IP65F (Front Water Proof Structure)								
Size (W×H×D)mm		181×140×56.5	181×140×66.5		240×174×73	317×243×73		395×294×73		
Panel Cut (W×H)mm			155.5×123		228×158	294×227		383×282		
Weight (kg)		0.62	0.75		1.4	2.2	2.4	3.9		
Power	Rated voltage	DC 24V					AC100~220V, DC 24V		AC100~220V	
	Permitted voltage	AC	-					MIN 85 VAC, MAX 264 VAC		MIN 85 VAC,
		DC	MIN 19.2 VDC, MAX 28.8 VDC					MIN 19.2 VDC, MAX 28.8 VDC		MAX 264 VAC
		Watt	AC	-	-	-	37	40	46	
		DC	5	8.5	20	27	30			



# XGT PANEL

Programmable Logic Controller

MASTER-K Series

## ■ Features

### Enhancing User-friendliness

- Flexible to draw: 192 X 64 Dot Graphic LCD
- Easy to upgrade: O/S and font download
- Various tag/drawing functions support: 15 types
- Easy to manage data: internal memory (1000 words) support
- User-defined function keys support for each screen (F1~F4, ◀, ▶, ▲, ▼)
- User-defined bitmap file input support
- Region-based upload/download support
- Built-in RTC: B type
- Large screen memory: 256K

### Flexible to supply power

- 5V supply by loader port for LS PLC and INV connection
- DC 24V supply from DC 24V input terminal

### Language support

- English, Chinese, Korean
- Font-download adoption support



### Strong communication functions

- Separate 2Ch support: RS-232C and RS-422/485
- Multi master communication (N:M) support
- Monitoring M PLCs with N XGT PANELs

### Various communication modes and protocol driver supply

- LS PLC: loader and link (Cnet)
- LS VFD: loader (iS5/iP5(A)/iV5) and RS-485
- MODBUS ASCII/RTU protocol
- Mitsubishi FX series
- OMRON C-mode protocol
- Communication drivers are continually added and updated.

## ■ Performance Specifications

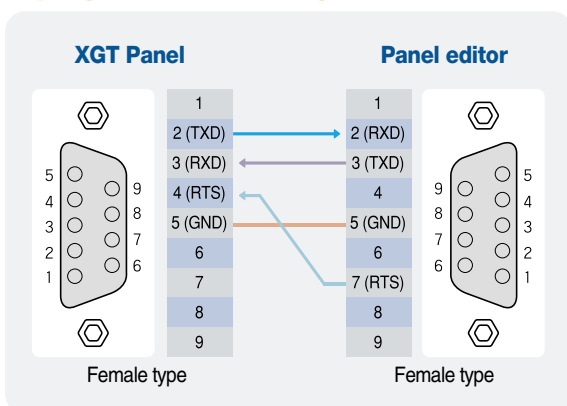
Item	Specifications		Remark
	XP10BKA/DC	XP10BKB/DC	
Input power	4.9~5.1VDC (RS-232C Connector), or 21.6V~26.4VDC (Power supply connector)		
Display	LED Back-light (192*64 Dot)		
Communication Interface	RS-232C, RS-422/485		Independent 2 channels
Memory	256k bytes		
Languages	English, Chinese, Korean		
RTC	None	Supports	
Up/Download spec.	Speed: 115,200bps Each memory area can be up/downloaded in part		
Key	12keys (F1~F4, ESC, ALM, ▲, ▼, ▶, ◀, SET, ENT)		
System memory	User area	M000~M899 (900 Word)	Latch area is supported, in XP 10BKB/DC
	System flags	M900~M999 (100 Word)	

## ■ Easy drawing tool: Panel editor

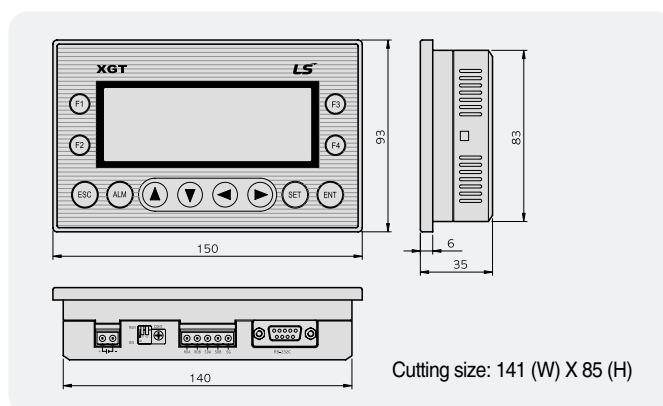
- Easy Programming
- Drawing Tool
- Direct Device Input
- Snap/Align Functions
- Print Function
- Simple Memory Management



## ■ Cable connection for program downloading



## ■ Dimensions



# Product list

Programmable Logic Controller

## ■ K10S1

Type	Part Number	Specification	Power supply	Remarks
Base	K14P1-DRS	DC 24V Inputs 8, Relay Output 6 User program: 800 steps	AC100~240V	

## ■ K80S/K120S

Type	Part Number	Specification	Power supply	Remarks
K80S main	K7M-DR10S (/DC)	DC 24V Input 6 points, Relay output 4 points	AC 100~240V (DC 24V)	
	K7M-DR20S (/DC)	DC 24V Input 12 points, Relay output 8 points		
	K7M-DR30S (/DC)	DC 24V Input 18 points, Relay output 12 points		
	K7M-DR40S (/DC)	DC 24V Input 24 points, Relay output 16 points		
	K7M-DR60S (/DC)	DC 24V Input 36 points, Relay output 24 points		
	K7M-DT10S	DC 24V Input 6 points, Tr. output 4 points	AC 100~ 240V	
	K7M-DT20S	DC 24V Input 12 points, Tr. output 8 points		
	K7M-DT30S	DC 24V Input 18 points, Tr. output 12 points		
	K7M-DT40S	DC 24V Input 24 points, Tr. output 16 points		
	K7M-DT60S	DC 24V Input 36 points, Tr. output 24 points		
K120S economic	K7M-DR10UE (/DC)	DC 24V Input 6 points, Relay output 4 points	AC 100~ 240V (DC 24V)	
	K7M-DR14UE (/DC)	DC 24V Input 8 points, Relay output 6 points		
	K7M-DR20UE (/DC)	DC 24V Input 12 points, Relay output 8 points		
	K7M-DR30UE (/DC)	DC 24V Input 18 points, Relay output 12 points		
K120S standard	K7M-DR20U (/DC)	DC 24V Input 12 points, Relay output 8 points		
	K7M-DR30U (/DC)	DC 24V Input 18 points, Relay output 12 points		
	K7M-DR40U (/DC)	DC 24V Input 24 points, Relay output 16 points		
	K7M-DR60U (/DC)	DC 24V Input 36 points, Relay output 24 points		
	K7M-DRT20U (/DC)	DC 24V Input 12 points, Tr. output 4 points/Relay output 4 points		
	K7M-DRT30U (/DC)	DC 24V Input 18 points, Tr. output 4 points/Relay output 8 points		
	K7M-DRT40U (/DC)	DC 24V Input 24 points, Tr. output 4 points/Relay output 12 points		
	K7M-DRT60U (/DC)	DC 24V Input 36 points, Tr. output 4 points/Relay output 20 points		
	K7M-DT20U (/DC)	DC 24V Input 12 points, Tr. output 8 points		
	K7M-DT30U (/DC)	DC 24V Input 18 points, Tr. output 12 points		
	K7M-DT40U (/DC)	DC 24V Input 24 points, Tr. output 16 points		
	K7M-DT60U (/DC)	DC 24V Input 36 points, Tr. output 24 points		
Expansion module	Digital I/O	G7E-DR08A	From main module	K120S only
		G7E-DR10A		
		G7E-DR20A		K80S CPU V1.7 ↑
	Input	G7E-DC08A		
		G7E-RY08A		K120S only
		G7E-RY16A		
		G7E-TR10A		K80S CPU V1.7 ↑
Special module	Analog I/O	G7F-ADHA	DC 24V from external power supply	
		G7F-ADHB		K120S only
		G7F-ADHC		
	Analog Input	G7F-AD2A		
		G7F-AD2B		
	Analog Output	G7F-DA2I		
		G7F-DA2V		K120S only
	RTD Input	G7F-RD2A		
Comm. module	Analog Timer	G7F-AT2A	From main module	
		G7L-CUEB		
	Cnet I/F	G7L-CUEC		
		G7L-FUEA		
	Rnet I/F	G7L-RUEA		
	Pnet I/F	G7L-PBEA		
	Dnet I/F	G7L-DBEA		
Option	RTC pack	G7E-RTCA		
	Memory pack	G7M-M256		K80S only
		G7M-M256B		K120S only

\* If a part number ends with /DC, the supply power is DC24V.

\* Slim type: G7E-DC08A, G7E-DR08A, G7E-RY08A, G7F-ADHB, G7F-AD2B, G7F-RD2A

## ■ K200S

Type	Part Number	Specification	Remarks		
CPU	K3P-07AS	Max. I/O: 384 points, Program memory: 7K, Built-in function: RS-232	Program memory: 7k steps		
	K3P-07BS	Max. I/O: 384 points, Program memory: 7K, Built-in function: RS-422, PID, RTC			
	K3P-07CS	Max. I/O: 384 points, Program memory: 7K, Built-in function: RS-232C, PID, RTC, HSC (50kpps)			
Power module	GM6-PAFA	AC input(Free), output: DC 5V 2A, DC 24V 0.3A	Analog		
	GM6-PAFB	AC input(Free), output: DC 5V 2A, DC 15V 0.5A, DC -15V 0.2A, when analog module used			
	GM6-PAFC	AC input(Free), output: DC 5V 3.5A, DC 24V 0.3A for 12-slot base board			
	GM6-PA2A	AC 220V Only, output: DC 5V 6A			
	GM6-PDFA	DC 12/24V input, output: DC 5V 2A			
	GM6-PDFB	DC 12/24V input, output: DC 5V 3A, DC 15V 0.5A, DC -15V 0.2A, when analog module used	Analog		
Base	GM6-B04M	4-slot base board	Not expandable		
	GM6-B06M	6-slot base board			
	GM6-B08M	8-slot base board			
	GM6-B12M	12-slot base board, Comm I/F module installation: slot 0~7			
DC input module	G6I-D21A	DC 12/24V input 8 points, Current Sink/Source type			
	G6I-D22A	DC 12/24V input 16 points, Current Sink/Source type			
	G6I-D22B	DC 24V input 16 points, Current Source type			
	G6I-D24A	DC 12/24V input 32 points, Current Sink/Source type			
	G6I-D24B	DC 24V input 32 points, Current Source type			
AC input module	G6I-A11A	AC 110V input 8 points			
	G6I-A21A	AC 220V input 8 points			
Relay output module	G6Q-RY1A	Relay output 8 points, DC 12/24V, AC 220V, 2A	AC, DC		
	G6Q-RY2A	Relay output 16 points, DC 12/24V, AC 220V, 2A			
	G6Q-RY2B	Relay output 16 points, DC 12/24V, AC 220V, 2A, Surge absorber			
Transistor output module	G6Q-TR2A	Tr.(NPN) output 16 points, DC 12/24V, 0.5A	DC		
	G6Q-TR2B	Tr.(PNP) output 16 points, DC 12/24V, 0.5A			
	G6Q-TR4A	Tr.(NPN) output 32 points, DC 12/24V, 0.1A			
	G6Q-TR4B	Tr.(PNP) output 32 points, DC 12/24V, 0.1A			
Triac output module	G6Q-SS1A	DC 12/24V input 8 points, AC 100~240V, 0.6A	AC		
I/O hybrid module	G6H-DR2A	DC 12/24V input 8 points, Relay output 8 points			
Special module	A/D module	G6F-AD2A	V/I input: 4 CHs, DC 1~5V, 0~10V, -10~10V, 4~20mA	GM6-PAFB/PDFB	
		D/A module	G6F-DA2V		V output: 4 CHs, DC -10~10V
		G6F-DA2I	I output: 4 CHs, DC 4~20mA		
	HSC module	G6F-HSCA	1Ch, Counting range: 0~16,777,215		
		G6F-HD1C	2 CHs, 500kpps, Counting range: -2,147,483,648~2,147,483,647, Line drive type		
		G6F-HO1C	2 CHs, 200kpps, Counting range: -2,147,483,648~2,147,483,647, Open collector type		
	Positioning module	G6F-PPxO	X=1, 2, 3: axis, Pulse output, 200kpps, Open collector type	CPU V2.3 ↑	
		G6F-PPxD	X=1, 2, 3: axis, Pulse output, 1M, Line drive type		
	Thermocouple input module	G6F-TC2A	Input: 4 CHs (Thermocouple: K, J, E, T, B, R, S)	GM6-PAFB/PDFB	
Comm. module	Fast Enet I/F module (Open type)	G6L-EUTB	10/100BASE-TX, UTP	CPU V2.4 ↑	
		G6L-EUFB	100BASE-FX, Fiber optic		
	Fast Enet I/F module(Dedicated Master)	G6L-EUTC	10/100BASE-TX, UTP		
		G6L-EUFC	100BASE-FX, Fiber optic		
	Fast Enet I/F module(Dedicated Slave)	G6L-ERTC	10/100BASE-TX, UTP		
		G6L-ERFC	100BASE-FX, Fiber optic		
	Fnet I/F module	G6L-FUEA	Fnet master module (Shielded twisted pair cable, 1Mbps)		
	Fnet remote I/F module	G6L-RBEA	Fnet remote module (Shielded twisted pair cable, 1Mbps)		
	Dnet I/F module	G6L-DUEA	DeviceNet master module (500kbps MAX.)		
	Pnet I/F module	G6L-PUEA	Profibus-DP master module (1Kbyte)		
		G6L-PUEB	Profibus-DP master module (7Kbyte)		
	Rnet I/F module	G6L-RUEA	Rnet master module		
	Cnet I/F module	G6L-CUEB	RS-232C		
		G6L-CUEC	RS-422/485		
Dummy module	GM6-DMMA	Dummy module for empty I/O slot			

# Product list

Programmable Logic Controller

## ■ K300S

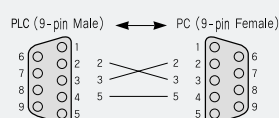
Type	Part Number	Specification	Remarks
CPU	K4P-15AS	Max. I/O: 1,024 points, Program memory: 15K steps	
Main base	GM4-B04M	4-slot main base board	
	GM4-B06M	6-slot main base board	
	GM4-B08M	8-slot main base board	
	GM4-B12M	12-slot main base board	Not expandable
Expansion base	GM4-B04E	4-slot expansion base board	
	GM4-B06E	6-slot expansion base board	
	GM4-B08E	8-slot expansion base board	
Expansion cable	G4C-E041	Length: 0.4m	
	G4C-E121	Length: 1.2m	
	G4C-E301	Length: 3.0m	
Power module	GM4-PA1A	AC 110V input, DC 5V: 4A, DC 24V: 0.7A	
	GM4-PA2A	AC 220V input, DC 5V: 4A, DC 24V: 0.7A	
	GM4-PA2C	AC 220V input, DC 5V: 8A	
	GM4-PD3A	DC 24V input, DC 5V: 4A	
DC input module	G4I-D22A	16 points DC 12/24V input (Current Sink/Source type)	
	G4I-D22B	16 points DC 12/24V input (Current Source type)	
	G4I-D22C	16 points DC 24V input (Current Sink/Source type)	
	G4I-D24A	32 points DC 12/24 input (Current Sink/Source type)	
	G4I-D24B	32 points DC 12/24 input (Current Source type)	
	G4I-D24C	32 points DC 24 input (Current Sink/Source type)	
	G4I-D28A	64 points DC 12/24 input (Current Sink/Source type)	
AC input module	G4I-A12A	16 points AC 110V input	
	G4I-A22A	16 points AC 220V input	
Relay output module	G4Q-RY2A	16 points Relay output (2A)	AC, DC
Transistor output module	G4Q-TR2A	16 points Tr. (NPN) output (0.5A) (Sink type)	
	G4Q-TR2B	16 points Tr. (PNP) output (0.5A) (Source type)	
	G4Q-TR4A	32 points Tr. (NPN) output (0.1A) (Sink type)	
	G4Q-TR4B	32 points Tr. (PNP) output (0.1A) (Source type)	
	G4Q-TR8A	64 points Tr. (NPN) output (0.1A) (Sink type)	
Triac output module	G4Q-SS2A	16 points Triac output (1.0A)	
	G4Q-SS2B	16 points Triac output (0.6A)	AC
I/O hybrid module	G4H-DR2A	8 points DC 12/24V input, 8 points relay output	
	G4H-DT2A	8 points DC 12/24V input, 8 points Tr. output	
Special module	A/D module	G4F-AD2A	V/I input: 4 CHs (DC -5~-5V/-10~-10V/DC -20~-20mA)
		G4F-AD3A	V/I input: 8 CHs (DC 1~-5V/0~-10V/DC 4~-20mA)
	D/A module	G4F-DA1A	V/I output: 2 CHs (DC -10~-10V, DC 4~-20mA)
		G4F-DA3V	V output: 8 CHs (DC -10~-10V)
		G4F-DA3I	I output: 8 CHs (DC 4~-20mA)
		G4F-DA2V	V output: 4 CHs (DC-10~-10V)
		G4F-DA2I	I output: 4 CHs (4~-20mA)
	HSC module	G4F-HSCA	1 CH, 50kHz, Counting range: 0~16,777,215
		G6F-HO1C	2 CHs, 200kpps, Counting range: -2,147,483,648~+2,147,483,647, Open collector type
		G6F-HD1C	2 CHs, 500kpps, Counting range: -2,147,483,648~+2,147,483,647, Line drive type
	Positioning module	G4F-PPxO	X=1, 2, 3: axis, Pulse output, 200kpps, Open Collector Type
		G4F-PPxD	X=1, 2, 3: axis, Pulse output, 1Mbps, Line Drive Type
	Thermocouple input module	G4F-TC2A	Input: 4 CHs (Thermocouple: K, J, E, T, B, R, S)
	RTD input	G4F-RD2A	Input: 4 CHs
	PID control module	G4F-PIDB	Max. 16-loop control (Autotuning), 16-point digital output
	Analog timer module	G4F-AT3A	Input: 8 points
	Interrupt module	G4F-INTA	Input: 8 CHs
	Memory module	GM4-M032	128kbyte (32kstep)



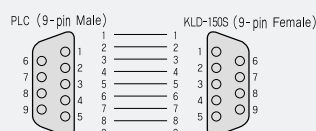
Type	Part Number	Specification	Remarks
Comm. module	Fast Enet I/F module (Open type)	G4L-EUTB G4L-EUFB G4L-EU5B	10/100BASE-TX, UTP 100BASE-FX, Fiber optic 10BASE-5, AUI
	Fast Enet I/F Module (Dedicated Master)	G4L-EUTC G4L-EUFC G4L-EU5C	10/100BASE-TX, UTP 100BASE-FX, Fiber optic 10BASE-5, AUI
	Fast Enet I/F module (Dedicated Slave)	G4L-ERTC G4L-ERFC G4L-ER5C	10/100BASE-TX, UTP 100BASE-FX, Fiber optic 10BASE-5, AUI
	Fnet I/F module	G4L-FUEA G4L-FUOA	Fnet master module (Shielded twisted pair cable), 1Mbps Fnet master module (Optic cable)
	Fnet remote I/F module	G4L-RBEA	Fnet remote module (Shielded twisted pair cable), 1Mbps
	Dnet I/F module	G4L-DUEA	DeviceNet master module (500kbps MAX.)
	Pnet I/F module	G4L-PUEA	Profibus-DP master module (1Kbyte)
		G4L-PUEB	Profibus-DP master module (7Kbyte)
		G4L-PUEC	Profibus-DP master module (7Kbyte)
	Rnet I/F module	G4L-RUEA	Rnet master module
	Cnet I/F module	G4L-CUEA	RS-232C/RS-422: 1Ch each, Stand alone/Interlocking mode
	Dummy module	GM4-DMMA	Dummy module for empty I/O slot
	Memory module	G4M-M032	Capacity: 128K (32k steps)

## Cable connection

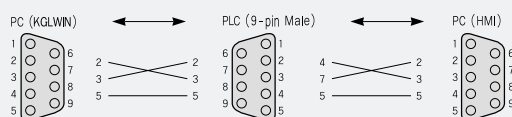
### Loader cable



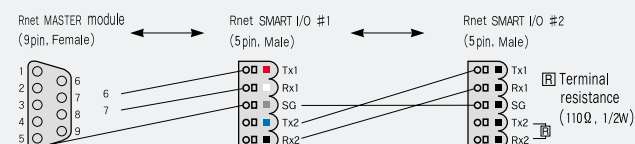
### Handy loader cable



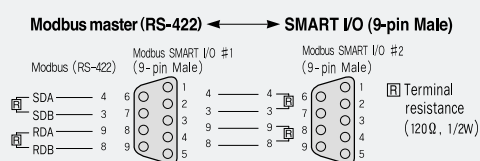
### K200S (A/C), K80S loader and built-in Cnet



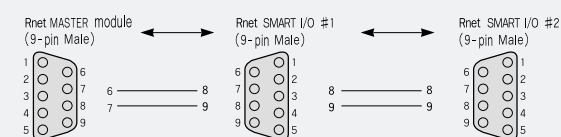
### Rnet cable I (SMART I/O 5pin)



### Modbus (RS-422)



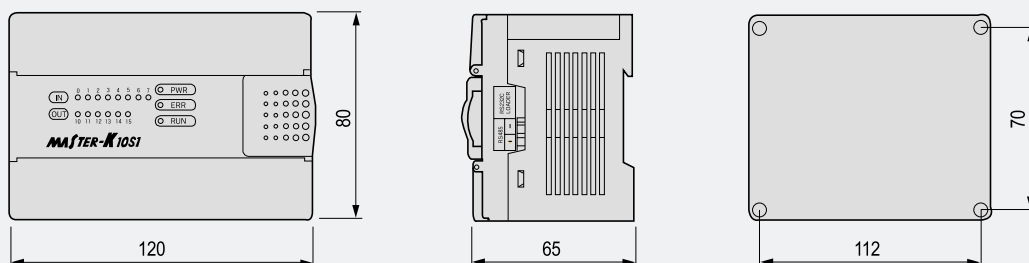
### Rnet cable II (SMART I/O 9pin)



# Dimensions

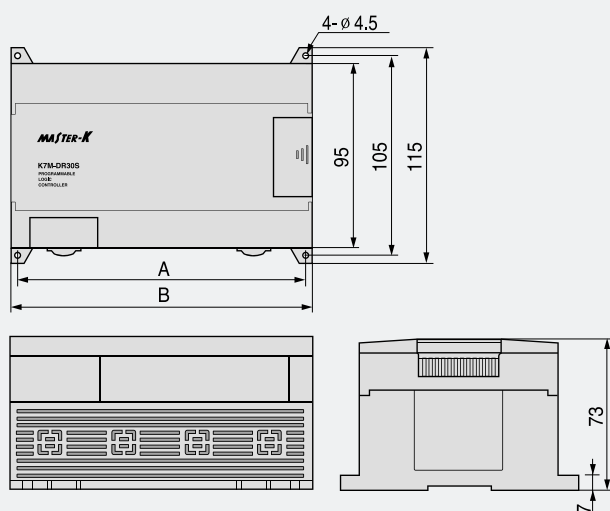
Programmable Logic Controller

## K10S1

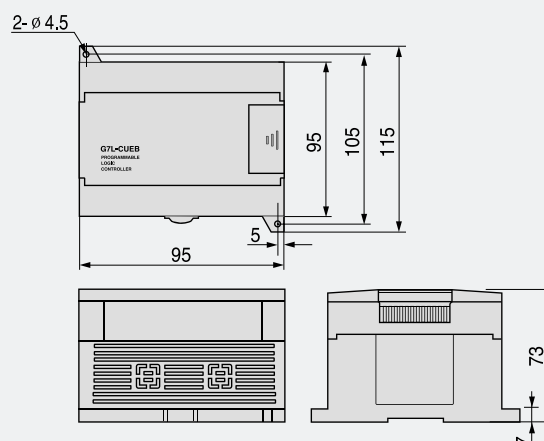


## K80S/K120S

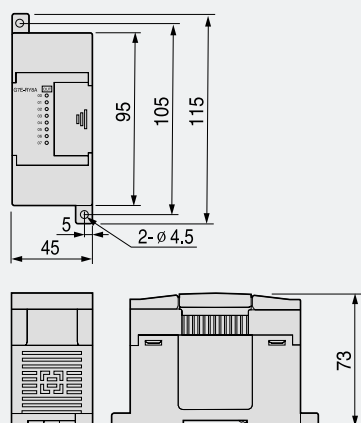
### Main



### Expansion module



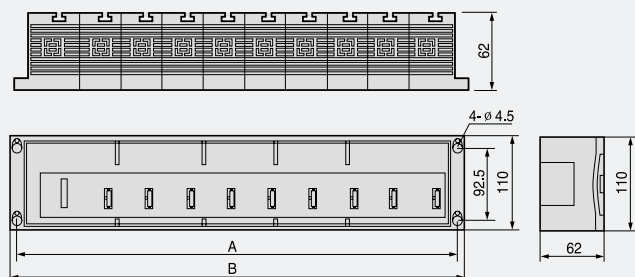
### Expansion module (K120S slim type)



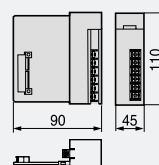
K80S	K120S	A	B
K7M-D□10S	K7M-D□10/14UE	85	95
K7M-D□20S	K7M-D□20U(E)	135	145
K7M-D□30S	K7M-D□30U(E)	135	145
K7M-D□40S	K7M-D□40U	165	175
K7M-D□60S	K7M-D□60U	215	225

## K200S

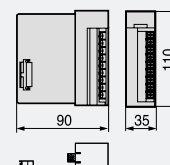
### Main



### Power



### CPU and I/O module



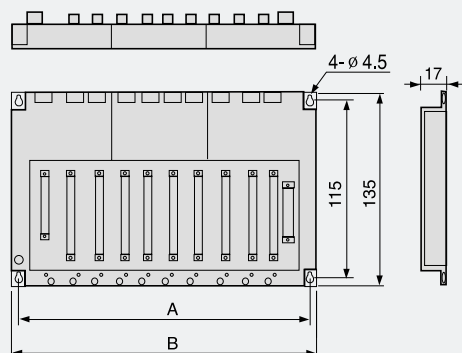
### ■ Width of base

(Unit: mm)

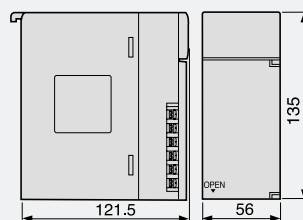
	Base board			
	GM6-B04M	GM6-B06M	GM6-B08M	GM6-B12M
A	230.5	300.5	370.5	510.5
B	244	314	384	524

## K300S

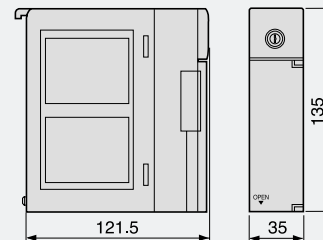
### Base



### Power



### CPU and I/O module



### ■ Width of base

(Unit: mm)

	Base board				Expansion Base		
	GM4-B04M	GM4-B06M	GM4-B08M	GM4-B12M	GM4-B04E	GM4-B06E	GM4-B08E
A	284	354	424	524	284	354	424
B	297	367	440	540	297	367	437

Leading Innovation, Creating Tomorrow 



**Safety Instructions**

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance.  
Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.

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