

K7M

Programmable Logic Controller





Functions



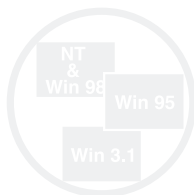
Performance



ALL in



Network



Programming

Aiming at the Compactness and High Function

- **High function and performance with Exclusive MPU chip**
 - Execution speed : 0.5μs/step
 - Program capacity : 7ksteps
- **Various built-in functions for the enlarging application fields**
 - One(1) High speed counter (1~16kHz, 2~8kHz)
 - One(1) Pulse train output (2kHz)
 - Eight(8) PID control with auto tuning
 - Eight(8) Pulse catch inputs
 - Filtered input
 - Eight(8) External interrupt inputs
 - One(1) RS-232C I/F (dedicated, user defined, Modbus protocol)

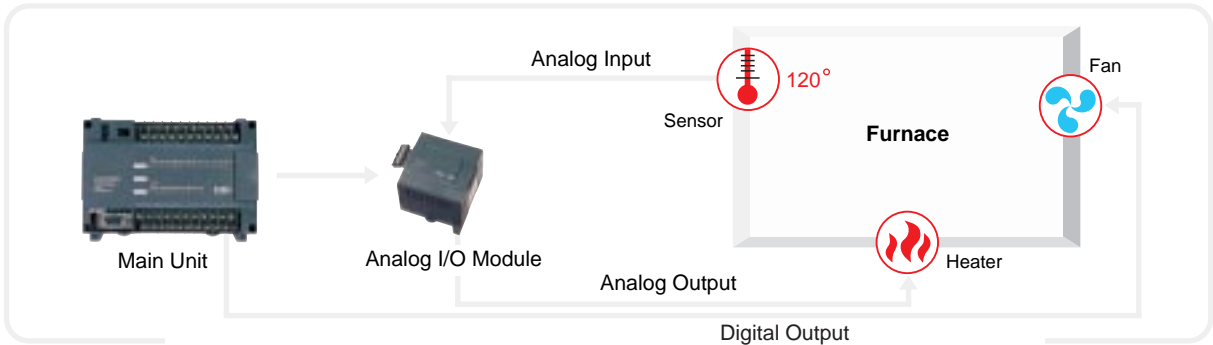
ONE, All for your needs

Powerful programming Tool (KGLWIN)

- **Windows-based tool (Windows 95, 98 and NT)**
- **Applicable to all the K series**
- **Ladder diagram, Mnemonic language supported**
- **Possible to Edit a program in RUN mode**
- **Forced I/O On/Off**
- **Display the comments in a program**
- **Available all printers supported by Windows**
- **Powerful debuggings**
 - Execution step by step
 - Execution to a given step
 - Execution till the data becomes a given value.
 - Execution the cycles at the No. of given times

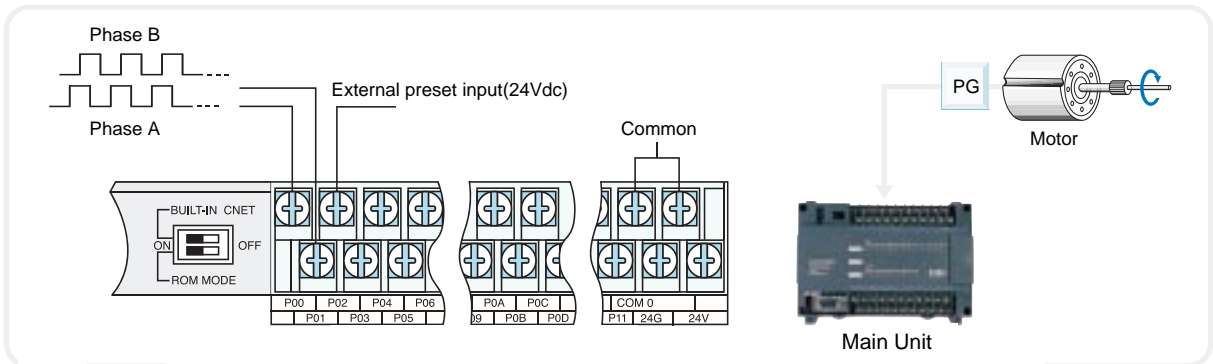
Eight(8) PID loops with auto tuning (built-in)

It can be applied for temperature control, Pressure control, Flow control in the fields such as Chemical and process Industries, Glass and ceramics, Wood and paper industry, Food & Drink industry and Furnace, etc.



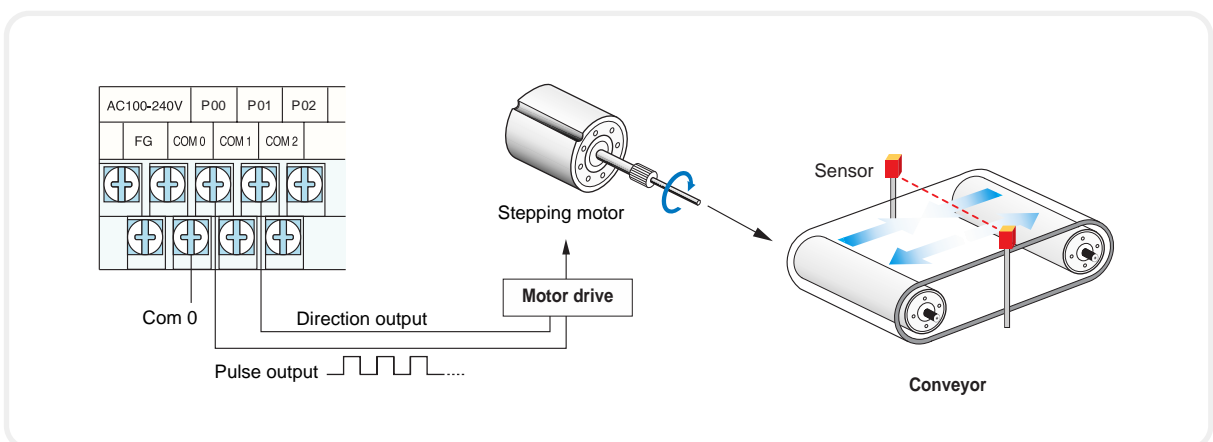
Single High Speed Up/Down Counter (built-in)

Single high speed counter up to 16kHz enables and resets input, as up/down counter for connecting incremental encoders or high speed pulse generator. This counter is independent of the CPU ladder logic execution, so counting is not affected(16kHz for 1phase, 8kHz for 2phases, 24bits) by the scan time.



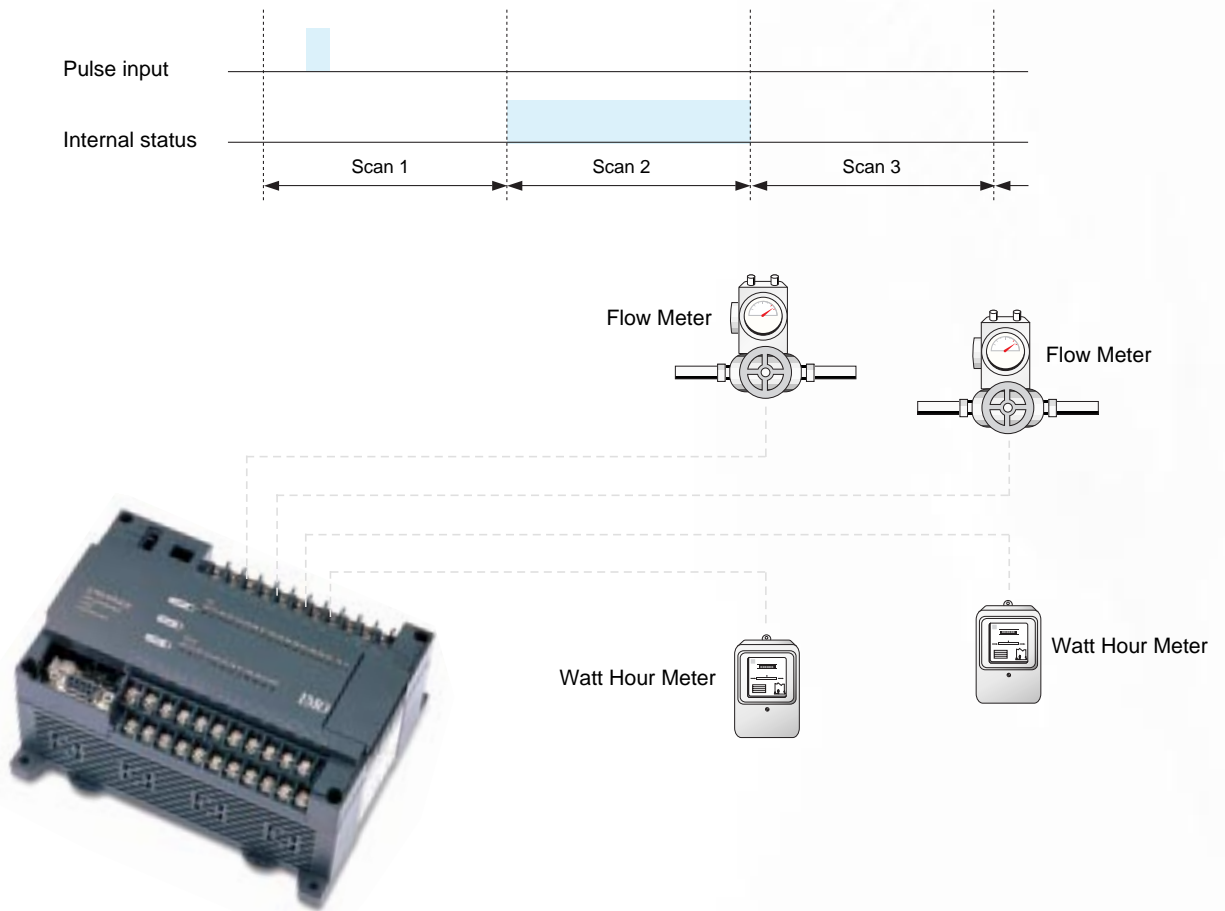
Pulse Output (built-in, TR type)

One high-frequency pulse output(max. 2kpps) enables to build stepping motor and simple positioning control systems.



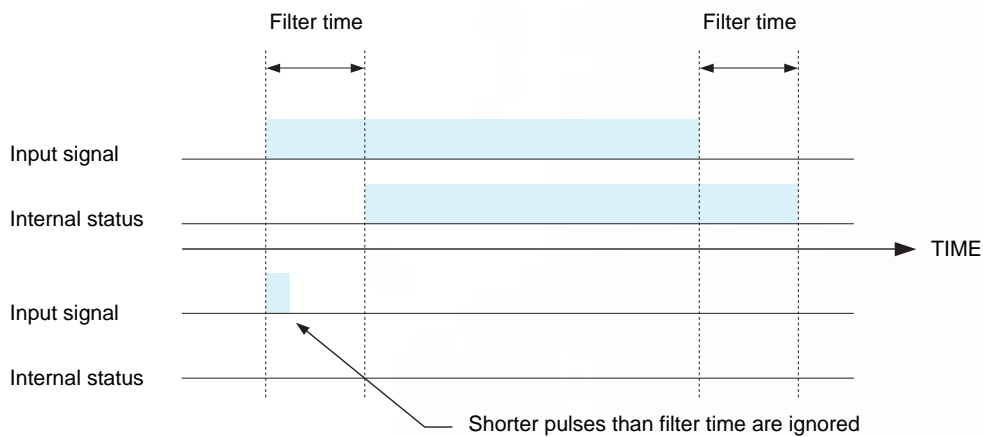
Eight (8) Pulse catch Inputs (built-in)

Pulse catch inputs can capture fast pulse inputs that cannot normally be detected during the normal input cycling. Max. 8 different pulse catch inputs (P000~P007) are available and pulses with width as small as 0.2ms can be captured. You can configure these inputs in the basic parameter setting of KGLWIN.



Discrete inputs with filters (built-in)

Inputs with filters prevent the CPU from reading abnormal inputs and reduce the possibility of input malfunction. The filter time can be programmed from 0 to 15ms in 1ms increments.

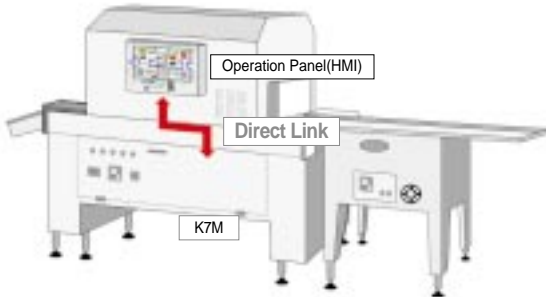


1:1 Direct Link

Application Example

Packaging Machine using Operation Panel

- Provides Additional RS232C Ch. via Loader Port.
- Direct Connection with Display Unit or HMI machine, etc.
- Can use Both Loader & Operation Panel
⇒ Convenient initial test Operation.
- 1:1 Link available using RS232-422 Converter

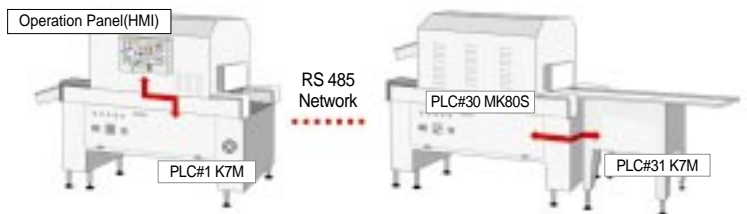


1:N Local Area Monitor & Control

Application Example

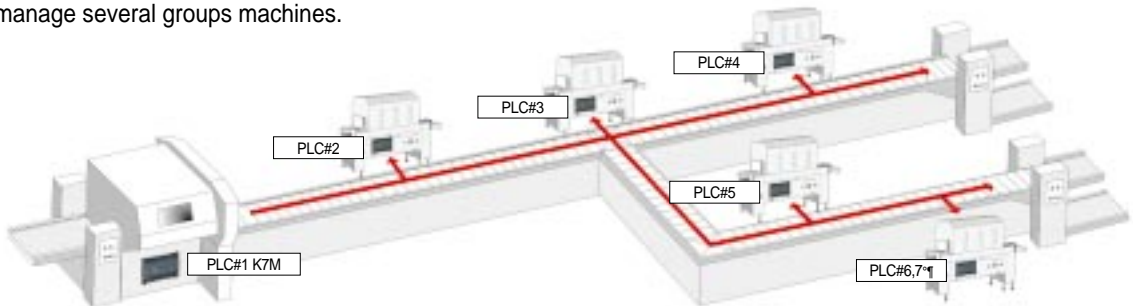
Complex Packaging Machine using Operation Panel & PLCs

- Provides 1:N Communications using RS485 Interface.
- Possible to manage a group of machines.



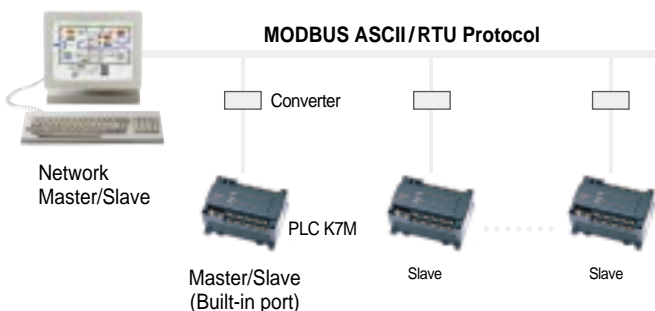
N:N Distributed Control

- Provides N:N Communications using RS485 Interface without any Host.
- Possible to manage several groups machines.



MODBUS Network Interface

- K7M Provides Industrial Standard Protocol like Modbus & User defined Protocol made by User.
- User can edit Link Characteristics & Protocol using User Defined Protocol (Stop Bit, Parity, Data length°¶)
- Frames to be sent or received can be created as required by user.

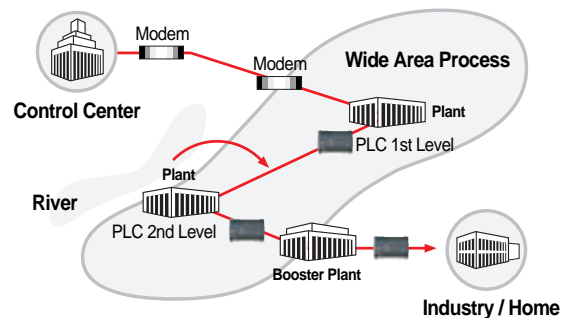


Modem Communication

Application Example

Water Treatment System in wide and long distance Area

- Modem enables Remote programming up to 100km
- Possible to program and monitor the PLCs via 2nd Level Link
- Low Cost TeleMetering & TeleControl System available



Overview

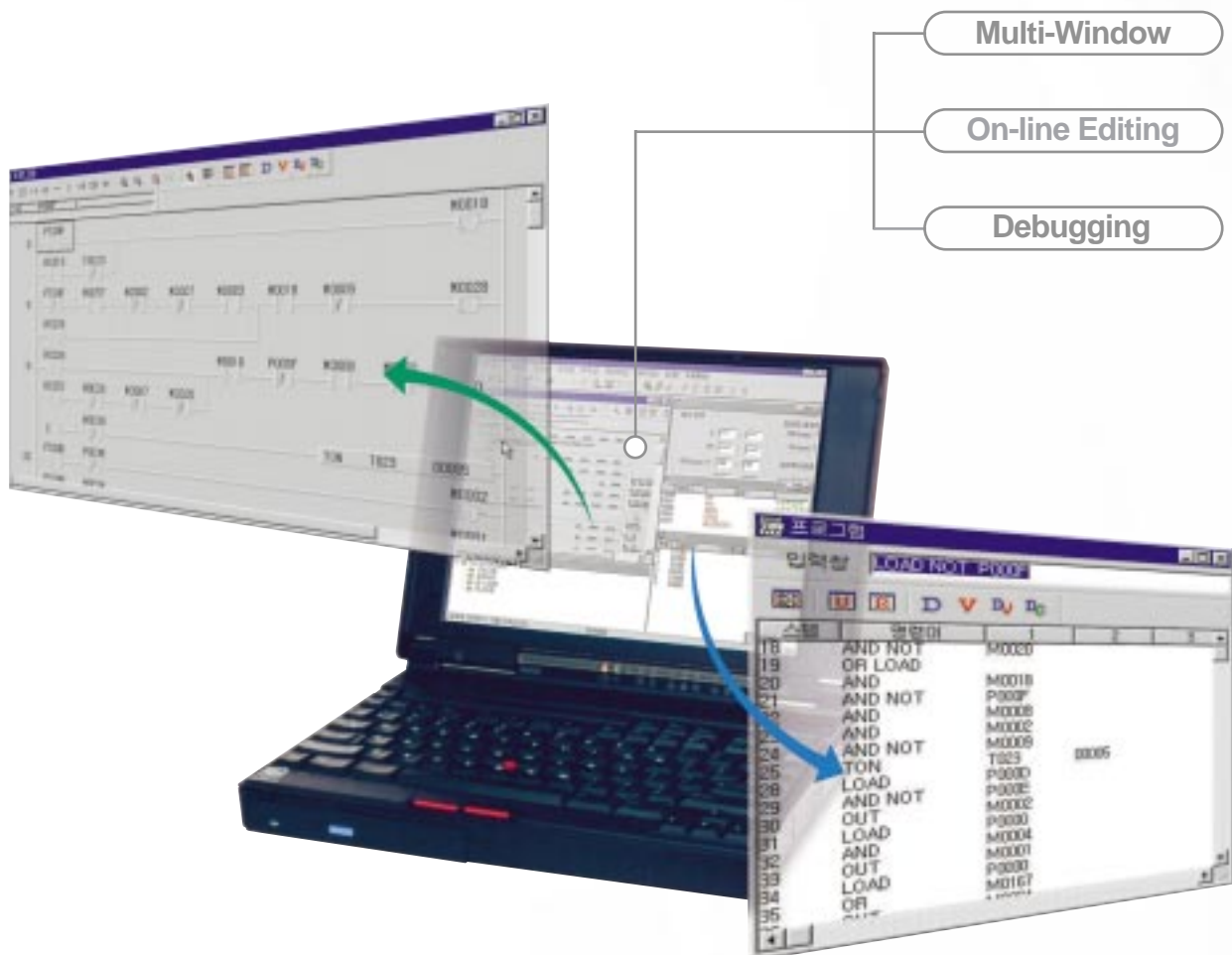
- Windows-based tool (Windows 95, 98 and NT)
- Applicable to all the MASTER-K series
- Ladder diagram, Mnemonic language supported
- Remote programming via network is available
- Several windows can be displayed in a screen
- Display the comments in a program Available all printers supported by Windows

On-line Editing

- Possible to Edit a program in RUN mode
- Forced I/O On/Off and change the value of data

Powerful debuggings

- Execution step by step
- Execution to a given step
- Execution till the data becomes a given value.
- Execution the cycles at the No. of given times



Performance specification of main module

Item		Specifications	Remarks	
Program control method		Cyclic operation of stored program, interrupt task operation		
I/O control method		Refresh method, Direct I/O method		
Programming language		Mnemonic program Ladder Diagram		
No. of instructions	Basic	30 kinds		
	Application	218 kinds		
Processing speed		0.5 μ s/step		
Program capacity		7ksteps		
I/O points		20 ~ 80 points		
Data memory	I/O area (P)	P0000 ~ P013F		
	Aux. Area (M)	M0000 ~ M191F		
	Keep area (K)	K0000 ~ K031F	Non volatile area	
	Link area (L)	L0000 ~ L063F		
	Special area (F)	F0000 ~ F063F		
	Timer (T)	100ms : T000 ~ T191 10ms : T192 ~ T255	Changeable by parameter setting	
	Counter (C)	C000 ~ C255		
	Step control area (S)	S00.00 ~ S99.99		
	Data register (D)	D0000 ~ D4999		
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)		Dedicated protocol MODBUS protocol User-defined protocol	
	High speed counter	Counting speed	1-phase: 16kHz(1 channel) 2-phase: 8kHz(1 channel)	
		Counting modes	3 counting modes - 1 phase, Up/down count with program input - 1 phase, Up/down count with B phase input - 2 phase, Up/down count with phase difference	
		Multiplication	select one of 1, 2, or 4	
	Pulse input		Pulse width: 0.2 ms, 8 points	
	Pulse output		1x 2 kHz (Transistor output only)	
	External interrupt		8 points, 0.4ms	
Input filter		0 ~ 15ms		



*Remark) K7M-DR10S(DC), K7M-DT10,:Built in RS232 and RS-485 I/F, not available for Cnet I/F module

Input

Item	Type	K7M-DR10S(/DC)	K7M-DR20S(/DC)	K7M-DR30S(/DC)	K7M-DR40S(/DC)	K7M-DR60S(/DC)	G7E-DR10A
		K7M-DT10S	K7M-DT20S	K7M-DT30S	K7M-DT40S	K7M-DT60S	-
Input Point		6	12	18	24	36	6
Insulation Device		Photo coupler					
Rated Input Voltage		DC12~24V					
Rated Input Current		DC12V 4.5mA, DC24V 9mA					
Operation Voltage		DC10.2~28.8V (Ripple : 5% or less)					
Max. Simultaneously On		100% Simultaneously on					
On Voltage / Current		More than DC9.5V/3.5mA (P000~P002 : 6.3mA)					
Off Voltage / Current		Less than DC5V/1.8mA (P000~P002 : 6.3mA)					
Input Impedance		About 2.7K Ω (P000~P002 : 1.5K Ω)					
Response Time	Off \Rightarrow On	1~15ms					
	On \Rightarrow Off	1~15ms					
Operation Indicator		LED					
External wiring		Terminal block (M3 x 6 screw)					

* Remark K7M-DR10S/DC, DR20S/DC, DR30S/DC, DR40S/DC, DR60S/DC : DC 12~24V powered.



Output(Relay)

Item	Type	K7M-DR10S(/DC)	K7M-DR20S(/DC)	K7M-DR30S(/DC)	K7M-DR40S(/DC)	K7M-DR60S(/DC)	G7E-DR10A
	Output Point		4	8	12	16	24
Switching Device		Relay					
Insulation Device		Relay					
Rated Load Voltage/ Current		DC24V / 2A (Resistive load), AC220V / 2A (COS ϕ =1) 1 Point 2A/1 Point/com, 4A/2 Points/com, 4A/4 Points/com					
Minimum Input		DC5V/1mA					
Max. Load Voltage		AC250V DC110V					
Max. Switching Frequency		1,200 Times/Hour					
Surge Killer		None					
Lifetime of Relay	Mechanical	Over 0.1 million times					
	Electrical	Over 20 million times					
Response Time	Off \Rightarrow On	Within 10ms					
	On \Rightarrow Off	Within 12ms					
Operation Indicator		LED					
External wiring		Terminal block (M3 x 6 screw)					



Output(Transistor)

Item	Type	K7M-DT10S	K7M-DT20S	K7M-DT30S	K7M-DT40S	K7M-DT60S	-
	Output Point		4	8	12	16	24
Rated Load Voltage		DC 12/24					
Rated Load Current		0.5A/1 Point, 3A/1com					
Response Time	Off \Rightarrow On	Less than 2ms					
	On \Rightarrow Off	Less than 2ms					
Common Method		8 Points / 1com, Sink type					
Operation Indicator		LED					
Insulation Device		Photo coupler					
Surge Killer		Clamp diode					
Internal Power Consumption		170mA					

Option module

Option Module

Analog I/O module
(G7F-ADHA)



Analog Potentiometer
Module (G7F-AT2A)

- Four analog potentiometer can be used on the job manually to adjust set Points such as timer values of other variables, without going into PLC program.
- Adjustment can be made from the front part of the module using variable resistors

Cnet I/F Module
(G7L-CUEB, G7L-CUEC)

- RS-422/485 interface enables communication between computer and 32 PLCs using the multidrop System(G7L-CUEC)
- MODBUS Master/Slave mode can be used on a MODBUS RTU or ASCII mode
- Long distance communication through RS-232C modem connection(G7L-CUEB)
- Communication parameter setting can be made in Programming Tool(KGLWIN)

Item		Specifications	
A/D part	Analog input	Voltage	DC0~10V
		Current	DC0~20mA or 4~20mA
	Digital Output Resolution	12bit (0~4,000)	
	Voltage/Current Selection	• Selected by dip switch • Short V and 1 terminal for current Input	
	Analog Input Channels	2channels/module	
Absolute Maximum Input	Voltage	DC+12V	
	Current	DC+25mA	
D/A part	Digital Output Resolution	12bit (0~4,000)	
	Analog Output	Voltage	DC0~10V (load impedance 2KΩ-1MΩ)
		Current	DC0~20mA (load impedance 560Ω) DC4~20mA (load impedance 560Ω)
	Voltage/Current Selection	Separated terminal	
	Analog Input Channels	1channels/module	
Absolute Maximum Input	Voltage	DC+15V	
	Current	DC+24mA	
Maximum Resolution	DC 0~10V	2.5mV (1/4,000)	
	DC 0~20mA	5 μA(1/4,000)	
	DC 0~20mA	6.25 μA(1/3,200)	
Accuracy	±0.5% or less (Full scale)		
Conversion Time	Scan time+1.5ms/channels		
Insulation Device	Photo coupler between Input terminal and ground (No insulation between channels)		
External Wiring	14Point terminal block		
Power supply	DC24V, 80mA		
Current consumption	DC5V, 10mA		
Weight	240g		

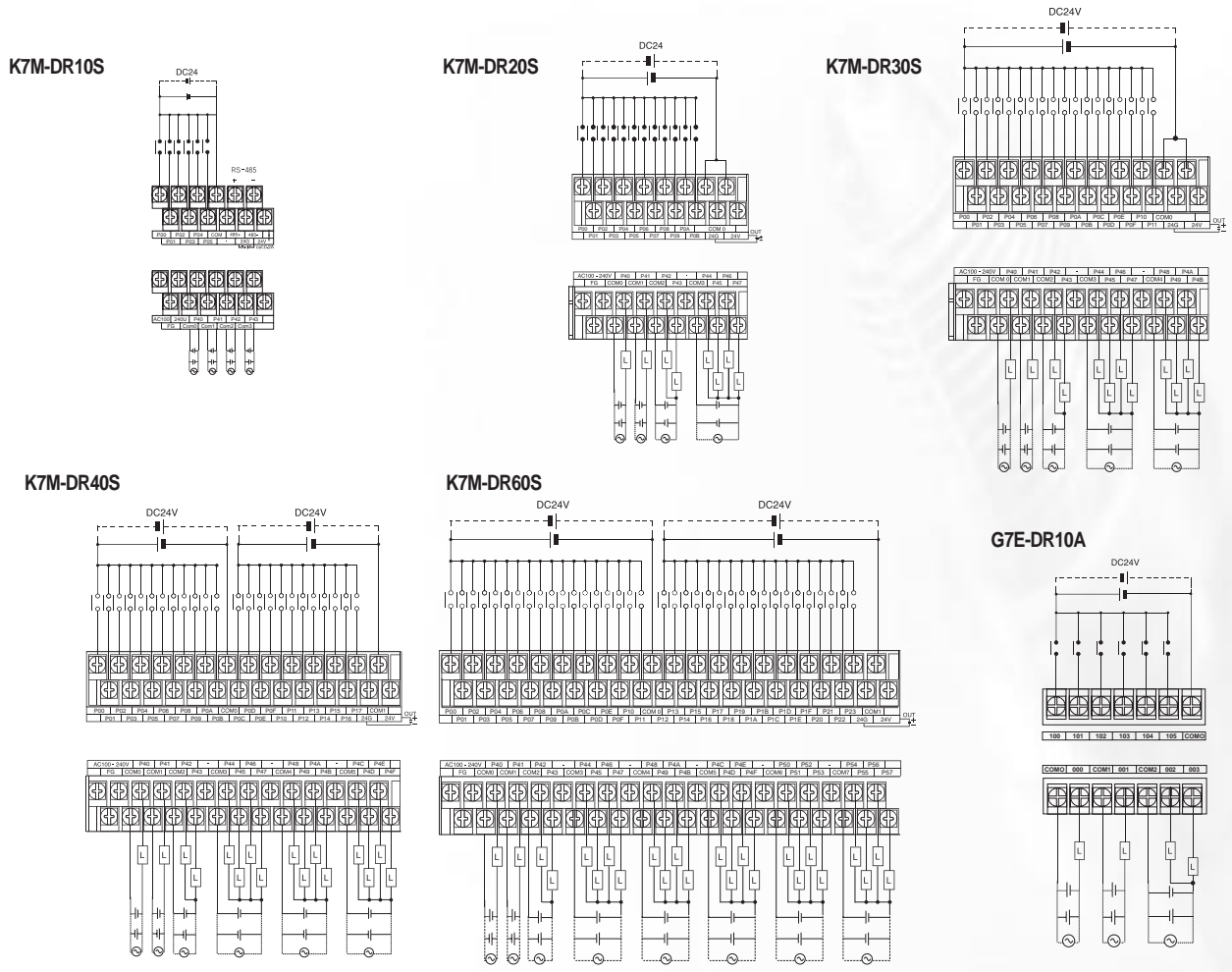
Item	Specifications
No. of Timers	4 Point
Digital Output Range	(8bit) 0~200
Timers Setting	Set by adjustable volume switch
Accuracy of Timer	±2.0% (Full scale)
Current Consumption	50mA
Weight	200g

Item		Specifications
Mode		RS-422, Modem (RS-232C)
	Dedicated Mode	Supports multidrop/1:1 communication via LG dedicated protocol Supports high speed link service
	KGMWIN Mode	Supports remote control via MASTER-K PLC protocol
	Modbus Mode	Supports master and slave function with MODBUS Protocol (ASCII, RTU)
	User Mode	Operated with user-defined protocol
D/A part	Date Bit	7 or 8
	Stop Bit	1 or 2
	Start Bit	1 or 2
	Parity	Even / Odd / None
Synchronization	Synchronization	Asynchronous method
	Transmission Speed	9,600/19,200/38,400/56,000/76,800/115,200/128,000 bps
	Setting Method	Parameter setting with KGLWIN software
	Max. Cable Length	500m
	Weight	180g

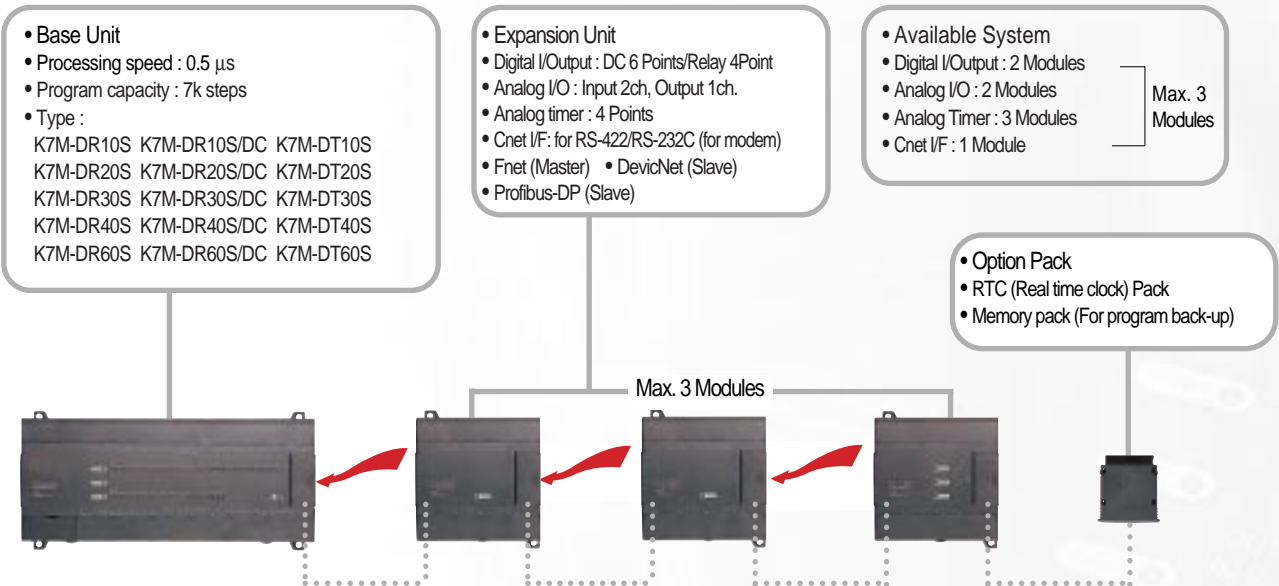
Power Specification

Item		Specifications	
Input	Type	AC Powered	DC Powered
	Rated Voltage	AC100~240 (Free voltage)	DC12~24V (Free Voltage)
	Input Voltage Range	AC85~264V	DC10.2~28.8V
	Frequency	47~63Hz	-
	Leakage Current	3mA or less (AC264V, 63Hz)	
	Dropout Tolerance	20ms or less	2ms or less
	Output Current	0.2A (Isolated from DC5V)	-
DC24V Output	Output Voltage	24V±10% (21.6~26.4V)	-
	Over-Current Voltage	0.22~1.5A	-

Wiring Diagrams



System Configuration



Memory pack
 *When only basic unit is used : connect to the expansion connector of the basic unit.
 *When expansion unit is used : connect to the expansion connector of the last connected expansion unit.

