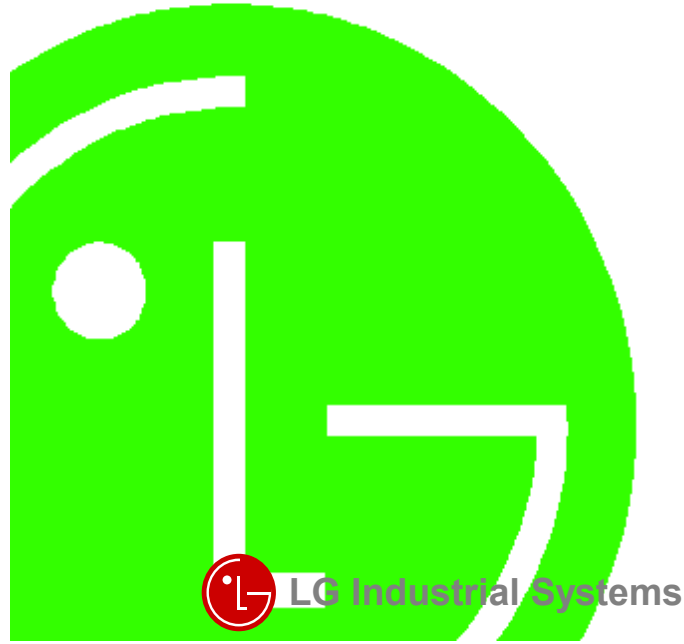


DATA SHEET

LG Programmable Logic Controller Analog Timer Module MASTER-K K7F-AT4A K4F-AT3A



702006346

Before handling the product

Read this data sheet carefully prior to any operation, mounting, installation or start-up of the product.

Materials for MASTER-K

Name	Code
MASTER-K KGL-WIN (Programming Software)	702005036
MASTER-K (Instructions & programming)	702006539
MASTER-K CPU User's Manual	702006391
MASTER-K K4F-AT3A / K7F-AT4A Manual	702006506

Name	Code
MASTER-K K4F-AT3A / K7F-AT4A Data Sheet	702006346

Installation Precautions

CAUTION

- ▶ Operate the PLC in the environment conditions given in the general specifications.
- ▶ If operated in other environment not specified in the general specifications, it can cause an electric shock, a fire, malfunction or damage or degradation of the module.
- ▶ Make sure the module fixing projections is inserted into the module fixing hole and fixed.
- ▶ Improper installation of the module can cause malfunction, disorder or falling.

Wiring Precautions

CAUTION

- ▶ When grounding a FG terminal, be sure to provide class 3 grounding which is dedicated to the PLC.
- ▶ Before the PLC wiring, be sure to check the rated voltage and terminal arrangement for the module and observe them correctly.
If a different power, not of the rated voltage, is applied or wrong wiring is provided, it can cause a fire or disorder of the module.
- ▶ Drive the terminal screws firmly to the defined torque.
If loosely driven, it can cause short circuit, a fire or malfunction.
- ▶ Be careful that any foreign matter like wire scraps should not enter into the module.
It can cause a fire, disorder or malfunction.

1. Introduction

The K7F-AT4A is used with the MASTER-K PLC K1000S series. The K4F-AT3A is used with the K300S series. Hereafter, they are called Analog Timer Module(A/T module). The A/T module performs on-delay operation for a setting time.

2. General Specifications

No	Item	Specifications	Standard
1	Operating temperature	0 ~ 55 °C	
2	Storage temperature	-25 ~ 70 °C	
3	Operating Humidity	5 ~ 95%RH, non-condensing	
4	Storage humidity	5 ~ 95%RH, non-condensing	
5	Vibration	Occasional vibration	
		Frequency	Acceleration
		10 ≤ f < 57 Hz	-
		57 ≤ f ≤ 150 Hz	9.8m/s ² (1G)
		Sweep count	
		10 times in each direction for X, Y, Z	IEC 1131-2
		Continuous vibration	
		Frequency	Acceleration
		10 ≤ f < 57 Hz	-
		57 ≤ f ≤ 150 Hz	4.9m/s ² (0.5G)
6	Shocks	*Maximum shock acceleration: 147m/s ² (15G) *Duration time : 11 ms *Pulse wave: half sine wave pulse(3 times in each of X, Y and Z directions)	IEC 1131-2
7	Noise immunity	Square wave impulse noise	± 1,500 V
		Electrostatic discharge	Voltage :4kV(contact discharge)
		Radiated electromagnetic field	27 ~ 500 MHz, 10 V/m
		Fast transient burst noise	Severity Level All power modules Digital I/Os (Ue ≥ 24 V) Digital I/Os (Ue < 24 V) Analog I/Os communication I/Os
		Voltage	2 kV 1 kV 0.25 kV
8	Atmosphere	Free from corrosive gases and excessive dust	
9	Altitude for use	Up to 2,000m	
10	Pollution degree	2 or lower	
11	Cooling method	Self-cooling	

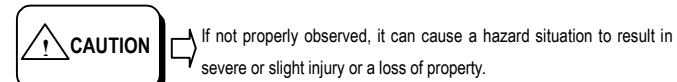
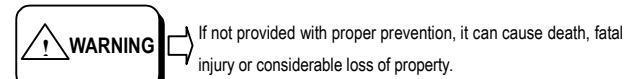
Safety Precautions

Be sure to read carefully the safety precautions given in data sheet and user's manual before operating the module and follow them.

The precautions explained here only apply to the K7F-AT4A and K4F-AT3A.

For safety precautions on the PLC system, see the MASTER-K CPU User's manual.

A precaution is given with a hazard alert triangular symbol to call your attention, and precautions are represented as follows according to the degree of hazard.



However, a precaution followed with **CAUTION** can also result in serious conditions.

Both of two symbols indicate that an important content is mentioned, therefore, be sure to observe it.

Keep this manual handy for your quick reference in necessary.

Design Precautions

CAUTION

- ▶ Do not run I/O signal lines near to high voltage line or power line.
Separate them as 100 mm or more as possible. Otherwise, noise can cause module malfunction.

Test RUN and Maintenance Precautions

CAUTION

- ▶ Do not contact the terminals while the power is applied. It can cause malfunction.
- ▶ When cleaning or driving a terminal screw, perform them after the power has been turned off.
- ▶ Do not perform works while the power is applied, which can cause disorder or malfunction.

CAUTION

- ▶ Do not separate the module from the printed circuit board(PCB), or do not remodel the module.
They can cause disorder, malfunction, damage of the module or a fire.
When mounting or dismounting the module, perform them after the power has been turned off.
- ▶ Do not perform works while the power is applied, which can cause disorder or malfunction.

Waste Disposal Precautions

CAUTION

- ▶ When disposing the module, do it as an industrial waste.

3. Performance Specifications

Items	Specifications	
	K7F - AT4A	K4F - AT3A
Timer point	16 points	8 points
Timer setting value range	0.1 to 1.0 sec 1 to 10 sec 10 to 60 sec 60 to 600 sec Setting can be done for each individual point	
Backup Method	For backup, set the operation mode selection switch to the TEST side.	
Setting Method	Setting by the adjustment volume.	
Timer Accuracy	± 2.0% (For maximum value)	
Operating Indicator	Timer Operation indication LED: 16 pts	Timer Operation indication LED: 8 pts
	Timer Contact indication LED: 16 pts	Timer Contact indication LED: 8 pts
Current consumption	0.3 A (5 VDC)	0.2 A (5 VDC)
Weight	390 g	200 g

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4. Setting Procedure for Each Function

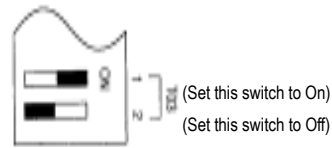
4.1 Setting Range Selection Switch

Set the time range for each analog timer (T00 to T15) by the setting range selection switch

Time range	0.1 to 1.0 sec	1 to 10 sec	10 to 60 sec	60 to 600 sec
Switch name				
Txx 1	Off	On	Off	On
Txx 2	Off	Off	On	On

xx : Means the number of an analog timer (00 to 15)

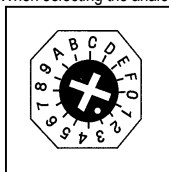
[Example] When setting the time range of the analog timer T03 to "1 to 10 sec"



4.2 Adjusting the Volume

- Apply the power after the CPU module and the A/T module are set to the following conditions.
 - Set the key switch of the CPU module to 'STOP'.
 - Set the operation mode selection switch of the A/T module to 'SET'.
- Select the numbers of the analog timers (T00 to T15) whose timer time will be adjusted by the timer number selection switch.

[Example] When selecting the analog timer T03

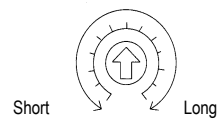


Set the timer number selection switch to 3

REMARK

If set the timer number selection switch of the K4F - AT3A to '8 to F', nothing will be processed.

- Set the adjustment volume to the timer time, which will be used as a goal, within the timer time range set in the selection 4.1.



Adjustment Volume

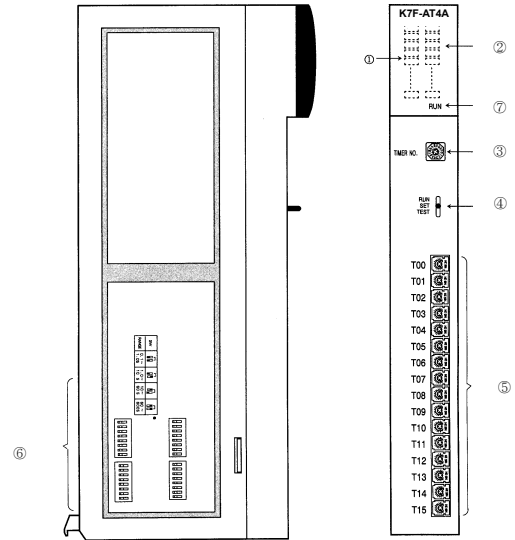
- Set the operation mode selection switch to "TEST" and check the time from turning-on of the timer operation indication LED to turn-on of the timer contact indication LED.
- After checking the on time of the timer contact indication LED, set the operation mode selection switch to 'SET'.
- To micro-adjust the timer time to the goal time, repeat 3) to 5).
- Set the timer time for each analog timer as the procedure shown by 2) to 6).
- After every timer time for every analog timer has been set, Set the operation mode selection switch to 'RUN' and execute the user program.
- To backup the timer time set, set the operation mode selection switch to 'TEST'. Then, the setting time will be stored to the memory.

REMARK

If an analog timer has been adjusted during the RUN state of the CPU module, the analog timer starts its operation by the prior one of the start signals by the operation mode selection switch of the A/T module and by the user program.

5. Parts Name and Functions

5.1 K7F-AT4A



No.	Name	Descriptions			
①	Timer contact indication LED	Indicates the On/Off state of the contact of Analog timers (T00 to T15) (On state : turn on, Off state : turn off)			
		LED	Contents	LED	Contents
		00	Contact of the Analog Timer T00	08	Contact of the Analog Timer T08
		01	Contact of the Analog Timer T01	09	Contact of the Analog Timer T09
		02	Contact of the Analog Timer T02	10	Contact of the Analog Timer T10
		03	Contact of the Analog Timer T03	11	Contact of the Analog Timer T11
		04	Contact of the Analog Timer T04	12	Contact of the Analog Timer T12
		05	Contact of the Analog Timer T05	13	Contact of the Analog Timer T13
②	Timer operation indication LED	Indicates the On/Off state of the contact of Analog timers (T00 to T15) (On state : turn on, Off state : turn off)			
		LED	Contents	LED	Contents
		16	Coil of the Analog Timer T00	24	Coil of the Analog Timer T08
		17	Coil of the Analog Timer T01	25	Coil of the Analog Timer T09
		18	Coil of the Analog Timer T02	26	Coil of the Analog Timer T10
		19	Coil of the Analog Timer T03	27	Coil of the Analog Timer T11
		20	Coil of the Analog Timer T04	28	Coil of the Analog Timer T12
		21	Coil of the Analog Timer T05	29	Coil of the Analog Timer T13
22	Coil of the Analog Timer T06	30	Coil of the Analog Timer T14		
23	Coil of the Analog Timer T07	31	Coil of the Analog Timer T15		

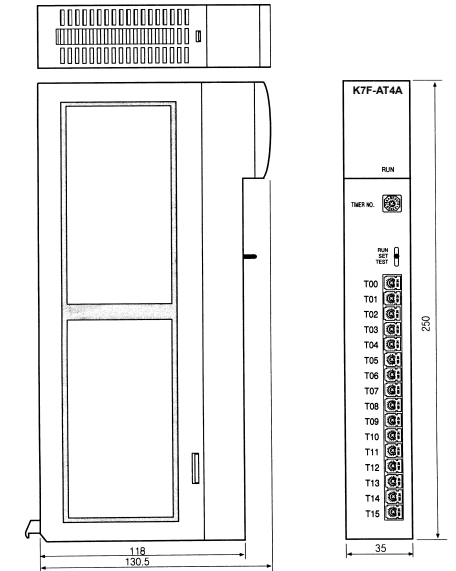
6. Handling Precautions

From unpacking to installation, be sure to check the following:

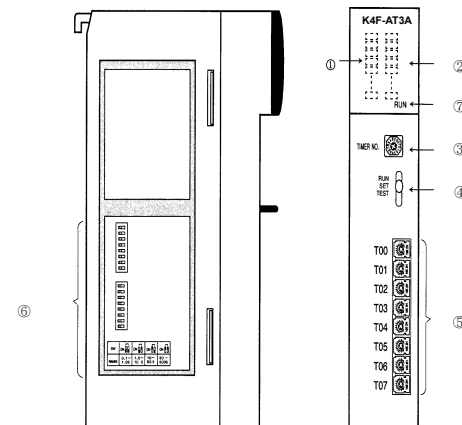
- Do not drop it off, and make sure that strong impacts should not be applied.
- Do not dismount printed circuit boards from the case. It can cause malfunctions.
- During wiring, be sure to check any foreign matter like wire scraps should not enter into the upper side of the PLC, and in the event that foreign matter entered into it, always eliminate it.
- Be sure to disconnect electrical power before mounting or dismounting the module.

7. Dimension

7.1 K7F-AT4A



5.2 K4F-AT3A



No.	Name	Descriptions			
③	Timer number selection switch	Used to select an analog timer (T00 to T15) whose time will be adjusted.			
		Timer No.	Selected Timer	Timer No.	Selected Timer
		0	T00	8	T08
		1	T01	9	T09
		2	T02	A	T10
		3	T03	B	T11
		4	T04	C	T12
		5	T05	D	T13
④	Operation mode selection switch	Used to adjust and backup the timer value, check the adjusted value and select the operation mode for each timer. . RUN : Position for normal operation . SET : Position for adjustment of the timer value of the timer selected by ③. . TEST : Position for manual check and backup of the adjusted timer value.			
⑤	Adjustment Volume	Used to adjust the timer value of an analog timer.			
⑥	Setting range selection	Used to select the setting range for each analog timer.			
⑦	RUN LED	Indicates the operation status of the A/T module.			
		<ul style="list-style-type: none"> On : Normal operation Off : 5 VDC line disconnection or A/T module defect. 			

REMARK

Only T00 to T07 are available in the K4F - AT3A. T08 to T15 are not processed.

7.2 K4F-AT3A

