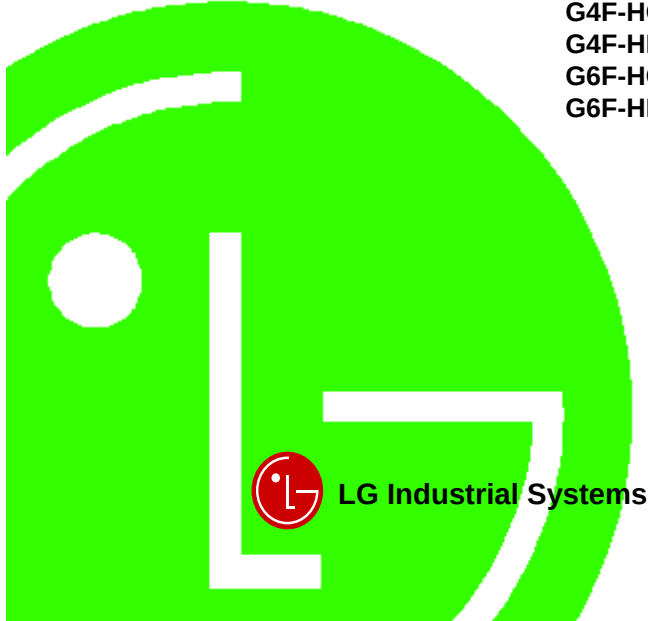


DATA SHEET

LG Programmable Logic Controller
High Speed Counter Module

G4F-HO1A
G4F-HD1A
G6F-HO1A
G6F-HD1A



- When using LGIS equipment, thoroughly read this datasheet and associated manuals introduced in this datasheet. Also pay careful attention to safety and handle the module properly.
- Store this datasheet in a safe place so that you can take it out and read it whenever necessary.

■ Safety Precautions

- ▶ Safety Precautions are for using the product safely and correctly in order to prevent the accidents and danger, so please go by them.
- ▶ The precautions explained here are only applied to High Speed Counter Module. For safety precautions on the PLC system, refer to the GLOFA GM4/6 CPU and MASTER-K CPU User's manual.
- ▶ The precautions are divided into 2 sections, 'Warning' and 'Caution'. Each of the meanings is represented as follows.

 **Warning** If violated instructions, it can cause death, fatal injury or a considerable loss of property.

 **Caution** If violated instructions, it can cause a slight injury or slight loss of Products.

- ▶ The symbols indicated in the PLC and User's Manual mean as follows.

 is a symbol that means paying attention because of danger in the specific situations.

 is a symbol that means paying attention because of danger of electrical shock.

- ▶ After reading this data sheet, keep it where the person who uses the product can see.

 Warning

- ▶ **Do not contact the terminals while the power is applied.**
It can cause electric shock and malfunction.

- ▶ **Protect the product from being gone into by foreign metallic matter.**
It can cause fire, electric shock and malfunction.

 Caution

- ▶ **Before wiring the PLC, be sure to check the rated voltage and terminal arrangement for the module and observe them correctly.**
It can cause fire, electric shock and malfunction.

- ▶ **Tighten up the terminal screws firmly to the defined torque when the PLC is wired.**
If the terminal screw looses, it can cause fire and electric shock.

- ▶ **Do not install the PLC around inflammables.**
It can cause fire.

- ▶ **Do not leave the PLC on direct vibration.**
It can cause fire and electric shock.

- ▶ **Do not break up, repair or modify the PLC except experts of the service department.**
It can cause fire and electric shock.

- ▶ **Use the PLC within the limit of standard environmental conditions specified in the User's manual and datasheet.**
It can cause fire, electric shock, malfunction or decline in quality of the product.

- ▶ **The load connected to the output terminal must be within the limit of the defined regular.**
It can cause fire, malfunction or trouble.

- ▶ **In case of disposing the PLC and the battery, treat them as the industrial waste.**
It can cause poisonous pollution or explosion.

Precautions for use

- ▶ Do not Install another places except PLC controlled place.
- ▶ Make sure that the FG terminal is grounded with class 3 grounding which is dedicated to the PLC. Otherwise, it can cause disorder or malfunction of PLC.
- ▶ Connect the expansion connector correctly when the expansion base is needed,
- ▶ Do not detach PCB from the case of the module and modify the module.
- ▶ Turn off power when mounting or removing the module.
- ▶ Cellular phone or walkie-talkie should be used farther than 30cm from the PLC.
- ▶ Input signal or communication line should be farther than minimum 100mm from a high-voltage cable or a power line in order not to be affected by noise and magnetic field.

Before handling the product

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

Materials for GLOFA-GM

Name	Code
GLOFA GM3/4 User's manual	10310000231
GLOFA GM6 User's manual	10310000259
GLOFA Instruction manual	10310000297
GLOFA GMWIN (Instruction & Programming)	10310000273
G4F-HO1A/HD1A, G6F-HO1A/HD1A Manual	10310000397

Materials for MASTER-K

Name	Code
MASTER-K 200S/300S/1000S User's manual	10310000272
MASTER-K (Instruction & Programming)	10310000271
KGL-WIN (Programming)	10310000294
G4F-HO1A/HD1A, G6F-HO1A/HD1A Manual	10310000397

1. Introduction

High Speed Counter is a module for counting the high-speed pulses, which is output from encoder etc. G4F-HO1A/G6F-HO1A is the pulse input type and G4F-HD1A/G6F-HD1A is the line drive input type.

2. General specification

No	Item	Specification	Standard
1	Operating Temperature	0℃ ~ +55℃	
2	Storage Temperature	-25℃ ~ +70℃	
3	Operating Humidity	5 ~ 95%RH, non-condensing	
4	Storage Humidity	5 ~ 95%RH, non-condensing	
5	Vibration	Occasional vibration Frequency Acceleration Amplitude Sweep Counter 10 ≤ f < 57Hz - 0.075mm 57 ≤ f ≤ 150Hz 9.8m/s² (1G) - Continuous vibration Frequency Acceleration Amplitude 10 ≤ f < 57Hz - 0.035mm 57 ≤ f ≤ 150Hz 4.9m/s² (0.5G) - 10 Times in each direction for X, Y, Z	IEC 61131-2
6	Shocks	*Maximum shock acceleration: 147m/s² {15G} *Duration time :11 ms *Pulse wave: half sine wave pulse (3 times in each of X, Y and Z directions)	IEC 61131-2
7	Noise immunity	Square wave impulse noise ±1,500V 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	LGIS Standard IEC 61131-2, IEC 1000-4-2 IEC 61131-2, IEC 1000-4-3 IEC 61131-2, IEC 1000-4-4
8	Atmosphere	Free from corrosive gases and excessive dust	
9	Altitude for use	Up to 2000m	
10	Pollution degree	2 or lower	
11	Cooling method	Self-cooling	

3. Performance Specification

Item		Specification			
		G4F-HO1A	G6F-HO1A	G4F-HD1A	G6F-HD1A
I/O Occupied Points		64 Points			
Number of Channel		2			
Counter Input Signal	Signal	Phase A, Phase B			
	Signal Level	DC5/12/24V		EIA RS-422A Standard	
	Signal Type	Open Collect			

Remark

- ▶ When using the High Speed Counter module, Be sure to check PADT version. GMWIN V3.61/ KGL-WIN V3.3.

4. External Input / Output Specification

4.1 Input Specification

Item	Open Collector Type		Differential Input Type
	Input Voltage	Level	Level
On-State Voltage(Min)	DC 5 V	4.5 V	EIA RS-422A Standard
	DC 12 V	11 V	
	DC 24 V	14 V	
Off-State Voltage(Max)	DC 5 V	0.8 V	
	DC 12 V	1.5 V	
	DC 24 V	2.5 V	

4.2 Preset, Gate Input Specification

Item		Level
Input Voltage		DC 5V / 12V / 24V
On-State Voltage(Min)	DC 5V	DC 4.5V
	DC 12V	DC 11V
	DC 24V	DC 14V
Off-State Voltage(Max)	DC 5V	DC 0.8V
	DC 12V	DC 1.5V
	DC 24V	DC 2.5V
On Delay Time		1ms or less
Off Delay Time		1ms or less

4.3 Transistor Output Specification

Item	Level
Coincidence Output	DC 24V, 100 mA/ point
Leakage Current	0.1 mA or less
Voltage drop	2.5 V or less
On Delay Time	0.2 ms or less
Off Delay Time	0.2 ms or less

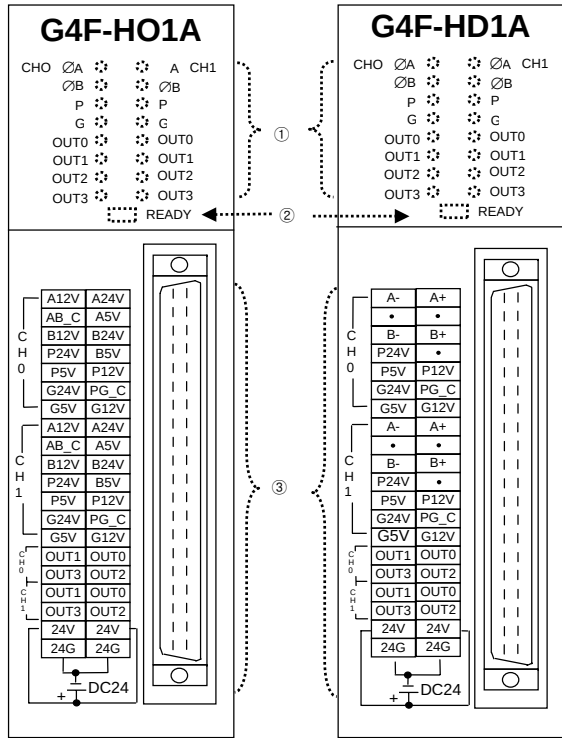
LG constantly endeavors to improve our products so that information in this datasheet is subjected to change without notice.

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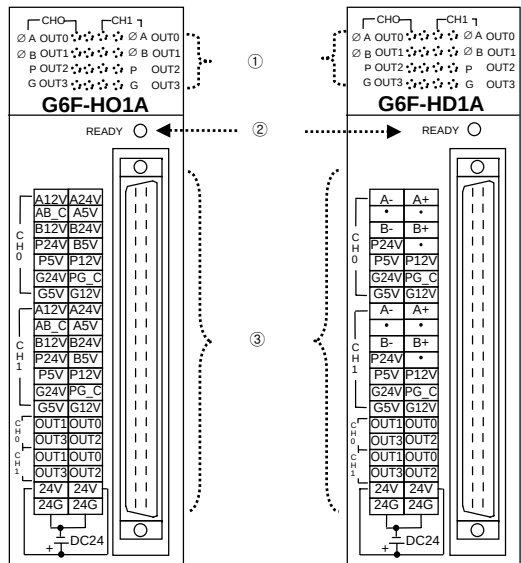
5. Part Identification Nomenclature

5.1 Part Identification

5.1.1 G4F-HO1A/HD1A



5.1.2 G6F-HO1A/HD1A



No	Name	Description
①	Run LED	Operating LED ▶ On: Voltage is applied to Phase A/ B pulse input terminals. Voltage is applied to Preset / Gate pulse input terminals. ▶ Off: No signal..
②	Ready LED	▶ On: Ready state. ▶ Off: PLC power off or CPU reset.
③	Connector	External wiring connector

5.2 Input/Output Terminal

Terminal Name		Signal Name			
		G4F-HO1A / G6F-HO1A		G4F-HD1A / G6F-HD1A	
	1	A12V	Phase A DC12V	A-	Phase A
	2	A24V	Phase A DC24V	A+	Phase A+
	3	AB_C	Phase A/B COM	-	-
	4	A5V	Phase A DC 5V	-	-
	5	B12V	Phase B DC 12V	B-	Phase B -
	6	B24V	Phase B DC 24V	B+	Phase B+
	7	P24V	Preset DC 24V	P24V	Preset DC 24V
	8	B5V	Phase B DC 5V	-	-
	9	P5V	Preset DC 5V	P5V	Preset DC 5V
	10	P12V	Preset DC 12V	P12V	Preset DC 12V
	11	G24V	Gate DC 24V	G24V	Gate DC 24V
	12	PG_C	Preset/Gate COM	PG_C	Preset/Gate COM
	13	G5V	Gate DC 5V	G5V	Gate DC 5V
	14	G12V	Gate DC 12V	G12V	Gate DC 12V
	15	A12V	Phase A DC12V	A-	Phase A -
	16	A24V	Phase A DC24V	A+	Phase A+
	17	AB_C	Phase A/B COM	-	-
	18	A5V	Phase A DC 5V	-	-
	19	B12V	Phase B DC 12V	B-	Phase B -
	20	B24V	Phase B DC 24V	B+	Phase B+
	21	P24V	Preset DC 24V	P24V	Preset DC 24V
	22	B5V	Phase B DC 5V	-	-
	23	P5V	Preset DC 5V	P5V	Preset DC 5V
	24	P12V	Preset DC 12V	P12V	Preset DC 12V
	25	G24V	Gate DC 24V	G24V	Gate DC 24V
	26	PG_C	Preset/Gate COM	PG_C	Preset/Gate COM
	27	G5V	Gate DC 5V	G5V	Gate DC 5V
	28	G12V	Gate DC 12V	G12V	Gate DC 12V
	29	OUT1	Coincidence output 1	OUT1	Coincidence output 1
	30	OUT0	Coincidence output 0	OUT0	Coincidence output 0
	31	OUT3	Coincidence output 3	OUT3	Coincidence output 3
	32	OUT2	Coincidence output 2	OUT2	Coincidence output 2
	33	OUT1	Coincidence output 1	OUT1	Coincidence output 1
	34	OUT0	Coincidence output 0	OUT0	Coincidence output 0
	35	OUT3	Coincidence output 3	OUT3	Coincidence output 3
	36	OUT2	Coincidence output 2	OUT2	Coincidence output 2
	37	24V	24V	24V	24V
	38	24V	24V	24V	24V
	39	24G	24V COM	24G	24V COM
	40	24G	24V COM	24G	24V COM

6. Handling precautions

- 2) Do not detach PCB from the case, it may cause malfunction.
- 3) During wiring or other work, do not allow any wire chips get inside the product.
- 4) Switch the external power off before mounting or removing the module and the cable.

7. Wiring

- 1) Be sure to separate the power line and the signal line during wiring.
- 2) Wire the cable as short as possible.
- 3) Use the separate cable between the AC power line and the signal line not to be affected by the AC surge or inductive noise.
- 4) Use the stable external power source for DC24V.
- 5) When wiring, separate the line from something heating and avoid the product from contacting with oil etc for a long time. It may cause malfunction, short or damage.

8. Function Block (GLOFA GM Series)

Function Block	Description	Operating Condition
HSCB_PRE	Preset value setting	Edge
HSCB_MOD	Count mode and Linear/Ring count selection	Edge
HSCB_AUX	Function setting	Edge
HSCB_CMP	Coincidence output setting	Edge
HSCB_CNT	Current count value reading	Level
HSCB_WR	Operating information writing	Level
HSCB_RD	Operating information reading	Level
HSCB_OUT	Coincidence output state reading	Level

9. Buffer Memory (MASTER-K Series)

Buffer Memory		Description
CH0	CH1	
00	32	1 phase, 2 phase, CW/CCW selection
01	33	Ring / linear count selection
02	34	Supplementary function selection
03	35	Coincidence output Out0 condition setting
04	36	Coincidence output Out1 condition setting
05	37	Coincidence output Out2 condition setting
06	38	Coincidence output Out3 condition setting
07	39	Preset value setting
08	40	
09	41	User-defined maximum value setting for ring count
10	42	
11	43	User-defined minimum value setting for ring count
12	44	
13	45	Time setting for the sampling count or Time setting for the periodic pulse count.
14	46	-
15	47	OUT0 coincidence output value for selection 0,1,2,3,4
16	48	OUT0 coincidence output user-defined minimum value for selection 5,6
17	49	OUT0 coincidence output user-defined maximum value for selection 5,6
18	50	OUT1 coincidence output value for selection 0,1,2,3,4
19	51	OUT1 coincidence output user-defined minimum value for selection 5,6
20	52	OUT1 coincidence output user-defined maximum value for selection 5,6
21	53	OUT2 coincidence output value for selection 0,1,2,3,4
22	54	OUT2 coincidence output user-defined minimum value for selection 5,6
23	55	OUT2 coincidence output user-defined maximum value for selection 5,6
24	56	OUT3 coincidence output value for selection 0,1,2,3,4
25	57	OUT3 coincidence output user-defined minimum value for selection 5,6
26	58	OUT3 coincidence output user-defined maximum value for selection 5,6
27	59	OUT3 coincidence output user-defined minimum value for selection 5,6
28	60	OUT3 coincidence output user-defined maximum value for selection 5,6
29	61	OUT3 coincidence output user-defined maximum value for selection 5,6
30	62	Current count value
64	80	Latch count value or Previous value of peoridic pulse count
66	82	Latch count value or Previous value of peoridic pulse count
67	83	Latch count value or Previous value of peoridic pulse count
68	84	Sampling count value or Current value of peoridic pulse count
69	85	Sampling count value or Current value of peoridic pulse count
70	86	Sampling count value or Current value of peoridic pulse count
71	87	Number of clock for Phase A
72	88	Number of clock for Phase B
73	89	Number of clock for Phase B

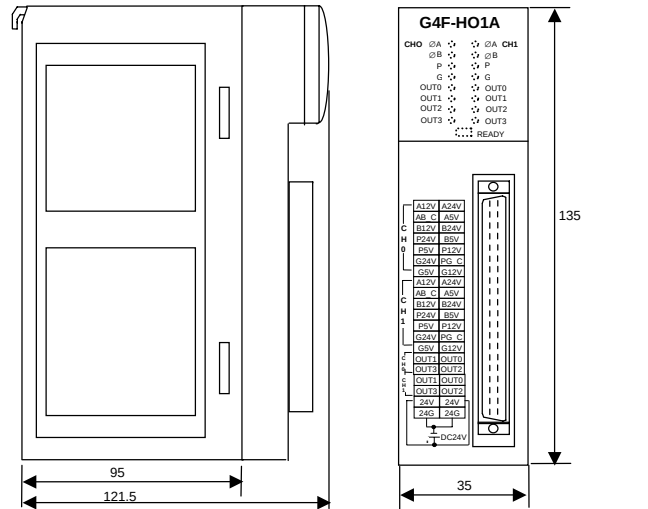
10. Input/Output Signal (MASTER-K Series)

Input/Output occupied points of high speed counter module is 64points.

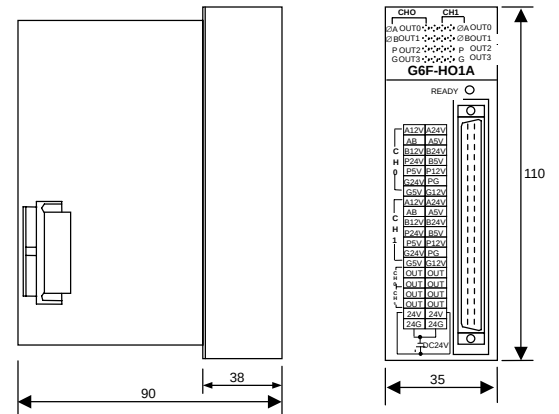
CH	PLC <- Counter		PLC -> Counter	
	Address	Description	Address	Description
0	P(N)0	Up/Down enable command	P(N+2)0	Count enable command (Level)
	P(N)1	Preset flag	P(N+2)1	Preset enable command (Edge)
	P(N)2	Gate flag	P(N+2)2	Up/Down count enable command (Level)
	P(N)3	Carry	P(N+2)3	Supplementary function enable Command (AUX_E, GATE)
	P(N)4	Borrow	P(N+2)4	Comparing enable command (Level)
	P(N)5	Supplementary function flag	P(N+2)5	Output enable command (Level)
	P(N)6	Out 0	P(N+2)6	Out 0 coincidence output reset (Edge)
	P(N)7	Out 1	P(N+2)7	Out 1 coincidence output reset (Edge)
	P(N)8	Out 2	P(N+2)8	Out 2 coincidence output reset (Edge)
	P(N)9	Out 3	P(N+2)9	Out 3 coincidence output reset (Edge)
	P(N)A	-	P(N+2)A	Carry/Borrow reset command (Edge)
	P(N)B	-	P(N+2)B	External Preset input enable command
	P(N)C	-	P(N+2)C	External supplementary function enable command
	P(N)D	-	P(N+2)D	Preset flag reset command
	P(N)E	-	P(N+2)E	Supplementary function flag reset command
	P(N)F	-	P(N+2)F	-
1	P(N+1)0	Up/Down enable command	P(N+3)0	Count enable command (Level)
	P(N+1)1	Preset flag	P(N+3)1	Preset enable command (Edge)
	P(N+1)2	Gate flag	P(N+3)2	Up/Down count enable command (Level)
	P(N+1)3	Carry	P(N+3)3	Supplementary function enable Command (AUX_E, GATE)
	P(N+1)4	Borrow	P(N+3)4	Comparing enable command (Level)
	P(N+1)5	Supplementary function flag	P(N+3)5	Output enable command (Level)
	P(N+1)6	Out 0	P(N+3)6	Out 0 coincidence output reset (Edge)
	P(N+1)7	Out 1	P(N+3)7	Out 1 coincidence output reset (Edge)
	P(N+1)8	Out 2	P(N+3)8	Out 2 coincidence output reset (Edge)
	P(N+1)9	Out 3	P(N+3)9	Out 3 coincidence output reset (Edge)
	P(N+1)A	-	P(N+3)A	Carry/Borrow reset command (Edge)
	P(N+1)B	-	P(N+3)B	External Preset input enable command
	P(N+1)C	-	P(N+3)C	External supplementary function enable command
	P(N+1)D	-	P(N+3)D	Preset flag reset command
	P(N+1)E	-	P(N+3)E	Supplementary function flag reset command
	P(N+1)F	-	P(N+3)F	-

11. External Dimension

11.1 G4F-HO1A/HD1A



11.2 G6F-HO1A/HD1A



12. Warranty

1. Warranty period
LGIS provides an 18-month-warranty from the date of the production.
2. Warranty conditions
For troubles within the warranty period, LGIS will replace the entire PLC or repair the troubled parts free of charge except the following cases.
 - (1) The troubles caused by improper condition, environment or treatment except the instructions of LGIS.
 - (2) The troubles caused by external devices.
 - (3) The troubles caused by remodeling or repairing based on the user's own discretion.
 - (4) The troubles caused by improper usage of the product.
 - (5) The troubles caused by the reason which exceeded the expectation from science and technology level when LGIS manufactured the product.
 - (6) The troubles caused by natural disaster.
3. This warranty is limited to the PLC itself only. It is not valid for the whole system which the PLC is attached to.