

FnIO G-Series:

GL-9981

G-Series Embedded Type Programmable I/O

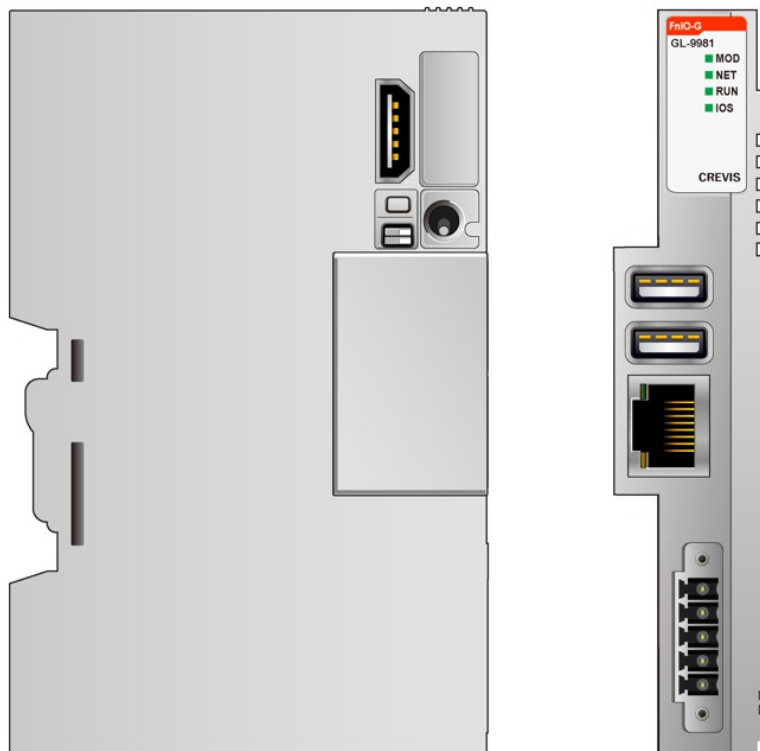


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History

Rev	Pages	Remarks	Date	Editor
1.00			Jul 20, 2023	Tae Eun, Kim

1. Environment Specification

Environmental Specification	
Operation Temperature	-25°C~50°C
Storage Temperature	-40°C ~85°C
Relative Humidity	5%~90% Non-condensing
Mounting	DIN rail
General Specification	
Shock Operating	IEC 60068-2-27
Vibration Resistance	Based on IEC 60068-2-6, 4g
Industrial Emissions	EN61000-6-4/All : 2011
Industrial Immunity	EN 61000-6-2 : 2019
Installation Position	Vertical and horizontal installation is available
Product Certifications (TBD)	CE, UKCA

2. GL-9981 (Embedded Type Programmable I/O)

2.1. GL-9981 Specification

Items	Specification								
Communication Interface Specification									
PIO Type	G-Series Embedded Type Programmable I/O								
Meaning of the last letter *	GL-9981-L : Linux Version GL-9981-C : CoDeSys Version								
Installed Version	Raspberry Pi OS GNU/Linux 11 (bullseye) 5.10.73-v7l+ #1468								
RAM	LPDDR4 2GB								
eMMC Flash Memory	16GB								
CoDeSys Runtime (Only GL-9981-C)	CODESYS Control for Raspberry Pi MC SL pre-installed & licensed. - Runtime Package 4.2.0.0 (raspberrypi, armhf) - Available from version CODESYS V3.5 SP17 Patch 1 or higher * Tested in CODESYS V3.5 SP17 Patch 3+ (64-bit) version								
Max. Data Size	Max Input Data Size 6300 bytes / Max Output Data Size 6300 bytes								
Max. Expansion Module	63 Slots (TBD)								
Interface Connector	RJ-45 Socket * 1pcs USB 2.0 Port * 2pcs Monitor Port * 1pcs								
Ethernet Baudrate	100Mbps, Auto-negotiation, Full Duplex								
Indicator	4 LEDs 1 Green, Module Status (MOD) 1 Green, Network Status (NET) 1 Green/Red, Custom (RUN) 1 Green/Red, Expansion I/O Module Status (IOS)								
Programmable	Push Botton * 1pcs Toggle Switch * 1pcs								
RTC	Retain Time : < 15 day (fully recharged battery at room temperature) <table border="1" data-bbox="529 1256 1086 1413"> <thead> <tr> <th>Battery charging time</th> <th>Retain time (room temperature)</th> </tr> </thead> <tbody> <tr> <td>4 hours</td> <td>< 2 day</td> </tr> <tr> <td>12 hours</td> <td>< 12 day</td> </tr> <tr> <td>16 hours</td> <td>< 15 day</td> </tr> </tbody> </table> RTC Warning : There are 3 operating problems when the battery is discharged. - Retain data is not save. - RTC data is not stored and is the initial value. - Reset button does not work.(PLC Reset and Factory Reset cannot be used) - Recommend charging for at least 16 hours when the battery is discharge.	Battery charging time	Retain time (room temperature)	4 hours	< 2 day	12 hours	< 12 day	16 hours	< 15 day
Battery charging time	Retain time (room temperature)								
4 hours	< 2 day								
12 hours	< 12 day								
16 hours	< 15 day								

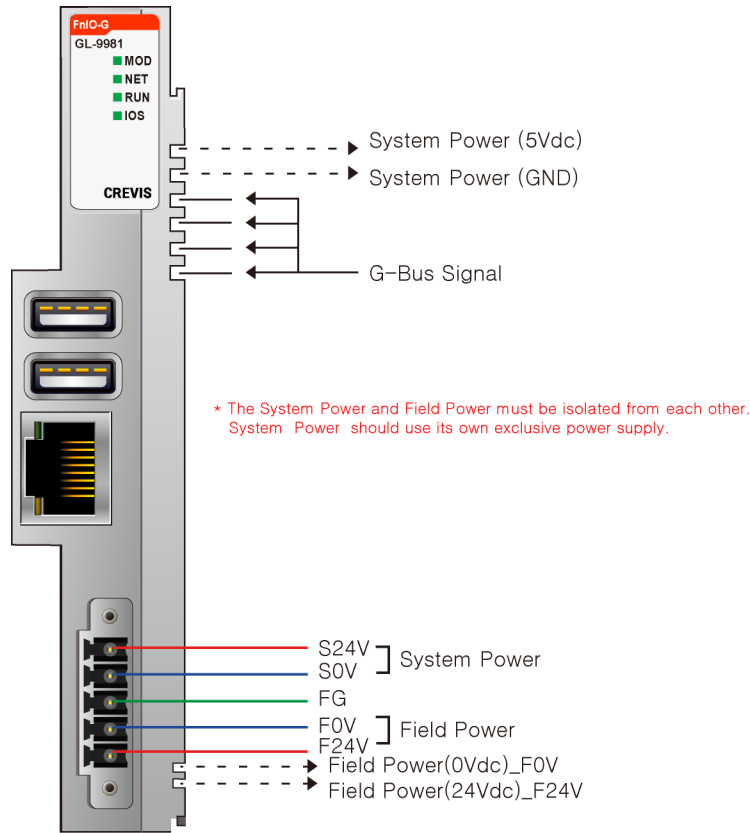
* Identification by markings printed on the case

Items	Specification
General specification	
UL System Power	Supply voltage : 24Vdc nominal, Class2
System Power	Supply voltage : 24Vdc nominal Supply voltage range : 15~28.8Vdc Reverse polarity protection
Power Dissipation	225mA typical @ 24Vdc
Current for I/O Module **	0.5A @ 5Vdc
Isolation	System power to internal logic : Non-isolation System power I/O driver : Isolation
UL Field Power	Supply voltage : 24Vdc nominal, Class2
Field Power	Supply voltage : 24Vdc typical (Max. 28.8Vdc) * Field Power Range is different depending on IO Module series. Refer to IO Module`s Specification.
Max. Current Field Power Contact	DC 8A Max
Wiring	0.05mm ² - 1.31mm ² (30-16 AWG)
Weight	87g
Module size	22.5mm x 109mm x 70mm
Environment Condition	Refer to '1. Environment Specification'

** If the load used exceeds the specifications, a throttling mode may occur due to heat, resulting in degraded performance or abnormal operation. (The internal temperature must be less than 85°C)

** Install it in a ventilated place that is not closed place, and if possible, install a circulation fan to generate air flow.

2.2. GL-9981 Wiring Diagram



2.2.1. Power Connector



Pin No.	Signal Description
1	System Power, 24V
2	System Power, Ground
3	F.G
4	Field Power, Ground
5	Field Power, 24V

* **Warning:** The system power must not be connected with field power. Use separate voltage supplies.

2.3. GL-9981 LED Indicator

2.3.1. LED Indicator



LED No.	LED Description	LED Color
MOD	Module Status	Green
NET	Network Status	Green
RUN	Custom	Green/Red
IOS	Expansion IO Status	Green/Red

2.3.2. MOD (Module Status LED)

Status	LED is	To indicate		
Not Powered	Off	Power is not supplied to the unit.		
Idle		Powered on but not accessing eMMC.		
Normal, Operational (eMMC access)	Flashing Green	The unit is operating in normal condition.		
Error during booting	Blinking Green (See 'To indicate'.)	Error patterns		
		Long flashes	Short flashes	Status
		0	3	Generic failure to boot
		0	4	start*.elf not found
		0	7	Kernel image not found
		0	8	SDRAM failure
		0	9	Insufficient SDRAM
		0	10	In HALT state
		2	1	Partition not FAT
		2	2	Failed to read from partition
		2	3	Extended partition not FAT
		2	4	File signature/hash mismatch
		3	1	SPI EEPROM error
		3	2	SPI EEPROM is write protected
		3	3	I2C error
		4	4	Unsupported board type
		4	5	Fatal firmware error
4	6	Power failure type A		
4	7	Power failure type B		

2.3.3. NET (Network Status LED)

Status	LED is	To indicate
Not Powered	Off	Power is not supplied to the unit.
Ethernet off		LAN cable is not connected, or Ethernet is inactive.
Ethernet Activity	Green	LAN cable is physically connected to the Ethernet port and is active.

2.3.4. RUN (Custom LED)

Status	LED is	To indicate
User-defined (TBD)	Off/Green/Red	Displayed by the user's program.

2.3.5. IOS (Expansion Module Status LED)

Status	LED is	To indicate
No Expansion I/O	Off	Device has no expansion modules or not powered.
Have Expansion I/O	Green	Device has expansion modules.
Configuration Fault	Red	Replace expansion modules or fail to initialize. <ul style="list-style-type: none"> - Detect invalid expansion module ID. - Initial protocol failure. - Mismatch vendor code between adapter and expansion module. - Changed expansion module configuration. - Too many expansion modules. - Communication failure. - Overflowed I/O size.

2.4. GL-9981 Electrical Interface

2.4.1. RJ-45 Socket



RJ-45	Signal Name	Description
1	TD+	Transmit +
2	TD-	Transmit -
3	RD+	Receive +
4	-	
5	-	
6	RD-	Receive -
7	-	
8	-	
Case	Shield	

2.4.2. USB 2.0 Port



USB 2.0 (Type-A)	Signal Name	Description
1	VCC	+5Vdc
2	D-	Data-
3	D+	Data+
4	GND	Ground

2.4.3. Monitor Port



Monitor	Signal Name	Description
1	TMDS Data2+	TMDS Lanes
2	TMDS Data2 Shield	
3	TMDS Data2-	
4	TMDS Data1+	
5	TMDS Data1 Shield	
6	TMDS Data1-	
7	TMDS Data0+	
8	TMDS Data0 Shield	
9	TMDS Data0-	
10	TMDS Clock+	
11	TMDS Clock Shield	
12	TMDS Clock-	
13	CEC	CEC Remote Control
14	Reserved	
15	SCL	DDC Clock
16	SDA	DDC Data
17	GND	CEC/DDC/HEAC Ground
18	+5V	Power EDID/DDC
19	HPD	Hot Plug Detect

2.4.4. Switch and Button



Push Button	Signal Name	Description
Push and detach	User-defined	It operates according to the user's program.



Toggle Switch	Signal Name	Description
Up/Down	User-defined	It operates according to the user's program.



Dip Switch	Signal Name	Description
Turn on switch 1	force USB boot mode	After connecting to PC and booting in USB Device mode, OS installation is possible.
Turn on switch 2	EEPROM write protect.	Write-protect to the onboard EEPROM that stores the boot code.

* **Warning:** Turn off the switch when not in use.