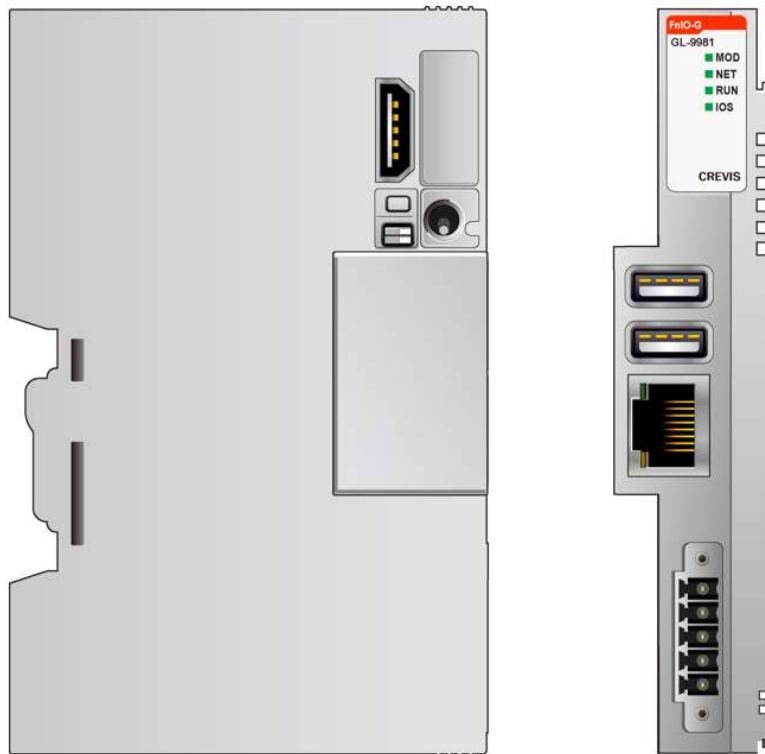


FnIO G-Series:

GL-9981

G-Series Linux Type Programmable I/O



[History]

Rev	Page	Remarks	Date	Editor
1.00		Draft	2021.11.17	YM KIM

Table of Contents

1.Environment Specification.....	4
2.G-Series Linux Type Programmable I/O.....	5
2.1.GL-9981 Specification.....	5
2.2.GL-9981 Wiring Diagram.....	7
2.2.1.Power Connector.....	7
2.3.GL-9981 LED Indicator.....	8
2.3.1.LED Indicator.....	8
2.3.2.MOD (Module Status LED).....	8
2.3.3.NET (Network Status LED).....	8
2.3.4.RUN (PLC Run/Stop Status LED) - TBD.....	9
2.3.5.IOS (Expansion Module Status LED) - TBD.....	9
2.4.Electrical Interface.....	9
2.4.1.RJ-45 Socket.....	9
2.4.2.USB 2.0 Port.....	9
2.4.3.Display Port.....	10
2.4.4.Switch and Button.....	10

1. Environment Specification

Environmental specification	
Item	Specification
Operating Temperature	-25°C~60°C
UL Temperature	-25°C~60°C
Storage Temperature	-40°C~85°C
Relative Humidity	5% ~ 90% non-condensing
Mounting	DIN rail

Vibration Resistance	
Item	Specification
Shock Operating	IEC 60068-2-27
Vibration Resistance	IEC 60068-2-6, 4g
Industrial Emissions	EN 61000-6-4/A11 : 2011
Industrial Immunity	EN 61000-6-2 : 2019
Installation Position	Vertical and horizontal installation is available.
Product Certifications	CE,UL,FCC (TBD)

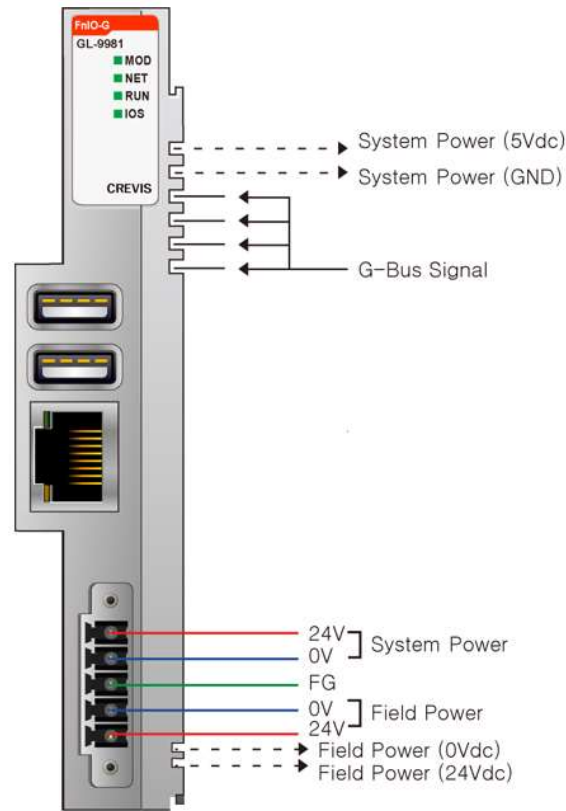
2. G-Series Linux Type Programmable I/O

2.1. GL-9981 Specification

Communication Interface Specification									
Item	Specification								
PIO Type	Linux Type Programmable I/O - Linux Version : GL-9981-L - CoDeSys Version : GL-9981-C								
Processor	Quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz								
RAM	LPDDR4 1GB								
eMMC Flash Memory	8GB								
Interface Connector	RJ-45 Socket * 1pcs USB 2.0 Port * 2pcs Display Port * 1pcs								
Ethernet Baudrate	100Mbps, Auto-negotiation, Full Duplex								
Indicator (TBD)	4 LEDs 1 Green/Red, Module Status (MOD) 1 Green/Red, Network Status (NET) 1 Green/Red, PLC Status (RUN) * can be changed. 1 Green/Red, Expansion I/O Module Status (IOS) * can be changed.								
PLC Status Control	Reset Push Botton * 1pcs Run/Stop Toggle Switch * 1pcs								
Programming * GL-9981-C (TBD)	CoDeSys V3.5.11.3 - Runtime : Multicore CODESYS Control runtime pre-installed & licensed.								
RTC (TBD)	Retain Time : < 15 day (fully recharged battery at room temperature) <table border="1"> <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> <p>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.</p>	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								

General specification	
Item	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 (TBD)	75mA typical @ 24Vdc
Current for I/O Module	1.0A @ 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	I/O Cable Max. 2.0mm ² (AWG 14)
Torque	0.8Nm(7 lb-in)
Weight (TBD)	76g
Module size	22mm x 109mm x 70mm
Environment Condition	Refer to '1. Environment Specification'

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	PLC Status	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 (PLC Run/Stop Status LED) - TBD

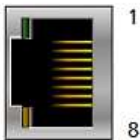
Status	LED is	To indicate
None PLC	Off	Device has no program.
PLC Run	Green	PLC program is running.
PLC Stop	Blinking Green	PLC program stop.
Firmware Fault	Red	The unit has occurred unrecoverable fault in self-testing.
Diagnostic	Blinking Red	PLC program and expansion I/O modules do not match.

2.3.5. IOS (Expansion Module Status LED) - TBD

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. - Detect invalid expansion module ID. - Initial protocol failure. - Mismatch vendor code between adapter and expansion module. - Changed expansion module configuration.
Connection Fault	Blinking Red	One or more expansion module occurred in fault state. - Too many expansion modules. - Communication failure. - Overflowed I/O size.

2.4. 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. Display Port



USB 2.0	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	Reset	Reset CodeSys PLC program and make the program be in the stop status.
Push for 5sec	PLC Reset	Erase CodeSys PLC program and retain memory.
Push for 20sec	Factory Reset	Erase CodeSys PLC program and parameter reset.



Toggle Switch	Signal Name	Description
Up	Run	PLC Run.
Down	Stop	PLC Stop.



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:** Leave the switch off when not in use.