FL721-0806R-D

Datasheet

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1 Product Overview

1.1 Product introduction

The FL7 Series PLC, developed by Flexem, represents a new generation of programmable logic controllers (PLCs) that integrate cutting-edge industrial technologies and high-performance components.

Key Features:

- Object-Oriented Programming (OOP) Design: Enhances code reusability and modularity.
- Compliance with IEC 61131-3 Standard: Ensures industry-standard programming compatibility.
- Dual Programming Language Support: Combines Ladder Logic (LD) and Structured Text (ST) for flexible development.
- Compatibility with Japanese & European PLC Styles: Adapts to diverse user preferences while enabling complex computational functions.
- Motion Control Compliant with PLCOpen Standards: Supports advanced automation and precise motion control applications.

The FL7 Series PLC is engineered to deliver high reliability, advanced functionality, and seamless integration, making it ideal for modern industrial automation systems.

1.2 Product Appearance

2 Main Information

Item	Specification
Series	FL7
Product Or Component Type	Programmable Logic Controller
Rated Supply Voltage	DC 24V
Discrete Input Number	8（8 Fast）
Discrete Output Type	Relay
Discrete Output Number	6
Discrete Output Voltage	DC 5V~30V；AC100V~250V
Discrete Output Current/Point	Max 2A
Discrete Output Current	Max 4A

3 Detail Specification

3.1 Fast Transistor input（HSC）

Item		Specification
Rated Voltage		DC 24 V
Input Range		DC 19.2V~28.8V
Input type		NPN/PNP
Input points		8
HSC Channel		4
Rated Current		0.1A
Input impedance		2.8KΩ
State	Voltage in state 1	> 15 V DC (15~28.8 V DC)
	Voltage in state 0	< 5 VDC (0~5 V DC)
	Current in state 1	> 5 mA
	Current in state 0	< 1.5 mA
Max Frequency	A/B	100kHz
	Pulse/Direction	200kHz
	Single Phase	200kHz
Operation Mode		◆ A/B ◆ Pulse/Direction ◆ Single/Dual Phase
Cable length		Max 5m
Type		Shielded cable
Wiring terminal		Removable terminal block

3.1.1 Relay Output

Characteristics	Parameter
Rated Voltage	DC 24V；AC 220V
Input range	DC 5V~30V；AC100V~250V
Rated Current	Max 2A/Point

Current/group		4A (relay output @60°C, 50% derating required)
Peak	Maximum switching voltage	AC 250V；DC 30V
	Current per point	5A
Isolation type		Relay coil
Maximum out put frequency	Max Load	0.1Hz
	Without load	5Hz
Resistive load		2A/Point，DC 24V/ AC 220V
Mechanical life		Minimum 5,000,000 times
Electrical contact life		Minimum 100,000 times
Short circuit protection		None
Wiring terminal		Removable terminal block

3.2 Environmental Characteristics

Category	Characteristic
Operating ambient temperature	-10℃~60℃
Storage temperature	-20℃~70℃
Relative humidity	55%~95%， without condensation
Class of pollution	2（IEC60664）
Class of protection	IP20
Coating	Coated protection, dry film thickness ≥ 20μm; reinforced dry film thickness ≥ 40μm
Altitude	Operation：0m~3,000m Transportation：≤6,000m
Seismic performance	5~13.2Hz Amplitude 7mm, 13Hz~100Hz Acceleration 2G, 20 times each in X, Y and Z axes
Impact performance	Semi-positive sine wave, acceleration 15G, duration

	11ms, 6 times in each of the X, Y and Z directions

3.3 Electromagnetic Susceptibility

Standard	Method	Item
EN IEC 61000-6-4:2019	CISPR 16-2-1	Conducted Emissions at AC Mains Power Port (150kHz-30MHz)
	CISPR 32	Conducted Emissions at Wired Network Port(150kHZ-30MHz)
	CISPR 16-2-3	Radiated Emissions(30MHZ-1GHz)
	CISPR 16-2-3	Radiated Emissions(Above 1GHz)
EN IEC 61000-6-22019	EN 61000-4-6:2014	Conducted Immunity at AC Mains Power Port(150kHZ-80MHz
	EN 61000-4-6:2014	Conducted Immunity at Signal Port150kHz-80MHz
	EN 61000-4-4:2012	Electrical Fast Transients Burst at AC Mains Power Port
	EN 61000-4-4:2012	Electrical Fast Transients Burst at Signal Port
	EN 61000-4-2:2009	Electro static Discharge
	EN 61000-4-8:2010	Power Frequency Magnetic Field
	EN IEC 61000-4-3:2020	Radiated Immunity(80MHZ-6GHz)
	EN 61000-4-5:2014+A1:2017	Surge at AC Mains Power Port
	EN 61000-4-5:2014+A1:2017	Surge at Signal Port
	EN IEC 61000-4-11:2020	Voltage Dips and Interruptions

The FL7 Series DC power supply type PLCs system meets the following safety standards:

- IEC 61010-1:2010 + A1:2019
- AMD1: 2016

3.4 Power

3.4.1 Safety notes

- If the specified voltage range cannot be maintained, the output may not switch as expected. Please use a proper safety interlock and voltage monitoring circuit.
- Required for the FL7 Series PLCs and associated I/O extension modules. According to IEC 61140, the 24 V DC power supply must be rated for Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV). These power supplies are isolated between the electrical input and output circuits of the power supply.
- The FL7 Series PLCs must be supplied by a 24 V external power supply device. During a power failure, the PLC associated with a suitable power supply can continue to operate normally for at least 10 ms according to the IEC standard.
- For relay output (≥2A) wiring, use a conductor with a cross-sectional area of at least 0.5 mm² and a rated temperature of at least 80°C.

3.4.2 Connect Power Cord

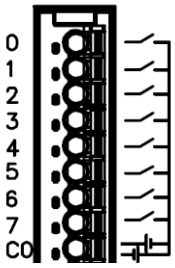
Make sure the external DC power supply meets the following characteristic requirement.

Characteristic	Value
Rated voltage	24V DC
Supply voltage range	20.5V~28.8V DC
Power interruption time	10 ms at 24V DC
Maximum peak current	35A
Maximum power consumption	15W

The method of connecting DC power cords is as follows：

- Connect the positive pole of the external DC power supply to the "24V" terminal of the PLC DC power input.
- Connect the negative pole of the external DC power supply to the "0V" terminal of the PLC DC power input.

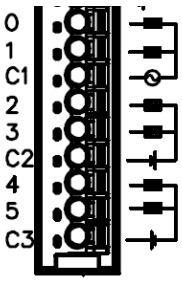
3.5 Digital Input Wiring Diagram



- The C0 terminal can be connected to the positive or negative terminal of the power supply according to the input type.
- When using the high speed pulse input, use a shielded cable and keep it well earthed.

3.6 Output Wiring Diagram

- Relay output wiring：



- The C1, C2, and C3 terminals are independent of each other and can be connected to different power as needed.

3.7 Connect to USB Port

You can program for the PLC via USB interface. The method of connecting USB ports is as follows：

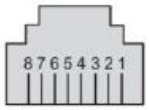
1)Connect the Type-C end of the USB connection cable to the USB interface of the PLC.

2)Connect the Type-A end of the USB cable to the USB interface of the PC.

3.8 Connect to Ethernet Port

Ethernet interface is RJ45 type, 10Mbps/100Mbps, adaptive/half full duplex.

The following diagram shows the Ethernet connector pin definitions:



No.	Signal
1	TD+
2	TD-
3	RD+
4	-
5	-
6	RD-
7	-
8	-

Using RJ45 standard Ethernet cable to connect Ethernet ports of PLC to Ethernet port of device such as PC.

3.9 Connect to Serial Communication Port 1

The position of serial port 1 of the controller is shown below, Serial port 1 interface type is RS485, with isolation

3.10 Connect to Serial Communication Port2

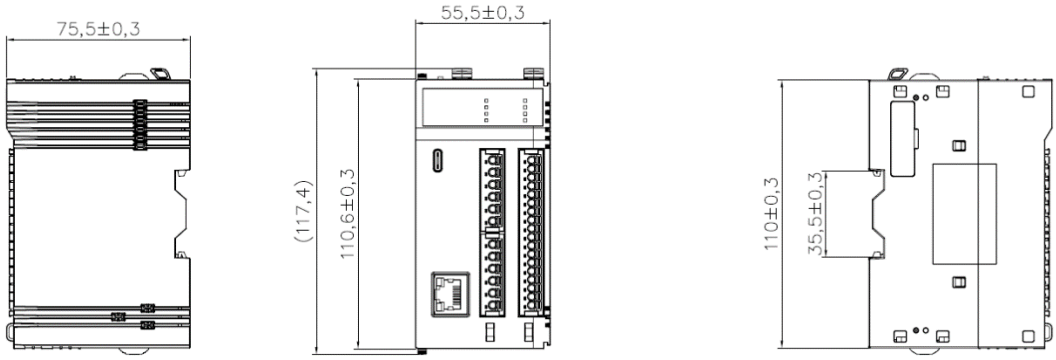
The position of serial port 2 of the controller is shown below, Serial port 2 interface type is RS485, with isolation

Use twisted pair wire to connect to A and B terminals, and the other end of twisted pair to RS485 + and RS485- terminals to the serial port of the peer device, respectively.

4 Dimension&Installation

4.1 Product dimension

CPU Dimension(Unit: mm)



Model	IO	DIN rail dimension	Dimension
			W×H×D
FL721-0806R-D	14	35	56×118×76

4.2 Ventilation requirements

The equipment needs to be installed in a cabinet with good ventilation conditions and to ensure that there is enough space around the equipment to allow it to dissipate heat.

- Install the equipment that dissipates the most heat on top of the cabinet to ensure proper ventilation.
- Do not install the equipment next to or above equipment that may cause overheating.
- To ensure that the equipment works well，please keep the ambient temperature between 0 °C and 50 °C.

4.3 Minimum Spacing

The FL7 Series PLCs have an IP20 protection grade and must be installed in a chassis. The installation spacing must be taken into account when installing this product. There are 3 types of spacing as follows:

- Spacing to all sides of the cabinet (including panel doors).
- Spacing between the terminal block and the wiring duct. This distance reduces electromagnetic interference between the controller and the wiring ducts.
- Spacing to other heat generating equipment installed in the same cabinet.

The minimum spacing for the FL7 Series PLCs installation（the spacing between PLC upper panel （lower panel, left panel, or right panel）and cabinet sides is at least 30mm; the spacing between PLC front panel and cabinet door is at least 80mm).

4.4 Anti-foreign object sticker

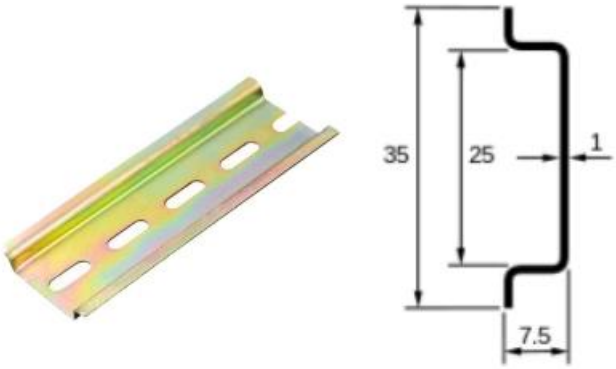
Do not remove the anti-foreign object protection sticker during installation to prevent foreign objects from falling into the machine and causing short circuits and other faults.After installation and before powering up the unit, the anti-foreign object protection sticker must be removed to avoid overheating of the PLC caused by poor heat dissipation.

4.5 Installation of DIN Rail

The controller and its extension modules can be installed on DIN rails which can be fitted to a flat installation surface.

1)Prepare DIN rails of the following specifications and install DIN rails into the cabinet.

The recommended DIN rail for PLC installation is 35 mm high and 7.5 mm deep, as shown below.



2) Press down on the red installation buckle of the PLC to make the guide rail installation slot open. Then insert the PLC into the DIN rail.

3) Pull up the red installation buckle of the PLC to lock it onto the DIN rail.