

LE5107 14 通道数字量输入/10 通道继电器数字量输出 CPU 模块

LE5107 是 LE 系列小型 PLC 的 CPU 模块，可完成系统所需的控制、检测、诊断和 RS485 通讯。具体实现的功能如下：RUN/STOP 开关选择模块的运行停止模式；实时时钟记录运行时间；自带 USB 存储卡接口，方便加载用户程序；RS485 接口提供应用程序的下载通道，支持对外部设备的访问和 PLC 多机互联；自带 14 通道数字量输入，10 通道继电器输出，是一款通用的 CPU 模块。

技术规格

CPU 特性		电源规格		
本机 I/O	14 通道 24VDC 数字量输入/10 通道继电器输出	输入电源	额定电压	100~240VAC
可扩展模块数量（Max.）	16（满足模块功耗的条件下）		允许范围	85~264VA （50/60Hz）
可扩展扩展板数量	1		电流消耗	600mA
编程语言	LD/ST/CFC/SFC	对外输出电压		24VDC
程序区存储容量	128K 字节	对外输出电流（Max.）	+24VDC（对扩展总线提供）	500mA
数据区存储容量	36K 字节		+24VDC（对外提供）	200mA
掉电保持区容量	4K 字节		+5VDC（对扩展总线提供）	1200mA
存储卡	USB 接口存储卡	掉电保持时间		80ms
高速计数器（Max.）	单相计数器：4 点，100KHz	输出特性		
	双相计数器：2 点，50KHz	输出通道数目	10	
脉冲捕获	4 点	输出类型	继电器	
快速外部中断	6 点	额定电压	24VDC 或 24~230VAC	
测频功能	4 点	允许范围	5~30VDC 或 5~250VAC	
基本指令处理时间	0.1μs	输出电流	2A（阻性负载）	
输入特性		公共端输出电流总和	<10A	
输入通道数目	14	接通状态阻抗	0.2Ω	
输入类型	漏型/源型	输出开关频率（Max.）	1Hz	
额定电压	24VDC	继电器机械寿命	无负载：达 10,000,000 次以上	
允许范围	0~30VDC		额定阻性 2A 负载：达 100,000 次以上	
逻辑 1 信号	15~30VDC，允许最小电流 3mA	隔离方式	继电器隔离（现场与系统间）	
逻辑 0 信号	0~5VDC，允许最大电流 1mA	隔离组	3	
滤波参数	不滤波、5μs、10μs、20μs、100μs、200μs、1ms、5ms、10ms、20ms、50ms、100ms	隔离耐压	2500VAC，持续时间 1min，漏电流<5mA	
		通讯特性		
隔离方式	光耦隔离（现场与系统间）	通讯接口	2 个 RS485	
隔离组	1	接口类型	RS485 圆形接口，端子接口	
隔离耐压	500VAC，持续时间 1min，漏电流<5mA	通讯速率（bps）	1200、2400、4800、9600、19200、38400、57600、115200	
物理特性		通讯协议	专有协议、Modbus 主从、自由口协议、多机互联（仅限端子接口）	
尺寸规格（宽×高×深）	117mm×97mm×90mm			
重量	567g	存储温度	-40~70℃	
工作温度	0~60℃	存储环境相对湿度	5%~95%（无凝结）	
工作环境相对湿度	5%~95%（无凝结）			

指示灯定义

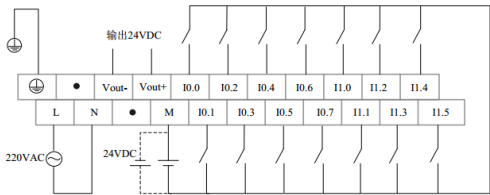
指示灯类型	颜色	状态	含义
电源 PWR	绿色	亮	电源工作正常
		灭	电源工作不正常或没有相应的电源加载
通道指示灯 Ix.y,Qm.n	绿色	亮	本通道 ON 状态
		灭	本通道 OFF 状态
运行指示灯 RUN/STOP	绿色 黄色	绿亮	PLC 处于 RUN 状态, 用户程序运行
		黄亮	PLC 处于 STOP 状态, 用户程序停止
		黄绿交 1Hz	PLC 处于等待从存储卡加载用户程序状态
		替闪烁 4Hz	PLC 处于正在从存储卡加载用户程序状态
故障指示灯 ERR, (详见右侧说明)	红色	亮	PLC 发生某种或某些可以诊断的故障
		灭	PLC 工作正常

说明: ERR 亮的可能性及解决方法:

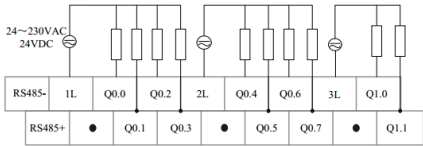
- (1) 编程软件的系统配置与实际硬件配置不一致;
方法: 重新配置编程软件;
- (2) 与扩展模块通讯故障;
方法: 检查扩展模块连接是否正确;
- (3) 扩展的各个模块发生故障上报;
方法: 更换发生故障的扩展模块。

端子定义与接线

LE5107 模块使用 220VAC 电源，采用两个双排可插拔端子（11×2 和 9×2），上排端子为输入通道（DI），下排端子为输出通道（DO），接线简单方便，采用螺丝固定，是一种典型的现场接线示例。



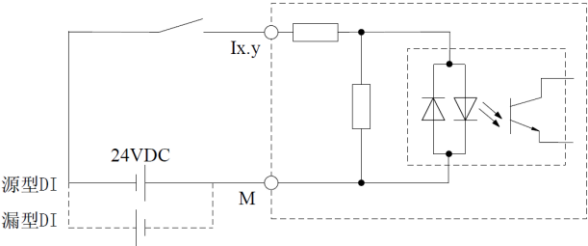
LE5107 上排端子定义与接线图



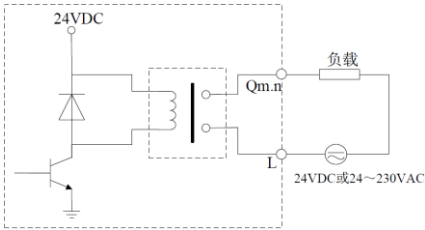
LE5107 下排端子定义与接线图

端子标识	含义	端子标识	含义
	保护地	L	火线
•	无连接	N	零线
Vout-	输出 24VDC 负	•	无连接
Vout+	输出 24VDC 正	M	输入通道外接公共端
I0.0	快速外部中断 1脉冲捕获 1侧频通道 1单相计数器 1/双相计数器 1 的 A 相/普通输入	I0.1	快速外部中断 2脉冲捕获 2侧频通道 2单相计数器 2/双相计数器 1 的 B 相/普通输入
I0.2	快速外部中断 3脉冲捕获 3侧频通道 3单相计数器 3/双相计数器 2 的 A 相/普通输入	I0.3	快速外部中断 4脉冲捕获 4侧频通道 4单相计数器 4/双相计数器 2 的 B 相/普通输入
I0.4	快速外部中断 5单相计数器 1 方向控制端/普通输入	I0.5	快速外部中断 6单相计数器 2 方向控制端/普通输入
I0.6	单相计数器 3 方向控制端/普通输入	I0.7	单相计数器 4 方向控制端/普通输入
I1.0	单相计数器 1 清零端/双相计数器 1 清零端/普通输入	I1.1	单相计数器 2 清零端/普通输入
I1.2	单相计数器 3 清零端/双相计数器 2 清零端/普通输入	I1.3	单相计数器 4 清零端/普通输入
I1.4	普通输入端	I1.5	普通输入端
RS485-	RS-485 通信	RS485+	RS-485 通信
1L	输出公共端 (Q0.0~Q0.3)	•	无连接
Q0.0	普通输出端	Q0.1	普通输出端
Q0.2	普通输出端	Q0.3	普通输出端
2L	输出公共端 (Q0.4~Q0.7)	•	无连接
Q0.4	普通输出端	Q0.5	普通输出端
Q0.6	普通输出端	Q0.7	普通输出端
3L	输出公共端 (Q1.0、Q1.1)	•	无连接
Q1.0	普通输出端	Q1.1	普通输出端

电气原理图



LE5107 输入通道电气原理图



LE5107 输出通道电气原理图

通讯接口

RS-485 通讯接口，通过编程电缆建立与个人计算机(PC)的连接，实现用户程序下载和在线调试，并且用于与现场设备进行通讯。通过 LE5107 的 8 芯圆形接口插座（图①处）实现 LE5107 CPU 模块和上位机的连接通信，通过连接器（图②处）实现与扩展模块的连接通信。

8 芯圆形接口插座针脚定义

针号	定义	针号	定义	针号	定义	针号	定义
1	—	3	—	5	RS485 信号正	7	系统地 GND
2	—	4	—	6	RS485 信号负	8	系统地 GND



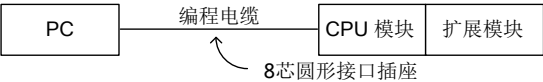
软件配置

由于 PLC 的编程软件和 PLC 模块之间均提供“运行”和“停止”两种状态，故定义硬件与软件相互约束关系。

RUN/STOP 选择开关位置	编程软件状态	模块状态
运行（开关在上档）	RUN	RUN；如果用户在该状态下装用户程序，自动变为 STOP 状态
	STOP	STOP
停止（开关在下档）	RUN/STOP	STOP（用户程序停止，无法运行）

通讯连接

- 下载前，请将 PLC 按图连接；请使用和利时 PLC 编程电缆进行程序下载；
- 在下载之前，确认已经安装 AutoThink V3.1.0 及以上版本软件；
- 下载时，请点击 AutoThink 软件在线菜单中的“下装”选项，按提示进行下载。



注意：

- (1) 在电源线连接好之后，应该把端子盖扣好，以免造成不必要的人身伤害或设备损坏；
- (2) 在安装或者拆卸 PLC 的输入电源时，如果没有切断电源，就有可能导致严重的人身伤害或设备损坏。因此，在安装或拆卸模块前，一定要切断所有电源，并且要随时地注意这一点；
- (3) 在给 PLC 供电之前，请确认已正确连接编程电缆，在模块带电状态下，请勿插拔通讯口，以免损坏设备。
- (4) 如果设备未按照制造商规定的方式使用，设备提供的保护可能会受损。
- (5) 高压危险标识，请勿触碰，严禁带电操作。

LE5107 14DI/ 10 DO CPU Module

LE5107 is a CPU module of LE Series micro PLC which can complete control, detection, diagnosis, RS485 communication needed for system. Functions specifically achieved as follows: RUN/STOP switch selects running and stopping mode of module; RTC records operation time; equipped with USB memory card interface to facilitate download user program; RS485 interface provides channel to download application program and supports access to peripheral device and multi-PLC interconnection; equipped with 14 DI and 10 DO and is a general-purpose CPU module.

Technical Specifications

CPU Specifications		Power Supply Specifications			
On-board I/O	14 DI / 10DO	Input	Rated voltage	100~240VAC	
I/O expansion module (max.)	16 (total modules power consumption ≤ CPU rating)		Permissible range	85~264VAC (50/60Hz)	
Number of expansion board	1		Current consumption (max.)	600mA	
Programming language	LD/ST/CFC/SFC	External output voltage	24VDC		
Program memory	128K bytes	External output current (max.)	+24VDC (supply for expansion bus)	500mA	
Data memory	36K bytes		+24VDC (supply for peripheral device)	200mA	
Power-loss retentive memory	4K bytes		+5VDC (supply for expansion bus)	1200mA	
Memory card	Memory card with USB interface	Hold up time (loss of power)			80ms
HSC		Communication Specifications			
Pulse catch	4 HSC at 100KHz for single phase	Communication interface	2 RS485		
	2 HSC at 50KHz for A/B phase	Interface type	PS/2, pluggable terminals		
Fast external interruption	4	Baud rates (bps)	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200		
Basic instruction processing time	6		Proprietary protocol, Modbus master-slave, free port communication protocol,multi-PLC interconnection(only for terminal connecting)		
0.1μs		Communication protocol			
Input Specifications		Output Specifications			
Number of inputs	14	Number of outputs	10		
Input type	Sink/Source	Output type	Relay		
Rated voltage	24VDC	Permissible range	5~30VDC or 5~250VAC		
Permissible range	0~30VDC	Output current	2A (resistance load)		
Logic 1 signal	15~30VDC, permissible min. current 3mA	Rated current per common (max.)	<10A		
Logic 0 signal	0~5VDC, permissible max. 1mA	On state resistance	0.2Ω (max.)		
Filtering parameter	No.filtering, 5μs, 10μs, 20μs, 100μs, 200μs, 1ms, 5ms, 10ms, 20ms, 50ms, 100ms	Switching frequency (max.)	1Hz		
		Mechanical life of relay	No load: up to 10,000,000 open/close cycles		
Isolation mode	Optocoupler (field side to system)		Rated resistance 2A load: up to 100,000 open/close cycles		
Isolation groups	1	Isolation mode	Relay (field side to system)		
Isolation withstand voltage	500VAC for 1minute, leakage current <5mA	Isolation groups	3		
		Isolation withstand voltage	2500VAC for 1minute, leakage current <5mA		
Physical Specifications					
Dimensions W x H x D (mm)	117×97×90	Operating temperature	0~60℃		
Weight	567g	Storage temperature	-40~70℃		
Relative humidity	5%~95% (non-condensing)				

Definition of Indicators

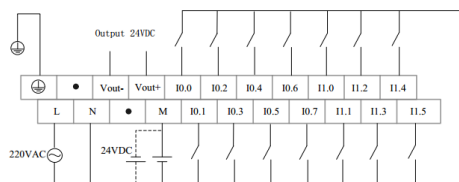
Type	Color	Status	Description
Power supply PWR	Green	On	Power supply works in normal mode.
		OFF	Power is defective or not supplied.
Channel status indicator lx.y Qm.n	Green	ON	The channel is ON.
		OFF	The channel is OFF.
Operation indicator RUN/STOP	Green	ON green	PLC is in RUN mode and user program is running.
		ON yellow	PLC is in STOP mode and user program is not running.
		Flash alternately	1Hz Wait to load the user program from a memory card
			4Hz loading the user program from a memory card
Failure status indicator ERR	Red	ON	The CPU is in failed mode.
		OFF	PLC is in normal operating mode.

i Instructions: possibility and solutions if ERR indicator is on:

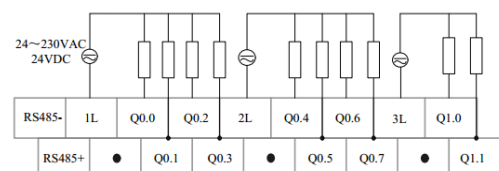
- (1) System configuration of programming software is inconsistent with actual hardware configuration;
Solutions: Check system configuration in programming software;
- (2) Communication with expansion module failed;
Solutions: Check whether expansion module is connected correctly;
- (3) Report faults occurring to each expansion module;
Solutions: Replace faulty expansion module;

Terminal Definition and Connection

LE5107 is connected with an external 220VAC power and has two pluggable terminals (11x2 and 9x2), the upper terminal offers digital input channel (DI), the lower terminal offers digital output channel (DO), and wiring is easy and convenient and is secured with screw, which is a typical field connection case.



LE5107 Upper Terminals Definition and Wiring Diagram



LE5107 Lower Terminals Definition and Wiring Diagram

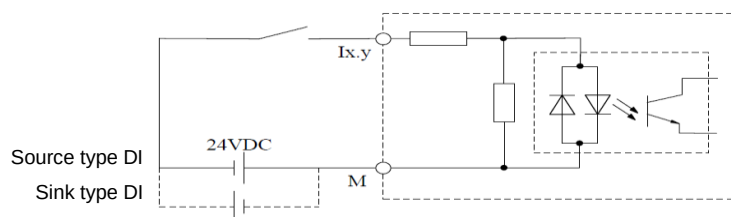
LE5107 Upper Terminals Definition

Terminal Identification	Description	Terminal Identification	Description
	Grounding	L	Fire wire
•	No connection	N	Null wire
Vout-	Output 24VDC negative	•	No connection
Vout+	Output 24VDC positive	M	Common of Input
I0.0	Fast external interruption 1/ Pulse catch 1/Frequency measurement 1/ Single-phase counter 1/ A/B phase counter 1 phase A / Ordinary input	I0.1	Fast external interruption 2/ Pulse catch 2/Frequency measurement 2/ Single-phase counter 2/ A/B phase counter 1 phase B / Ordinary input
I0.2	Fast external interruption 3/ Pulse catch 3/Frequency measurement 3/ Single-phase counter 3/ A/B phase counter 2 phase A / Ordinary input	I0.3	Fast external interruption 4/ Pulse catch 4/Frequency measurement 4/ Single-phase counter 4/ A/B phase counter 2 phase B / Ordinary input
I0.4	Fast external interruption 5 / Single-phase counter 1 direction control / Ordinary input	I0.5	Fast external interruption 6 / Single-phase counter 2 direction control / Ordinary input
I0.6	Single-phase counter 3 direction control / Ordinary input	I0.7	Single-phase counter 4 direction control / Ordinary input
I1.0	Single-phase counter 1 reset/ A/B phase counter 1 reset/ Ordinary input	I1.1	Single-phase counter 2 reset/ Ordinary input
I1.2	Single-phase counter 3 reset/ A/B phase counter 2 reset/ Ordinary input	I1.3	Single-phase counter 4 reset/ Ordinary input
I1.4	Ordinary input	I1.5	Ordinary input

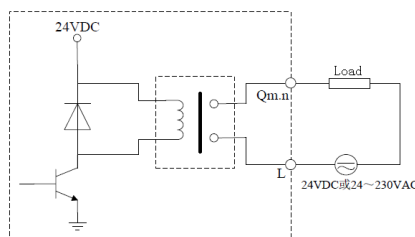
LE5107 Lower Terminals Definition

Terminal Identification	Description	Terminal Identification	Terminal Identification
RS485-	RS485 communication	RS485+	RS485 communication
1L	Common of Output (Q0.0~Q0.3)	•	No connection
Q0.0	Ordinary output	Q0.1	Ordinary output
Q0.2	Ordinary output	Q0.3	Ordinary output
2L	Common of Output (Q0.4~Q0.7)	•	No connection
Q0.4	Ordinary output	Q0.5	Ordinary output
Q0.6	Ordinary output	Q0.7	Ordinary output
3L	Common of Output (Q1.0~Q1.1)	•	No connection
Q1.0	Ordinary output	Q1.1	Ordinary output

Electrical Schematic Diagram



Electrical Schematic Diagram of LE5107 Input



Electrical Schematic Diagram of LE5107 Output

Communication Interface

RS485 communication interface can establish connection to personal computer (PC) through programming cable, realize download of user program and on-line debugging and be applied to communication with field devices. Junction and communication between LE5107 CPU module and upper computer are achieved through PS/2 of LE5107 (at ① in the figure), junction and communication between LE5107 CPU module and expansion module are achieved through connector (at ② in the figure).

Definition of PS/2

Pin No.	Definition	Pin No.	Definition	Pin No.	Definition	Pin No.	Definition
1	—	3	—	5	RS485+	7	System GND
2	—	4	—	6	RS485-	8	System GND



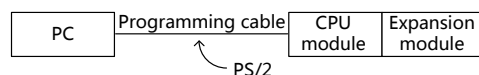
Software Configuration

Both programming software and CPU module provide the setting of "Run" and "Stop" status, therefore the software and hardware are constrained each other.

RUN/STOP selective switch position	Status of programming software	Module status
Run (Switch to upper position)	RUN	RUN: automatically changed into STOP if users download program in this state.
	STOP	STOP
Stop (Switch to lower position)	RUN/STOP	STOP(user's program stops, unable to run)

Communication Connection

- Before downloading, please confirm that PLC is connected as per the schematic diagram.
- Please use HollySys PLC programming cable to download the program.
- Before downloading, please confirm that AutoThink V3.1.0 or above version has been installed
- To download, please click "Download" option in menu bar of AutoThink software and follow the instructions for downloading.



Caution:

- Cover of the terminal should be fastened properly prior to power on of the PLC system to avoid unnecessary personal injury or device damage.
- When connecting or removing PLC power, severe personal injury or device damage may be caused if power is not isolated. Therefore, before module installation or removal, all power must be turned off and please pay attention to this at any time.
- Before connecting power to PLC, please confirm programming cable is connected properly and please do not remove from or insert into communication port during power on to avoid device damage.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



- Warning symbol for high voltage, please do not touch equipment with the warning symbol, operation in electricity is strictly prohibited.