LC-131 User Manual

Warranty

All products manufactured by ICP DAS are under warranty regarding defective materials for a period of one year from the date of delivery to the original purchaser.

Warning

ICP DAS assumes no liability for any damage resulting from the use of this product. ICP DAS reserves the right to change this manual at any time without notification. The information furnished by ICP DAS is believed to be accurate and reliable. However, no responsibility is assumed by ICP DAS for its use, nor for any infringements of patents or other rights of third parties resulting from its use.

Copyright

Copyright© 1999 - 2012 ICP DAS. All rights reserved.

Trademarks

Names are used for identification purposes only and may be registered trademarks of their respective companies.

Date: 2013/5/8

Table of Contents

1 Introduction

The LC-131 is an easy-to-use digital input module, equipped with 3-channel digital input, functions open/short circuit detection, and 1-channel relay output. The digital input type is dry contact, meaning that wiring is easy. There are two methods of controlling the relay inputs, either directly from the digital output or via a remote host. Settings, such as communication protocol and node address can be configured either via hardware or via software, depending on the situation. The module has also passed + / -4 kV ESD reliability test, and is designed to operate in harsh environments.

2 Hardware Information

2.1 IO Specifications

Digital Input		
Channels		3
Type		Dry
On Voltage Level		Close to GND
Off Voltage Level		Open
Counters	Max. Count	16-bit (65535)
	Max. Input Frequency	100 Hz
	Min. Pulse Width	5 ms
Short Circuit Detection		Yes, optioned external terminal resistance of 1 K Ohms is required
Relay Output		
Channels		1
Type		Power Relay, Form A (SPST N.O.)
Operating Voltage		250 VAC or 30 VDC
Max. Load Current		16 A (Res. Load)
Operate Time		15 ms Max.
Release Time		5 ms Max.
Mechanical Endurance		10,000,000 ops.
Electrical Endurance		50,000 ops.
Power-on and Safe Values		Yes, programmable

2.2 System Specifications

Communication	
Interface	RS-485
Format	N,8,1
Baud Rate	1200 ~ 115200 bps
Protocol	DCON, Modbus RTU
Node Addresses	96 ~ 127
Connector	RJ-11
LED Indicators	
Power	1 LED as Power Indicator
EMS Protection	
ESD (IEC 61000-4-2)	±4 kV Contact for Each Terminal ±8 kV Air for Random Point
EFT (IEC 61000-4-4)	±4 kV for Power Line
Power	
Reverse Polarity Protection	Yes
Powered from Terminal Block	Yes, 10 ~ 30 VDC
Consumption	0.8 W Max.
Mechanical	
Dimensions (W x L x H)	52 mm x 98 mm x 27 mm
Installation	Screw Mounting
Environment	
Operating Temperature	-25°C ~ +75°C
Storage Temperature	-30°C ~ +75°C
Humidity	10 ~ 95% RH, Non-condensing

2.3 Pin Assignments
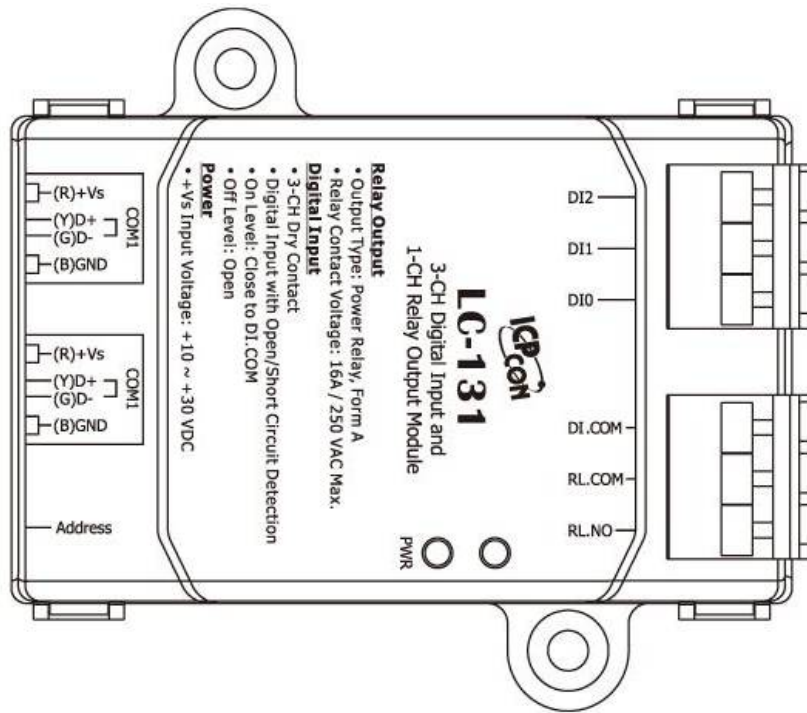
RJ-11 Connector

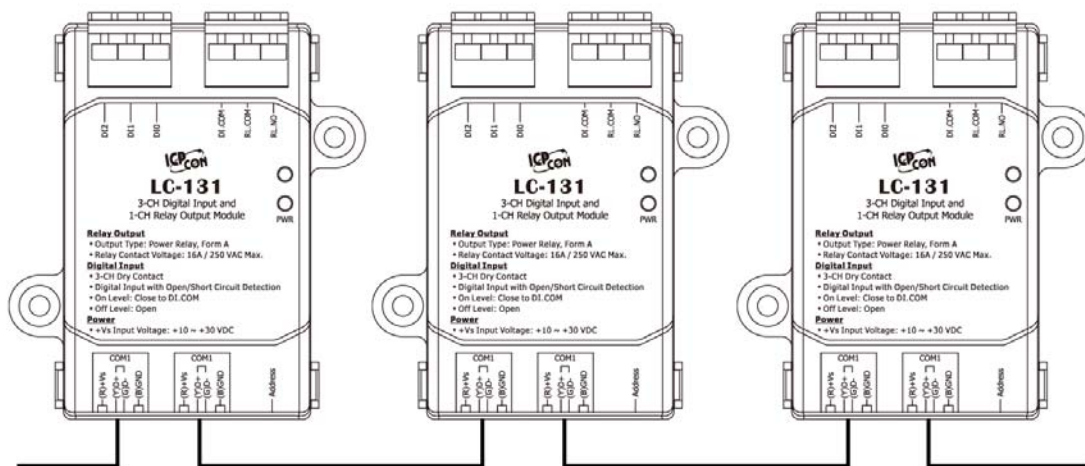| Pin		Descriptions
1	+VS	Power Input Voltage (+10 VDC ~ 30 VDC)
2		
3	DATA+	RS-485 Serial Communication Interface
4	DATA-	
5	GND	Ground
6		

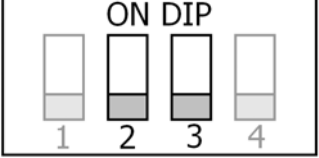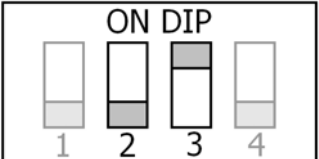## 2.4 Wire Connections
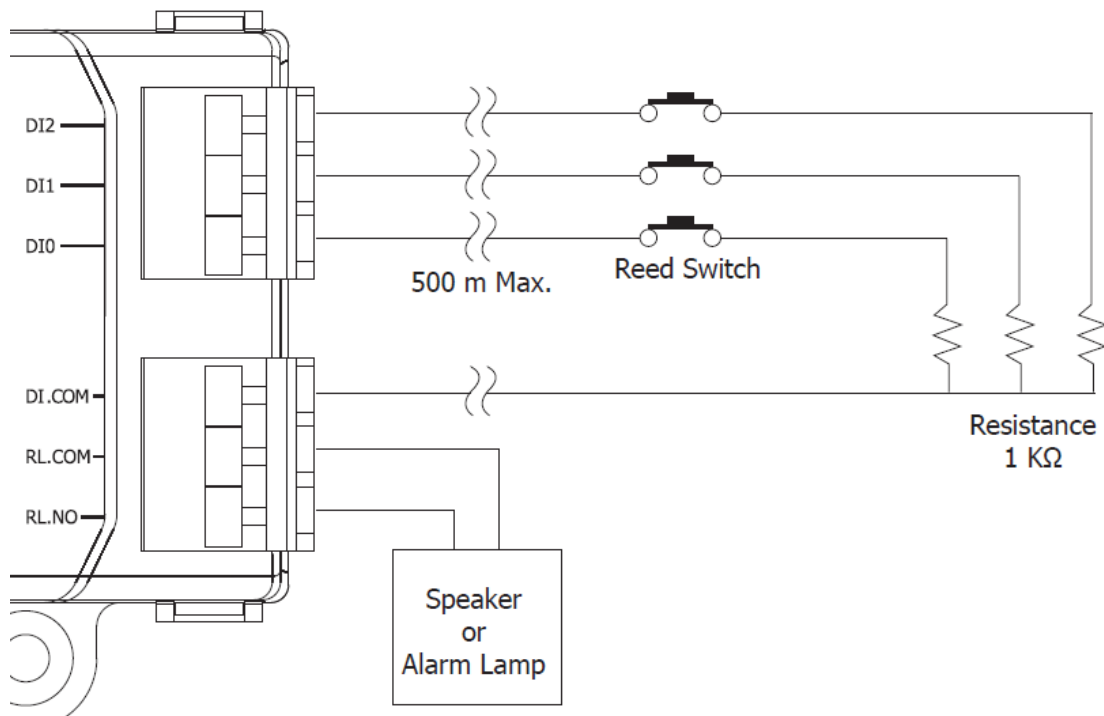
2.5 Power and Communication

RS-485 and power input daisy chain using RJ-11 connectors

2.6 DIP Switch and Jumper Settings

		ON	DCON Protocol
	SW1	OFF	Modbus RTU Protocol
	SW2	ON	Software Configuration
		OFF	Hardware Configuration
	SW3	ON	High Node Address
		OFF	Low Node Address
	SW4	ON	INIT Mode
		OFF	Normal Mode

Address Settings via Hardware Configuration

		0 ~ F for Addresses 96 ~ 111 (Low Node Address)
		0 ~ F for Addresses 112 ~ 127 (High Node Address)

3 Modbus Address Mapping

Address	Description	Attribute
30001 ~ 30004	Counter value of digital input	R
40481	Firmware version (low word)	R
40482	Firmware version (high word)	R
40483	Module name (low word)	R
40484	Module name (high word)	R
40485	Module address, valid range: 1 ~ 247	R/W

40486	Bits 5:0
	
	   Baud rate, valid range: 3 ~ 10
	
	Bits 7:6
	
	    00: no parity, 1 stop bit
	
	    10: even parity, 1 stop bit
	
	    11: odd parity , 1 stop bit
		R/W

40488	Modbus response delay time in ms, valid range: 0 ~ 30	R/W
40489	Host watchdog timeout value, 0 ~ 255, in 0.1s	R/W
40492	Host watchdog timeout count, write 0 to clear	R/W
10033 ~ 10036	Digital input value of channel 0 ~ 3	R
10065 ~ 10068	High latched values of DI	R
10073 ~ 10076	High latched values of DO	R
10097 ~ 10100	Low latched values of DI	R
10105 ~ 10108	Low latched values of DO	R
10225 ~ 10227	Short circuit status of DI	R
00001	Digital output value of channel 0	R/W
00129	Safe value of digital output channel 0	R/W
00161	Power on value of digital output channel 0	R/W
00193 ~ 00196	Counter update trigger edge of channel 0 ~ 3	R/W
00257	Protocol selection, 0: DCON, 1: Modbus	R/W
00260	Modbus host watchdog mode 0: same as I-7000 1: can use AO and DO command to clear host watchdog timeout status	R/W
00261	1: enable, 0: disable host watchdog	R/W
00262	1: enable, 0: disable alarm	R/W
00263	Alarm type, 0 -> momentary, 1-> latched	R/W
00264	Write 1 to clear latched DIO	W

Address	Description	Attribute
00265	DI active state, 0: normal, 1: inverse	R/W
00266	DO active state, 0: normal, 1:inverse	R/W
00270	Host watch dog timeout status, write 1 to clear host watch dog timeout status	R/W
00273	Reset status, 1: first read after powered on, 0: not the first read after powered on	R
00282	Write 1 to clear latched alarm	W
00513 ~ 00518	Write 1 to clear counter value of channel 0 ~ 3	W
00545 ~	Enable/disable alarm on DI channels	R/W
00553 ~	Enable/disable alarm on short circuit	R/W
00577 ~	Status of alarm on DI channels	R
00585 ~	Status of alarm on short circuit	R