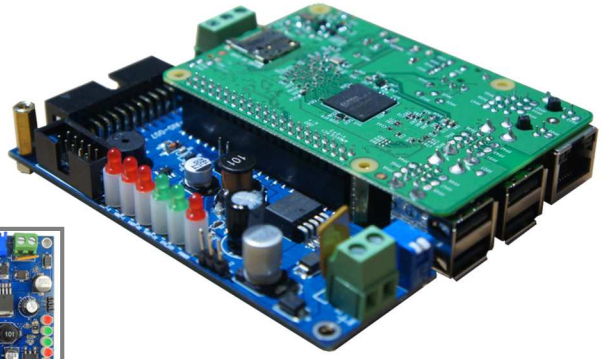
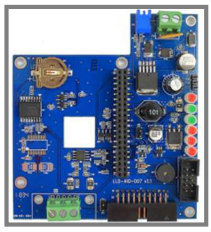
LLD-AIO-007 Raspberry Pi3 Industrial-Application Module

- Specific Cape for Industrial communication and Application control
- 9~24VDC Input Working Power
- 1-Channel RS-485 serial equipment data transmission communication
- 1-Channel RS-232 serial equipment data transmission communication (Optional)
- 16 Digital Control Points (GPIO)
- With RTC Chip and battery holder
- With simple & easy human machine interface
- Embedded Linus Operating System
- Demo Program for transmission communication and control interface





Product Feature

Specific cape for Raspberry Pi3

LLD-AIO-007 is a tailor-made cape for Raspberry Pi3 (RS-Pi3) design by LLD technology. Through the signal conversion function on LLD-AIO-007, RS-Pi3 developers can connect all kinds of target device easily. Complete the development and testing of industrial automation, common data communication monitoring and state control application.

Stable DC power conversion and protection function

LLD-AIO-007 has direct current (DC) 9~24V working voltage input function. Not only let developer can use the power easily, but also match with the actual application of the power supply.

Terminal block for easy connection

In addition to the original configuration of RS-Pi3 standard RJ45 network interface, USB and MicroSD interface. LLD-AIO-007 converted the power input, extended serial communication and Digital I/O interface to a more convenient and stable connectors for connecting wire.

The power input, RS-485 interface use industrial pluggable terminal block. RS-232 (optional) is using standard DB9 male with standard pin definition. Digital I/O is using a needle type simple block header. Besides convenient for testing, it's easy to make cable and connect with other I/O signal conversion modules.

Simple and Easy Demo Program

The RS-485 and GPIO interface of the LLD-AIO-007 has a corresponding Demo program. The developer can easily get started to achieve the purpose of familiar with the product and executive function. Then accelerate the development of the system or program for corresponding application

Serial transmission interface

RS-232 and RS-485 are still the main communication interface of card reader, thermometer, power meter and other small equipment or instrument. LLD-AIO-007 converted RS-Pi3's 1 high speed serial port (UART) signals into 1 channel of half duplex RS-485 allowing users to connect to the target device for development and testing. For RS-232 interface, we provide another customization model for optional.

Digital I/O Control Interface

LLD-AIO-007 extended the RS-Pi3's 16 GPIO points to the 20-pin simple box header, the Digital Input and Output can be controlled through the program. Can also match with LLD-M13 Digital I/O control module (4 sets of Relay control and 4-point dry contact and 1-point wet contact input) to develop switches or sensors for physical connections. Reach the goal of monitoring application development and testing.

Simple and easy human machine interface

LLD-AIO-007 extended and converted part of the RS-Pi3's GPIO to human-computer interface. 2 points of DIP Switch can be used as input judgment of manual switching for application operation mode. A number of LED lights and 1 set of buzzer can be used as LLD-AIO-007 machine status display or alert function. The judgment or control of these status can be compared to the control of GPIO software development.

on-board Real-Time Clock

LLD-AIO-007 has Real-Time Clock (RTC) function, with battery holder to maintain the RTC operation during power outage.

Product Specification

Hardware

Core

- Raspberry Pi3 Module (excluded in LLD-AIO-007 Cape)

GPIO

- Quantity：22
- Signal Type：3.3V CMOS
- 2x10 2.54mm simple box header x 16 GPIO
- DIP Switch x 2 GPIO
- LED x 3 GPIO
- Beeper x 1 GPIO

RS-485 serial port interface

- Quantity：1 (chip : MAX1348)
- Signal：Data+, Data-, GND
- Multi-Drop Nodes : 128 (1/4 Load)
- Built-in Terminal Resistor : 120Ω，By Jumper
- Protection：2KV ESD Static, 400W Surge protection
- Connector：5.00mm 3-pin pluggable terminal block

RS-232 serial port interface (Optional Customization)

- Quantity：1 (chip: SP3243)
- Signal : TxD, RxD, GND
- Protection：15KV ESD Static，400W Surge protection
- Connector：DB9 Male

GPIO extent signal

- 2x5 2.54mm simple box header (shared connector)
- Power: 5VDC, 3.3VDC
- I2C Signal: SDA, SCL (Share with GPIO)
- SPI Signal: MOSI, MISO, SCLK, CSx2 (Share with GPIO)

Power

- Working Voltage：DC 9-24VDC
- Power Connector：5.00mm pluggable terminal block
- Power Consumption：<10W (not include USB device)
- DC Output for RS-Pi3：5V (3A max.)
- DC Output for FAN：5V (0.1A max.) 2.54 mm 3-pin contact

Others

- Real Time Clock (RTC) : 1 set (chip: DS3231)
- Buzzer : 1 set
- LED indicator：power, network, serial port, user defined
- PCB Size：98 x 102 mm
- Fixing hole： Φ3.50mm x 5 (for RS-Pi3 fixing x3，PCB supporting x2)
- Applicable temperature：0~50℃
- Applicable humidity：20%~80% RHG

Connect with RS-Pi3

interface

- 2x20 2.54mm Pin header *1 set

  VDC working voltage

  UART *1

  GPIO *22

  RTC (I2C) *1

Raspberry Pi3 built-in comm. contact

- Ethernet : 100Mbps, RJ45 x 1
- USB Host : USB 2.0, Type A x 4
- SD : MicroSD socket x 1

Ordering Info

- **LLD-AIO-007** Raspberry Pi3 Industrial-Application Module, RS-485 Interface

  Content： Raspberry Pi3 x 1， LLD-AIO-007 Cape x 1， QIG x1， 12mm pillar x5， 3mm nut x5， 3mm screw x3

- **LLD-AIO-007 Cape** Raspberry Pi3 Industrial-Application Cape, RS-485 Interface

  Content： LLD-AIO-007 Cape x 1， QIG x1， 12mm pillar x5， 3mm nut x5， 3mm screw x3

Non-standard Customization Model no.

- **LLD-AIO-007(232)** Raspberry Pi3 Industrial-Application Module, RS-232 Interface
- **LLD-AIO-007(232) Cape** Raspberry Pi3 Industrial-Application Cape, RS-232 Interface

Optional accessories

- **LLD-M01** 8-ch Isolated Digital Input (Dry/Wet selectable) and 8-ch Relay Output I/O Expanding Module
- **LLD-M13** 4-ch DO, 5-ch DI Digital Signal Control Module with optical isolation protection in GPIO
- **CD12V** 100~240V AC to 12VDC Power Adapter (US Type)

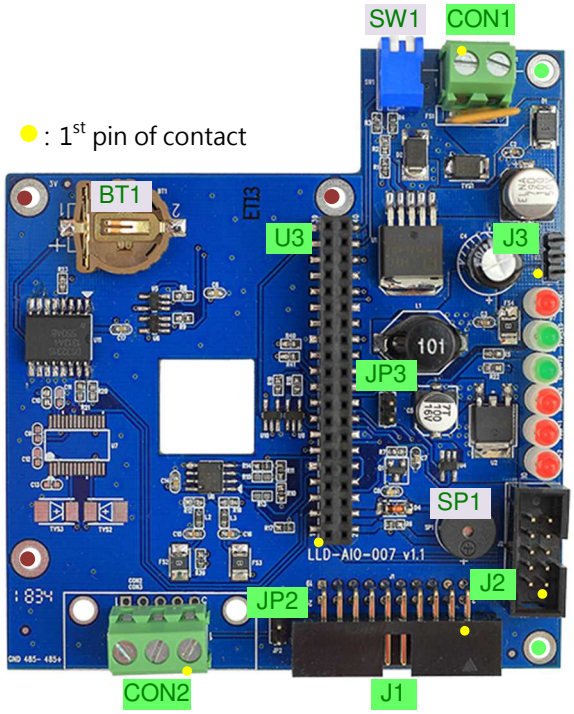
LLD-M13

Product exterior and PIN definition

LLD-AIO-007 Cape

Fixed hole description

- : for 12mm pillars · RS-Pi3 supporting and fixing
- : for 18mm pillars · LLD-AIO-007 cape supporting



Contact

Function	Part no.
RS-Pi3 connecting Pin header	U3
LLD-AIO-007 power input terminal block	CON1
RS-485 x 1 5.00mm terminal block (D+, D-, GND)	CON3
20-pin simple box header corresponding to GPIO x 16	J1
10-pin simple box header · I2C · SPI signal extent · provide 3.3VDC	J2
DC5V for FAN	J3
Active RS-485 120Ω Terminal resistor	JP2
RTC reset	JP3
optional: RS-232 DB9 Male (TxD, RxD, GND)	CON2

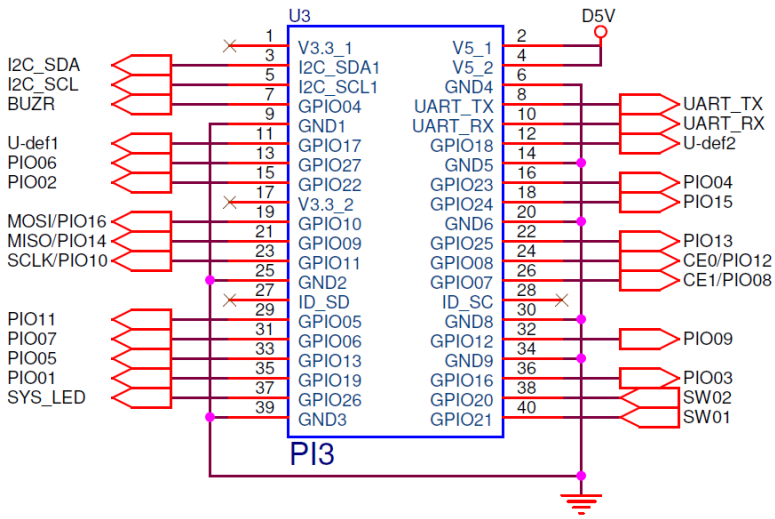
LED legend (from top to bottom)

Color	legend	Part no.
Red	Power *	D7
Green	SYS_LED	D3
Green	UART TX *	D10
Red	UART RX *	D9
Red	User Def 1	D5
Red	User Def 2	D6
* Couldn't be controlled by Software		

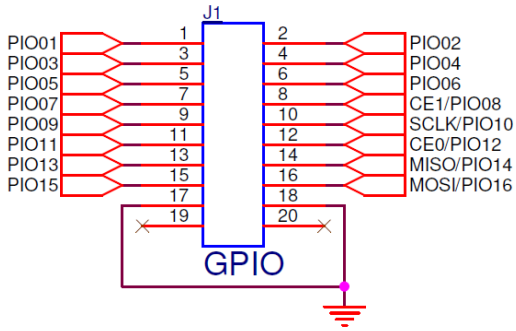
Others

Function	Part no.
Beeper corresponding to RS-Pi3 GPIO x 1	SP1
RTC battery holder	BT1
DIP Switch corresponding to RS-Pi3 GPIO x 2	SW1

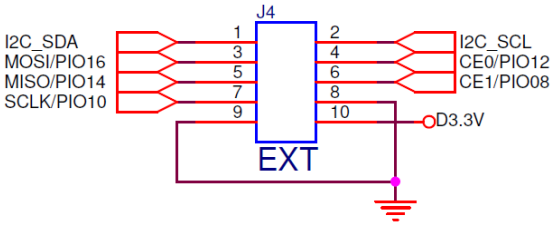
U3 - Pi3 connector pin diagram reference



J1 - GPIO connector pin diagram reference



J2 - EXT connector pin diagram reference



LLD-AIO-007 Signal conversion and extensive function corresponding to Raspberry-Pi3 Definition

Function	Connector/ Part no.	External signal definition – Connector pin assignment	U3 (Raspberry Pi Connector) Pin assignment - Pi3 definition
RS-485	U8+CON3	(U8 – MAX1348) RS-485 D+ – pin-01 RS-485 D- – pin-02	pin-08 – UART_Tx pin-10 – UART_Rx
RTC	U11	(U11 – DS3231)	pin-03 – I2C_SDA pin-05 – I2C_SCL
Beeper	SP1		pin-07 – GPIO04
Dip Switch	SW1	SW01 – pin-01	pin-40 – GPIO21
		SW02 – pin-02	pin-38 – GPOI20
LED		SYS_LED – x	pin-37 – GPIO26
		U_def1 – x	pin-11 – GPIO17
		U-def2 – x	pin-12 – GPIO18
GPIO	J1	PIO01 – pin-01	pin-35 – GPIO19
		PIO02 – pin-02	pin-15 – GPIO22
		PIO03 – pin-03	pin-36 – GPIO16
		PIO04 – pin-04	pin-16 – GPIO23
		PIO05 – pin-05	pin-33 – GPIO13
		PIO06 – pin-06	pin-13 – GPOI27
		PIO07 – pin-07	pin-31 – GPIO06
		PIO08 – pin-08	pin-26 – CE1/GPIO07
		PIO09 – pin-09	pin-32 – GPIO12
		PIO10 – pin-10	pin-23 – SCLK/GPIO11
		PIO11 – pin-11	pin-29 – GPIO05
		PIO12 – pin-12	pin-24 – CE0/GPIO08
		PIO13 – pin-13	pin-22 – GPIO25
		PIO14 – pin-14	pin-21 – MISO/GPIO09
		PIO15 – pin-15	pin-18 – GPIO24
		PIO16 – pin-16	pin-19 – MOSI/GPIO10
I2C	J2 (EXT)	I2C_SDA – pin-01	pin-03 – I2C_SDA
		I2C_SCL – pin-02	pin-05 – I2C_SCL
SPI	J1	MOSI – pin-16	pin-19 – MOSI/GPIO10
		MISO – pin-14	pin-21 – MISO/GPIO09
		SCLK – pin-10	pin-23 – SCLK/GPIO11
		CE0 – pin-12	pin-24 – CE0/GPIO08
		CE1 – pin-08	pin-26 – CE1/GPIO07
	J2 (EXT)	MOSI – pin-03	pin-19 – MOSI/GPIO10
		MISO – pin-05	pin-21 – MISO/GPIO09
		SCLK – pin-07	pin-23 – SCLK/GPIO11
		CE0 – pin-04	pin-24 – CE0/GPIO08
		CE1 – pin-06	pin-26 – CE1/GPIO07
RS-232 (optional)	U7+CON2	(U7 – SP3243) RS-232 Tx – pin-03 RS-232 Rx – pin-02	08 – UART_Tx 10 – UART_Rx
FAN DC	J3	5V+ – pin-01	X
		GND – pin-02	X