

COMPANY PROFILE

Chengkong Electronics, Professional data collection product supplier.

More than ten years of ingenious quality assurance
and first-class data collection services



Product Categories

I

Analog input module

II

Analog output module

III

AC input module

IV

Weighing module

V

TC/RTD temperature acquisition module

VI

Analog input and output module

VII

Switching/digital module

VIII

Develop custom modules

IX

signal isolator

X

Interface conversion module

Application areas



Automation equipment



Medical electronics



Smart manufacturing



Remote monitoring



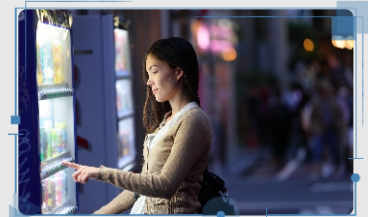
Industrial control



Smart warehousing



Instruments anemometer



new retail



The quality of 品质自然出众
 材质与众不同 深圳市诚控电子有限公司
 DIFFERENT



16-bit analogue input module

Overview

The CK module is a new generation of modular data collector based on embedded system. It adopts the standard DIN35 rail mounting method, which is easy to install and flexible to use; it can cope with a variety of on-site applications. The module is equipped with RS485 cascade and short interface, which is convenient for communication with PC or PLC.

CK-7041R analog input data collector can collect up to 4 differential analog signals; the module adopts a high-performance 16-bit AD chip, the collection and measurement accuracy of $\pm 0.1\%$. The module adopts high-performance 16-bit AD chip and has an acquisition and measurement accuracy of $\pm 0.1\%$.

The CK-7041R utilizes photoelectric technology to ensure reliable and safe data collection.

Applications

- Automation equipment
- Remote monitoring and data collection
- Intelligent manufacturing/smart factory
- Industrial site control
- Smart warehousing and monitoring
- Medical and industrial control product development
- Packaging and material transfer
- Electronic product manufacturing

Technical Parameters

- ◆ Embedded Real-Time Operating System
- ◆ Analog input channel: 4-ch
- ◆ Analog input signal range: $\pm 20\text{mA}$, $\pm 100\text{mV}$, $\pm 2.5\text{V}$, $\pm 5\text{V}$, $\pm 1\text{V}$, $\pm 10\text{V}$
- ◆ AD conversion resolution: 16 bit
- ◆ measurement accuracy: $\pm 0.1\%$
- ◆ Conversion rate: 30 times/s (all channels)
- ◆ Wide power supply range: DC +10 ~ +30V
- ◆ Address/ baud rate configurable by user
- ◆ Support MODBUS-RTU protocol
- ◆ Support module to actively send data mode
- ◆ ESD protection: $\pm 15\text{KV}$
- ◆ Power consumption: less than 2W
- ◆ Isolation withstand voltage: DC 2500V
- ◆ Operating temperature range: $-40^\circ\text{C} \sim +80^\circ\text{C}$
- ◆ Input overvoltage protection, overcurrent protection, and low-pass filtering
- ◆ Normal Mode Rejection(NMR):60 dB (1k Ω Source Imbalance @ 50/60 Hz)
- ◆ Common Mode Rejection(CMR):120 dB (1k Ω Source Imbalance @ 50/60 Hz)
- ◆ Industrial grade plastic housing, standard DIN35 rail installation

Function configuration

Module model	CK-7041R	CK-7082R	CK-7160R	CK-8082R	CK-8160R
AD resolution	16bit	16bit	16bit	24bit	24bit
Channel	4	8	16	8	16
485 cascade	support	support	support	support	support
OLED menu	unsupport	unsupport	support	unsupport	support

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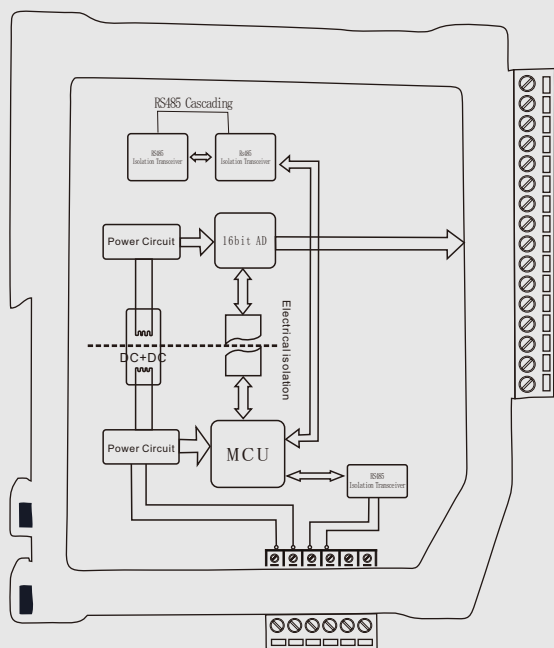
CK-7041R 4-ch input
CK-7082R 8-ch input

Input: $\pm 20\text{mA}/\pm 100\text{mV}/\pm 10\text{V}/\pm 5\text{V}$
 Output: RS485 modbus-RTU

CK-7041R is a 16-bit analog input module, supporting 4-channel 4-20 ma/0-10V inputs, adopting high-precision ADC chip and high-performance ARM processor. It supports RS485 communication interface, standard modbus-RTU protocol, triple isolation of power, signal and communication, realizing high accuracy and reliability of data acquisition. Blade rail mounting, space-saving, support for local dialing code to adjust the address, greatly facilitates the use of the site. It can communicate with many kinds of PLC, industrial control machine, touch screen and configuration software. Applied in automation equipment manufacturing, remote data monitoring, intelligent factory, on-site data collection and other fields.



Module working principle diagram



High-precision data acquisition

CK-7041R adopts advanced $\Delta-\Sigma$ high-precision integrated digital-to-analog converter. The resolution of 7041R is up to 16 bits, and the measurement accuracy is better than 0.1% (typical value). It can meet the industrial sites with high measurement requirements and security, smart buildings, smart homes, power monitoring, process control and other occasions.

Input and output isolation

The product is designed for industrial applications: through DC-DC conversion, the measurement circuit and the main control circuit power supply are isolated; at the same time, the control unit and the signal acquisition unit are electrically isolated using photoelectric isolation technology, effectively ensuring reliable and safe data acquisition.

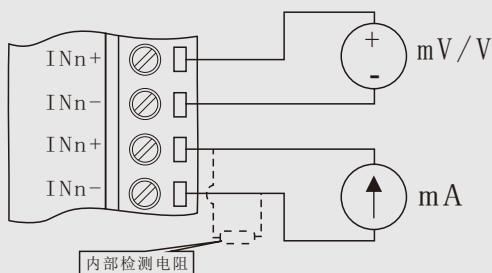
Surge protection

The module is equipped with a transient suppression circuit, which can effectively suppress various surge pulses and protect the module to work reliably in harsh environments.

analog input

The so-called analog signals are continuous signals that can be any value at any time, such as our common signals of temperature, pressure, flow, etc. The CK-7041R module is equipped with up to 8 differential analog inputs.

Analog input wiring



CK-7041R analog input wiring diagram

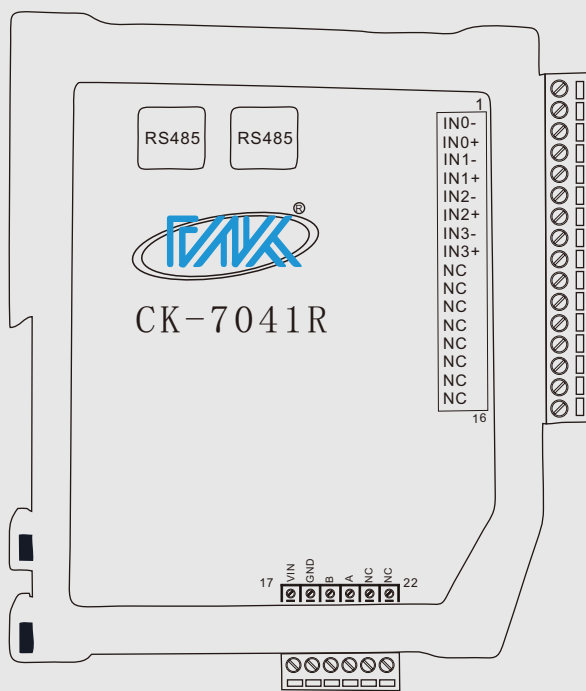
The analog input of CK-7041R is differential input. Each analog input channel has two wiring ports, namely analog input positive (IN_n+) and analog input negative (IN_n-).

Voltage signals and current signals can be directly connected to the module for detection. When collecting current, it is necessary to inform the module for collecting current signals when ordering. In this way, the module will have a high-precision current detection resistor placed inside the module and calibrated with a standard current signal when leaving the factory.

port information

CK-7041 port description

Port	Port ID	Port Function
1	IN0-	Analog input channel 0 negative
2	IN0+	Analog input channel 0 positive
3	IN1-	Analog input channel 1 negative
4	IN1+	Analog input channel 1 positive
5	IN2-	Analog input channel 2 negative
6	IN2+	Analog input channel 2 positive
7	IN3-	Analog input channel 3 negative
8	IN3+	Analog input channel 3 positive
9	NC	empty port
10	NC	empty port
11	NC	empty port
12	NC	empty port
13	NC	empty port
14	NC	empty port
15	NC	empty port
16	NC	empty port
17	VIN	Power Input Positive
18	GND	Power ground
19	B	RS485 signal negative input
20	A	RS485 signal positive input
21	NC	empty port
22	NC	empty port

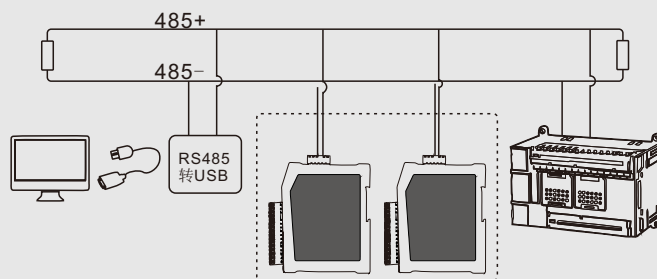


communications interface

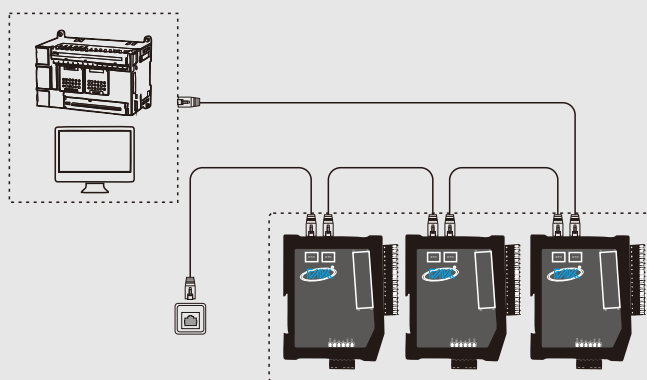
CK-7041R is equipped with RS485 cascade and 1 RS485 shorting interface; it can be connected with PLC or other hosts individually, or connected with PLC or other hosts after networking multiple modules.

RS485 Connection

The RS485 interface of the CK system module is a standard RS485 interface, which adopts differential signal logic. The logic "1" is represented by a voltage difference of $+(2\sim6)V$ between the two lines; the logic "0" is represented by a voltage difference of $-(2\sim6)V$ between the two lines. The network connection of RS485 devices is very simple. You only need to connect the positive and negative ends of the device to the bus. When the communication distance is long, you should pay special attention to the network topology. The RS485 network topology generally adopts a terminal matching bus structure, and does not support ring or star networks. The lead-out line length from the bus to each node should be as short as possible to minimize the impact of the reflected signal in the lead-out line on the bus signal. For more detailed information, please refer to the relevant information.



CK module is connected to other devices through RS485 interface

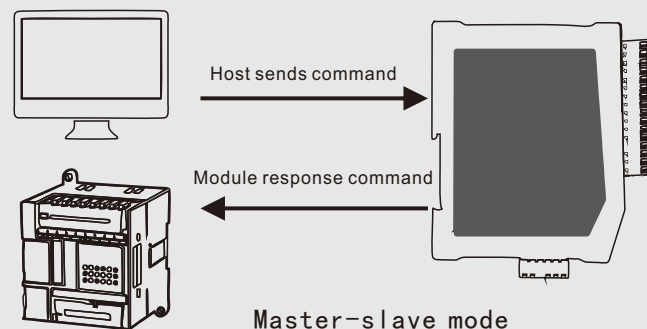


CK module through the network port RS485 interface device networking connection diagram

Module communication mode

Master-slave mode

The communication mode of the CK-7041R module is usually the master-slave mode (question-answer mode); the host sends commands to the module through the communication interface, and the module responds accordingly after receiving the correct command.



Serial communication parameters (default 9600 8, N, 1 address01)

contact address

The communication address range of the CK-7041R module is 01 to F7 (1 to 247). The module address is set to 01 at the factory. The module communication address can be modified by the user through commands according to site needs. For specific methods, please refer to the corresponding commands.

letter of agreement

MODBUS-RTU Protocol

Modbus protocol is a universal communication protocol that has been widely used in today's industrial control field. Through this protocol, controllers can communicate with each other or with other devices via a network (such as Ethernet).

The MODBUS address allocation of the CK module is as follows:

Command (HEX)	Register address (HEX)	Corresponding PLC address (DEC)	the data shows
03	0060	40097	AD channel 0 collects the results by amplifying the range by 1000 times ⁽¹⁾
03	0061	40098	AD channel 1 collects the results by amplifying the range by 1000 times
03	0062	40099	AD channel 2 collects the results by amplifying the range by 1000 times
03	0063	40100	AD channel 3 collects the results by amplifying the range by 1000 times
03	0064	40101	AD channel 4 collects the results by amplifying the range by 1000 times
03	0065	40102	AD channel 5 collects the results by amplifying the range by 1000 times
03	0066	40103	AD channel 6 collects the results by amplifying the range by 1000 times
03	0067	40104	AD channel 7 collects the results by amplifying the range by 1000 times

(1) The total number of channels varies depending on the module model.

AD type acquisition module Modbus output data calculation:

The read data result is a 16-bit signed number, and the result value is related to the range.

$$\text{Measurement results} = \frac{\text{Data Results}}{1000}$$

for example:

Range ±20mA, The data read out is 16781, The measurement results are $16781 \div 1000 = 16.781\text{mA}$;

Range ±10V, The data read out is 5089, The measurement results are $5089 \div 1000 = 5.089\text{V}$;

Range ±5V, The data read out is -3511, The measurement results are $-3511 \div 1000 = -3.511\text{V}$;

communications rate

CK-7041R module RS485 supports baud rates: 1200bps, 2400bps, 4800bps, 9600bps, 19200bps, 38400bps, 57600bps, 115200bps; the module communication rate can be modified by the user through commands according to site needs. For specific methods, please refer to the corresponding commands.

The module supports the industrial standard MODBUS-RTU (RS485) protocol, and the module works in MODBUS slave (server) state. It can communicate with PLC, RTU or computer of various brands. The module supports MODBUS commands as follows:

Serial number	Command (HEX)	Function	Remark
1	03	Read module AD conversion results and module information	

Modbus RTU protocol

Chengkong Electronics AD acquisition module supports the industrial standard Modbus RTU protocol. Modbus RTU protocol is the most commonly used one in serial communication among various Modbus protocols. After the module is configured as Modbus RTU protocol through corresponding commands, it can work in Modbus slave state. It can communicate with PLCs, configuration screens and computers of various brands.

For more information about the Modbus protocol, please refer to GB/T19582.1-2008 Industrial Automation Network Specification Based on Modbus Protocol or the official website of the Modbus organization <http://modbus.org>

Modbus RTU communication example of AD acquisition module:

In actual use, due to different module configuration addresses and different input signal amplitudes, the data is not completely consistent with the example. When using PLC and other communications, you may not need to understand the underlying communication protocol, so you do not need to understand the following table. You can refer to the communication examples of related products.

Example																										
Module Description	Channel quantity: 4, address: 1, range: $\pm 10V$																									
Master sends	01 03 00 60 00 04 44 17																									
Module Reply	01 03 08 11 68 16 39 09 26 F6 D7 C7 8B																									
The main station sends analysis	01: Module slave address 03: Modbus RTU Read holding register function code 00 60:0x0060 Register start address 00 04:Number of registers 44 17:CRCCheck Digit																									
Module reply analysis	01:Module slave address 03: Modbus RTU Read holding register function code 08:Number of data bytes <table border="1"> <thead> <tr> <th>Channel</th> <th>Receive data</th> <th>Hexadecimal</th> <th>10 hex</th> <th>Parsing results</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>11 68</td> <td>0x1168</td> <td>4456</td> <td>4.456V</td> </tr> <tr> <td>1</td> <td>16 39</td> <td>0x1639</td> <td>5689</td> <td>5.689V</td> </tr> <tr> <td>2</td> <td>09 26</td> <td>0x0926</td> <td>2342</td> <td>2.342V</td> </tr> <tr> <td>3</td> <td>F6 D7</td> <td>0xF6D7</td> <td>-2345</td> <td>-2.345V</td> </tr> </tbody> </table> C7 8B:CRC Check Digit	Channel	Receive data	Hexadecimal	10 hex	Parsing results	0	11 68	0x1168	4456	4.456V	1	16 39	0x1639	5689	5.689V	2	09 26	0x0926	2342	2.342V	3	F6 D7	0xF6D7	-2345	-2.345V
Channel	Receive data	Hexadecimal	10 hex	Parsing results																						
0	11 68	0x1168	4456	4.456V																						
1	16 39	0x1639	5689	5.689V																						
2	09 26	0x0926	2342	2.342V																						
3	F6 D7	0xF6D7	-2345	-2.345V																						

Electrical parameters

Unless otherwise specified, the electrical parameters of the CK-7041R data acquisition module are the values when $T_{amb}=25^{\circ}C$.

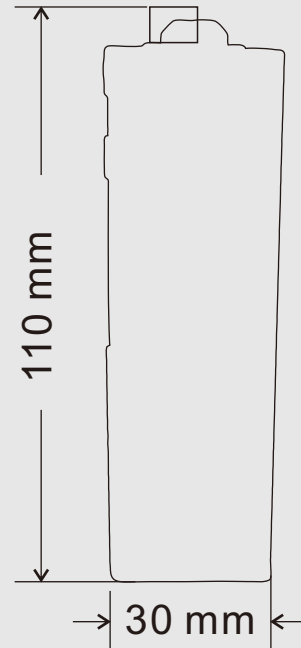
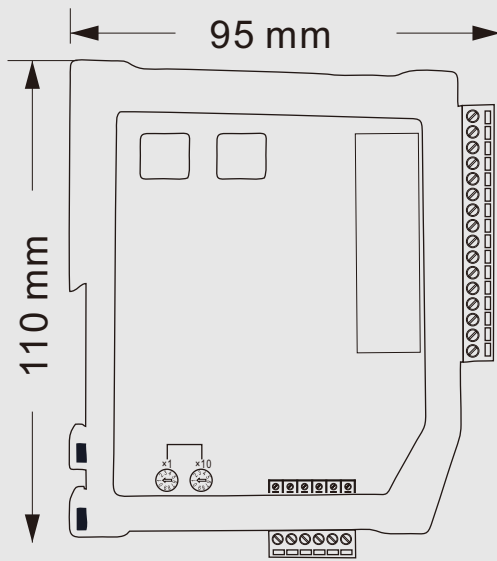
Module parameters

参数	Parameter	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
供电电压	Power Supply	+10	---	+30	V
看门狗复位周期	Watchdog Period		1		S
输入保护	Input Protect		100/60		mA/V

Analog input parameters

参数	Parameter	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
分辨率	Resolution		16		bit
精度	Accuracy		± 0.1		% of SFR
零点漂移	Zero Drift	-50		+50	$\mu V/^{\circ}C$
温度系数	Temperature Coefficient			± 50	ppm/ $^{\circ}C$
非线性	Differential Nonlinearity			± 1	LSB
隔离电压	Isolation Voltage			2500	V dc
输入阻抗	Load Impedance		2M		Ω

Mechanical Dimensions



Installation method

CK-7041R supports DIN35 rail installation. Users can easily install or remove the module on the rail, providing assistance for industrial site application and installation.

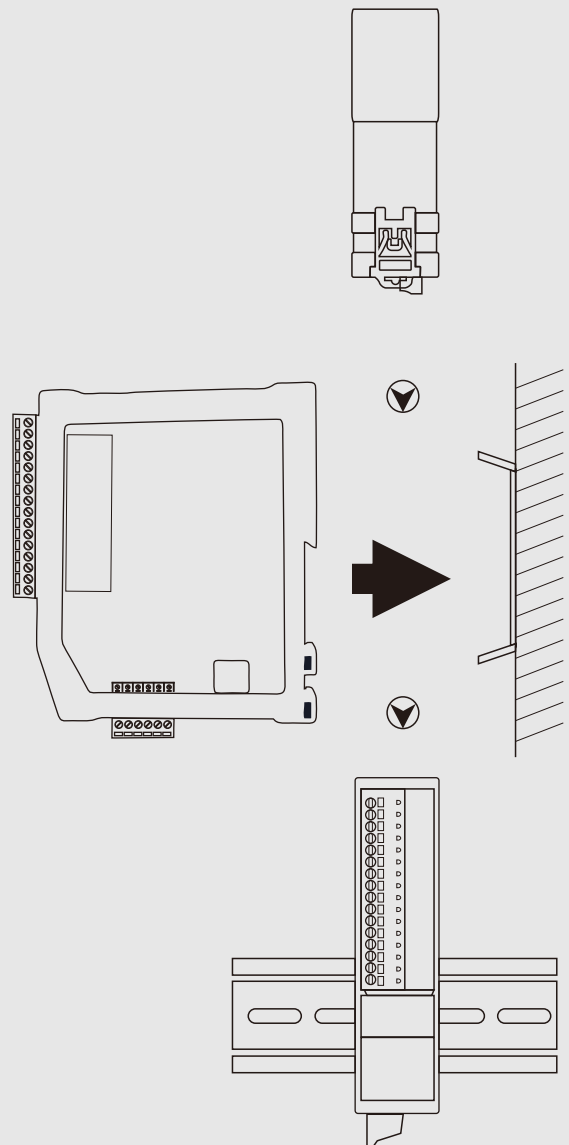
Three guarantees and maintenance instructions

Within five years from the date of sale, if the product is damaged or the product quality is lower than the technical indicators under the conditions of storage, transportation and use, the user can return it to the factory for free repair. If the damage is caused by violation of operating regulations and requirements, the device fee and repair fee shall be paid.

Disclaimer

copyright

The copyright of the product text and related software described in this manual belongs to Shenzhen Chengkong Electronics Co., Ltd., and its property rights are absolutely protected by national laws. Without the authorization of our company, other companies, units, agents and individuals shall not illegally use and copy them, otherwise the company has the right to impose severe sanctions on national laws.



Product Showcase



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Wiring Diagram

